FOSTEX

User's Guide for the *RD-8*

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If you have any suggestions or comments concerning this document, please contact Fostex, 15431 Blackburn Ave., Norwalk, CA 90650.

If you have problems with the operating instructions as stated, or questions about specific operations, please call 1-800-7-FOSTEX between the hours of 8:00 AM and 5:00 PM, Pacific Coast Time.

This is the Second Edition of the User's Guide. May 5, 1995.

The lightning flash with arrow symbol within an equalateral triangle means "electrical caution!" Be alert to all electrical caution messages. They include information about operating voltage and potential risks of electrical shock.

The exclamation point within an equalateral triangle means "caution!" Important operating information is included within caution messages. Read the information next to all caution signs.

Safety Instructions

Please read the following safety instructions before operating the *RD-8*.

Safety Instructions

1 **Obey all warnings on the unit and in the *User's Guide*.**

2 **Do not block ventilation openings.**

3 **Do not place near heat sources, such as radiators, heat registers, or appliances which produce heat, including amplifiers.**

4 **Guard against objects or liquids entering the enclosure and damaging the unit.**

5 **Connect only to AC power outlets rated 100-125V or 200-250V 47-63 Hz. Current ratings should be a minimum of 7A for the 120V rage and 3.5A for the 240V range.**

6 **Never operate the system with the cover removed. Permanent damage could occur.**

7 **Always connect to AC power outlets.**

8 **Group all equipment to reduce ground loops that may occur.**

9 **Do not step on power cords. Do not place items on top of power cords so that they are pinched or leaned on. Pay particular attention to cords at plugs ends and the point where they are attached to the unit.**

10 **Unplug when not in use for extended periods of time.**

11 **For continued protection against fire & circuit damage, replace only with fuse of the same specified voltage and current ratings.**

12 **Do not perform service operations beyond those described in the *User's Guide*. In the following circumstances, repairs should be performed only by qualified service personnel:**

- power supply cord or plug is damaged
- liquid is spilled into the unit
- an object falls into the unit
- the unit does not operate normally or changes in performance in a significant way
- the unit is dropped or the enclosure is damaged

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

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INTRODUCTION

Unpacking the RD-8

Package Contents

BEFORE CONNECTING YOUR RD-8, take inventory of the items in your package. Here is a list of standard equipment shipped with your RD-8.

Package Contents	
RD-8	8-track digital recorder
User's Guide	Operational manual for users
Registration Card	Official registration of ownership
Warranty Info	Warranty Information
Power Cable	Cable for connecting RD-8 to power source
Optical Cable	Cable for connecting digital I/O bus
8313 Remote	Remote control unit

Registration Card

Included with your RD-8 package is a registration card. Please take time right now to fill this out and return it. This ensures that you will be notified of all software and hardware upgrades and new products as they become available.

About This Manual

This reference manual contains all the information you need for using the RD-8 in a variety of production environments. This manual is designed to be as user-friendly as possible, organizing the various features of the RD-8 in an intuitive manner. We ask that you take the time to read it thoroughly once, and familiarize yourself with the table of contents and indices, so that in the future you will know where to find the information you need. In a hurry? We recommend you go to Chapter 2, "Instant Gratification" and get started.

Conventions

Throughout this manual, the names of buttons, menus, LEDs and rear-panel connectors will be spelled out in all capital letters (like CHASE ON/OFF button, or SMPTE OUT jack).

The following icons appear periodically in the left column. They indicate special information.

Name	Description
 Note	Additional, peripheral information concerning the topic being discussed.
 Hint	These are shortcuts or ways for more experienced users to perform a particular operation.
 Caution	Be careful! Important operating information is included within caution messages. Read the information next to all caution signs.
 Electrical Caution	Be alert to all electrical caution messages. They include information about operating voltage and potential risks of electrical shock.

"Engaged" vs. "Disengaged" Tapes

Analog audio recorders typically move tape past the heads at anywhere from 1-7/8 to 30 inches per second. Higher speeds result in a higher *bandwidth*, or an ability to record high-frequency signals.

The RD-8's digital audio signals require much higher bandwidth than analog audio signals. In addition to moving the tape faster than standard S-VHS VCRs, the RD-8 increased the head/drum speed for increased bandwidth.

In contrast to analog multi-track recorders, the tape and rotating heads of the RD-8 remain in contact when the tape is stopped. This allows for going into play or record faster, as well as "cue" and "review" functions that let you monitor the tape audio in fast forward or rewind.

When the tape is "disengaged" (the STOP LED will be flashing), the head is not spinning and it takes slightly longer to go into play or record. This is because the tape moves away from the head in order to prolong tape and head life. Cue and review are not possible while the tape is disengaged, but rewind and fast forward speeds are much faster.

When the tape is engaged and stopped (the STOP LED will remain lit), you can manually disengage it by pressing the STOP button. The STOP LED will flash, indicating the tape is now disengaged. Pressing either PLAY or STOP will re-engage the tape (or by pressing PLAY and RECORD to engage recording).

If the tape is engaged, and no transport activity (play, record, rewind, etc.) occurs for 4 minutes, the tape will automatically disengage itself to minimize tape wear.

About S-VHS Tape

Fostex recommends you use only *premium quality, name brand* S-VHS T-120 or 3M ASD 44+ cassettes. We cannot over stress the importance of this recommendation. The cassette shell, hubs, rollers and tape guides in S-VHS cassettes are precision devices that properly handle and protect the tape loaded into them.

Do not use inexpensive, budget VHS tapes. ONLY USE S-VHS TAPES.

While standard VHS tapes may work technically, their unpredictable quality and less than premium formulation will decrease the reliability of your recording. Don't trust your work to anything less than premium quality S-VHS tape.

Accidents can happen – so, like computer floppy disks and hard disks, your RD-8 tapes should be backed up to prevent loss. Back up your tapes to another RD-8 or ADAT using the fiber optic digital connector (see *Making Backups* in Chapter 4).

Treat your tapes as the precision, fragile components that they are. Do not expose them to extremes of heat, cold, or humidity (in other words, don't leave them in your car). Never place tapes near magnetic fields (such as power amps, TVs, monitors, magnets, etc.) and handle tapes gently.

Front and Rear Panel Diagrams

INSTANT GRATIFICATION

Overview

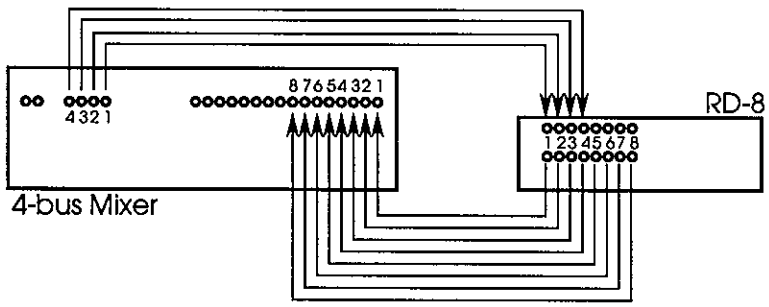
INSTANT GRATIFICATION IS DESIGNED to quickly help you setup the RD-8 so you can be up and running. It contains a basic overview of the main features so you can get familiar with the unit's operation. The RD-8 has more functionality than what is covered in this section. Consult the remainder of this manual for detailed information on topics such as digital bouncing, auto-locating, auto-recording and synchronizing.

Basic Connections

The RD-8 includes eight pairs of unbalanced, RCA jack inputs and outputs, which are compatible with low-impedance, unbalanced, -10 dBV outputs found on mixers, synthesizers, samplers, direct boxes, etc. The best way is to connect the eight buss outputs of your mixer to the inputs of the RD-8, and the RD-8's outputs back to the tape in on your mixer.

The inputs have a unique parallel wiring scheme, which allows either a 2-buss or 4-buss mixer be routed to all eight tracks. For more information, refer to the section entitled *Special Unbalanced Input Jack Wiring* in Chapter 3.

For this example, we will use four bus outputs from the mixer and come back in at the tape returns. Audio sent on buss 1 can be recorded onto tracks 1 and 5; buss 2 can be recorded onto tracks 2 and 6, and so on. This setup requires that your mixer have eight tape return inputs. For information on other ways of connecting the audio inputs and outputs, as well as the other connectors of the RD-8, see Chapter 3.



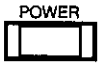
Connecting the audio inputs and outputs

1. **Connect four RCA cables to the Bus 1 through 4 outputs of your mixer.**
2. **Connect the other ends of the RCA cables to the RD-8's unbalanced inputs 1 through 4.**
3. **Connect eight RCA cables to the RD-8 outputs 1 through 8.**
4. **Connect the other ends of the RCA cables to the mixer's tape return inputs 1 through 8.**

Power-up

Connect the power cord which accompanies the RD-8 between the three-prong power socket on the back panel and an AC outlet receptacle. Please note that there are grounding considerations to be aware of. See the section entitled *Power*, in Chapter 3 for more information.

The RD-8 can produce a transient audio signal during power up and power down. When turning the RD-8 on or off, be sure to keep monitor levels low.

Turn the RD-8's power on by pressing the 

button. At power-up the LCD display will look like this:

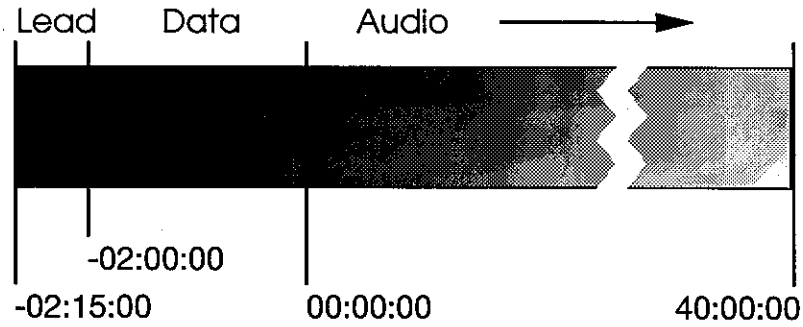
```
FOSTEX RD-8
Copyright 1994
```

If no tape has been inserted, the LED TIME display will show all dashes ("--------"). If a tape is inserted and is already formatted (see next section) the LED TIME display will show the time position the tape is located at. If a tape is inserted and has not been formatted, the LED TIME display will read "noFO", and the FORMAT LED will be flashing.

The RD-8 may need to be Initialized before formatting. Power Down; press REC and PLAY simultaneously; then Power Up.

Formatting A Tape – A MUST!

Formatting prepares a tape for 8 channels of audio, adds a master time reference and sample rate information to the data section. Similar to formatting a floppy disk to use on a computer or sampler, formatting an RD-8 tape time-stamps the tape to single-sample accuracy so that audio is referenced to an accurate time base. This simplifies the synchronization process between RD-8 machines and provides both accurate tape counter readings and intelligent autolocation functions. For more information, see *Tape Formatting* in Chapter 4. After completing the following exercise, we recommend you perform a complete format.



Formatting a tape erases audio on all eight tracks. Be sure to check that the tape is either blank or contains unwanted material before formatting. We recommend that you format your tapes completely from beginning to end.

Before formatting select the sample rate you will be using (either 48 kHz or 44.1 kHz). See page 4-25 for more information .

If you will be using SMPTE Time Code, you must stripe the RD-8 with time code (does not use an audio track). See Section 5 for further information.

Formatting a new tape

1 Insert a fresh, blank tape.

Be sure the tape is completely rewound. The RD8 will acknowledge that this is an unformatted tape; the FORMAT LED will flash while the LED display reads "noFO."

2 Press the FORMAT **button.**

The FORMAT LED will stop flashing and remain lit.

3 Hold ●RECORD **, and then press** ▶PLAY **.**

The RD-8 performs a complete format by recording 15 seconds of leader (the LED display will read "LEAd"), followed by two minutes of data (the display will read "data"), then time code starting at 00:00:00 and continuing to the end of the tape.

During formatting, the LCD will read:

```
Tape Formatting
  In Progress
```

You can record onto tape while formatting. Simply press the TRACK ENABLE button(s) 1–8 for any track(s) you wish to be in record before the formatting process begins. Prepare your source material to start playback at 00:00 on the RD-8 (do not begin recording before 00:00). See next section for more information on setting levels and recording.

The RD-8 is a complex device and, like all microprocessor based devices, is subject to occasional system errors commonly called 'crashes.' In the unfortunate event that this happens, re-initialize your unit (Power Down; press REC and PLAY simultaneously; Power Up) *and note the default settings ilisted in Section 7.*

Making A Recording

Recording on the RD-8 is very similar to most multitrack tape machines. The process involves formatting a tape (see previous tutorial), putting one or more tracks into record-ready, adjusting record levels on your mixer, setting the input monitor mode, locating to the start tape address and engaging record. In this tutorial, we will be recording from the analog audio inputs at the start of the audio portion of the tape (00:00:00). For more information on this and recording from the digital bus, see *Track Record/Monitor Controls* in Chapter 4.

Track Selection and Setting Levels

You'll find the RECORD ENABLE buttons for each of the eight tracks along with the monitor control buttons on the left side of the front panel, beneath the VU meters.

Selecting a track and setting levels

1 Choose a track to record on, and press the track's associated RECORD ENABLE button (1–8).

The selected track's RECORD LED will flash to indicate it is in record-ready.

2 Send an audio signal you wish to record to the track(s) you have placed into record-ready.

Adjust the levels on your mixer so that the average level is at -15 dB on the peak meters of the RD-8 and the loudest section never goes beyond 0 dB. Digital audio recording is very different from analog recording, and therefore requires a different method when setting levels. For more information, see *Setting Levels* in Chapter 4.

Transport Buttons and Time Display

Before recording, you should familiarize yourself with the transport buttons, and the 7-segment TIME display on the right side of the front panel, directly beneath the tape compartment. Ordinarily, the TIME display will show Absolute (ABS) time, that is the exact time reference being read directly off of the formatted tape.

DISP

Pressing the DISP button will advance the display through a series of modes including: ABS Time, Relative Time, LTC (timecode) TAPE, LTC EXT, ABSolute Offset, RELative Offset, and GENerator. A series of LED dot indicators along the top of the display indicate which mode the display is currently in.

Before you start recording, be sure the Time display is set to ABS Time; you will know when ABS Time is selected by the fact that none of the LED dot indicators will be lit along the top of the TIME display. For more information, see *Displays and Basic Editing* in Chapter 4.

During recording and playback, the following transport buttons are used frequently. Familiarize yourself with their functionality by using them while watching the TIME display.

Button	Function
●RECORD	Record; Press with PLAY to initiate recording.
■STOP	Stops transport and disables recording.
▶PLAY	Starts playback. Initiates recording when pressed with RECORD. Stops recording when in record mode; does not stop playback. Press with F.FWD to initiate *cue* mode. Press with REWIND to initiate *review* mode.
◀◀REWIND	High speed reverse. Press with PLAY to initiate *review* mode.
▶▶F.FWD	High speed forward. Press with PLAY to initiate *cue* mode.

Recording

Recording takes place only on tracks that are in record-ready. When you start recording, the RECORD LED lights; the TRACK RECORD LEDS for those tracks in record-ready will stop flashing and remain lit. Press PLAY or STOP to stop recording.

Recording on the tracks

1 Use the ◀◀REWIND or ▶▶F.FWD button to locate to the desired position you wish to record at.

Either the REWIND or FAST FORWARD LED will light (depending on which button was pressed), indicating that the transport is moving in that direction. The TIME display will also be moving either forward or backward to indicate the current tape location status while the transport is in motion.

2 When you've arrived at the desired tape address, press the ■STOP button.

The STOP LED will light.

3 Hold ●RECORD, and then press ▶PLAY.

Both the RECORD and PLAY LEDs will light to indicate you are now recording. For recording "on the fly" (that is, while play is engaged), it is recommended that you hold PLAY and press RECORD.

4a To punch out without stopping, press ▶PLAY.

The RECORD LED will turn off, while the PLAY LED will remain lit.

4b To punch out and stop the transport, press ■STOP.

The RECORD and PLAY LEDs will turn off; the STOP LED will light.

Playback

There are several ways to quickly play back your recording. You'll use the transport buttons first.

Locating and playing back

1 **Press** 

to locate back to a tape position before you engaged recording.

The REWIND LED will light and the TIME display will roll backward to indicate the current tape location status while the transport is in motion.

2 **Once you have arrived at the desired tape address, press the** 

button.

The REWIND LED will turn off and the STOP LED will light.

3 **Press** 

.

The PLAY LED will flash briefly, and then will light to indicate play mode has been engaged.

4 **Press** 

to stop playback.

The PLAY LED will turn off and the STOP LED will light.

Locating

Up to 100 tape positions can be stored for easy recall. These are called cues, and can be stored "on the fly" while playback is engaged, or when the transport is stopped. Once a cue is stored, its location can be edited, and you can even copy positions between cues. For more about locating and related functions, see *Autolocation Controls* in Chapter 4.

Storing cue points

1 Press the LOC button.

The LCD display will change to the Locate Point Modify page. The Locate Number defaults to 00, or the last displayed Locate Memory.

```
00:00:00:00
EDIT LOC00  XFER
```

The display will show the currently selected Locate Memory's tape address. The format of the address depends on the TIME display's mode, as set by using the DISP button. Normally, in ABS Time mode, the display will show four pairs of digits, as above, which are: Minutes: Seconds:Frames:Sub-Frames.

2 Use ▲ and ▼ to select a Locate Memory (L00–L99).

As you scroll through the Locate Memory numbers, the display will change to show each Locate Memory's stored tape address. Continually holding ▲ or ▼ will gradually increase the scroll speed.

3 Press F1 to move the cursor to the top line of the display.

Each time F1 is pressed, the cursor will advance through each field in the locate point address.

4 Use the ▲ and ▼ buttons to adjust each pair of digits in the locate point address as desired.

Storing cue points "on the fly"

1 Press the LOC button.

The LCD display will change to the Locate Point Modify page. The Locate Number defaults to 00, or the last displayed Locate Memory.

```
00:00:00:00
EDIT LOC00 XFER
```

2 Use ▲ and ▼ to select a Locate Memory (L00–L99).

As you scroll through the Locate Memory numbers, the display will change to show each Locate Memory's stored tape address.

3 Press ▶PLAY to engage playback.

4 Press F3 (XFER) when the TIME display reaches the tape location you wish to store.

The current tape position is transferred into the currently selected Locate Memory.

5 Use ▲ and ▼ first to select a different Locate Memory (L00–L99), then press F3 (XFER).

The current tape position is transferred into the new Locate Memory.

6 Press ■STOP to stop playback.

The PLAY LED will turn off and the STOP LED will light.

Locating a cue

1 Press LOC, if not already in the Locate Point Modify page.

If you are already in the Locate Point Modify page, pressing LOC will execute a locate to the currently displayed Locate Memory position. If this happens, press STOP to cancel the locate.

2 Use ▲ and ▼ to select a Locate Memory (L00–L99).

As you scroll through the Locate Memory numbers, the display will change to show each Locate Memory's stored tape address.

```
    03:26:14:63
EDIT LOC01  XFER
```

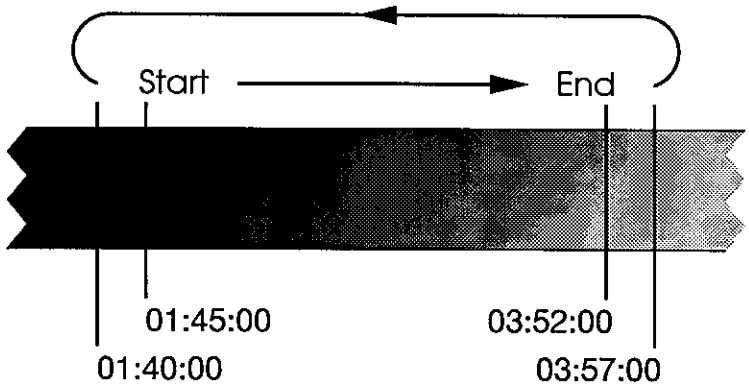
3 Press LOC to locate to the selected Locate Memory's position.

Either FAST FORWARD or REWIND will engaged, as indicated by either button's LED. When the locate function is complete, the transport will stop, and the STOP LED will light. If you wish the transport to automatically go into play after the locate function is complete, turn on Auto Play (see next section).

Creating A Loop

The Auto Return function causes the RD-8 to automatically rewind back to a specified tape position (called the start point) when playback or recording has reached a specified position (called the end point). Both the end point and start point are assignable to any of the 100 Locate Memories or the Mark In or Mark Out positions.

The Auto Play function is used to automatically engage playback whenever a locate function is completed. By using both the Auto Return and Auto Play functions, a loop can be created whereby the same region of tape is repeatedly played back. In the example below, the Auto-Return Start and End points have been set to the Mark In and Mark Out points with positions of 01:45:00 and 03:52:00, respectively. Both Pre-Roll and Post-Roll have been enabled, each set to 5 seconds. Auto Play is also enabled, thus creating a endlessly repeating loop. The figure below illustrates how the transport reacts to these settings. For more information on related functions, see the sections entitled *Autolocation Controls* and *Pre-Roll & Post-Roll* in Chapter 4.



In the following tutorials you will learn how to:

1) set the Auto Play function;
2) enable the Auto Return function; and,
3) create a loop using both the Auto Return and Auto Play functions.

Enabling the Auto Play Function

1 **Press** DATA EDIT .

Both the DATA EDIT LED and the LCD EDIT LED in the TIME display will light, and all other function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 **Press** AUTO REC .

The AUTO REC LED will light and the display will move to the Auto Return/Auto Play edit page.

3 **Press F1 (OFF) to enable Auto Play.**

The bottom left corner of the display will change from "OFF" to "ON", indicating that Auto Play is enabled. When the display reads "off", the function is turned off.

● A-PLAY

When turned on, the A-PLAY LED will light upon exiting Data Edit mode.

4 **Use LOC to execute a locate.**

Refer to the previous section for instructions. When the RD-8 arrives at the corresponding Locate Memory's position, it will automatically engage playback, and the PLAY LED will light.

Setting the Auto Return Function

If you've just completed the previous tutorial, skip to step 3.

1 **Press** DATA EDIT **, if not already turned on.**

The DATA EDIT LED will light, and all other function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 **Press** AUTO REC **, if not already selected.**

The AUTO REC LED will light and the display will move to the Auto Return/Auto Play edit page. If AUTO REC was the last function button pressed before exiting Data Edit mode, it will already be selected upon re-entering Data Edit mode.

```
AutoPlay AutoRtn
  On       Off
```

3 **Press** F1 **(ON) to disable Auto Play.**

O A-PLAY

For this tutorial, we will first use the Auto Return function by itself. When disabled, the A-PLAY LED will turn off upon exiting Edit mode.

4 **Press** F3 **(OFF) to enable Auto Return.**

The bottom right corner of the display will change from "OFF" to "ON", indicating that Auto Return is enabled. The display should look like this:

```
AutoPlay AutoRtn
  Off      On
```

● A-RTN

When enabled, the A-RTN LED will light upon exiting Edit mode.

5 **Press** NEXT .

This will move the LCD display to the Auto Return Address and Destination edit page.

```
End   >  Start
M-Out >  M-In
```

6 **Press** F1.

The value above F1 in the display will now be underlined, indicating that it may now be edited.

7 **Use the ▲ and ▼ buttons to select the Locate Memory (Mark In, Mark Out, L00–L99) you wish the end point to be.**

8 **Press** F3.

The value above F3 in the display will now be underlined, indicating that it may now be edited.

9 **Use the ▲ and ▼ buttons to select the Locate Memory (Mark In, Mark Out, L00–L99) you wish the start point to be.**

10 **Use** LOC **to locate to a position prior to the Auto Return end point and press** ▶PLAY.

Playback will begin. When the Auto Return end point is reached, the tape will be rewound to the specified start position and stop.

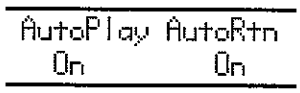
Creating a Loop

1 Repeat steps 1 and 2 in the previous tutorial.

Or, if you've just finished the previous tutorial, hold NEXT and press ▲ to move back to the previous page.

2 Press F1 (OFF) to enable Auto Play.

The bottom left corner of the display will change from "OFF" to "ON", indicating that Auto Play is enabled. When the display reads "off", the function is turned off.



When enabled, the A-PLAY LED will light upon exiting Edit mode.

3 Locate to a position prior to the Auto Return end point.

● A-PLAY

When the locate point is reached, playback will begin. When the Auto Return end point is reached, the tape will be rewound to the specified start position and resume playback.

Pre-Roll & Post-Roll

Pre-Roll and Post-Roll allow you to set up a certain amount of time (up to 25 seconds) by which the transport will overshoot when locating a cue. When you set a Pre-Roll time of 5 seconds, for example, and then locate to a cue set at 00:45:00 (ABS time), the transport will go to 00:40:00. Likewise, if you have the Auto Return point set to 10:23:00 and a Post-Roll of 10 seconds, the Auto Return function won't begin rewinding the tape until 10:33:00 is reached. For more information, see *Pre-roll and Post-Roll* in Chapter 4.

Setting the Pre-Roll time

1 **Press** DATA EDIT **, if not already turned on.**

Both the DATA EDIT LED and the LCD EDIT LED in the TIME display will light, and all other gray function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 **Press** AUTO REC **.**

The AUTO REC LED will light and the display will move to the Auto Return/Auto Play edit page.

3 **Press** NEXT **two times.**

The LCD display will advance to the Pre-Roll Time Set page. The status (on or off) of Pre-Roll is indicated in the upper-right corner of the display, while the current Pre-Roll Time is shown in the middle.

```
PreRoll 05s Off
ON/OFF
```

4 **Press F2 (ON/OFF) to toggle Pre-Roll on and off.**

The upper right display will change from OFF" to "ON", indicating that Pre-Roll has been enabled.

5 **Use the ▲ and ▼ buttons to either raise or lower the Pre-Roll Time in one second increments.**

The value range is 0–25 seconds. The default time is 5 seconds.

Setting the Post-Roll time

1 **Repeat steps 1 and 2 in the previous tutorial.**

This display will show the Pre-Roll Time Set page.

2 **Press NEXT .**

The LCD display will advance to the Post-Roll Time Set page. The status (on or off) of Post-Roll is indicated in the upper-right display, while the current Post-Roll Time is shown in the upper-middle.

```
PostRoll 05s Off
ON/OFF
```

3 **Press F2 (ON/OFF) to toggle Pre-Roll on and off.**

The upper right display will change to "On", indicating that Post-Roll has been enabled.

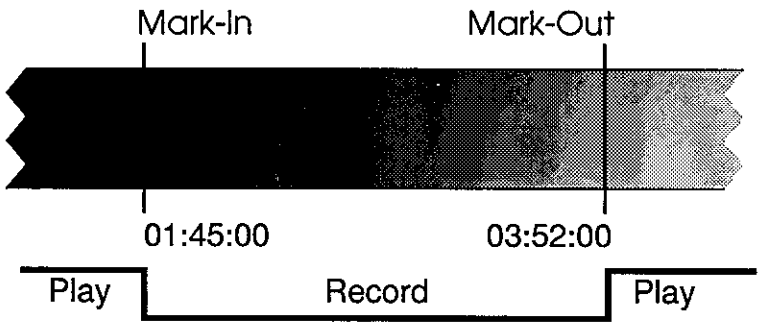
4 **Use the ▲ and ▼ buttons to raise/ lower the Post-Roll Time.**

The value range is 0–25 seconds. The default time is 5 seconds.

Automated Recording

So far, all of your recording has been done manually—you pressed the transport buttons when you wanted to start and stop recording. Auto recording stops and starts recording automatically at predetermined times. This is useful when you want to precisely punch in to a specific place on one or more tracks. You can either "rehearse" an auto-record (by pressing PLAY with AUTO REC turned on) or execute an actual "take" (by pressing both RECORD and PLAY simultaneously with AUTO REC turned on).

In this section, we will be storing the punch points (called Mark In and Mark Out) "on the fly" while playback is engaged. You can, however, manually modify the precise Mark In and Out points. Several other controls not described here make Auto Recording more functional, such as Auto Return, Auto Play, Pre-Roll and Post-Roll. For more information, see *Auto Record* in Chapter 4.



In the following tutorials you will learn how to:

1) set the Mark In and Mark Out points;
2) enable the Auto Record function;
3) exectue a rehearsal ; and,
4) record a take.

Setting the Mark In and Mark Out points

1 **Press** DATA EDIT **, if not already turned on.**

Both the DATA EDIT LED and the LCD EDIT LED in the TIME display will light, and all other gray function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 **Press** MARK IN .

The MARK IN LED will light and the display will move to the Mark In edit page.

```
00:00:00:00
EDIT M-IN  XFER
```

3 **Press** ▶PLAY **to engage playback.**

4 **Press** F3 **(XFER) to capture the current tape location (as indicated by the TIME display) as the Mark In point.**

5 **Press** MARK OUT .

The MARK OUT LED will light and the display will jump to the Mark Out Point Modify page.

```
00:00:00:00
EDIT M-OUT XFER
```

6 **Press** F3 **(XFER) to capture the current tape location (as indicated by the TIME display) as the Mark In point.**

Locating to the Mark In and Mark Out points

1 If the DATA EDIT LED is on, press DATA EDIT to exit Edit mode.

The DATA EDIT LED should be off.

2 Press MARK IN to locate to the current Mark In point.

The transport will execute the locate. While locating, the MARK IN LED will be on. Upon reaching the Mark In point, the MARK IN LED will turn off. If Auto Play is on (see previous section), the RD-8 will automatically engage playback upon reaching the Mark In point.

3 Press MARK OUT to locate to the current Mark Out point.

The transport will execute the locate. While locating, the MARK OUT LED will be on. Upon reaching the Mark Out point, the MARK OUT LED will turn off. If Auto Play is enabled, the RD-8 will automatically engage playback upon reaching the Mark Out point.

Rehearsing

1 Set-up the Auto Return, Auto Play, Pre/Post-Roll functions as desired, and record-enable the track(s) you wish to record on.

2 With the DATA EDIT button turned off (DATA EDIT LED off),

press AUTO REC .

The AUTO REC LED will light.

If AUTO REC is pressed when the Mark In point is set beyond the Mark Out point, the display will momentarily read "Mark In is not before Mark Out" indicating that you will not be able to enable the Auto Rec function. Refer to previous tutorials in this section.

3a ◀◀ REWIND **to a position prior to the Mark In point, and stop.**

While rewinding, the REWIND LED will light. Upon pressing STOP, the REWIND LED will turn off and the STOP LED will light.

3b Alternatively, you can locate to the Mark In point by pressing

MARK IN .

If Pre-Roll is enabled, the RD-8 will locate to a position before the Mark In point (see *Pre-Roll & Post-Roll* earlier in this chapter).

4 Press ▶ PLAY.

The PLAY LED will light. Upon reaching the Mark In point, the AUTO REC LED will begin flashing and any record enabled tracks will switch from monitoring tape to monitoring their inputs. When the Mark OUT point is reached, the AUTO REC LED will light (stop flashing) and any record enabled tracks will switch from monitoring their inputs to monitoring tape.

Recording a take

1 Set-up the Auto Return, Auto Play, Pre/Post-Roll functions as desired, and record-enable the track(s) you wish to record on.

2 With the DATA EDIT button turned off (DATA EDIT LED off),

press AUTO REC  **.**

The AUTO REC LED will light.

If AUTO REC is pressed when the Mark In point is set beyond the Mark Out point, the display will momentarily read "Mark In is not before Mark Out" indicating that you will not be able to enable the Auto Rec function.

3a  **to a position prior to the Mark In point, and stop.**

3b Alternatively, you can locate to the Mark In point by pressing

MARK IN  .

If Pre-Roll is enabled, the RD-8 will locate to a position before the Mark In point (refer to *Pre-Roll & Post-Roll* earlier in this chapter).

4 Hold  **, and then press**  **.**

The PLAY LED will light, and the RECORD LED will flash.

Upon reaching the Mark In point, recording will begin on any record enabled tracks and the RECORD LED will light (stop flashing). Simultaneously, the MARK IN and MARK OUT LEDs will light. If no tracks are record enabled when the Mark In point is reached, the RECORD LED will continue flashing. At any time before the Mark Out point a track may be record enabled, which will cause the track to immediately enter record and the RECORD LED will light (stop flashing). Upon reaching the Mark Out point, recording will cease and the RECORD, MARK IN and MARK OUT LEDs will turn off.

CONNECTIONS

Overview

THIS CHAPTER contains everything you need to know to connect the RD-8 to just about anything, including: power, audio, digital I/O, SMPTE, MIDI, Word Clock, Video, other RD-8s or ADATs, RS-422, Sony 9-pin protocol, Meter Bridge and footswitches. For specific examples of how to connect and use the RD-8 in various applications of the post-production, film and broadcast industries, see Chapter 7.

While great care is taken during design to ensure that installations are as trouble-free as possible, the following guidelines should be noted:

- Keep audio cables separate from AC power cables.
- Avoid running audio cables near sources of electromagnetic interference.
- Avoid multiple earth connections, which can result in hums, buzzes or sometimes radio reception.

Power

The RD-8 works with any voltage from 90 to 250 volts, 50 or 60 Hz. The IEC-spec AC cord is designed to feed an outlet that includes three pins, with the third, round pin connected to ground. The ground connection is an important safety feature designed to keep the chassis of electronic devices such as the RD-8 at ground potential. Unfortunately, the presence of a third pin does not always indicate that an outlet is properly grounded. You can use an AC line tester to determine if the AC outlet is properly connected. When AC currents are suspected of being unstable in VAC or Hz, a professional power conditioner should be used.

Turning on the power

1. **Unwrap the power cable for the unit.**
2. **Locate the AC power plug on the RD-8's back panel.**
3. **Insert the female end of the power cable into the plug.**

4 **Plug the male end into an AC-receptacle outlet.**

5 **Press the** POWER **switch on the lower left corner of the RD-8's front panel.**

The LCD display should look like this:

```
FOSTEX RD-8
Copyright 1994
```

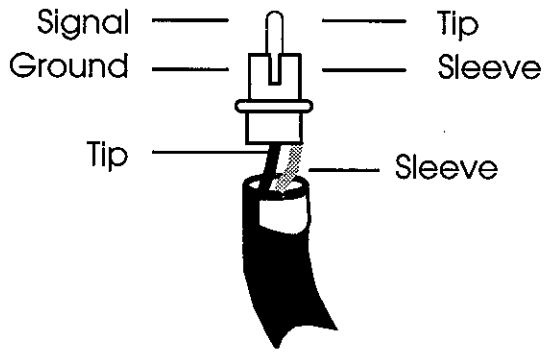
The RD-8 can produce a transient audio signal during power up and power down. When turning the RD-8 on or off, be sure to keep monitor levels down.

Audio – Unbalanced Inputs

Input jack characteristics

The RD-8 includes eight unbalanced, RCA jack inputs. These are compatible with low-impedance, unbalanced, -10 dBV outputs typical of equipment such as mixers, synthesizers, samplers, direct boxes, etc.

The unbalanced input jack wiring convention is as follows:



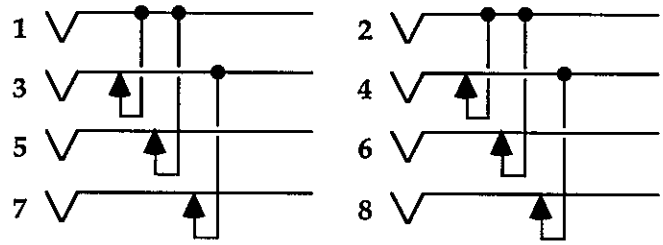
Typical input jack hookups

The input jacks are typically hooked up in one of three ways:

- To a console's direct outs;
- To a mixer's eight bus outputs;
- To a combination of direct outputs and bus outputs.

Special unbalanced input jack wiring

The RD-8's inputs have a unique normalled wiring scheme. Anything you plug into input 1 also feeds inputs 3, 5 and 7; likewise, anything you plug into input 2 also feeds input s 4 , 6 and 8. In addition, input 3 feeds input 7 and input 4 feeds input 8. However, plugging into one of the normalled inputs breaks this connection. The reason for this wiring scheme is to take equal advantage of 2, 4 and 8 bus mixing consoles. If you have two busses, connect them to inputs 1 and 2. If using four busses, connect them to inputs 1 through 4.



When using a 2 bus mixer, connect its two outputs to the RD-8's inputs 1 and 2. Anytime you want to record on an odd number track you will route the signal(s) to bus #1 or left. Likewise, to record onto an even number track, route the signal(s) to bus #2 or right. By simply putting the desired track into record, the proper signal will get there, although not directly connected to the track's input jack.

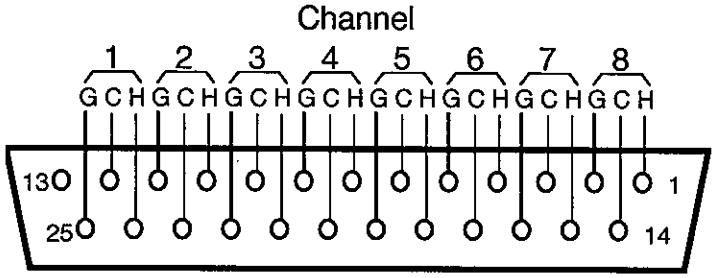
When using a 4 bus mixer, connect its four outputs to the RD-8's inputs 1 through 4. Anytime you want to record on tracks 1 or 5 you will route the signal(s) to bus #1. Likewise, to record onto tracks 2 or 6, route the signal(s) to bus #2, and so on.

Audio – Unbalanced Outputs

The -10 dBV outputs use RCA jacks, and carry signals at a nominal -10 dBV level. These should be connected to your mixer's channel line inputs or tape returns. The unbalanced outputs wiring scheme is similar to that of the unbalanced inputs (see previous section).

Audio – Balanced Inputs and Outputs

The +4 dBu balanced line inputs and outputs use DB25 multipin connectors. Both the unbalanced and balanced inputs and outputs may be used simultaneously. The balanced in/out connector wiring scheme is as follows (G = ground, C = cold, H = hot):



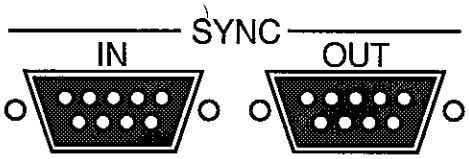
Sync In/Out

The two DB 9 connectors marked SYNC IN and SYNC OUT are used for synchronizing two or more RD-8s together, or a combination of RD-8s and ADATs. This requires a male/male, 9-pin D connector cable for each additional machine in the chain. In such a system, you are basically treating all connected machines as though they were a large multitrack unit. The first RD-8 or ADAT is called the "master", and all other connected units are referred to as "slaves". However, each slave can be used independently when the REMOTE/LOCAL switch is in Local and Remote mode (both the REMOTE and LOCAL LEDs lit).

For more information about using multiple RD-8s and/or ADATs, refer to the section entitled *Multiple Machine Operation* in Chapter 6.

To synchronize multiple RD-8s and/or ADATs

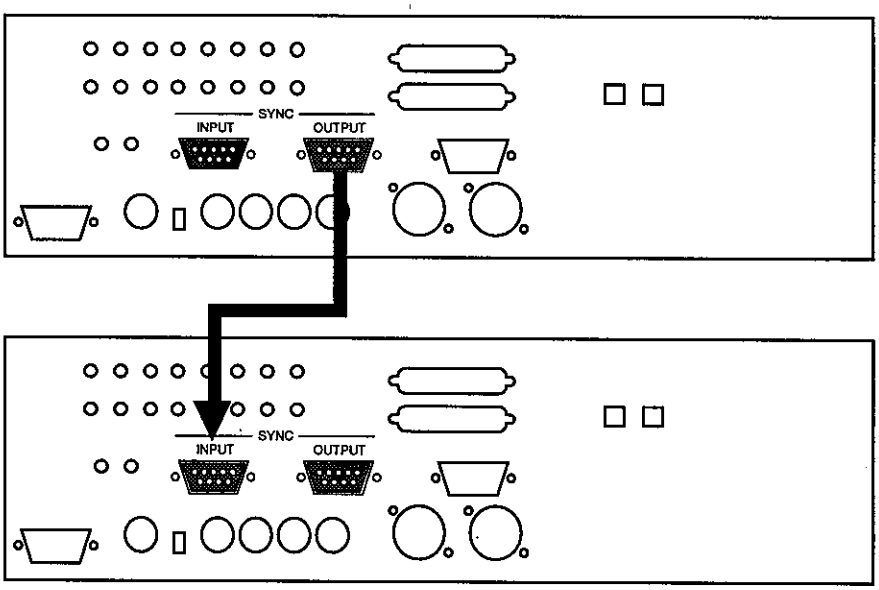
1 **Locate the SYNC IN and SYNC OUT connectors.**



2 **Connect one end of a male/male, 9 pin connector cable to the master's SYNC OUT jack.**

3 **Connect the other end of the cable to the first slave's SYNC IN jack.**

4 **For additional slaves, connect one end of a male/male, 9 pin D connector cable to the first slave's SYNC OUT jack, and the other end to the second slave's SYNC IN jack. Its SYNC OUT jack then connects to the third slave's SYNC IN jack, and so on.**

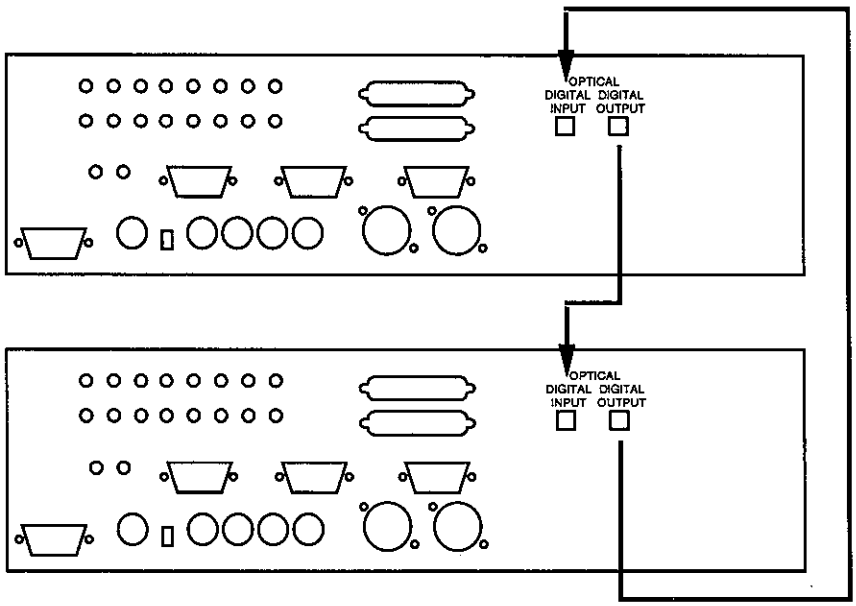


Optical In/Out

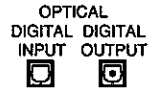
The digital input and output carries all eight tracks on a single fiber optical cable. This allows you to bounce audio within a single RD-8 or between multiple machines within the digital domain. This also lets you route digital audio from the RD-8 to ADAT-compatible products from other companies.

Since the fiber optic connector carries the digital information for all 8 tracks of the RD-8, it is also useful for backing up all tracks in one pass (see *Making Backups* in Chapter 6).

Digital bussing requires a fiber optical cable for each RD-8 in the system (or any other ADAT-compatible product). This connection can be made while power is on or off, and the machines do not need to be turned on in any particular order. To bounce tracks within a single RD-8, connect an optical cable between the DIGITAL INPUT and DIGITAL OUTPUT.



Connecting the digital optical network



1 **Locate the OPTICAL INPUT and OPTICAL OUTPUT connectors.**

2 **Connect one end of the fiber optic cable into the OPTICAL OUTPUT jack of the first machine in the system.**

The cable is non-polarized, so either end can be inserted into the optical output.

3 **Connect the other end of the fiber optic cable to the OPTICAL INPUT of the second machine in the system.**

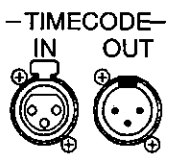
4 **For each additional machine, connect one end of an additional fiber optic cable to the second machine's OPTICAL OUT jack, and the other end to the third machine's OPTICAL IN jack. Its OPTICAL OUT jack then connects to the fourth machine's OPTICAL IN jack, and so on.**

5 **Finally, connect one end of a fiber optic cable to the last machine's OPTICAL OUT jack, and the other end to the first machine's OPTICAL IN jack.**

This last step creates a loop, and thus makes the digital bus accessible to all machines that are connected to it.

Always connect the optical cables in the same order as the sync cables, so that the digital routing will work correctly. Also note that the receiving machine MUST *be set to* WordOpt *(see Page 5.9 for menu navigation).*

Timecode In/Out

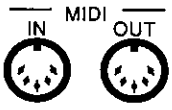


The TIMECODE IN and TIMECODE OUT connectors are XLR balanced jacks. Nominal input level is 3.0V p-p; nominal output level is 2.4v p-p. However, when used with unbalanced connectors, the output signal will not suffer the typical 6 dB loss. Connect a Longitudinal Time Code (LTC) feed to the TIMECODE IN connector when it is required to resolve the speed of the system to timecode, or to chase timecode.

Connect an XLR cable to the TIMECODE OUT connector when it is required for synchronization, external control or to have the RD-8 generate timecode for an external device. The timecode output level is adjustable from the RD-8's front panel. Timecode input is for syncing the RD-8 to an external device that outputs either SMPTE or VITC. Timecode output is for generating SMPTE to synchronize an external device to the RD-8.

For more information about SMPTE and VITC, refer to the sections entitled *Clock Source, Chasing* and *Generator* in Chapter 5.

MIDI In/Out

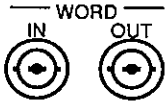


The MIDI IN and MIDI OUT connectors are 5-pin DIN sockets. MIDI input is provided for MIDI Machine Control (MMC) messages., and for uploading/downloading system setup information via MIDI System Exclusive dumps.

Connect a MIDI cable to the MIDI IN socket when you need to control the RD-8 from an external MIDI device or controller. MIDI output is provided for generating MTC and system exclusive messages. Connect a MIDI cable to the MIDI OUT socket when using an external MIDI device that requires MTC, or some type of MIDI System Exclusive data storage device.

For more information about MIDI, refer to the sections entitled *Remote Control* and *MIDI* in Chapter 5.

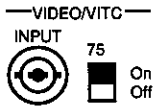
Word Sync In/Out



The WORD SYNC INPUT and WORD SYNC OUTPUT are female BNC sockets. Connect a word clock reference source to this input when you need to resolve the speed of the system to an external digital sample rate signal (word clock). The input can accept a TTL or CMOS level square wave input. Input signals with 50% duty cycle are recommended. The output signal is a 5.0V p-p, 75 TTL level square wave.

For more information about synchronizing to Word clock, refer to the section entitled *Remote Control* in Chapter 5.

Video/VITC In



The VIDEO/VITC IN connector is a female BNC socket. The video input is single ended with an input impedance of >2k ohms and an input signal range of 0.5 – 2.5V p-p. Connect the output of your house sync generator to this input when it is required to resolve the speed of the system to video sync. The video input will accept composite video as well as black burst video inputs. The RD-8 will automatically recognize the type of video signal (NTSC, PAL or SECAM) and its sample clock can be synchronized to the incoming video signal. The input includes a 75 ohm termination switch. Typically, if running a chain of devices all on one video bus, either the first or last device should be terminated. However, if more than one device in the chain is terminated, the signal level drops.

For more information about video sync, refer to the section entitled *Remote Control* in Chapter 5.

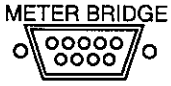
Remote

The RD-8 supports Sony 9 Pin protocol via the REMOTE port, which uses a DB 9-pin connector. Its purpose is for use with a video editor or edit controller, from which the RD-8 will respond to locate references and transport commands. These capabilities are dependent on the master device having Sony 9 pin protocol installed. The RD-8 emulates a BVU950 video tape recorder, for best results select this device driver in the video editor.

Connect a standard RS-422 cable from the 9-pin REMOTE connector on the RD-8' back panel to a control output port on the editor. Connect a video reference signal to the RD-8's VIDEO IN connector. This video can be either composite sync or black burst, at either video or sync levels. This video reference signal should also be connected to the Video In of the editor which is controlling the RD-8 through the REMOTE connector.

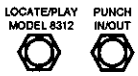
For more information about REMOTE and the Sony 9 pin protocol, refer to the sections entitled *Remote Control* and *Remote* in Chapter 5.

Meter Bridge



The Meter Out connector uses a DB 9-pin connector for hooking up a meter bridge, like the RMB Remote Meter Bridge from Alesis. Please refer to the Meter Bridge Owner's Manual for more information on hook-up and operation.

Footswitches/8312 Remote



The RD-8 provides two footswitch connectors using 1/4" mono (T/S) jacks. One, labeled LOCATE/PLAY MODEL 8312, allows locate and play commands; the other, labeled PUNCH IN/OUT, is for punch in/out control. The two footswitch jack functions are designed to be used with the Fostex 8051 Remote Footswitch, although any momentary single-pole/single-throw footswitch (either normally open or normally closed) will work. These should be plugged in prior to power-up so that the RD-8 can configure itself for the type of footswitch being used.

Either of these footswitch connectors can be used to connect the Model 8312 remote control that comes with the RD-8. You can even connect two Model 8312 remote controls into the RD-8, one in each footswitch jack.

BASIC OPERATIONS AND SETUP

Overview

THIS CHAPTER IS DESIGNED FOR OPERATORS who may not have experience working with digital audio. All functions of the RD-8 (with the exception of synchronization functions) are explained in detail. If you are already familiar with multitrack recording concepts, you may not need to read this chapter. Instead, use the *Operational Reference* chapter to look up specific functions and how to access them.

Power-up, and Tape Insertion

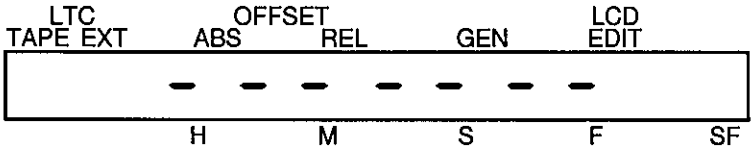
After you've made all the necessary connections, turn the power on. At power-up, the LCD display should look like this:

Next, the RD-8 checks whether a tape has been inserted.

- If a formatted tape is present, the TIME display will show the elapsed time since the beginning of the tape.

- If an unformatted tape is present, the display will read "noFO".

- If there is no tape, the display shows "— — — — —".



Insert the tape with the hinged door end first, label side up, until you encounter a slight bit of resistance. Push gently until the RD-8 draws the tape inward.

To record on a S-VHS cassette, the write protect tab (located on the spine of the cassette) must be intact. If you try to record on a tape that has had the write protect tab broken off, the LCD display will read "Prot" and the RD-8 will not record on the tape. This allows you to prevent accidental erasure of valuable recordings. To record on a tape that has had the tab broken off, simply use a piece of scotch tape, label, etc. in place of the write protect tab to completely cover the hole in the cassette's spine.

Tape Formatting

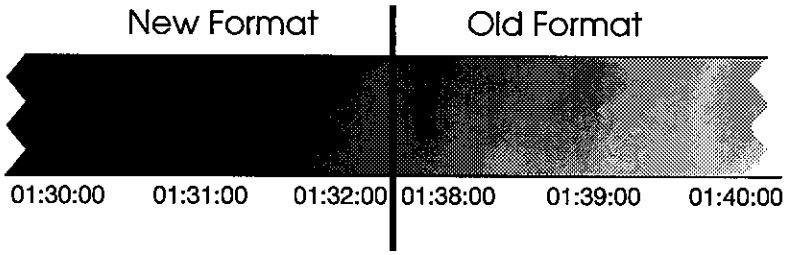
Formatting a tape is a simple yet necessary operation before recording can begin. This process involves recording sample rate information in the data section, and time-stamping the tape with a highly accurate time reference which has greater resolution than SMPTE because of its single-sample resolution. Formatting a tape is what allows accurate synchronization, autolocation and auto recording functions, as well as accurate tape counter readings. You can either format a tape completely before recording, or format while you are recording, or you can extend the format of a tape that was not completely formatted to begin with.

Formatting a tape erases the audio on all 8 tracks. Be sure to label your tapes clearly, so you don't accidentally erase something valuable. We recommend that you completely format your tapes from beginning to end.

Formatting Considerations

- Blank tapes must be rewound to the beginning for formatted.
- Before formatting, select the sample rate that you will be using (either 48 kHz or 44.1 kHz). See page 4-25 for more information.

Caution: *If you re-format over a previously formatted tape, do not stop in the middle of re-formatting. When the tape transitions from the newly-formatted part to the previously formatted part, there will be timing discontinuities and the audio will do unpleasant things. Also, during that transition the tape will be non-functional and you will not be able to record anything over it. When in doubt, either re-format the entire tape, from beginning to end, or back up a bit and perform a format extend (see previous section).*



A discontinuity in the time reference occurs when new formatting gives way to old formatting.

- The only way to stop formatting is to press STOP—punching out is not sufficient.
- Tapes can be bulk-erased with a video tape eraser.
- In a multiple RD-8 setup where one is the master and the other RD-8s are slaves, there are several other considerations. See *Multiple Machine Operation* in Chapter 6.

The auto sample rate detection and selection process only works in the data section of the tape (after the lead).

Complete Format

Formatting or reformatting/erasing an entire tape

1 Insert a fresh, blank tape.

Be sure the tape is completely rewound.

2 Press the FORMAT **button.**

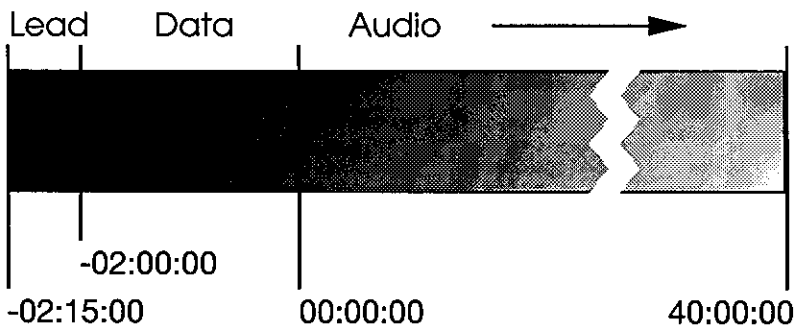
If the tape was unformatted, the FORMAT LED will have been flashing prior to pressing it. Once pressed, the FORMAT LED will stop flashing and remain lit to indicate that formatting will begin if the RD-8 enters record mode. Also, all eight RECORD LEDs will flash to indicate all eight tracks will be recorded. Pressing the eight RECORD buttons has no effect while the FORMAT LED is lit.

3 Hold ●RECORD **and press** ▶PLAY.

The RD-8 briefly enters play mode to achieve proper speed and check if the tape is formatted. The display will read:

```
Tape Format
In Progress
```

The RD-8 performs a complete format by recording 15 seconds of leader (the LED display will read "LEAd"), followed by two minutes of data (the LED display will read "data"), then time reference starting at -00:05 and continuing to the end of the tape.



If an unformatted tape is not at the very beginning, then format is disabled and no recording will take place. Be sure to rewind to the beginning of the tape before formatting it for the first time.

If the tape has been previously formatted and is in the data portion (before 00:00), the tape will be automatically rewound to the beginning of the tape and the RD-8 performs a complete format.

If the tape has been previously formatted and is in the audio portion of tape (past 00:00), the tape will be formatted from that point upon entering record mode (this is called Format Extend).

Recording While Formatting

Audio can be recorded while formatting a tape, just in case you need to record something immediately and have no formatted tapes available. To place a track into record-ready, press the TRACK ENABLE button(s) 1–8 for the track(s) to be recorded. When pressed, the RECORD and INPUT LEDs for the selected track(s) will light. Pressing TRACK ENABLE again takes the track(s) out of record-enable. While formatting, record-enabled tracks will be recorded with audio from the inputs (analog or digital). However, audio will not be recorded until the audio portion of tape is reached (00:00:00). Tracks not record-enabled while formatting will be recorded with silence.

End of Format Search

When working with a partially formatted tape, the End of Format Search function will locate the section of tape where formatting ends. This makes it easy to perform a format extend (see next section). An EOF search can be initiated by accessing the End of Format Search page.

Executing an End of Format Search

1 Press DATA EDIT, if not already turned on.

The DATA EDIT LED will light, and all other gray function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 **Press** FORMAT .

The FORMAT LED will light and the display will move to the End of Format Search page.

```
Find format end
        EXECUTE
```

3 **Press** F1 **(EXECUTE) to initiate an End of Format Search.**

If the tape is currently positioned within the formatted portion, the transport will engage fast forward until an unformatted section is reached. At this point, the tape is rewound for 10 seconds and stops. If the tape is currently positioned within the unformatted portion when an EOF search is executed, the transport will engage rewind until a formatted section is reached, whereupon the tape is stopped.

4 **It is recommended to perform a Format Extend at this time (see next section).**

When using format extend, allow 10 seconds of silence after the last second of audio.

Format Extend

It's always a good idea to format a tape from beginning to end, but this isn't always possible (see illustrations on page 4-6 and 4-7). It is possible to extend the formatting on a tape that has only been partially formatted. To extend the format on a partially formatted tape, enter format mode before the end of the previously formatted section, or use the EOF (end of format) search (see previous section). The RD-8 reads the time reference from tape and begins formatting starting from that time onward; this insures continuous time-stamping when a tape plays from beginning to end. Everything on the tape from that point on will be erased.

There is one exception, however. If the tape is already formatted but is in the leader or data sections of the tape (i.e., prior to time 00:00:00), entering format mode will automatically rewind the tape to the begin-

ning and start reformatting. While rewinding, the LED TIME display will read "FO" (format over) and the REWIND LED will flash. This indication is telling you that the RD-8 must format over from the LEAD or beginning portion of the tape.

When performing a format extend, the RD-8 begins "time-stamping" from the last valid time-stamp it reads from tape. This allows a partially formatted tape to have its format extended by entering format mode before the end of the previously formatted section. For safety purposes, label your tape. You don't want your tape confused with a standard video tape.

Displays and Basic Editing

Let's take a look at the group of buttons that are used for setting up the RD-8. These include the two displays, and the following buttons: DISP, DATA EDIT, HOME, NEXT, F1, F2, F3, ▲ and ▼, and CURSOR.

The RD-8 has two displays. The first is a 7 segment LED type, called the TIME display, which is used to display tape position and time code status. The other is an LCD type used for viewing and editing various functions and their parameters.

TIME Display & DISPlay Button

The TIME display (found on the far right of the front panel) is used to indicate the current tape position.

DISP

The DISP button advances the TIME display through a cycle of modes. Each time the button is pressed, a different mode is selected. Along the top of the TIME display are several LED dots which indicate which mode the display is in and the type of time code being displayed. When none of these LEDs are lit, ABS Time is being displayed. An "r" on the left indicates Relative Time.

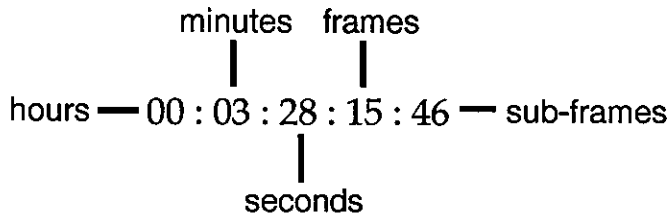
The Locate points ' addresses are displayed in the format of the display mode you've selected.

See the *Autolocation* section later in this chapter for more information about the difference between ABS Time and Relative Time.

The TIME display's cycle of modes is as follows:

- TIME-ABS — Absolute Time: This is the RD-8's time reference, which is created when a tape is formatted.
- TIME-REL — Relative Time: This is based on the RD-8's time reference of a formatted time, but is relative to where the tape was positioned when RESET was pressed last.
- LTC-TAPE — Tape Timecode: Timecode which has been recorded onto the TC track of the RD-8 tape.
- LTC-EXT — External Timecode: Timecode, such as SMPTE or VITC, being received from an external source.
- OFFSET-ABS — Absolute Offset: This is based on the RD-8's current offset relative to the timecode reference of a formatted tape.
- OFFSET-REL — Relative Offset: This is how far off the tape is from where it should be. When the machine is synchronizing to external timecode, this number will be "00:00:00:00" when the RD-8 is locked to the correct location.
- GEN — Generator: Current status of the Generator's timecode output.

The TIME display in ABS Time or Relative Time modes indicates time code in hours:minutes:seconds:frames. When displaying SMPTE time code (either internal or external) or an offset, an additional unit, sub-frames, is also indicated. When the TIME display is in the Generator mode, pressing DISP cycles you back to ABS Time mode. For more information on the different TIME display modes, see Chapter 5.



RESET Button

RESET

Pressing the RESET button sets the current tape position to 00:00:00 Relative Time. In Relative Time mode, the TIME display indicates a small "r" to the left of the address.

LCD Display

The LCD display is where all setup and editing occurs. The various parameters of the RD-8 are found on separate "pages." Pages containing related parameters (like all auto-record functions) are grouped into sub-menus. These sub-menus are accessed by using the DATA EDIT button (see below). Seven buttons on the front panel help you navigate through these pages, including: HOME, NEXT, ▲, ▼, F1, F2, and F3. When you simultaneously press the HOME and NEXT buttons, the LCD will move to the first page of the Main Function Menu.

Whenever you are in the Main Function Menu or some other sub-menu of pages, each time you press the NEXT button the display will advance to the next page in the menu. The Main Function Menu has 8

pages in all. To move back to a previous page, hold the NEXT button and press ▲. Press the HOME button to return to the first page of the current menu. Use the FUNCTION buttons (F1, F2, F3) to select an item in the display or change a value (see below).

LCD Contrast

Occasionally, the characters in the display may be difficult to read, depending on existing lighting conditions and the placement of the RD-8. If this is the case, adjust the LCD contrast in the following manner.

Adjusting LCD contrast

1 Simultaneously press HOME and NEXT .

The LCD will display the first page of the Main Function menu.

2 Press NEXT seven times.

This selects the eighth page of the Main Functions menu.

```
MAIN MENU     8
Tape Length LCD
```

3 Press F3 (LCD).

This moves the display to the LCD Contrast page. The current setting will be displayed in the upper right corner, and will have an underline beneath it indicating it is ready for editing.

```
LCD Contrast: 5
```

4 Use ▲ and ▼ to adjust contrastbetween 0 and9, as needed.

As the value is adjusted, the screen contrast will adjust accordingly.

DATA EDIT Button

The DATA EDIT button is used to access and edit various function parameters. When pressed, its LED will light indicating you are now in Data Edit mode. and all other function button's LEDs turn off except that of the last function selected in DATA EDIT mode. At this point, you can press any one of the gray function buttons to view and/or edit parameter settings in the LCD display. For example, by pressing DATA EDIT and then pressing the CHASE ON/OFF button, the display changes to the Chase Settings menu.

While the DATA EDIT LED is still on, you can press any other gray function button to access its parameter(s). Press DATA EDIT again to exit Data Edit mode; the DATA EDIT LED will turn off. Pressing a gray button now will toggle that function on or off. The next time DATA EDIT is turned on, the display will return to the last page you were in before exiting Data Edit mode.

The DATA EDIT button works with the following buttons:

- FORMAT –> End of Format Search Page
- TRACK ENABLES 1–8 –> Track Slip Page
- GEN SET-UP –> Generator Menu
- CHASE ON/OFF –> Chase Settings Menu
- VARI SPEED –> Vari Speed Edit Page
- REMOTE LOCAL –> Remote Menu
- DIGITAL IN –> Digital In Channel Assignment Page
- AUTO REC –> Auto Record Menu
- MARK IN –> Mark In Edit Page
- MARK OUT –> Mark Out Edit Page
- LOC –> Locate Menu (entering this menu automatically exits Data Edit mode)

As long as you are in Data Edit mode (DATA EDIT LED lit), pressing one of the buttons listed above will either display the currently stored value(s) for that function or access that function's menu, and will *not* toggle the function on and off.

To exit Data Edit mode, press the DATA EDIT button again, or press the LOC button or simultaneously press HOME and NEXT (this takes you into the Main Function menu; see next section). The DATA EDIT LED will turn off, indicating that you are no longer in Data Edit mode. Pressing the MARK IN or MARK OUT buttons on the 8312 Remote Control will also cause the RD-8 to exit Data Edit mode, and cue to the Mark In or Mark Out point, depending on which button is pressed.

For a detailed illustration of the order of pages within each Data Edit Function button and how to navigate through them, see the separate *LCD Display Pages* reference card that accompanies this manual.

While in Data Edit mode, only the currently selected button's LED will be lit (along with the DATA EDIT LED). The current on/off status of all other gray buttons is retained, but is not visible on the LEDs until Data Edit mode is exited.

HOME/NEXT Buttons

The HOME and NEXT buttons are used to navigate through the various editing pages in the LCD display.

- Simultaneously press both HOME and NEXT to return to the first page of the Main Function menu. If you were in Data Edit mode (DATA EDIT LED lit), you will automatically exit Data Edit mode and the DATA EDIT LED will turn off.
- Press HOME to return to the first page of the menu.
- Press NEXT to advance the display to the next page in the current menu.
- Hold NEXT and press ▲ to move back to the previous page in the current menu.

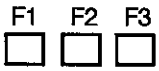
All the Main Function Menu's sub-menus are linked. This means

once you select a sub-menu from the Main Function Menu, you can use the NEXT button to move between the various sub-menus.

Example: In the first page of the Main Function Menu, you'll see two options: "SmpRate" (Sample Rate) and "Pull+/-" (Pull-Up & Pull-Down). If you press F1 to select SmpRate, you will be in the Sample Rate page. Press NEXT to go to the Pull-Up & Pull-Down page. Press NEXT again to go to the MIDI Sysex Dump page, and so on.

For a detailed illustration of the order of Main Function Menu, its sub-menus, and how to navigate through them, see the separate *LCD Display Pages* reference card that accompanies this manual.

F1, F2, and F3



The F1, F2 and F3 buttons (located directly beneath the LCD display) are used to select items which appear on the bottom line of the LCD display. Their function changes depending on the current page being displayed. For example, in the first page of the Main Functions Menu, pressing the F1 button will call up the Sample Rate page.

When a value or function is displayed in the lower half of the LCD display, pressing the F button below it will select it (as indicated by an underline appearing below the item in the display). The ▲ and ▼ buttons may now be used to change the value of the selected item.

▲▼ Buttons

The ▲ and ▼ buttons are used to increment or decrement parameter setting by single values. They are used to edit values in either the LCD display. By holding either button, the increment or decrement value increases its speed.

If the NEXT button is held while pressing the ▲ button, the display will move backwards to the previous page in the current menu.

Cursor Button

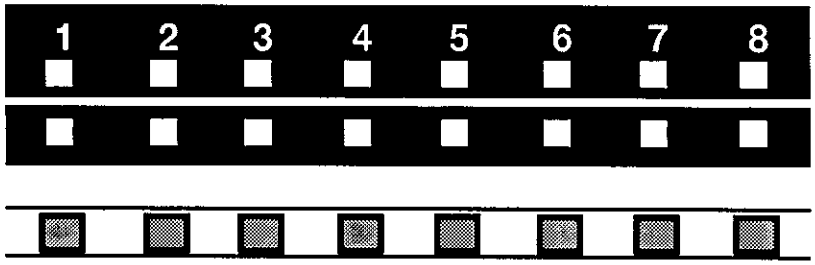
The CURSOR button lets you advance the cursor in the LCD display when multiple fields are available for editing, such as a machine offset value. This button only functions if there is a parameter underlined, and there is at least one additional parameter in the current display that can be selected for editing with the ▲ and ▼ buttons.

Track Record/Monitor Controls

The following controls determine which tracks will be recorded on in record mode, and whether the tracks will monitor the input signal or the audio on tape.

Record Enable

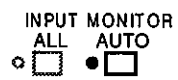
To record enable a track, press the track's RECORD ENABLE button.



When you press a track's RECORD ENABLE button for the first time, the track's RECORD LED will flash, indicating the track is in record-ready, and its INPUT LED will light, indicating you will be able to monitor that track's input. If the transport is put into record mode (see *Transport Controls* in this chapter), recording will begin; the track's RECORD LED will stop flashing and remain lit. To disable record-ready, press the track's RECORD ENABLE button once again. The track's RECORD LED will turn off.

RECORD ENABLE buttons can be turned on or off while you are in record mode.

Auto Input Monitor



The AUTO INPUT MONITOR button toggles between two tape/input monitoring options. When a track is monitoring its input signal, its INPUT LED will be lit.

- When the AUTO INPUT MONITOR button is off (its LED is off), all record-enabled tracks will monitor the input signal and all other tracks will monitor the taped signal.

- When the AUTO INPUT MONITOR button is on (its LED is on), it allows input monitoring of record enabled tracks while in record, stop, rewind or fast forward; but not in play.

The reason for having these two options is to accommodate different stages of the recording process. Auto Input Monitor Off is the "normal" option and is what you would use when first recording tracks. When performing punch-ins and overdubs, Auto Input Monitor will probably be On so that you can hear what was recorded on tape for a given track right up to the point you want to punch in. As soon as the RD-8 punches into record mode, the tape signal is replaced by the input signal so you can hear what's being recorded to tape. After you punch-out, the monitor reverts to tape.

All Input Monitor

When the ALL INPUT MONITOR button is on (its LED is lit), the Auto Input Monitor setting is overridden so that all tracks monitor their input signals regardless of their record enable status. All eight track INPUT LEDs will be lit. When ALL INPUT MONITOR is off (its LED will be off), the Auto Input Monitor setting determines track monitoring.

The following table indicates the status of tracks that are record-enabled and tracks that are not depending onthe status of the AUTO INPUT MONITOR and ALL INPUT MONITOR buttons.

Record-enabled tracks = ■ ; Tracks not record-enabled = ❑

Transport Function	Auto = Off All = Off	Auto = On All = Off	Auto = Off/On All = On
Stop,Pause, Rew.,F.Fwd	■ = Input ❑ = Tape	■ = Input ❑ = Tape	■ = Input ❑ = Input
Play	■ = Input ❑ = Tape	■ = Tape ❑ = Tape	■ = Input ❑ = Input
Record	■ = Input ❑ = Tape	■ = Input ❑ = Tape	■ = Input ❑ = Input

Another way of turning either AUTO INPUT MONITOR or ALL INPUT MONITOR on or off is by using the dedicated buttons on the Model 8312 remote control (for more information, refer to the section entitled Remote Control *in Chapter 5).*

Digital Input

DIGITAL IN

The DIGITAL IN button determines whether the RD-8 will record from its analog or digital input. The digital input can be used to record from another RD or ADAT compatible optical signal.

To record from the digital input, press the DIGITAL IN button (its LED will light). All eight channels will be received via the fiber optic connection (see *Digital In/Out* in Chapter 3) and the analog inputs will be ignored. For more information about recording from the digital input and digital track bouncing, refer to Chapter 7.

Setting Levels

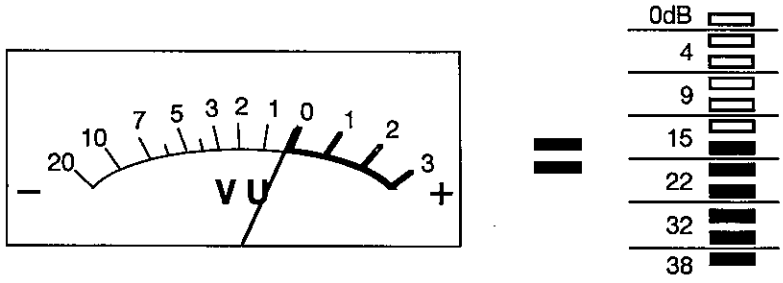
Unlike analog tape recorders, where signals routinely exceed 0 dB with no apparent ill effects, 0 dB on the RD-8 represents the maximum possible signal level. Signals above 0 dB will be clipped and lead to digital distortion.

Because of the limitations of analog tape, there is always a tradeoff between noise, level and distortion. More level improves the signal-to-noise ratio, but also increases distortion. This distortion increases linearly, which is why signal-to-noise is often specified for a certain amount of distortion (typically 3%). You can always record with hotter levels or softer levels, but either more distortion or more noise will result—with analog, you can't have low noise, high levels and low distortion.

With digital recording, there is a much wider dynamic range, and distortion does not increase with increasing level. Yet once a digital system runs out of headroom and hits 0 dB, that's it—the onset of distortion is immediate and very noticeable. As a result, because of the RD-8's signal to noise characteristics, it's better to err on the side of setting levels not quite high enough rather than having them distort, especially in live recording when you don't get a second chance. To insure against overload, consider using a limiter on the input signal.

However, since 0dB on the RD-8 equals the maximum level, the input reference level is set below 0 VU. With the RD-8, a 0 VU signal on a +4 dBu mixer plugged into the RD-8's +4 dBu connectors (or a 0 VU signal on a -10 dBV mixer plugged into the RD-8's -10 dBV connectors) will register -15 dB on the RD-8's meters. Therefore, you can run the

mixer over 0 VU and still have 15 dB of headroom on the RD-8 before distortion occurs. Just remember that no matter what, if the RD-8's meters indicate over 0 dB, distortion is occurring or is on the verge of occurring.

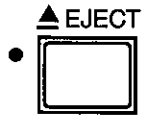


Be sure the output level of your mixer matches the inputs connected to the RD-8 (+4 or -10).

Transport Controls

The RD-8's six transport control buttons resemble those of a conventional tape recorder, although there are several extra features.

Eject



Press the EJECT button to eject the tape from the RD-8. If the tape is moving, it will stop before ejecting. In a multiple RD-8 system where there is one master and one or more slave RD-8s and/or ADATs, pressing EJECT on the master will eject the tapes on all machines; pressing EJECT on a slave machine will only eject the tape on that machine.

The EJECT button will not operate while recording or formatting to avoid interrupting these processes.

Rewind/Review

Press the REWIND button to rewind the tape, as confirmed by the REWIND LED. When fully rewound, the REWIND LED turns off and the STOP LED lights.

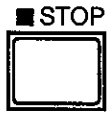
- Pressing REWIND while recording punches out before rewinding.
- Engaged tapes rewind at about ten times normal speed. Disengaged tapes rewind at about twenty times normal speed.
- Pressing REWIND while holding the PLAY button initiates "Review" mode. The tape rewinds at about three times normal speed, and you can hear chunks of attenuated audio so you know where you are on the tape. The PLAY LED will be lit, and the REWIND LED will be flashing. Pressing F FWD reverses the direction; this is called "Cue" mode (see next section). Pressing the PLAY button alone returns the transport to normal play mode.
- While in "Review" mode, pressing both REWIND and F FWD causes the transport to stop.

Fast Forward/Cue

Press the F FWD button to fast forward the tape, as confirmed by the F FWD LED. Upon reaching the tape's end, the F FWD LED turns off, and the STOP LED lights.

- Pressing F FWD while recording punches out before fast forwarding.
- Engaged tapes fast forward at about ten times normal speed. Disengaged tapes fast forward much faster.
- Pressing F FWD while holding the PLAY button initiates "Cue" mode. The tape fast forwards at about three times normal speed, and you can hear chunks of attenuated audio so you know where you are on the tape. The PLAY LED will be lit, and the F FWD LED will be flashing. Pressing REWIND reverses the direction; this is called "Review" mode (see previous section). Pressing the PLAY button alone returns the transport to normal play mode.
- While in "Cue"mode, pressing both REWIND and F FWD causes the transport to stop.

Stop



The STOP button performs three functions.

- **Stop the transport.** Push STOP to stop any function involving tape motion. A lit STOP LED indicates that the tape is not moving and is engaged. A flashing STOP LED indicates that the tape is not moving and is disengaged.
- **Disengage/engage the tape.** While the STOP LED is lit, press STOP again to disengage the tape (STOP LED flashes). While the STOP LED is flashing, press STOP again to engage the tape (STOP LED is lit). Entering play or record more will also engage the tape, if it was previously disengaged.
- **Punch out.** While recording,, pressing STOP exits record mode and stops.

Play

Press the PLAY button to play the tape. The PLAY button by itself has no effect while playing, but it will terminate recording or formatting.

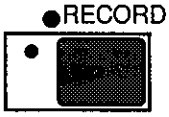
While locating, pressing PLAY will cause the RD-8 to start playing after finding the location (PLAY LED will flash).

Pressing PLAY while recording causes the RD-8 to punch out (recording stops and playback continues). Pressing PLAY in any mode other than locating causes the transport to enter play mode, and the PLAY LED lights.

What occurs when you press PLAY after inserting a tape in the RD-8 depends on whether the tape being played is formatted or not.

- **Formatted.** The tape plays normally and the tape counter shows elapsed time since the beginning of the tape.
- **Unformatted tape.** The RD-8 will detect the lack of a format and flash the FORMAT LED while reading "noFO" in the LED display.
- **Tape transitions from a formatted to unformatted section while playing back.** The RD-8 will detect the lack of a format and flash the FORMAT LED while reading "noFO" in the LED display.
- **Tape transitions from a formatted to unformatted section while recording.** The RD-8 will detect the lack of a format and stop.

Record/Punch In or Out



Use the RECORD button to enter or exit record mode, and to format a tape. There are two methods of entering record mode. You can first enable the tracks you wish to record on and then engage recording using the PLAY and RECORD buttons. Or you can engage record mode and then use the TRACK ENABLE buttons to place tracks in or out of record. If no tracks are enabled for recording and record mode is engaged, the RECORD LED will flash. When at least one track is enabled for recording and record mode is engaged, the RECORD LED will light (instead of flashing).

To start recording:

- Hold PLAY and press RECORD to cause any record-enabled track to enter record mode. This is recommended for punching "on the fly."
- Hold RECORD and press PLAY to cause any record-enabled track to enter record mode. This is recommended for initiating recording when the tape is stopped, or for punching "on the fly."

To punch out and stop the transport, simply press STOP. There are three ways to exit record mode (punch out) yet have the transport continue to play; use whichever method is most natural to you.

- Press PLAY.
- Hold RECORD, and then press PLAY.
- Use the TRACK ENABLE buttons to take tracks out of record.

Record Crossfade Time

Crossfading is the process of fading out the original audio on tape while fading in the new audio when punching in (or vice-versa when punching out). Whenever recording begins or ends, the RD-8 provides a smooth transition between the audio on tape and the audio being recorded. This provides for a smooth transition between the old and the new audio when punching in and out of record.

The Record Crossfade Time setting determines how long it takes for

the audio to completely transition from the previous audio to the current audio when recording. The default is 11 milliseconds but can be increased to 43 ms. The faster crossfade time allows you to punch in and out quicker, and is best used when the audio on tape is similar to the audio you are recording. The longer crossfade time allows for a smoother transition and is more useful when punching in new material that is very different from what is already on tape. Crossfading always begins at the punch point and continues for the amount of time you have specified.

Setting the Crossfade Time

1 Simultaneously press HOME and NEXT .

2 Press NEXT five times.

This selects the sixth page of the Main Function Menu.

```
MAIN MENU      6
Xfade      MMCOut
```

3 Press F1 (Xfade).

This selects the Crossfade Time page. The current setting will be displayed in the upper right corner, and will have an underline beneath it indicating it is ready for editing.

```
XfadeTime 11 ms
```

4 Use ▲ and ▼ to Select either 11, 21, 32 and 43 ms.

These time values assume a playback rate of 48KHz, and are therefore not exact if the Vari Speed amount is changed, or an external clock source is used. If you are running at 44.1 KHz, the available crossfade times are 12, 23, 35 and 46 ms.

Sample Rate (Fs)

The RD-8 records digital audio in the same manner as a DAT recorder or digital sampler. You may select between two sample rates when recording: 48 kHz and 44.1 kHz. Select the sample rate to match the balance of the recording system you are connected to.

Fs (kHz)
● 48
○ 44.1

The currently selected sample rate is indicated by the two LEDs labeled FS (kHz). When the 44.1 LED is on, the RD-8 is set to 44.1 kHz. When the 48 LED is on, the 48 kHz setting is in use. Only one of these LEDs will be lit. The default setting is 48 kHz.

The auto sample rate detection and selection process only works in the data section of the tape (after the lead).

Selecting the sample rate

1 Simultaneously press HOME and NEXT .

2 Press F1 (SmpRate).

This will advance the display to the Sample Rate page. The currently selected sample rate will be displayed in the upper right corner.

3 Press either the F1 or F3 button to select 44.1K or 48K.

The corresponding LED will light and the value in the upper right corner of the display will change accordingly, depending on the selection you make.

Pull-Up & Pull-Down

As stated in the previous section, the RD-8's sample rate is adjustable between 48 kHz and 44.1 kHz (see above). However, for film to video transfers the sample rate must be changed to compensate for timing differences between film and video formats. This can be done using the Pull-Up & Pull-Down function, which can either raise or lower the selected sample rate by .1%. For example, if you recorded everything at 44.1 kHz while locked to film, and then you transferred to NTSC video, the sample rate would have to be "pulled-down". The result would be that all your recordings will run a little slower. The Pull-Up & Pull-Down function changes the speed of the tape plus or minus .1% without changing the timecode format.

Adjusting Pull-Up & Pull-Down

1 **Simultaneously press** HOME **and** NEXT **.**

2 **Press** F3 **(Pull+/-).**

The display will move to the Sample Rate Pull Up/Down page.

3 **Press** F2 **(UP) pull-up the sample rate by .1%.**

4 **Press** F3 **(DOWN) to pull-down the sample rate by .1%**

5 **Press** F1 **(OFF) to reset the sample rate pull up/down to 0% (no change).**

Vari Speed Controls

Vari Speed is a function which controls the tape's speed, and thus the pitch of the audio recorded on it. The RD-8'sVari Speed control has a range of ±6%, or -100 to 100 cents. However, unlike Sample Rate Pull Up/Down, the SMPTE output is also affected by the Vari Speed amount. Vari Speed does not function while locking to an external clock.

The VARI SPEED button toggles the Vari Speed function on and off. When pressed, the VARI SPEED LED turns on, and the LCD display immediately moves to the Vari Speed Edit page. The Vari Speed amount may displayed in either a percentage (%) or as cents.

Setting the Vari Speed amount

1 **Press DATA EDIT, if not already turned on.**

Both the DATA EDIT LED and the LCD EDIT LEDT inthe TIME display will light, and all other gray function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 **Press VARI SPEED.**

The VARI SPEED LED will light and the display will enter the Vari Speed Edit page.

```
VariSpeed +0.0%
          PERCENT
```

3 **Use ▲ and ▼ to adjust the Vari Speed from -6.0% to +6.0%.**

4 **Press F3 to toggle the display between Percentage and Cents.**

When turning on the Vari Speed button, the speed will not change instantaneously, but will change at a fixed rate to the new setting.

Track Slip

Track Slip lets you delay individual tracks up to 170 ms, in order to achieve a more desirable "feel." For example, if the bass track is anticipating the beat, you can push it back so it's "in the pocket" by delaying it a few milliseconds. If you need one track to play back earlier than the others, try offsetting all other tracks by the same amount. This will make the remaining track appear to be playing ahead of the others. Track Slip is also useful for moving sound effects. For example, you could move a door-slam to get a better "feel."

● T.SLIP

Track Slip times are set individually per track in the Track Slip Edit page. When any tracks have a slip setting greater than 0, the T.SLIP LED will be lit. When all tracks have a slip time of 0, the T.SLIP LED will be off.

Setting the Track Slip amount

1 **Press ● DATA EDIT, if not already turned on.**

The DATA EDIT LED will light, and all other gray function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 **Press one of the eight TRACK ENABLE buttons (1–8).**

The selected track's RECORD LED will light and the display will advance to the Track Slip edit page. The slip amount of the track you selected will be shown in the upper right corner. Press a different TRACK ENABLE button to select another track (1–8) to edit.

```
Tr1 Slip 000.0ms
EDIT  CLEAR  CMP
```

The first digit of the Track Slip time will be underlined.

3 **Press F1 (EDIT) to advance the underline through each digit.**

4 **Use ▲ and ▼ to adjust the Track Slip time.**

Holding either button for 2 or more seconds will cause them to scroll faster. After holding them for more than 7 seconds, they will scroll yet even faster.

5 **Press F3 (CMP) to compare the new Track Slip amount to the previous setting.**

Press F3 again to switch back to the new setting. Upon exiting the Track Slip page, whichever value is displayed is the one that is kept.

6 **Press F2 (CLEAR) to reset the Track Slip time to 0.0 ms.**

Autolocation Controls

The RD-8's autolocation controls consist of 100 Locate Memories which can be set either manually or "on the fly", and recalled instantly.

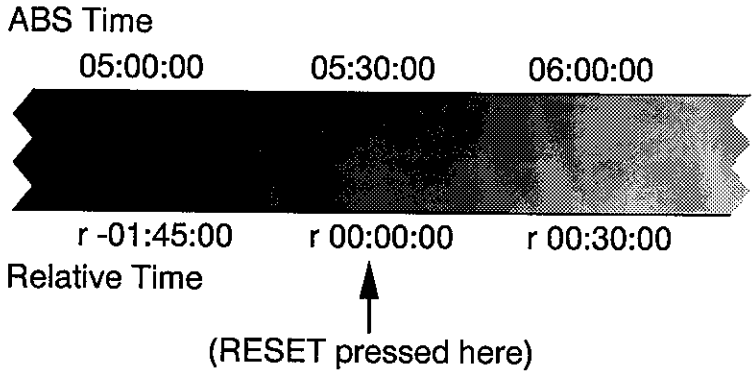
Each Locate Memory's address can be displayed and set using any of three different time reference modes: Internal LTC, External LTC and ABS Time.

Generally, ABS Time and LTC will differ in their values. The RD-8, however, maintains a constant offset between them. This makes it possible to locate to various tape positions using either time reference.

Absolute (ABS) Time vs. Relative Time

The LED display indicates where you are on the tape by using a time reference. There are two ways of reading the ADAT time reference off tape: Absolute (ABS), the actual time reference, or Relative, the same time reference relative to where zero is (00:00:00). The Relative Time 00:00:00 point is set by pressing the RESET button.

The TIME display has different Time modes; a series of LED dots along the top of the display indicate which it is currently in. When the display is in ABS Time Mode (no LEDs lit), the display reflects the actual tape time. When in Relative Mode (no LEDs lit, "r" appears on the left), the display reflects the tape's time reference relative to the 00:00:00 position. Once you press RESET to establish a new 00:00:00 position on tape (see below), ABS and Relative times will be offset from one another. However, that offset will remain constant until the next time the relative zero position is reset. Likewise, if the TIME display is in one of the LTC (timecode) modes, this will be offset from the ABS Time. Again, this offset will remain constant at all times. For more information about the TIME display modes, see the section entitled *Displays and Basic Editing* earlier in this chapter



Reset

RESET

The RESET button is used to set the relative zero time. When this button is pressed, the relative tape counter is reset to zero (00:00). Once the RESET button is pressed, you have changed the Relative Time starting point.

LOCate 0

LOC 0

If the LOC 0 button is pressed, the transport will immediately begin locating to the 00:00 time location of the tape. If the TIME display is in ABS mode when LOC 0 is pressed, the absolute 00:00 position is located. If the TIME display is in Relative mode ("r" appears on left) when LOC 0 is pressed, then the relative 00:00 position is located.

Setting Cues

There are two ways of storing Locate Memories: manually or "on the fly." The difference between the two is whether you enter a tape position from the front panel, or transfer the tape location to a Locate Memory. To do either, you must first access the Locate Point Modify page in the LCD display. This is done by pressing the LOC button. If DATA EDIT was turned on, it will be automatically turned off. When you want to go back to a DATA EDIT function, pressing DATA EDIT again will take you back to the last page you were in before exiting.

Storing cues "on the fly"

1 **If not already in the Locate Point Modify page, press** LOC .

The display will move to the Locate Point Modify page. If the DATA EDIT LED was on, it will now be turned off.

```
00:00:00:00
EDIT LOC01 XFER
```

2 **Use ▲ and ▼ to select a Locate Memory (L00–L99).**

The address of the currently selected Locate Memory will be displayed in the upper part of the display.

3 **Press** ▶PLAY **to engage playback.**

4 **When the tape location you wish to store is reached, press** F3.

The current tape location will be stored.

5 **Use ▲ and ▼ first to select a different Locate Memory, then press** F3 **(XFER) to store another cue.**

While in the Locate Point Modify page, pressing DISP will cycle through the different time references (see DISP button).

Editing a Locate Memory

1 **If not already in the Locate Point Modify page, press LOC .**

2 **Use ▲ and ▼ to select the Locate Memory (00–99) you wish to edit.**

The address of the currently selected Locate Memory will be displayed in the upper part of the display.

3 **Press F1 (EDIT).**

An underline will appear beneath the first two digits of the current Locate Memory's address.

4 **Use ▲ and ▼ to alter the first pair of digits.**

5 **Continue to press F1 (EDIT) or CURSOR to advance through each pair of digits, and use ▲ and ▼ to alter the values.**

When altering the digits in the minutes, seconds, frames or sub-frames fields, the counter will increment the next higher field when the maximum value is past; and will decrement if the minimum value is past. *Example:* If you adjust the minutes field from 59 to 00, the hours field count will advance by 1. If the hours field is already at 23, it will advance to 0. Alternatively, if you lowered the minutes field from 00 to 59, the hours will be lowered by 1.

Locating a Cue

Once you are in the Locate Point Modify page, pressing the LOC button will initiate a locate to the currently displayed Locate Memory.

Initiating a locate

1 **If not already in the Locate Point Modify page, press** LOC .

2 **Use ▲ and ▼ to select the Locate Memory (L00–L99) you wish to locate to.**

The address of the currently selected Locate Memory will be displayed in the upper part of the display.

3 **Press** LOC .

The transport will either fast forward or rewind to the selected Locate Memory's address.

The Pre-Roll function, if enabled, will affect a locate function. For more information, see the section entitled Pre-Roll and Post-Roll *later in this chapter.*

Auto Return

The Auto Return function lets you determine a position on tape where, once reached during playback, the transport begins rewinding to a predetermined position. The position at which the rewinding begins is called the "end" point; the position which is rewound to is called the "start" point. Both the start and end points are edited in the Auto Return Locate Points page. To turn Auto Return on, you must access the Auto Play/Return page. Both are found by pressing DATA EDIT and then AUTO REC.

Setting the Auto Return start and end points

1 **Press** DATA EDIT **, if not already turned on.**

Both the DATA EDIT LED and the LCD EDIT LED in the TIME display will light, and all other gray function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 **Press** AUTO REC .

The AUTO REC LED will light and the display will move to the Auto Play/Return page (page one of the Auto Rec menu). The current Auto Return status appears in the lower right corner of the display.

```
AutoPlay AutoRtn
  Off      Off
```

3 **Press** F3 **(OFF) to toggle the Auto Return function on and off.**

The bottom right corner of the display will change from "OFF" to "ON", indicating that Auto Return is enabled. When the display reads "off", the function is turned off.

● A-RTN

After exiting Data Edit mode, the A-RTN LED will light.

4 **Press** NEXT .

The display will move to the Auto Return Locate Points page.

```
     End > Start
M-Out > M-In
```

5 **Press** F1 **and use** ▲ **and** ▼ **to select the "end" point.**

You may select any Locate memory (L00–L99), or the Mark In or Mark Out points.

6 **Press F3 and use ▲ and ▼ to select the "start" point.**

7 **Locate the tape to a position prior to the Auto Return end point, and press ▶PLAY.**

See the previous sections on how to execute a locate. The tape will play, and the PLAY LED will light. When the Auto Return end point is reached, the transport will begin rewinding (as indicated by the REWIND LED). Upon reaching the Auto Return start point, the transport will stop (as indicated by the STOP LED).

Both the Pre-Roll and Post-Roll functions, if enabled, will affect a locate function. See Pre-Roll and Post-Roll *later in this chapter for more information.*

A faster way of turning Auto Return on and off is by using the AUTO RETURN button on the Model 8312 remote control.

Auto Play

The Auto Play function determines whether or not the transport will automatically go into play when a locate function is completed. This function can also be used in conjunction with the Auto Return function (see above) to created a "loop", whereby a section of tape is played over and over.

Enabling Auto Play

1 **Press ● DATA EDIT, if not already turned on.**

Both the DATA EDIT LED and the LCD EDIT LED in the TIME display will light, and all other gray function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 **Press** ● AUTO REC ■ .

The AUTO REC LED will light and the display will move to the Auto Play/Return page, the first page of the Auto Rec menu.

3 **Press** F1 □ **(OFF) to toggle the Auto Play function on and off.**

The bottom left corner of the display will change from "OFF" to "ON", indicating that Auto Play is enabled. When the display reads "off", the function is turned off.

● A-PLAY

Upon exiting Data Edit mode, the A-PLAY LED will light.

A faster way of turning Auto Play on and off is by using the AUTO PLAY button on the Model 8312 remote control.

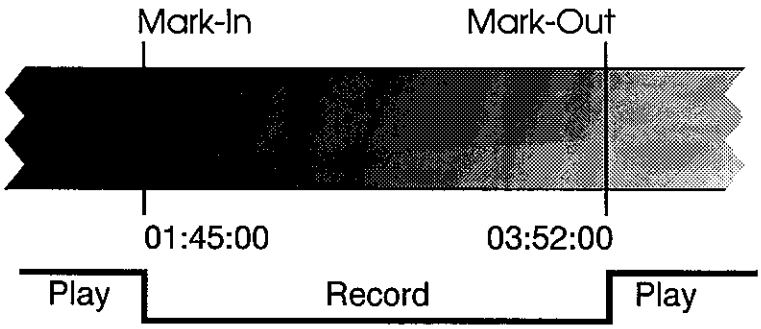
Auto Record

The Auto Record function lets you determine exactly where recording should begin and end beforehand, so that the machine automatically takes you in and out of record. The Mark In and Mark Out points determine where recording should take place.

After setting the Mark In and Mark Out points, press the AUTO REC button (with DATA EDIT turned off) to enable this function; the AUTO REC LED will light. To execute a "take", hold RECORD and press PLAY, just as you would to record normally. When the Mark In point is reached, recording will begin. When the Mark Out point is reached, recording will stop while the transport continues (unless the Auto Return function is enabled). By only pressing PLAY (without pressing RECORD), you can rehearse instead of executing a take. This lets you audition the Auto Record function without actually recording anything.

Mark In and Mark Out

The Mark In and Mark Out points are used to determine where Auto Recording should begin and end. These points can be set to any of the 100 Locate Memories (L00–L99), or to the specific Mark In and Mark Out memories provided just for these functions (think of the Mark In and Mark Out memories as Locate Memories 100 and 101).



Setting the Mark In and Mark Out points

1 **Press** DATA EDIT **, if not already turned on.**

The DATA EDIT LED will light, and all other gray function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 **Press** MARK IN .

The MARK IN LED will light and the display will jump to the Mark In Point Modify page.

```
      00:00:00:00
EDIT  M-IN  XFER
```

The current Mark In point address will appear in the upper part of the display. An underline will appear beneath the first pair of digits.

3 **Press F1 (EDIT) to advance the underline through each pair of digits in the Mark In point's address.**

4 **Use ▲ and ▼ to adjust the selected pair of digits.**

5 **Press F3 (XFER) to store the current tape location (as indicated by the TIME display) as the Mark In point.**

This can be done "on-the-fly", if desired, by pressing PLAY and engaging playback. When the desired Mark In point is reached, press F3 to store the tape location as the Mark In point.

6 **Press MARK OUT.**

The MARK OUT LED will light and the display will jump to the Mark Out Point Modify page.

```
      00:00:00:00
EDIT  M-OUT XFER
```

7 **Repeat steps 3 through 5 to modify the Mark Out point.**

To execute a Take

1 **Record-enable the track(s) you wish to record on.**

2 **If the DATA EDIT LED is on, press DATA EDIT.**

The DATA EDIT LED should be off.

3 **Press AUTO REC.**

The AUTO REC LED will light.

If AUTO REC is pressed when the Mark In point is set beyond the Mark Out point, the display will momentarily read "Mark In is not before Mark Out" indicating that this is illegal, and you will not be able to enable the Auto Rec function. Refer to previous tutorials in this section.

4a Rewind the tape to a position prior to the Mark In point.

4b Or, you can press MARK IN **locate to the Mark In point.**

If the Pre-Roll function is enabled, the RD-8 will locate to a position before the Mark In point (see the section *Pre-Roll & Post-Roll* earlier in this chapter). If the Auto Play function is enabled, the RD-8 will automatically go into play mode upon reaching the locate position (see *Autolocation* earlier in this chapter).

5 Hold ●RECORD **, and then press** ▶PLAY **.**

The PLAY LED will light, and the RECORD LED will flash.

Upon reaching the Mark In point, recording will begin on any record enabled tracks and the RECORD LED will light (stop flashing). Simultaneously, the MARK IN and MARK OUT LEDs will light. If no tracks are record enabled when the Mark In point is reached, the RECORD LED will continue flashing. At any time before the Mark Out point, a track may be record enabled, which will cause the track to immediately enter record and the RECORD LED will light (stop flashing). Upon reaching the Mark Out point, recording will cease and the RECORD, MARK IN and MARK OUT LEDs will turn off.

Whenever the RD-8 is put into play, it requires a brief moment to locate the timecode reference on tape and "lock." If the Mark In point is reached while the AUTO REC LED is on before the RD-8 establishes a lock, the punch in will not take place, and the LCD display will read "Not Locked at Mark In." If this occurs, no recording will be possible.

Rehearsal

With Auto Record turned on, you can rehearse before actually recording. The difference between rehearsing and an actual take is whether or not RECORD is press along with PLAY. If you only engage playback while Auto Record is enabled, you will hear the record-enabled tracks switch over to monitor their inputs precisely at the Mark In point.

In rehearsal mode, when the Mark In point is reached, the AUTO REC LED begins flashing and any tracks that are in record-ready will be in input monitor mode. When the Mark Out point is reached, the AUTO REC LED will light (stop flashing) and any tracks that are in record-ready may return to tape monitor mode (if Auto Input is enabled).

Auto Return and Auto Play

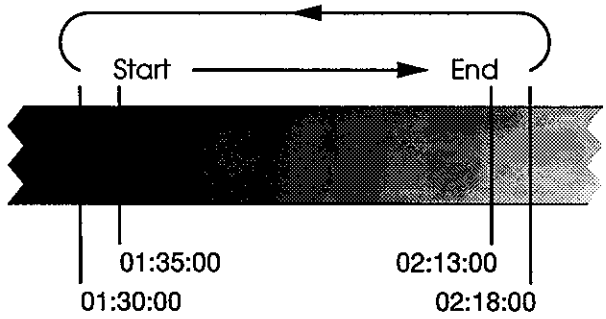
The Auto Return and Auto Play functions can be used along with Auto Record to create a recording loop. That is, you can record a take over and over until you get it right. Refer to the *Auto Record* and *Auto Play* sections earlier in this chapter for more information.

Pre-Roll & Post-Roll

Pre-Roll and Post-Roll allow you to set a certain amount of time (up to 25 seconds) by which the transport will overshoot when locating a cue. Pre-Roll is useful when you need some time before a punch-in, so the musicians can hear the material on tape leading up so they can get "into the groove" before recording begins. In post-production, it is necessary to allow ample time for all machines to lock before the edit point is reached.

Here is an example of how you would use Pre-Roll and Post-roll along with Auto Record, Auto Return and Auto Play. Let's set the Mark In point and Auto Return Start point to Locate Memory 01 (which is, say, set to 01:35:00) and the Mark Out point and Auto Return End point to Locate Memory 02 (which is set to 02:13:00). Now set both the Pre-Roll and Post-Roll times to 5 seconds. When you locate to the Mark In point (by pressing MARK IN while the DATA EDIT button is turned off), the transport will go to 01:30:00 and start playing (if Auto Play is turned on).

when the Mark In point is reached at 01:35:00, recording will automatically begin. When the Mark Out point is reached at 02:13:00, recording stops but the transport continues playing until 02:18:00 before rewinding back to 01:30:00 and playing back what you just recorded.



Setting the Pre-Roll time

1 Press DATA EDIT **, if not already turned on.**

The DATA EDIT LED will light, and all other gray function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 Press AUTO REC **.**

The AUTO REC LED will light and the display will move to the Auto Return/Auto Play edit page, which is the first page of the Auto Rec menu.

3 Press NEXT **two times.**

The LCD display will advance to the Pre-Roll Time Set page. The status (on or off) of Pre-Roll is indicated in the middle upper display, while the current Pre-Roll Time is shown in the upper-right corner.

```
PreRoll  05s Off
   ON/OFF
```

The current Pre-Roll setting will appear in seconds (0–25) in the upper middle part of the display, with the Pre-Roll status at right.

4 **Press F2 (ON/OFF) to toggle the Pre-Roll function on and off.**

The upper right display will change from OFF" to "ON", indicating that Pre-Roll has been enabled.

5 **Use ▲ and ▼ to either raise or lower the Pre-Roll Time in one second increments, or turn the Pre-Roll function on and off, depending on which field the cursor appears under.**

Setting the Post-Roll time

1 **Repeat steps 1 and 2 in the previous tutorial.**

This display will show the Pre-Roll Time Set page.

2 **Press NEXT .**

The LCD display will advance to the Post-Roll Time Set page. The status (on or off) of Post-Roll is shown in the upper-middle display. The current Post-Roll Time appears in the upper-right corner.

```
PostRoll 05s Off
    ON/OFF
```

The current Post-Roll setting will appear in seconds (0–25) in the upper middle part of the display, with the Post-Roll status at right.

3 **Press F2 (ON/OFF) to toggle the Post-Roll function on and off.**

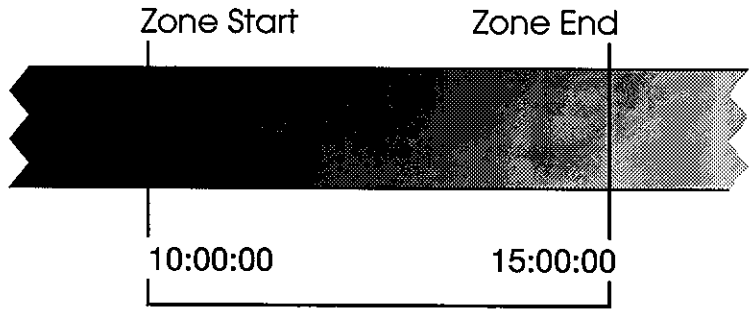
The upper right display will change to "On", indicating that Post-Roll has been enabled.

4 **Use ▲ and ▼ to either raise or lower the Post-Roll Time in one second increments, or turn the Post-Roll function on and off, depending on which field the cursor appears under.**

Zone Limit

The Zone Limit establishes the working portion of tape. When Zone Limits are enabled, functions such as recording and locating will only operate within this region. This is a useful function when you wish to remain within a section of tape. If you fast forward or rewind the tape and a Zone Limit point is reached, the transport will stop.

The Zone Start point can be assigned to any of the 100 Locate Memories (00–99), or the Mark In or Mark Out points. The Zone Length can be set from 00:00 to 40:00 (40 minutes). The Zone Limit function can be toggled on and off, without changing the Start points or Zone Length.



All transport activity is restricted to within the Zone Start and End points.

Setting the Zone Limits

1 Simultaneously press HOME and NEXT .

This will return the LCD display to the first page of the Main Function Menu.

2 Press NEXT four times.

The display will advance to page 5 of the Main Function Menu.

```
MAIN MENU      5
ZoneStrt ZoneLen
```

3 **Press F1 (ZoneStrt).**

```
Zone Start    Off
  Loc00    ON/OFF
```

This selects the Zone Limit Start page. The current status (ON/OFF) of the Zone Limit will appear in the upper right corner, while the current Zone Limit Start setting will appear in the lower left corner.

4 **Use ▲ and ▼ to select a Locate Memory (L00–L99), Mark-In (M-In) or Mark-Out (M-Out) point to be the Zone Limit Start point.**

5 **Press F3 (On/Off) to toggle the Zone Limit on and off.**

6 **Press NEXT .**

The display will advance to the Zone Limit Length page.

```
Zone Len      Off
  40:00    ON/OFF
```

The current status (ON/OFF) of the Zone Limit will appear in the upper right corner, while the current Zone Limit Length setting will appear in the lower left corner. A cursor will appear beneath the minutes field of the Zone Limit Length value.

7 **Press F1 to select the minutes field, or press F2 to select the seconds field.**

The cursor will be placed beneath either the minutes field if F1 is pressed, or the seconds field if F2 is pressed.

8 **Use ▲ and ▼ to adjust the Zone Limit Length.**

9 **Press F3 (ON/OFF) to toggle the Zone Limit on and off.**

Footswitch Controls

The RD-8 provides two footswitch jacks: LOCATE/PLAY (8312) and PUNCH IN/OUT. Both accept any momentary, single pole/single throw, 1/4-inch mono (T/S) footswitch, such as the Fostex 8051 footswitch. During power-up, the RD-8 checks the footswitch to determine whether it is normally open or normally closed type, and calibrates itself accordingly. If you use a footswitch and its operation seems "reversed," make sure it is firmly plugged into the jack, then turn off the RD-8, wait a few seconds, and turn the RD-8 on again. It will calibrate itself to work with the footswitch.

Footswitch Controlled Punching

The PUNCH IN/OUT footswitch is used to enable and disable recording. Here's how it works:

- If a track (or tracks) is record-enabled, and the tape is playing, pressing the punch footswitch puts the track(s) into record mode at the instant you punch. This is equivalent to pressing PLAY and RECORD to enter record mode.
- If the RD-8 is already in record mode, pressing the footswitch punches out of record (the track(s) will remain record-enabled should you need to punch in again later on) and the tape will continue to play. this is equivalent to pressing PLAY.

The PUNCH FOOTSWITCH jack can also be used for connecting an 8312 Remote Control. The PUNCH footswitch and the 8312 cannot be used at the same time, since they occupy the same jack, unless you connect them with a Y-cord. However, you can interchange them if you observe certain precautions (see *Remote Control* in this chapter).

Footswitch Controlled Autolocating

The LOCATE/PLAY footswitch has three functions:

- If the transport is currently stopped, pressing the Locate/Play footswitch is the equivalent to pressing the PLAY button.

- If the transport is currently playing or recording, pressing the Locate/Play footswitch causes the transport to locate to the last selected locate point (the locate point is selected by pressing the LOCATE button; see *Autolocation Controls* in this chapter), and then either Stop or Play, depending on the setting of the AUTO-PLAY function.
- If the RD-8 is in the process of locating, pressing the Locate/Play footswitch will stop the transport.

The Locate/Play footswitch jack can also be used for connecting an 8312 Remote Control. The Locate/Play footswitch and the 8312 cannot be used at the same time, since they occupy the same jack, unless you connect them with a Y-cord. However, you can interchange them if you observe certain precautions (see next section).

Backup All Settings

The entire contents of the RD-8's memory can be backed up for later retrieval and archival purposes. This can be done in two ways. First, you can record this information onto the beginning of the tape; this is called the TOC or Table of Contents. Whenever you resume work on a tape, you should load the TOC into the RD-8 to retrieve the correct settings for that project.

Second, you can store and retrieve setup information via a MIDI System-Exclusive dump. This information can be stored into a MIDI sequencer, librarian, or some other System-Exclusive storage device. Although the MIDI dump backup option is much faster and allows for multiple versions of backups to be stored, the TOC should be saved onto tape whenever you finish a session.

Creating a TOC

The beginning of each RD-8 tape is reserved for the TOC; this is called the data section of tape. The TOC uses the same format as the Alesis BRC™ Master Remote Control. This means the RD-8 can load in a TOC that was created by a BRC, and you can load an RD-8 created TOC into a BRC. Because of this interchangability, you have the freedom to

move your tapes between these two systems, or send your tapes to other people who may use an ADAT/BRC system.

There are some differences to consider. For example, because the RD-8 has a Pre- and Post-Roll value range of up to 25 seconds and the BRC's Pre- and Post-Roll value range only goes to 10 seconds, the BRC will ignore any values higher than 10 when loading an RD-8 created TOC.

The following list indicates which parameters are saved with a TOC.

PARAMETER	RANGE	BRC
Track Slip	0 to 170.0ms x 8	*
Generator Source	int/ext	
Generator mode	free/rec-run	
Generator frame rate	24/25/29.97/29.97df/30/30df	*
Generator User Bits mode	Ext TC/RTC/User	
Generator RTC select	YMDH/MDHM/DHMS	
Generator User Bits	00:00:00:00 to FF:FF:FF:FF	
Chase Clock select	Int/TC/Video/WordBNC/WordOpt	
Chase Sync select	Ext TC LTC/VITC/RS-422	
Chase Ext TC frame rate	29.97/30	
Chase mode	once/cont	
Chase slew rate	slow/fast	
Chase sync code	tape/abs	
Chase offset	±00:00:00:00	*
Digital in routing	1-8	
All input monitor	on/off	*
Auto input monitor	on/off	*
Vari Speed mode	percent/cent	
Vari Speed amount	-100 to +100	*
Remote source	ADAT/RS422/MIDI	
MIDI device ID	0 to 127	*
Locate points	32-bit sample address x 100	**
Zero point	32-bit sample address	*
Auto record	on/off	*
Auto play	on/off	*
Auto return	on/off	*
Auto return start address	M-IN/M-OUT/LOC 00–99	
Auto return end address	M-IN/M-OUT/LOC 00–99	
Pre-roll	on/off	*

Pre-roll amount	0–25 seconds	*
Post-roll	on/off	*
Post-roll amount	0–25 seconds	*
Mark in point	32-bit sample address	*
Mark out point	32-bit sample address	*
Display mode	abs/rel/LTC int/LTC ext/offset abs/offset rel/gen	
Sample rate	44.1 KHz/48 KHz	
Sample rate pull up/down	norm/pull-up/pull-down	
Zone limit	on/off	
Zone limit start	M-IN/M-OUT/LOC 00–99	
Zone limit length	00:00–40:00	
Crossfade time	11/21/32/43 milliseconds	*
Tape timecode output rate	24/25/29.97/29.97df/30/30df	
Tape timecode output level	0.1V to 3.1V	
Timecode rew/ffwd mode	always/play only	*
MMC output	on/off	*
Tape length	T120/T160	
LCD contrast	0–9	*

(* can be loaded to and saved from an Alesis BRC.)
(** Saved into the first five Song locations of the BRC, 20 locate points each.)

The following tutorials describe how you can save and load a TOC. If you press EJECT while the RD-8 is either saving or loading a TOC, the save or load operation is canceled.

Saving a TOC

1 Simultaneously press HOME **and** NEXT **.**

This selects the first page of the Main Function Menu page.

2 Press NEXT **.**

The display will advance to page 2 of the Main Function menu.

3 Press F3 (TOC).

The display will move to the TOC page.

```
TableOfContents
LOAD      SAVE
```

4 Press F3 (SAVE) to save the TOC to tape.

The display will look like this:

```
Are you sure?
YES        NO
```

5 Press F1 (YES) to initiate the save, or press F3 (NO) to cancel the save.

If F3 is pressed (NO), the display will return to the TOC page. If F1 is pressed (YES), the display will look like this:

```
Saving Table
of Contents
```

The tape is rewound to the beginning and the TOC is saved.

Loading a TOC

1 Follow steps 1 and 2 in the previous tutorial.

Alternatively, if you just finished the previous tutorial, simply hold NEXT and press ▲ to move back to the TOC page.

2 Press F1 (LOAD) to load the TOC from tape.

3 Press F1 (YES) to initiate the load, or F3 (NO) to cancel.

If F3 is pressed (NO), the display will return to the TOC page. If F1 is pressed (YES), the display will look like this:

The tape is rewound to the beginning and the TOC is loaded.

Backing Up via MIDI

This process is similar to saving a TOC to tape with two differences. The first difference is that the information will be sent via the RD-8's MIDI Out port as System Exclusive data. This is called a System Exclusive Dump. The second difference is that this dump information is only compatible with other RD-8 machines, and cannot be loaded into an Alesis BRC. To transmit a System Exclusive dump, follow the instructions below.

To load a System Exclusive dump back into the RD-8, simply send it back into the MIDI-In port. The RD-8 will automatically go into receive mode the moment it begins to see the System Exclusive data.

Executing a System-Exclusive dump

1 Simultaneously press HOME and NEXT .

This selects the first page of the Main Function Menu page.

2 Press NEXT .

The display will advance to page 2 of the Main Function menu.

```
MAIN MENU      2
MIDIDmp        TOC
```

3 Press F1 (MIDIDmp).

The display will move to the MIDI Dump page.

```
MIDI Sysex Dump
          EXECUTE
```

4 Press F3 (EXECUTE) to execute the dump.

When sending all data, the display will read:

```
Sending Sysex out
     MIDI...
```

MIDI System-Exclusive dumps may be transmitted or received at any time, regardless of whether the MIDI OUTPUT function is turned on or off.

The MIDI Device ID should be set as desired before performing a System-Exclusive dump, and should not be changed thereafter. Refer to the MIDI section of Chapter 5 for more information.

SYNCHRONIZATION

Overview

THERE ARE TWO TYPES OF SYNCHRONIZATION required by the RD-8: clock source and location reference. When synchronizing to a clock source, the internal clock of the RD-8 (which determines the sampling rate) is locked to an external source, such as word sync or composite video clock. When locking to a location reference, the RD-8 is following a time code reference to locate to a position. An example of when you would use a clock base without a locate reference is when you are recording from another digital source (like DAT); the clock rates must be the same in order to record the digital audio, but the two machines need not necessarily be at the same location. Most of the time, however, you will probably want to be synchronized to both the clock and locate reference of an external source. When working in a post-production environment, you will want to lock the RD-8 to a video sync (clock) and SMPTE or VITC timecode (location).

The RD-8 features a Generator which is responsible for dealing with timecode. Whenever you want to lock to an external timecode source, the generator reads it, then reshapes and regenerates it before chasing. The Generator can output timecode onto the RD-8 tape or to an external source. This timecode can either be generated internally or based on an external source. When generating timecode based on an external source, the parameters related to chasing are taken into account, even if the RD-8 is not actively chasing (CHASE button turned off).

This chapter outlines the various synchronization possibilities, and provides an overview of how these functions interact in general. For more details and examples of different synchronization applications, refer to Chapter 7, *System Configurations*. This chapter assumes you have read and understand the basic operation of the display menus and pages, and how to select and alter parameter values in general. If this is not clear to you, please review the section entitled *Displays and Basic Editing* in Chapter 4.

Remote Control

While the synchronization controls are available within the Data Edit Chase menu, the choices available within the pages of this menu depend on which Remote Control Input you have selected. Remote control can be directed to one of three sources: ADAT, RS-422 and MIDI. The Remote Control Input is selected by pressing DATA EDIT followed by the REMOTE LOCAL button. The number and order of display pages in the Remote, Generator and Chase menus will differ depending on which of the three Remote Control In sources has been selected.

In addition, the 8312 remote controller may be used as a remote control source. This control is always possible, regardless of the setting of the REMOTE LOCAL button.

Remote Local Button

The REMOTE LOCAL button is used to select either Remote control, Local control, or both (as indicated by the REMOTE LOCAL LEDs). Each time the REMOTE LOCAL button is pressed, you cycle through these three settings:

- Upper (red) LED only: Remote Only mode is selected. All front panel buttons are disabled with the exception of EJECT, REMOTE LOCAL and POWER. The EJECT button may only be pressed while the RD-8 is either in engaged or disengaged Stop mode. The LCD will read:

REMOTE ONLY MODE

- Lower (green) LED only: Local mode is selected. All remote control functions will be ignored.

- Both upper and lower LEDs: Both Remote and Local modes are selected. All controls are available.

When not in Remote Only mode, the Remote Control In may selected in the following manner:

Selecting the Remote Input

1 **Press** DATA EDIT **, if not already turned on.**

Both the DATA EDIT LED and the LCD EDIT LED in the TIME display will light, and all other gray function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 **Press** REMOTE LOCAL .

The top (red) REMOTE LOCAL LED will light and the display will enter the Remote Source page.

```
Remote In: Adat
ADAT RS422 MIDI
```

3 **Press** F1 **(ADAT) to select ADAT as the Remote Source, or press** F2 **(RS422) to select RS-422, or press** F3 **(MIDI) to select MIDI.**

ADAT

When either Remote or Local and Remote mode is selected and the Remote Source is set to ADAT, the RD-8 functions as a slave ADAT (connected to a multiple ADAT system). When the Remote Source is set to ADAT, the CHASE ON/OFF LED will always be lit anytime the REMOTE LOCAL button is set to either Remote or Local and Remote.

If no ADAT(s) are connected and the Remote Source is set to ADAT, the REMOTE LOCAL button will not function and will remain set to Local mode (lower/green LED lit).

When Local and Remote mode is selected, the RD-8 can also function as an "independent slave" from its own front panel. In other words, you can activate transport commands and other functions from the front panel, as well as from the master RD-8 (ADAT or BRC for that matter).

When the Remote Source is set to ADAT, no synchronization to video, RS-422, LTC, VITC, word clock or digital clock is possible. All synchronization (clock and locate reference) comes from the master machine and is provided at the RD-8's SYNC IN connector. All the CLOCK LEDs will be off to indicate that the SYNC IN connector is providing the clock. Setting the REMOTE LOCAL button to Local mode will automatically turn off the CHASE ON/OFF LED. At this point, the Chase Mode may be set to any other mode (LTC, VITC, etc.) while in Local mode. However, setting the mode back to Remote or Local and Remote will revert the Chase Mode back to ADAT, and will turn on the CHASE ON/OFF LED. For more information, refer to the section entitled *Multiple Machine Operation* in Chapter 6.

NEXT ☐ If the NEXT button is pressed while the Remote Source is set to ADAT, the following page is available:

```
ADAT I.D. 01
```

This page displays the ADAT ID number that has been assigned to the RD-8 by either the master RD-8 or ADAT, or the BRC that is connected to the SYNC IN connector. This value cannot be adjusted, and is displayed for information purposes only. If nothing is plugged into the SYNC ON connector, the ID will be 01.

MIDI

When the Remote Source is set to MIDI, the REMOTE LOCAL button will enable and disable MIDI Machine Control input of the RD-8. MIDI Machine Control provides mostly transport commands and other functions. The synchronization settings you create are unchanged whether the REMOTE LOCAL button is placed in Local, Remote or Local and Remote mode.

NEXT ☐ If the NEXT button is pressed while the Remote Source is set to MIDI, the following page is available:

This page displays the MIDI Device ID number. Use the ▲ and ▼ buttons to set the MIDI Device ID between 000 and 126, or ALL. By setting the Device ID to ALL, the RD-8 will respond to all MIDI Machine Control messages, regardless of their individual ID number settings.

RS-422

When the Remote Source is set to RS-422, all machine control commands will be received via the RS-422 connector. The RD-8's synchronization will be dependent on how you have setup the Chase parameters, described later in this chapter.

8312 Remote

To use the 8312 remote, plug it into either the LOCATE/ PLAY or the PUNCH IN/OUT jack. The 8312 offers the following functions:

- **Transport functions.** Rewind, Review, Fast Forward, Cue, Stop, Play, and Record.
- **Autolocation functions.** LOCate, Locate Mark In, Locate Mark Out, Auto Return, Auto Play, and Auto Record. The locate functions on the 8312 allow you to locate to 0, locate Mark In or locate Mark Out.
- **Track functions.** Auto Input Monitor and All Input Monitor.

If your Locate/Play footswitch is a normally open type, the footswitch and 8312 remote control can be interchanged , or used simultaneously with a Y-cord. If the Play/Locate footswitch is a normally closed type, the RD-8 must be reset when switching between the footswitch and the remote, and they will not work simultaneously with a Y-cord.

Resetting the footswitch control

1 **Unplug the device you don't want to use (footswitch or remote).**
2 **Turn off the RD-8.**
3 **Plug in the device you want to use (footswitch or remote).**
4 **Turn on the RD-8.**

Clock Source

As mentioned in the previous section, the RD-8 has two types of synchronization characteristics: clock source and location reference. Locking to a location reference, such as timecode, is called chasing. Normally, the RD-8 uses its own internal clock as its clock source. Alternatively, three types of external clock sources exist which the RD-8 can synchronize to: timecode clock, video clock and word clock. Unlike timecode (which provides both a clock and location reference), both video and word clock provide only clock information.

Sometimes you will want to lock to an external clock source (such as from a DAT or hard disk recording system) without chasing. This is called an "indirect lock". For example, maybe you just want to record digital audio, and don't particularly care about being locked with regard to position (timecode may not even exist on the source); it is important, however, that the RD-8 clock be in perfect sync with that of the source. Otherwise, clicks may result in the recorded audio, since the clocks will not be in perfect sync when recording takes place.

At other times, you will want to both lock to a source's clock and location. In the example above, this would be especially useful if the digital audio source provided some sort of timecode reference. This is called "direct lock" and is the most dependable type of synchronization. In post-production, you will need both a video sync clock source and timecode for location reference.

If the Remote Source is set to ADAT and the REMOTE LOCAL button is set to either Remote or Locate and Remote mode, the Clock Source page will not be accessible; nor will any other Chase menu pages described here, with the one exception of the Machine Offset Modify page. For more information, refer to the section entitled Multiple Machine Operation, *in Chapter 6.*

Selecting the Clock Source

1 Press DATA EDIT, if not already turned on.

Both the DATA EDIT LED and the LCD EDIT LED in the TIME display will light, and all other gray function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 Press CHASE ON/OFF.

The CHASE ON/OFF LED will light, and the LCD display will now be showing you the Clock Select page, which is the first page of the Chase menu. If this page does not appear, press HOME. The display will look like this:

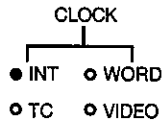
```
ClockSrc Internl
```

The current Clock Select assignment will appear in the upper right corner. If the Clock Select page still does not appear, it is probably because the Remote Source is set to ADAT (see previous section).

3 Use ▲ and ▼ to select the Clock source.

The available options are:

• Internl	The RD-8's internal clock.
• LTC	External timecode received at the SMPTE IN connector.
• Video	External sync generator output received at the VIDEO IN connector.
• Word Optical	Word clock received at the OPTICAL INPUT connector.
• Word BNC	Word clock received at the WORD SYNC IN connector.



When selecting the Clock Source, the four CLOCK LEDs will indicate the current selection. The WORD CLOCK LED will be lit for both the WORD Optical and Word BNC settings. If the selected clock type is not present at its respective connector, its associated LED will flash.

When the Clock Source is set to something other than Internal the Vari Speed controls will not operate.

This is because the RD-8's clock (or sample rate) is locked to the external clock source (LTC, Video or Word Clock). It is possible, however, to pull-up or pull-down the RD-8's sample rate by ±1% while locked to an external clock source. Refer to the section entitled *Pull-Up and Pull-Down* later in this chapter for more information.

Word Clock

When using the RD-8 with a DAT machine or hard disk recorder that provides both timecode and word clock, it is better to set the RD-8's Clock Source to WORD (either WORD-OPTICAL or WORD-BNC, depending on what is available) while the Generator Source is set to EXTERNAL TIMECODE (refer to next section), in order to provide a more accurate lock. Word Clock is a much better clock source than timecode, but does not provide a locate reference for the RD-8. For this to function correctly, the timecode rate the RD-8 is chasing must be from the same source.

Refer to the tutorial at the beginning of this section on how to select Word Clock as the Clock Source.

Video

The RD-8 is capable of locking to composite video, black-burst or video sync. When the Clock Source is set to VIDEO, the RD-8 will automatically recognize the type of video signal (NTSC, PAL or SECAM) it receives at the Video In connector, and its sample clock will be in sync with video. However, this does not mean the RD-8 will be locked to the video's position. Unlike timecode, video is only a clock reference and does not provide a location reference. Therefore, you should set-up the RD-8 to chase the timecode occupying the audio track of the video tape (if available), while its clock is synchronized to LTC.

If the timecode on video tape is not synchronous with the video clock (or no timecode exists on the tape), you may wish to use the RD-8 to stripe timecode to the audio track of a video tape. In this case, you should have the video recorder and the RD-8 connected to the same video sync reference. Set the RD-8's Generator Source to Internal. The RD-8 will be sample-locked to the video sync while striping the tape with synchronous timecode, generating 29.97 fps or 29.97 fps Drop-Frame for NTSC or 25 fps for PAL or SECAM (see the next section). By striping the video tape in this manner, the timecode on the video tape will be frame-locked to the video frames.

Refer to the tutorial at the beginning of this section on how to select Video as the Clock Source.

LTC

When you are locking to timecode, it is not enough to merely chase. Chasing will cause the RD-8 to locate to the same timecode position as the external timecode it receives (refer to the section entitled *Chasing* later in this chapter), but doing this alone does not ensure a perfect lock. That is because the RD-8 would still be using its own internal clock, and thus not in perfect sync with the external timecode. Every now and then, the RD-8 will have to adjust itself to "catch up" (this is called "re-chasing").

By selecting LTC as the RD-8's Clock Source, the RD-8 is perfectly synchronized with the timecode. This is referred to as a "direct lock", and provides the most accurate and dependable synchronization possible (when no video clock or word clock is available).

Refer to the tutorial at the beginning of this section on how to select LTC as the Clock Source.

Chase

CHASE ON/OFF

● LOCKED

Chasing is the ability to locate and lock to a specific time reference position on tape designated by incoming timecode. The CHASE ON/OFF button is used to enable and disable chasing. When enabled, the CHASE ON/OFF LED will light. Simultaneously, the LOCKED LED will either be flashing to indicate that the RD-8 is waiting for a locate reference to lock to (i.e., timecode), or will remain lit to indicate it is locking to an external locate reference.

Pressing CHASE ON/OFF while in Data Edit mode (DATA EDIT LED lit) will access the Chase menu, which includes various pages, each with specific parameters and functions related to Chasing. Among these are the Clock Source (described in the previous section), External Time Code Source, Frame Rate (fps), Chase Mode (Once or Continuous), Slew Rate (Fast or Slow), Sync Reference (Tape or ABS) and Machine Offset. Once in the Chase menu, pressing NEXT advances you through each page (holding NEXT and pressing ▲ moves the display backwards).

Although there might be a time when you only want to chase timecode and use the RD-8's internal clock, it is not recommended. This is called an "indirect lock". It is always more desirable to lock the RD-8 to a clock that is synchronous to the timecode it is locating to. Usually the clock will be video with a timecode reference.

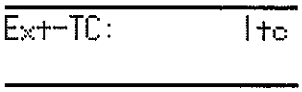
The following menus are available at different times, depending on how the Remote Source is set. Some of the following pages will not be available, depending on how previous pages were setup.

External Timecode Source

NEXT

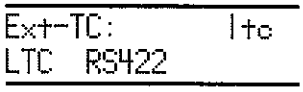
The second page of the Chase menu selects the External Timecode Source. This can be set to LTC or RS-422. For more information, refer to the section entitled *RS-422* later in this chapter. The choices available for the External Timecode Source are dependent on the currently select Clock Source and Remote Mode.

When in Local, ADAT or MIDI Remote mode, with the Clock Source set to Internal, Ext TC, Video, WordOpt or WordBNC, the only external timecode source available is LTC. The display will look like this:



The current setting will be displayed in the upper right corner. In this case, the display reads "LTC", and no options appear in the lower section of the display.

If the Remote Source is set to RS-422, and the Clock Source is set to Internal, Ext TC, Video, WordOpt or WordBNC, the display will look like this:



- **Press F1 to select LTC, or press F2 to select RS-422.**

Frame Rate

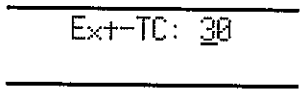
NEXT

The next page in the Chase menu is the Frame Rate page. When locking to an external time code source, the RD-8 automatically detects the frame rate of the incoming time code and adjusts itself accordingly. By calling up the LTC Frame Rate page, you can see exactly what the frame rate of the incoming time code is.

The RD-8 will not be able to determine the difference between 29.97 and 30. This is due to the fact that these frame rates are much too similar. Therefore, it is necessary for you to make sure the RD-8 is set to the correct frame rate.

This page is only available if the External Timecode Source is set to LTC, regardless of the Clock Source setting.

If the external timecode source is running at either 24 or 25 fps, you will not be able to modify the value in this page. However, if the timecode source is running at 29.97 or 30, you will be able to select between these two values.



The current setting will appear in the upper right corner.

- **Use ▲ and ▼ to select between 29.97 and 30 fps.**

The RD-8 will automatically detect whether or not Drop-frame is being used.

Chase Mode

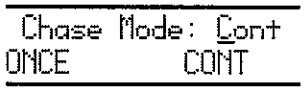
NEXT

The next page in the Chase menu is the Chase Mode page. The Chase mode determines the basic mode the RD-8 will use when locking to an external time code reference. When using Once mode, the RD-8 locates and locks to the time code reference it receives, but at that point no longer uses the time code location; instead it locks to the timecode's field

rate. If the timecode is advancing but has a discontinuity in its timecode value, the RD-8 will continue to play without regard to the new timecode location. This mode is also referred to as "lock and release". This means the RD-8 is only using this time code for a locate reference (where to initially go to). As playback continuous doesn't care if it is not exactly locked to the time code. If the incoming timecode stops for more than one second, or is running but not advancing its frame numbers, or starts counting frames backwards, or begins to advance at a non-play speed, the RD-8 will stop playing.

When using Continuous mode, however, the RD-8 is constantly checking to make sure it is perfectly locked with the incoming time code numbers. In this mode, the RD-8 will rechase any time the incoming timecode does not match the current location of the RD-8 tape.

This page is only available if the External Timecode Source is set to either LTC or VITC.



The current setting will be displayed in the upper right corner.

- **Press F1 to select Chase Once mode.**
- **Press F3 to select Chase Continuous mode.**

Slew Rate

NEXT

The next page in the Chase menu is the Slew Rate page. The Chase Slew Rate determines how quickly the RD-8 will re-chase once the time code on tape and the external time code are offset. When the RD-8 re-chases, it actually adjusts its speed to "catch-up" with the time code reference it is locking to. The Fast setting allows the RD-8 to adjust its speed so that it matches the incoming time code as quickly as possible. The Slow setting means the RD-8 will take a little longer to catch up, but the speed change will be less noticeable.

This page is only accessible if the Chase Mode is set to Continuous, and the Clock Source is set to Internal.

The current setting will appear in the upper right corner.

- **Press F1 to select the Slow setting.**
- **Press F3 to select the Fast setting.**

Sync Reference

NEXT

The next page in the Chase menu is the Sync Reference page. The Sync Reference determines whether the ABS Time or the TC track will be used as the reference for chasing LTC or VITC.

This page is only available if the Clock Source is set to Internal, LTC or video.

The current setting will appear in the upper right corner.

- **Press F1 to select the timecode on the TC track as a reference.**
- **Press F3 to select ABS Time as a reference.**

Machine Offset

NEXT

The last page of the Chase menu is the Machine Offset page (if the Remote Source is set to ADAT, it is the only page). In this page, only the DATA EDIT and OFFSET LEDs will be lit.

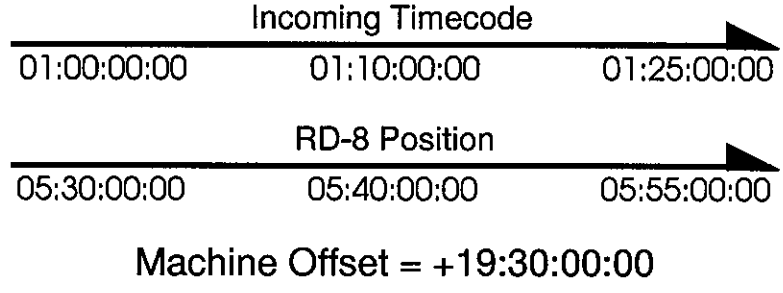
```
+00:00:00:00:00
EDIT CAPTURE CMP
```

The Machine Offset is a powerful feature that can be used in three different ways: ABS to timecode, timecode to timecode, and ABS to ABS. Each offset is set in the same manner. The difference is what is selected as the master clock , remote input and how the chase parameters are setup. Refer to Appendix 2: *Clock/Sync/Remote Reference.*

Timecode Offset

When you are locking to external timecode (LTC or VITC), the Machine Offset establishes a timecode offset using a standard range of 24 hours. In other words, when the offset is set to 00:00:00:00, the RD-8 will locate to the exact tape position that matches the timecode position it receives. If you were locking to video tape which had SMPTE striped on it beginning at 02:30:00:00 (2 hours, 30 minutes), you would want to set the Machine Offset to 02:30:00:00. This offset is the equivalent of 00:00:00 ABS Time on the RD-8 tape. While using this offset, locating to 02:35:00:00 (2 hours, 35 minutes) on the video tape would cause the RD-8 transport to locate to 05:00:00 (5 minutes) ABS Time.

In the example below, the RD-8 has been given a machine offset of +19:30:00:00. Therefore, the RD-8 will always be ahead of the incoming timecode it receives by this amount of time.



Machine Offset = +19:30:00:00

ABS to ABS Offset

Another purpose of Machine Offset is when you are locking multiple RD-8 machines together. In this situation, one RD-8 is the master while the rest are slaves. The slave RD-8 will have its REMOTE LOCAL button set to either Remote or Local and Remote mode and its Remote Source set to ADAT. In this case, the Chase menu offers only one page: Machine Offset. When you access the Machine Offset page on a slave RD-8, the time is confined to a range of 40 minutes and lets you offset the machine from the other machines in the system. For more information, see the section on *Multiple Machine Operation*, in Chapter 6.

Setting the Timecode Offset

- **Use F1 (EDIT) or CURSOR to advance the cursor through each pair of digits, and use ▲ and ▼ to adjust each value.**

  By selecting the first position to the left of the offset value, you can use ▲ and ▼ to select either + or -, thereby creating either a positive or negative offset. Whenever the Machine Offset value does not equal 00:00:00:00, the OFFSET LED will light.

- **Press F2 (CAPTURE) to capture the offset between the ABS Time and the external timecode being received.**

If the Remote Source is set to ADAT, the Capture command (F2) will not appear in the display, and the F2 button will not function.

- **Press F3 (CMP) to compare the offset with its previous value.**

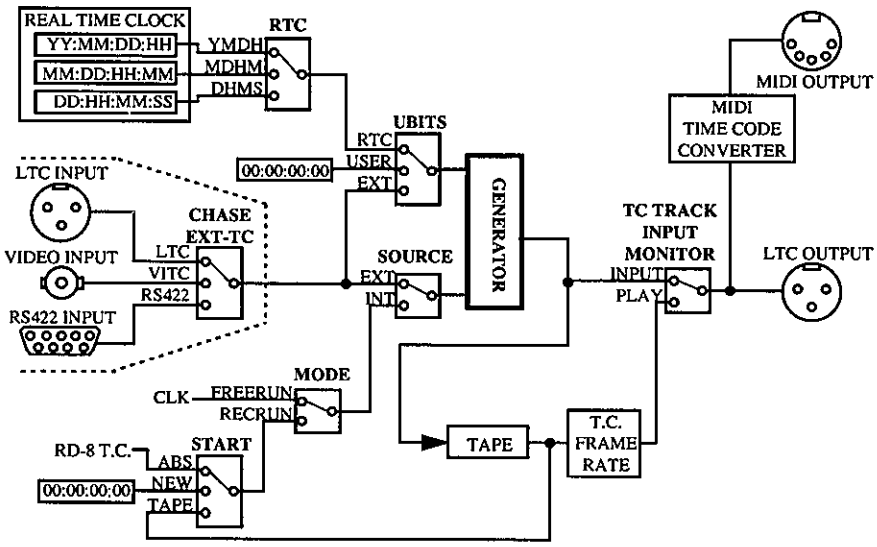
  Each time F3 is pressed, the display toggles between the new offset and the original offset value used when the Machine Offset page was first entered.

Once you leave the Machine Offset page, (by moving to another page or exiting Data Edit mode) the offset value displayed is retained. If this was the new offset, the original offset value is lost. If the displayed value was the original offset, the new offset is lost.

Generator

The Generator is used for all timecode applications, whether you are writing fresh timecode to tape or refreshing existing timecode. The Generator's output is connected to the TC track's input (track 9), and the TC track's output is routed to the TIMECODE OUT connector, on the back of the machine. Normally, the TIMECODE OUT connector will produce timecode that has been recorded onto the TC track. When you wish to output the Generator's timecode, the TC track must be put into record-ready, to allow the Generator's output to be routed through to the TIMECODE OUT connector. Whenever the Generator is outputting timecode, the GEN LED dot in the LED display will flash.

Generator Block Diagram



When not in Data Edit mode (DATA EDIT LED off) the GEN SET-UP button enables and disables record-ready for the TC track. Pressing GEN SET-UP while in Data Edit mode (DATA EDIT LED lit) will access the Generator Set-up menu, which includes various pages, each with specific parameters and functions related to generating timecode. Once in the Gen Set-up menu, pressing NEXT advances you through each page. Hold NEXT and press ▲ to move back in the opposite direction.

The first thing you must decide is whether you wish to generate new timecode internally or use an external source. When the Generator Source is set to Internal, you can base timecode on the ABS Time on the RD-8's tape, or the timecode recorded onto the TC track (if available), or you can have timecode begin from an arbitrary start address. You can choose any timecode frame rate, including 24 fps (frames-per-second), 25 fps, 29.97 fps, 29.97 fps DF (Drop-Frame), 30 fps and 30 fps DF.

When the Generator Source is set to External the RD-8 will generate fresh timecode based on an external timecode source. Anytime the CHASE ON/OFF button is turned on while the Remote Source is not set to ADAT, the Generator's timecode output will be based on and will follow the current timecode input (this is called regeneration).

Now you can either output the Generator to the TIMECODE OUT connector directly, or record it onto the TC track of the RD-8 tape. Recording timecode is dependent on the current Chase menu settings. In other words, if the Chase Mode is set to Once, the timecode coming from the Generator will ignore forward moving discontinuities in the incoming timecode. None of the Gen Set-up menu pages will have any effect while CHASE ON/OFF is turned on. If the GEN SET-UP button is pressed while DATA EDIT is turned on, the display will look like this:

```
Gen from Chase
```

- **The F1, F2 and F3 buttons do nothing, and no other pages in the Gen Set-up menu are available.**

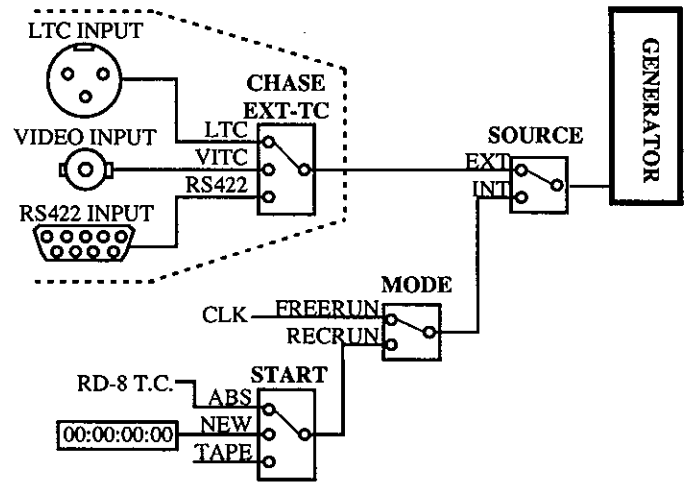
If the current Chase settings are reading the RD-8's TC track, putting the TC track into record-ready would defeat any locking capability, since the timecode on tape is no longer being played. In this case, the Generator will automatically being using the ABS Time as a reference, with an offset automatically adjusted so that it continues from where the TC track's timecode left off. Normally, the TC track is present at the TIMECODE OUT connector. If the TC track is put into record-ready, the Generator's output will be present at the TIMECODE OUT connector.

If the Generator Source is set to Internal, several other pages in the Gen Set-up menu become accessible, which cannot be found when set to External. The Generator Mode can be set to Free (where timecode is constantly being generated regardless of the tape transport's status) or to

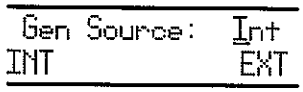
Rec-Run (whereby timecode is only generated while the transport is engaged; i.e. not in Stop mode). The Timecode Address (start time for generating new timecode) can also be set to either the current tape position (ABS Time), the current timecode position or to a manually preset start time.

Finally, a very unique function of the RD-8 exists when writing or reading timecode. User Bits are customized chunks of information that can be inserted into the timecode being generated. Later this information can be retrieved while reading timecode that contains such information. User Bits can be comprised of Real Time Clock information (which identifies when the timecode was established), or a User Memo (a message containing up to 8 characters).

Generator Source



The first page of the Gen Set-up menu is the Generator Source page. The Generator Source determines where timecode originates: Internal or External. When set to External, all of the parameters setup in the Chase menu are utilized for the Generator functions, regardless of whether CHASE ON/OFF is turned on or off. This means that the timecode input selected in the Chase menu will be recorded on to the TC track and output at the SMPTE OUT connector if the TC track is put into record-ready. In addition, if the Generator Source is set to External, most of the following additional Gen Set-up menu pages are not accessible.



The current setting will be displayed in the upper right corner.

- **Press F1 to select Internal mode**

If Internal mode is selected, four more pages are accessible beyond the Generator Source page in this menu.

- **Press F3 to select External mode.**

If External mode is selected, no further pages will be accessible (nothing will happen upon pressing NEXT) since you are at the end of the menu.

Internal Generator Mode

When the Generator Source is set to Internal, there are four additional pages that become accessible within the Gen Set-up menu (these are not available when the Generator Source is set to External, because these parameters become the responsibility of the Chase menu functions). These additional pages determine the settings for how timecode should be internally generated (some of these pages will not be available, depending on how previous pages were setup). If you need to supply an external device with timecode from the RD-8, you can either output timecode based on the ABS Time on tape, or you can record this timecode onto the TC track of the RD-8 tape. This can make things easier if you are using an offset, since you can record the timecode with the offset onto tape.

The second page in the Generator Set-up menu is the Internal Generator Mode, which determines whether timecode will be generated at all times (Free) or only when the RD-8 is in record mode (Rec-Run).

This page is only accessible if the Generator Source is set to Internal.

The current setting will be displayed in the upper right corner.

- **Press F1 to select Free mode**
- **Press F3 to select Rec-Run mode.**

If the Generator Mode is set to Free mode, it will generate timecode continuously, and none of the remaining pages in the Gen Set-up menu will be available.

The Generator's output will still only go to the TC track and will only be sent to the TIMECODE OUT connector if the TC track is placed into record. This means that playback will cause the timecode output to follow the TC track, while the generator is internally continuing to run, possibly at an entirely different location. Switching the mode to Rec-Run while not in record will stop the Generator. Switching between the two modes allows you to start and stop the free running generator.

If the Generator Mode is set to Rec-Run, the Generator will only generate new code while the TC track is in record. The other functions in the Generator menu may only be changed while the Generator is not running.

Address Mode

NEXT

The next page in the Gen Set-up menu is the Address Mode page, and is only available if the Generator Mode is set to Rec-Run. When timecode will be generated by putting the TC track into record mode, the timecode will begin at an address based on the current Address Mode (Tape, ABS or New).

This page is only available if the Generator Source is set to Internal, and the Generator Mode is set to Rec-Run.

The current setting will be displayed in the upper right corner.

- **Press F1 to select Tape mode,**

If the Address Mode is set to **Tape**, the Generator will continue generating the same format code as on the timecode track when record is entered on the TC track. If no timecode exists on tape, no timecode will be output, nor will can be recorded. This will be indicated by the fact that you will not be allowed to enter record on the TC track in this condition.

- **Press F2 to select ABS**

If the Address Mode is set to **ABS**, the Generator will output timecode based on the ABS Time on tape. Selecting this mode will create the identical timecode output as generated by the ABS Time on tape. On order for this timecode to be output at the TIMECODE OUT connector, the TC track must be placed into record-ready, or must be playing back a tape that has had the ABS Time recorded onto the TC track (see*Recording Timecode*, later in this section).

- **Press F3 to select New.**

If the Address Mode is set to **New**, the Generator will output timecode that is synchronous to the ABS Time, but starting at an arbitrary address as defined in the next page (Address Start page). The timecode will be generated while the TC track is in record. While not in record, the generator will retain the address it was stopped at, and will continue again when put back into record.

NEXT

To set the Address Start, press NEXT while the Address Mode is set to New. This page is only available if the Address Mode is set to New.

The New Start Time will appear in the upper part of the display.

- **Use F1 (EDIT) or CURSOR to advance the cursor through each pair of digits, and use ▲ and ▼ to adjust each value.**

- **Press F3 (CLEAR) to clear the timecode. This resets the Start Address to 00:00:00:00.**

Frame Rate

NEXT

The next page in the Gen Set-up menu is the Frame Rate page. This is where you determine what rate of timecode is to be generated.

This page is only available when the Generator Mode is set to Internal, and the Address Mode is not set to TAPE.

The currently selected frame rate will appear in the upper right corner of the display.

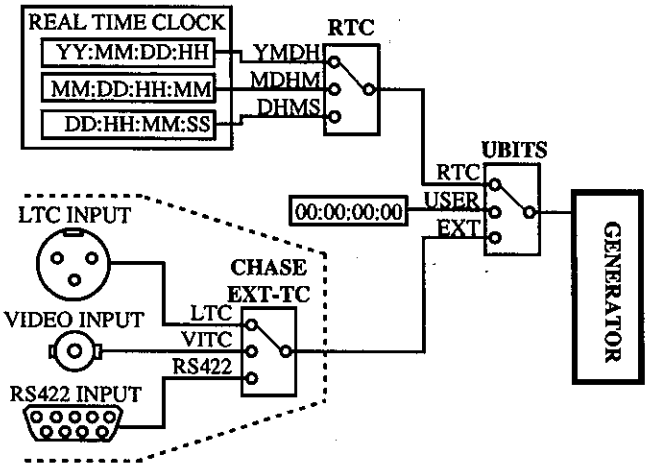
- **Use ▲ and ▼ to select the desired frame rate.**

The options are: 24, 25, 29.97, 29.97DF (Drop Frame), 30, and 30DF. Continually holding ▲ or ▼ will allow you to scroll through the available options.

User Bits

NEXT

The last page of the Gen Set-up menu is the User Bits function of the Generator. User Bits are specific pieces of information which may be imbedded into the timecode generated by the RD-8 and recorded onto the TC track. When this timecode is later read back, the User Bit information may be retrieved and displayed using a special page found in the Main Function menu.



User Bits can either be a memo containing a maximum of eight characters, or a time-stamp from the RD-8's real-time clock. When the real-time clock is selected, you may choose the format the date and time are in (year-month-day-hour, Month-day-hour-minute, or day-hour-minute-second). User Bits are generated and read with every frame of timecode.

The first of the User Bits pages is the User Bits Source page.

```
GenUBits: Ext-tc
EXT-TC RTC  USER
```

The current setting will be displayed in the upper right corner.

- **Press F1 to select External Timecode (EXT-TC)**

  If the User Bits Source is set to External Timecode, the Generator's User Bits will follow the incoming User Bits that accompany the external timecode it receives. If no timecode is being received, the Generator User Bits will be set to 00:00:00:00.

- **Press F2 to select Real Time Clock (RTC)**

  If the User Bits Source is set to Real Time Clock, the current settings of the RD-8's real-time clock will be placed in the User Bits (date and time information). The format of the date/time can be set by advancing to the next page (see next step).

- **Press F3 to select User Memo (USER).**

  If the User Bits Source is set to User, you may advance to the next page where you can create a memo of up to 8 hex characters (00–FF).

NEXT

If the User Bits Source is set to RTC, pressing NEXT will advance the display to the Real Time Clock Set page.

```
RTC Select: ymdh
YMHD  MDHM  DHMS
```

The current selection will appear in the upper right corner.

- **Press F1 to select Year-Month-Day-Hour (YMDH)**
- **Press F2 to select Month-Day-Hour-Minute (MDHM),**
- **Press F3 to select day-hour-minute-second (DHMS).**

To set the internal clock's time and date, see next section.

NEXT

If the User Bit Source is set to USER, pressing NEXT will advance the display to the User Memo Input page.

```
UBit 00:00:00:00
EDIT
```

- **Use F1 (EDIT) or CURSOR to advance the cursor through each pair of digits.**
- **Use ▲ and ▼ to adjust each value.**

Reading User Bits from timecode

1 Set the User Bits Source to External Timecode (EXT-TC).

Refer to previous tutorial.

2 Simultaneously press HOME and NEXT .

This will return the LCD display to the first page of the Main Function Menu page.

3 Press NEXT three times.

The display will advance to page four of the Main Function menu.

```
MAIN MENU        4
TCRew    UsrBits
```

4 Press F3 (UsrBits).

The display will move to the Tape TC User Bits page.

```
Tape TC UserBits
 (no time code)
```

This page exists only for viewing the current User Bits of the tape timecode track. No parameters are editable.

5 Press ▶PLAY to engage playback.

The TC track will be read and the imbedded User Bits will be displayed. If no timecode exists on tape, the display will read "(no timecode)."

Realtime Clock

The realtime clock can be embedded into the User Bits of the Generator's timecode output. This is helpful when trying to find out when timecode was recorded. Once the realtime clock is set, it remains operational while the RD-8's power is turned off.

Setting the realtime clock

1 Simultaneously press HOME and NEXT .

This will return the LCD display to the first page of the Main Function Menu page.

2 Press NEXT six times.

This will advance the display to the seventh page of the Main Function menu.

```
MAIN MENU        7
DateSet  TimeSet
```

3 Press F1.

The display will move to the Date Set page.

```
Date Jan/01/1993
MONTH  DAY  YEAR
```

The previously set date will appear in the upper right corner.

4 Press F1, F2 or F3 to select the Month, Day and Year, respectively, and use ▲ and ▼ to adjust.

The display will change as you adjust each value.

5 **Press NEXT .**

The display will advance to the Clock Set page.

```
Time     12:34:56
HOUR     MIN   SET
```

The previously set time will appear in the upper right corner.

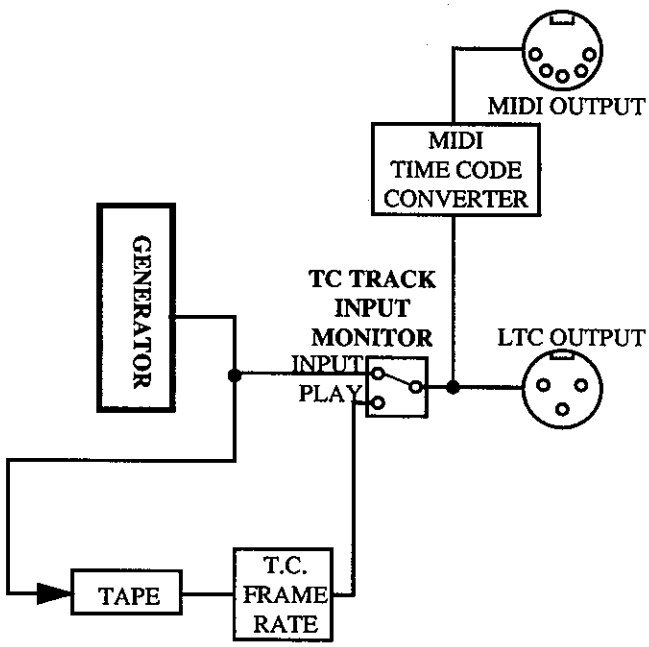
6 **Press F1 or F2 to select Hours or Minutes, and use ▲ / ▼ to adjust.**

The display will change as you adjust each value, while the seconds will continue counting.

7 **Press F3 (SET) to reset the Seconds counter to "00".**

Recording Timecode

Once timecode is being generated, you can record it onto the TC track of the RD-8's tape (actually, timecode is recorded as data into the subcode area of the tape, similar to professional timecode-ready R-DAT recorders). This can be done in the same manner as recording onto any other track, by putting the TC track into record-ready and engaging record. The generator's output is always going to the TC track's input. When the TC track is placed into record-ready, the Generator's output will be routed to the TIMECODE OUT connector on the back of the machine.



Recording Timecode onto the TC Track from the Internal Generator

1 **Follow the instructions in each of the previous sections to set-up the Generator and Chase functions to your satisfaction.**

2 **With DATA EDIT turned off (DATA EDIT LED off), press** GEN SET-UP **.**

When not in Data Edit mode, pressing GEN SET-UP puts the TC track into record-ready (instead of accessing the Generator Set-up menu). The RECORD LED for the TC track will flash.

3 **Use ◀◀REWIND or ▶▶F.FWD to locate to the tape position you wish to begin recording timecode.**

Double check that the Address Mode (and, if necessary, the Start Address) has been set as desired.

4 **Hold ● RECORD and press ▶ PLAY to engage recording.**

Both the RECORD LED and PLAY LED will light, and the RECORD LED for the TC track will light (stop flashing).

5 **When you have recorded enough timecode, press ■ STOP.**

The STOP LED will light.

Later, if you want to extend timecode striping, find the end of the coded section, rewind about 10 seconds, press PLAY, and confirm that the PLAY LED is lit and that the address is TAPE. Then press REC and PLAY simultaneously.

We recommend that you strip timecode in one continuous pass from the beginning of the TAPE section to the end. You can either manually select the desired ABS time reference, or you can select ABS as the generator reference--so that when ABS starts, the generator will start simultaneously (00:00:00:00 ABS equals 00:00:00:00:00 SMPTE Time Code.

When using the internal generator, you may stipe timecode and format the tape simultaneously.

Recording Timecode onto the TC Track from an External Source

1 Follow the instructions in each of the previous sections to set-up the Generator and Chase functions to your satisfaction.

2 With DATA EDIT turned off (DATA EDIT LED off), press GEN SET-UP.

When not in Data Edit mode, pressing GEN SET-UP puts the TC track into record-ready (instead of accessing the Generator Set-up menu). The RECORD LED for the TC track will flash.

3 Use ◀◀ REWIND or ▶▶ F.FWD to locate to the tape position you wish to begin recording timecode.

Double check that the Address Mode (and, if necessary, the Start Address) has been set as desired.

4 Hold ● RECORD and press ▶ PLAY to engage recording.

Both the RECORD LED and PLAY LED will light, and the RECORD LED for the TC track will light (stop flashing).

5 When you have recorded enough timecode, press ■ STOP.

The STOP LED will light.

Later, if you want to extend timecode striping, find the end of the coded section, rewind about 10 seconds, press PLAY, and confirm that the PLAY LED is lit and that the address is TAPE. Then press REC and PLAY simultaneously.

We recommend that you strip timecode in one continuous pass from the beginning of the TAPE section to the end. You can either manually select the desired ABS time reference, or you can select ABS as the generator reference--so that when ABS starts, the generator will start simultaneously (00:00:00:00 ABS equals 00:00:00:00:00 SMPTE Time Code.

When recording timecode from an external source, first format the tape and then stipe time code; do not attempt to stripe code and format simultaneously.

Transmitting Timecode

Normally, the TIMECODE OUT connector will transmit timecode that has been recorded onto the TC track. Think of this connector as being the TC track's output. However, you can also route the Generator's output directly to this connector by placing the TC track into record-ready. This is done in the same manner as putting any other track into record-ready, however in this case you use the GEN SETUP button.

When reading back timecode from the TC track, you can determine the frame rate even though you have already recorded timecode onto tape using a different frame rate. The timecode level at the TIMECODE OUT connector can also be adjusted.

Finally, you can choose whether to output timecode while only in play, or anytime the transport is moving (i.e. play, rewind, fast forward, cue, review or record).

Setting the timecode output level

1 Simultaneously press HOME and NEXT .

The LCD will display the first page of the Main Function menu.

```
MAIN MENU      1
SmpRate  Pull+/-
```

2 Press NEXT twice.

The display will advance to the third page in the Main Function menu.

```
MAIN MENU      3
TCLevel  TCFrame
```

3 Press F1 (TCLevel).

The display will move to the TC Level page.

```
TCOut Level 2.4V
Ref
```

4 Use ▲ and ▼ to adjust the timecode output level.

The value range is 0.0V to 3.0V, in 0.1 volt increments.

5 Press F1 (REF) will reset the timecode output level to the nominal level, which is 2.4V.

Selecting the TC track's timecode frame rate

1 **If you have just finished the previous tutorial, press NEXT and begin at step 4.**

2 **Simultaneously press HOME and NEXT .**

The LCD will display the first page of the Main Function menu.

```
MAIN MENU      1
SmpRate  Pull+/-
```

3 **Press NEXT twice.**

The display will advance to the third page in the Main Function menu.

```
MAIN MENU      3
TCLevel  TCFrame
```

4 **Press F3 (TCFrame).**

The display will move to the TC Frame Rate page.

```
TCOut FR TAPE
   (30 df )
```

5 **Use ▲ and ▼ to select the timecode frame rate.**

Choose either 24, 25, 29.97, 29.97df, 30, 30df or Tape. Selecting Tape sets the frame rate to that which was recorded onto the TC track

Selecting timecode output during rewind/fast forward

1 If you have just finished the previous tutorial, press NEXT and begin at step 4.

2 Simultaneously press HOME and NEXT.

The LCD will display the first page of the Main Function menu.

```
MAIN MENU      1
SmpRate  Pull+/-
```

3 Press NEXT three times.

The display will advance to the fourth page in the Main Function menu.

```
MAIN MENU      4
TCRew    UsrBits
```

4 Press F1 (TCRew).

The display will move to the TC Rewind/Fast Forward page.

```
TC REW/FWD:  Off
```

5 Use ▲ and ▼ to toggle the function on and off.

When on, timecode will be output whenever the transport is in motion. During fast forward and rewind, the RD-8 will continuously output 5 frames at a time of play speed time code in a forward direction, which is constantly tracking the ABS Time position on tape. When off, timecode will only be output while the transport is in play or record.

Pull Up & Pull Down

As stated in the previous section, the RD-8's sample rate is adjustable between 48 kHz and 44.1 kHz (see above). However, for film to video transfers the sample rate must be changed to compensate for timing differences between film and video formats. This can be done using the Pull-Up & Pull-Down function, which can either raise or lower the selected sample rate by .1%. For example, if you recorded everything at 44.1 kHz while locked to film, and then you transferred to NTSC video, the sample rate would have to be "pulled-down". The result would be that all your recordings will run a little slower. The Pull-Up & Pull-Down function changes the speed of the tape plus or minus .1% without changing the timecode format. Refer to Appendix 3.

Setting Pull-Up & Pull-Down

1 Simultaneously press HOME and NEXT.

The LCD will display the first page of the Main Function menu.

```
MAIN MENU      1
SmpRate  Pull+/-
```

2 Press F3 (Pull+/-).

The display will move to the Sample Rate Pull Up/Down page.

```
  Rate No Change
OFF    UP     DOWN
```

3 Press F2 (UP) pull-up the sample rate by .1%.

4 Press F3 (DOWN) to pull-down the sample rate by .1%

5 Press F1 (OFF) to reset the pull up/down to 0% (no change).

RS-422

The RD-8 features an RS-422 connector on the back which supports the Sony 9-pin protocol for VTR emulation. The Sony 9-pin protocol was established as a means of controlling tape machines from a single controller source. To make use of this function assumes you have a Sony 9-pin equipped controller (which should be connected to the Sony 9-pin connector on the back of the RD-8). This protocol includes timecode and transport commands. The RD-8 emulates a BVU video tape recorder; for best results select this device driver in the video editor. For more information, refer to your controller's operational manual.

To establish RS-422 control of the RD-8, set the Remote Control In source to RS-422, and place the REMOTE LOCAL button in either Remote or Local and Remote mode. Refer to the section entitled *Remote Control* earlier in this chapter for more information.

MIDI

The RD-8 can respond to MIDI Machine Control messages. This is done by setting the Remote Source to MIDI and placing the REMOTE LOCAL button in either Remote or Local and Remote mode. When this is done, you may also set the RD-8's MIDI Device ID number. Refer to the section entitled *Remote Control* earlier in this chapter for more information.

The RD-8's generator is capable of outputting MIDI Time Code (MTC) as well as MIDI Machine Control (MMC) messages. Whenever SMPTE is being generated, MTC is also being sent out the MIDI OUT connector. However, it is possible to disable MMC messages from being transmitted. This is convenient when you wish to leave your MIDI connections hooked up (for sending MTC or System-Exclusive dumps) but do not want to transmit this other information.

Enabling and Disabling MMC Output

1 Simultaneously press HOME and NEXT .

The display will move to the first page of the Main Function menu.

2 Press NEXT five times.

This will advance the display to the sixth page of the Main Function menu.

```
MAIN MENU          6
Xfade          MMCOut
```

3 Press F3 (MMCOut).

The display will move to the MIDI Machine Control Output page

```
MMC Output: Off
```

The current setting will appear in the upper right corner.

4 Use ▲ and ▼ to toggle the MMC Output on and off.

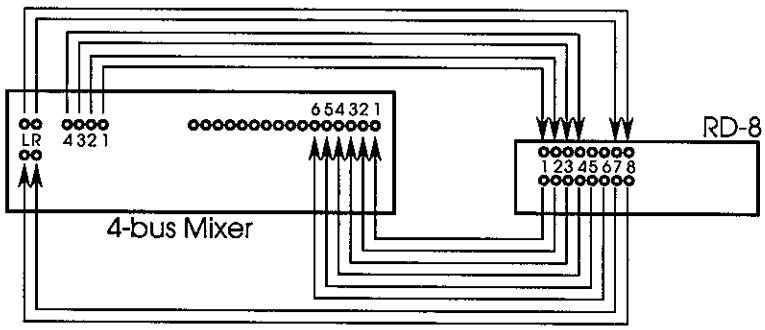
APPLICATIONS

Overview

THIS CHAPTER is designed to give you an idea of the multitude of applications for RD-8. The RD-8 can be easily integrated into virtually any production system, be it in the film, post-production, project studio or broadcast fields. We will discuss the concepts of how the RD-8 connects and interacts with other professional equipment commonly used in such applications. These applications are not broken down into great detail. Therefore, where applicable you will need to refer to other sections of this manual for instructions on how to setup the RD-8 for a particular job.

Combined Multitrack/Mastering Deck

The RD-8 can serve as a combination 6-track multitrack recorder and 2-track mastering deck. Record your audio onto tracks 1–6, then run them through a mixer, using the sub or group outs to send them back to tracks 7 and 8. Tracks 7 and 8 will contain the stereo master recording; their outputs should then be connected back to the mixer's 2-track playback inputs.



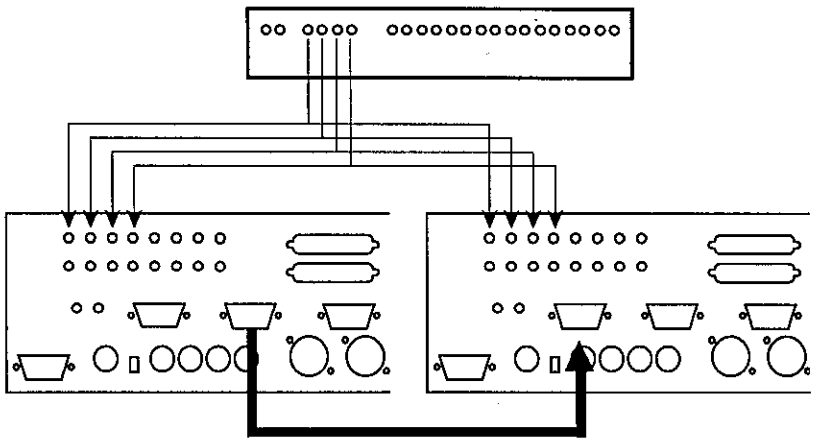
In addition, the RD-8's Generator can output SMPTE or MTC to simultaneously synchronize a MIDI sequencer to tape. This way, you can mix down not only the first 6 tracks from the RD-8 but your "virtual" tracks on the sequencer as well, all onto tracks 7 and 8.

If you are using a multiple machine system (with one or more RD-8s and/or ADATs), you can dedicate any two tracks in the system for a stereo mix. Because all machines are perfectly synchronized to one another, you can punch-in and -out of the mix itself. This opens up all sorts of possibilities, like changing the EQ, effects and other mix settings for different sections of the recording.

Live/Long-Term Recording

The RD-8 is excellent for record:live recording because of its compact size and easy operation. Eight tracks allow for recording audience sounds, ambiance, and individual soloists as well as a stereo mix of the PA. Of course, multiple machines may be interconnected and synchronized to allow for more tracks.

When using more than one RD-8, you can increase the recording time by offsetting the second machine. This way, the second machine kicks into record just before the first machine is at the end of the tape. Naturally, the audio signals would need to be split and connected to both sets of inputs.



If you are using more than two machines, you can split the system into two sets of machines by offsetting the second set by 35 minutes (allowing for 5 minutes of overlap). This would allow for extended recording time on more than 8 tracks. Refer to *Multiple Machine Operation* later in this chapter for more details on connecting multiple machines and setting machine offsets.

Besides the typical 120 minute type of S-VHS tapes (which provide 40 minutes of digital audio recording time), 160 minute tapes are also available (which provide over 53 minutes recording time). The RD-8 must be setup for the length of tape being used. This is done within the Main Function Menu.

To select the tape size

1 Simultaneously press HOME and NEXT .

This will return the LCD display to the first page of the Main Function Menu.

2 Press NEXT seven times.

The display will advance to page eight of the Main Function Menu.

```
MAIN MENU      8
TapeLength   LCD
```

3 Press F1 (TapeSize).

This will advance the display to the Tape Size page.

```
Tape = T120/E180
LENGTH
```

The current setting will be displayed in the upper right corner.

4 Press F3 (Length) to toggle between T120/E180 and T160/E240.

Location Recording

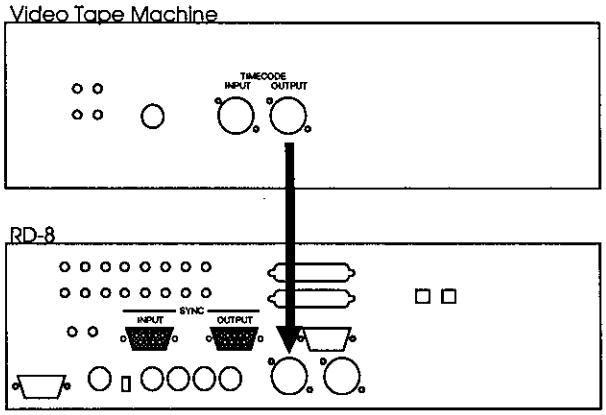
With the RD-8, you can stripe tape with timecode onto a dedicated track (the TC track) and still record 8 tracks of digital audio (dialog, sound effects) while on location. In such a situation, you will want the timecode on the RD-8's TC track to be synchronous with the film camera's timecode. To do this, setup the RD-8's Generator to write timecode based on an external source.

The RD-8's User Bits can be used on location to identify the date of the shoot, or the reel number you are working on.

The RD-8 also makes an excellent mixdown deck for current multi-channel formats (such as surround sound) that require more than two tracks.

Locking to Video: Code Only Master

A common application in the audio post-production environment is locking to video using only the timecode on the video tape as both a clock source and a locate reference. The connections consist of running a balanced or unbalanced XLR cable between the RD-8's SMPTE IN connector and the VTR's SMPTE OUT (if timecode is recorded onto either the left or right audio track of the tape, connect the cable to the proper channel's output connector).



The RD-8 now must be set to lock to both the clock and locate reference of the VTR's timecode. This is done in the Chase menu (see *Chase* in Chapter 5). Assign the Clock Source to EXT-TC, and the EXT-TC source to LTC.

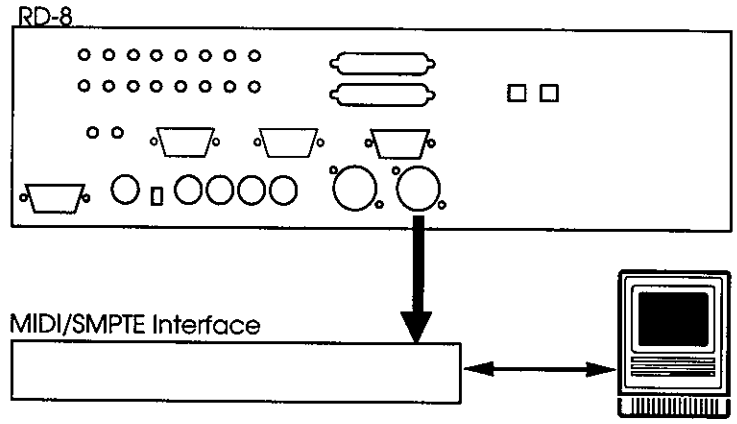
If the Remote Control In source is set to ADAT, you will not be able to adjust the clock and Ext-TC parameters in the Chase menu.

To synchronize the RD-8's clock to the video frames of the VTR's tape, it is necessary to connect the video recorder and the RD-8 to the same sync source. The RD-8's VIDEO IN connector accepts composite video, video sync or black burst from a reference generator. In this situation, the RD-8 is still relying on timecode for locate reference. The RD-8's clock, however, should be assigned to VIDEO.

Computer Control

MIDI Systems: Virtual Tracking

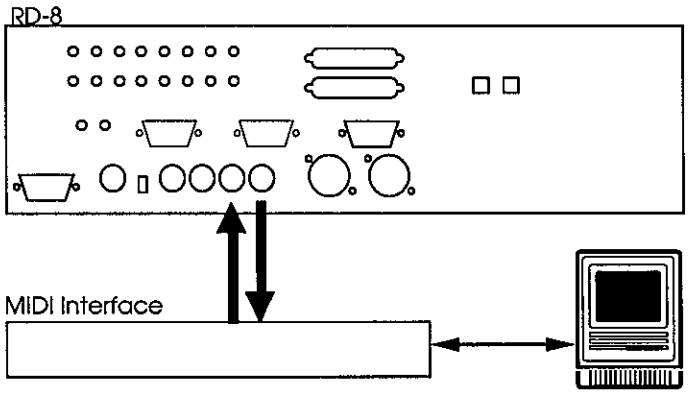
Lately, many sequencing software manufacturers have been integrating digital audio hard disk recording and playback into their sequencers. However, the RD-8 can offer much the same flexibility without the added expense of a new program (or upgrade) or the hardware that accompanies a hard disk recording system.



Setup the RD-8's Generator to output SMPTE (or MTC) and route the related connector to the sequencer (SMPTE OUT or MIDI OUT). Sync your sequencer to this timecode by whatever means you normally use (for example, a SMPTE converter). As you control ADAT's tape motion with the transport controls, the sequencer will automatically follow along, letting you mix digital recordings with virtual MIDI tracks on any computer-based sequencer.

MIDI Machine Control: Virtual Remote Control

Many of the computer-based sequencing software programs today have implemented (or will soon implement) MMC — MIDI Machine Control — into their sequencers. MMC is a specification implemented by the MIDI Manufacturers Association (MMA) and the Japan MIDI Standards Committee (JMSC) which details a set of messages that provide a universal way of having sequencers and tape machines speak to one another (not to mention tape machines talking to each other). These messages include: basic transport functions (like Play, Stop and Record), Locate functions (go to a specific tape location), Track functions (record-enable, input monitor, track delay), and many other types of messages. However, not all sequencers send out all these messages; some even send only basic transport commands. The total amount of control you have over your RD-8 depends entirely on how much of the MMC specification has been implemented in the software you use.



First, make sure your sequencer is receiving either SMPTE or MTC from the RD-8 (see previous section). In addition, connect the MIDI Out of your sequencer to the MIDI In of the RD-8. If your sequencer generates MMC commands, you should be able to put your sequencer into play and have the RD-8 follow along. However, don't be surprised if the RD-8 does not immediately go into play. When a PLAY command is sent from the sequencer, the RD-8 is issued a locate command, telling it where the sequencer is positioned (in timecode). The RD-8 may first have to fast forward or rewind to get to the same location as the sequencer. Once this is done, the RD-8 should resume playback which is when either SMPTE or MTC is generated, which causes the sequencer to go into play. In essence, the sequencer is always locking to the RD-8 timecode, while the transport commands you issue from the sequencer act as remote functions, more or less.

Libraries and Archives

The RD-8 is superb for archiving purposes, such as speeches and broadcasts, stereo mixes or libraries of stereo samples. The RD-8 can record over five hours of mono material by recording 40 minutes on each track. Over 2–1/2 hours of stereo mixes or samples can be recorded by mixing down to four sets of stereo pairs (1/2, 3/4, 5/6, and 7/8).

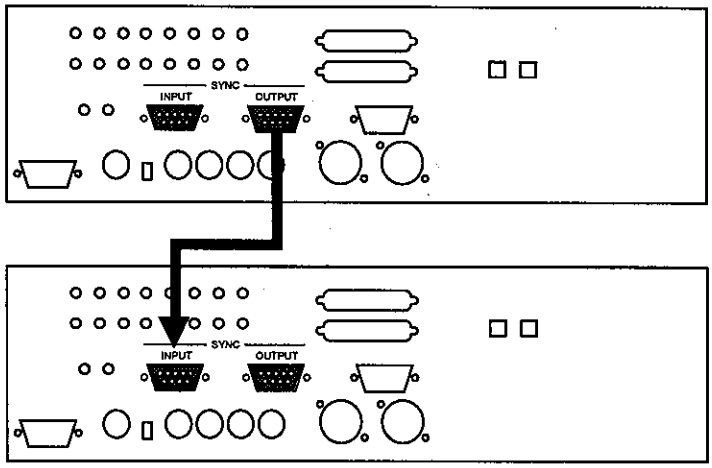
To further the computer's capabilities, an RS-422 connection can be made. The RS-422 connector on the RD-8 supports the Sony 9 pin protocol for remote control. When incorporated into computer software, this protocol opens up the possibility for a computer based editing system.

Multiple Machine Operation

Multiple Machine Basics

By itself, a single RD-8 provides a lot of flexibility. However, in a multiple machine system, new possibilities arise. When linking multiple RD-8s together, each is locked to a single master, and relies on the time refernce on the master machine to link up each of the slaves.

Connections are easy to make; one 9 pin D connector for each slave RD-8 or ADAT. Although a slave ADAT will automatically detect a master and go into slave mode, a slave RD-8 must be put into slave mode. This involves setting the Remote Control In source to ADAT, and the REMOTE LOCAL button to either Remote mode or Local and Remote mode.



Keep in mind that since the RD-8 is an ADAT-compatible machine, you can intermingle any number of RD-8s and ADATs together—up to 16 machines total for 128 tracks. If you plan to do this, it is a good idea to make one of the RD-8 machines the master, especially if you plan on locking to video, SMPTE or some other source.

Using the 8-channel proprietary digital bus, you can bounce tracks between machines. Not only does this result in a perfect copy, but is perfectly synchronized with the original. This means you can make

perfect safeties and archives of parts. One creative way of using a multiple system (though it can be done with just one RD-8) is to dedicate two tracks of one machine for stereo mix-down. Since these mix tracks are always in sync with the rest of the system, you can execute a seamless punch at any time. For example, you could mix-down different sections of a recording independent from one another, making changes in the mix as you go along.

Each slave RD-8 can have its own offset, with respect to the master machine. Combine this feature with the ability to bounce tracks in the digital domain, and you have the ability to perform cut-and-paste style assembly editing.

Synchronizing Machines

Synchronization requires a dual male, 9 pin D connector for each pair of RD-8s or ADATs to be synchronized. This connection should be made while power is off, and the machines do not need to be turned on in any particular order. For more about connections, refer to the section entitled *Sync In/Out* in Chapter 3.

If using one or more RD-8s as slaves, it is necessary to put them into slave mode. This involves assigning the Remote Control In source to "ADAT" and putting the REMOTE LOCAL button in either Remote mode or Local and Remote mode.

Putting an RD-8 in ADAT slave mode

1 **Press** DATA EDIT **, if not already turned on.**

Both the DATA EDIT LED and the LCD EDIT LED in the TIME display will light, and all other gray function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 **Press** REMOTE LOCAL .

The top (red) REMOTE LOCAL LED will light, and the display will move to the Remote Control In page.

The current Remote Control In source will be displayed in the upper right corner.

3 **Press F1 (ADAT), if not already selected.**

You have now assigned the RD-8 to slave to incoming ADAT sync from another RD-8 or ADAT.

4 **Press DATA EDIT to exit Data Edit mode.**

The DATA EDIT LED will turn off.

5 **Press the REMOTE LOCAL button repeatedly until either only the top LED is lit, or both the top and bottom LEDs are lit.**

When only the top (red) LED is lit, the RD-8 is in Remote mode. It will respond only to the ADAT sync coming from another RD-8 or ADAT, and none of the transport or function buttons will be available except EJECT when the transport is stopped.

When both the top (red) and bottom (green) LEDs are lit, the RD-8 is in Local and Remote mode. It will respond to the ADAT sync coming from another RD-8 or ADAT, but will also function as an independent slave. This means you can operate the transport commands independent of the master. However, when the master's transport is engaged, the slave will follow. For more information, see *Master/Slave Interaction* later in this section.

After you've connected multiple RD-8s and/or ADATS together, put any slave RD-8s into slave mode and turned the machines on, the master's display will show "Id 1" (which stands for ID=1). The second machine will show Id 2, the third Id 3, and so on. The order is automatically assigned according to how the cables are hooked up.

If a slave does not show an ID number on power-up, then it does not see anything connected to the SYNC IN or SYNC OUT jacks. Check the cables and connections to determine the source of the problem.

If needed, the machines will renumber their IDs if more RD-8s or ADATs are connected later. *Example:* Suppose you have three RD-8s hooked up so that machine 1 is the master, and machines 2 and 3 are slaves. If you turn on machines 2 and 3, machine 1 will not be active so machine 2 decides it's the master (Id 1) and machine three the only slave (Id 2). If you turn on machine 1, the machines will renumber themselves so that machine 1 becomes the master (Id 1), and machines 2 and 3 become the slaves (Id 2 and 3, respectively). Note that in this example, if machines 1 and 3 are turned on but machine is turned off, machine 3 will not slave to 1 because 2 is turned off, so the sync signal cannot pass through it from 1 to 3.

Master/Slave Interaction

Pressing any of the transport buttons (PLAY, STOP, etc.), or AUTO REC, MARK IN, MARK OUT, LOC, LOC 0, ALL INPUT MONITOR, AUTO INPUT MONITOR, or VARI SPEED will automatically trigger the same functions on the slave machine(s) as well. Fostex recommends that you always initiate operations from the master, including all transport control functions, to minimize confusion. When you press PLAY on the master, the slave(s) will locate to the same timecode point and begin playing once sync is achieved.

When recording or punching in on the slaves, initiate recording on the master *but do not have any master tracks record-enabled* (unless, of course, you need to record tracks on the master). Any tracks that are enabled on the slaves will go into record. This is why record enable is an independent function for each slave.

There are two cases where you want the slave(s) to act independently. Formatting is initiated independently on the slave for a number of reasons, as detailed in the next section. Digital Input can also be set independently for the slave(s) since you may want to record via the analog inputs on some machines and via the digital inputs on others.

Of the master ADAT is stopped, then each of the slaves will function independently. For example, press PLAY on one of the slaves and it will

go into play mode (or change the AUTO INPUT MONITOR mode, etc.); the other slaves will not respond to this command. However, any time you press PLAY on the master or initiate any transport function, it will take over and control the slaves.

Formatting Multiple Tapes

Formatting works similarly to formatting on a single ADAT. However, it is necessary to consider what the slave does when formatting is initiated on the master. See the section entitled *Tape formatting* in Chapter 4 for more information.

If the master's FORMAT LED is on, performing a complete start-to-finish format, and the slave tape *is not* already formatted:

- If the slave's FORMAT LED is on, the slave rewinds to the start of the tape and does a complete format.
- If the slave's FORMAT LED is off, the slave rewinds to the start of the tape and plays, but the TIME display reads "noFO" (no format) while flashing the FORMAT LED.

If the master's FORMAT LED is on, performing a complete start-to-finish format, and the slave tape *is* already formatted:

- If the slave's FORMAT LED is on, the slave rewinds to the start of the tape and does a complete format.
- If the slave's FORMAT LED is off, the slave rewinds to the start of the tape and plays in sync with the master.

If any channels re record-enabled, they will start recording at time 00:00:00.

If the master's FORMAT LED is on, and you are extending the format, and the slave tape *is not* formatted:

- The slave plays, but the TIME display reads "noFO" (no format) while flashing the FORMAT LED.

If the master's FORMAT LED is on, and you are extending the format, and the slave tape *is* formatted:

- If the slave's FORMAT LED is on, the slave autolocates to the same time as the master, then format extension begins.
- If the slave's FORMAT LED is off, the slave autolocates to the same time as the master and plays or records in sync.

To properly extend the format, the master and slaves should be playing in sync before punching into format record.

If the master's FORMAT LED is off and initiates a RECORD command anywhere in the tape and the slave's FORMAT LED is off:

- If the slave tape is unformatted, the slave plays, but the TIME display reads "noFO" (no format) while flashing the FORMAT LED.
- If the slave tape is formatted, the slave autolocates to the same time as the master and plays or records in sync,

To properly punch in, the master and slave should be in sync before punching. Otherwise, the master will punch in immediately, but the slaves won't punch in until sync is achieved.

If the master initiates recording from the audio portion of the tape and the slave's FORMAT LED is on:

- If the slave's tape is formatted, the slave autolocates to the same time as the master and then format extension begins.

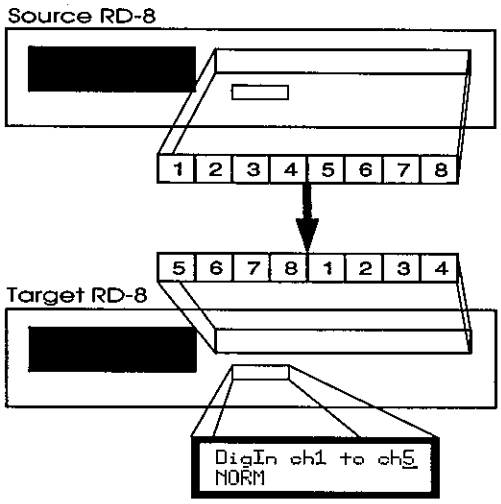
If the master initiates recording from the start of the tape and the slave's FORMAT LED is on, start-to-finish formatting begins regardless of whether the slave tape is formatted or not.

Bouncing Tracks

Tracks can be bounced between machines in a multiple ADAT system by using the digital bus. The digital bus is connected in much the same way as the sync cables, and should be done in the same order. Refer to the section entitled *Optical In/Out* in Chapter 3 for more information on connecting the digital bus.

If the DIGITAL INPUT button is pressed, the RD-8 will record from the DIGITAL IN connector. The proprietary 8 channel digital bus carries the 8 tracks of a source RD-8 or ADAT. These 8 channels are routed 1 to 1 to the 8 tracks of the RD-8 recording the digital audio.

However, it is possible to transpose the channel/track assignments. This is done by specifying which track the first channel of digital audio should be routed to. Based on this, the other channels will be assigned in a serial manner. For example, if you assign channel 1 to track 2, channel 2 will be assigned to track 3, channel 3 will be assigned to track 4, and so on; finally, channel 8 will be assigned to track 1. If, instead, you assigned channel 1 to track 5, channel 2 would be assigned to track 6, channel 3 to track 7, and so on. By transposing the channel/track assignment in this way, it is possible to bounce tracks on a single RD-8 by connecting a single fiber optic cable between the machine's DIGITAL IN and DIGITAL OUT jacks. By placing tracks 5–8 in record, you could have a copy of the first four tracks.



Transposing the digital input channels' track assignments

1 **Press DATA EDIT, if not already turned on.**

Both the DATA EDIT LED and the LCD EDIT LED in the TIME display will light, and all other gray function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 **Press DIGITAL IN.**

The DIGITAL IN LED will light, and the LCD display will show the Digital In Track Assignment page.

```
DigIn ch1 to ch1
NORM
```

The current setting will appear in the upper right corner.

3 **Use ▲ and ▼ to alter the track assignment mode.**

The value range is 1–8. Selecting a value of 2 will assign channel 1 to track 2, channel 2 to track 3, etc. Selecting a value of 5 will assign channel 1 to track 5, channel 2 to track 6, etc.

4 **Press F1 (NORMAL) to revert back to the normal track assignment mode.**

The Normal mode assigns channel 1 to track 1, channel 2 to track 2, etc.

Making Digital Backups

RD-8 tapes can be backed up for safety by copying all eight tracks to another RD-8 (or ADAT compatible machine) via the digital bus. The result is a perfect digital duplication of the original. It's a good idea to make backups on a regular basis, whenever you finish work for the day,

or complete a project. The backup can either be sample accurate to the time reference or not. This depends on whether or not the two machines are synchronized together via a 9-pin connector cable. It is recommended, however, that you do have the Sync cables connected between the machines, as described in the section entitled *Synchronizing Machines*.

When making a backup, the tape you are backing up is inserted into the *Source* machine. The tape you are backing up to is inserted into the *Target* machine. It is recommended that the Target machine comes after the Source machine in the system chain. If you initiate a backup from the beginning of a tape, the TOC will also be copied to the target machine.

Backing up a tape

1 **Connect a fiber optic cable between the OPTICAL OUTPUT of the Source RD-8 and the OPTICAL INPUT of the Target RD-8.**

This routes the digital audio from the Source RD-8 to the Target machine.

2 **Connect a male/male, 9-pin D connector cable between the SYNC OUT of the Source RD-8 and the SYNC IN of the Target RD-8.**

This synchronizes the two machines; the Source RD-8 becomes the master (ID 1) and the Target machine becomes the slave (ID 2).

3 **Insert the tape to be backed up into the Source RD-8.**

4 **Insert a blank tape into the Target machine.**

5 **Press the** DIGITAL IN **button on the Target RD-8.**

The DIGITAL IN LED will be lit on the Target machine.

6 **Record enable all tracks on the Target RD-8.**

The RECORD LEDs for tracks 9–16 (all eight of the Target machine's tracks) will flash.

*BE SURE THAT RECORD ENABLE IS SWITCHED **OFF** FOR TRACKS 1–8 OF THE SOURCE RD-8 AND THE WRITE-PROTECT TAB (OR RECORD TAB) IS REMOVED (OPEN).*

7 Press both ▶PLAY and ●RECORD on the Source RD-8.

Since this is the master machine (ID 1), it will simply enter play mode while engaging record on the slave machine.

8 Press ■STOP on the Source RD-8 after backing up is complete.

Both machines will stop.

Machine Offset

When synchronizing multiple RD-8s, it is possible to offset any of the slave units from the master. This is done in the same manner as when offsetting a master from an external timecode source. However, when offsetting from timecode, the editable offset value is read in the standard 24-hour mode (00:00:00:00:00). When offsetting a slave machine from the master, the value is displayed and edited within a 40 minute range, since this is the length of the RD-8's tape.

The main reason for doing this would be for cut-and-paste style editing. By bouncing audio over the digital bus to a slave machine which is offset from the master, you can copy portions of audio to different sections of tape without having to re-record the audio.

For example, if you wanted to use the same take of the background vocals from the first chorus for chorus 2 and 3, you could bounce those track(s) to another machine. Then, by offsetting the original machine the track(s) came from, you could bounce back the vocals at the positions corresponding to the other choruses. A good analogy is the type of cut-and-paste editing available on most computer-based sequencers and word-processors. First you copy a selection to an invisible "clipboard", and then paste it from the clipboard to any number of locations. In the example above, the first time you bounce audio you are using the track(s) on another machine as a sort of "clipboard". You can then bounce the material back from the clipboard track(s) onto the original tracks at any number of other positions on the tape.

Setting the Machine Offset

1 **Press** DATA EDIT **, if not already turned on.**

Both the DATA EDIT LED and the LCD EDIT LED in the TIME display will light, and all other gray function buttons' LEDs will turn off except that of the last function selected in Data Edit mode.

2 **Press** CHASE ON/OFF .

The CHASE ON/OFF LED will light. Press Next 6 times to display the Offset Modify page. This is the only page in the Chase menu, when the Remote Control In source is currently set to ADAT.

```
+00:00:00:00.00
EDIT  ADAT   CMP
```

3 **Use** F1 **(EDIT) to advance the cursor, and use ▲ and ▼ to adjust each value.**

By selecting the first position to the left of the offset value, you can use ▲ and ▼ to select either + or -, thereby creating either a positive or negative offset. Whenever the Machine Offset value does not equal 00:00:00:00.00, the OFFSET LED will light.

4 **Press** F3 **(CMP) to compare the new offset with the previous value.**

Each time F3 is pressed, the display toggles between the new offset and the original offset value used when the Machine Offset page was first entered.

Once you leave the Machine Offset page, (by moving to another page or exiting Data Edit mode) the offset value displayed is retained. If this was a new offset, the original offset value is lost. If the displayed value was the original offset (Compare), the new offset is lost.

Modular Recording

Collaborations work particularly well with a system of two or more RD-8s (and/or ADATs). You can record your tracks onto the master machine, then do a premix onto two tracks of another machine, which is of course perfectly synchronized to the master. Send this tape to your partner, who adds parts on the other tracks. When the tape comes back, just pop it into one of your machines, and your partner's parts will be in sync with the original tracks you laid down.

The tape's TOC becomes extremely helpful in this situation, since your partner can recreate every parameter setting you were using by loading your TOC into his master RD-8. The RD-8's User Bits are also helpful, as they can be used to indicate the original date the tape was sent out, or to encode the tape with a memo.

OPERATIONAL REFERENCE

TIME Display

The TIME display indicates tape or timecode position. The DISP button is used to advance the TIME display through seven different modes. Successive presses of the DISP button changes the TIME display mode. The mode cycle is as follows: TIME-ABS > TIME-REL > LTC-TAPE > LTC-EXT > OFFSET-ABS > OFFSET-REL > GEN.

		CONTENT OF DISPLAY	*
ABS TIME	ABSOLUTE	00 M 00 S 00 F	1
	RELATIVE	r - 00 M 00 S 00 F	2
TIME-CODE	TAPE	00H 00 M 00 S 00 F 00 SF	3
TIME-CODE	EXTERNAL	00H 00 M 00 S 00 F 00 SF	4
INT/EXT OFFSET	ABSOLUTE	00H 00 M 00 S 00 F 00 SF	5
INT/EXT OFFSET	RELATIVE	00H 00 M 00 S 00 F 00 SF	6
GENERATOR		00 H 00 M 00 S 00 F	7

* The five LED dots located at the top left of the TIME display indicate the following operational status modes:

1 All LED dots extinguished.

2 All LED dots extinguished.

3 LTC TAPE LED dot lights; Blinks when no time code is found during playback.

4 LTC EXTernal LED dot lights; Blinks when unable to read time code.

5 OFFSET ABSolute LED dot lights. Display shows the offset of RD-8 to chase timecode input.

6 OFFSET RELative LED dot lights. Display shows the "difference" between the RD-8's desired location relative to timecode input.

7 GENerator LED dot blinks upon entering GEN mode and remains solid while the generator runs.

Front Panel LEDs

LCD Edit

This is the sixth LED dot (far right) found in the top of the TIME display. It is lit whenever you are in Data Edit mode (the DATA EDIT LED will also be lit).

Offset

This LED lights during all operations that involve a difference between external and internal timecode whenever Chase Mode is ON. It will also light if an offset exists while in Remote ADAT or Remote & Local ADAT mode.

T. Slip

This LED will be lit if any of the eight tracks are delayed using the Track Slip function.

A-Play

This LED lights when Auto Play is enabled.

A-Rtn

This LED lights when Auto Return is enabled. If the A-RTN and A-PLAY address are assigned to the same location, or if the Auto Return location is before the Auto Play location, the A-RTN LED will blink.

Locked

This LED lights when a synchronization LOCK is established. It blinks during the lock-up process. The LOCKED LED is not affected by Data Edit mode; i.e., if the RD-8 is locked and Data Edit mode is entered (DATA EDIT LED lit), the LOCKED LED will remain lit while the RD-8 is locked.

Fs

Only one of these two LEDs can be lit at any one time. The lit LED corresponds to the chosen sampling frequency.

Clock

The associated LEDs light according to the chosen clock signal. If the RD-8 does not detect signal for the chosen clock source, the LED will blink. If DIGITAL IN is selected and receiving signal, the LED associated to WORD will light. If ADAT is selected as the remote control, then no clock LED will light.

If no ADAT is connected to the sync in, the RD-8 will not allow remote ADAT mode to be enabled.

Front Panel Buttons

Format

Pressing the FORMAT button toggles between format enabled and disabled. To format a new tape (or to reformat/erase an old tape), the FORMAT button is first pressed (if the current tape was unformatted, the FORMAT LED will have been flashing before pressing it). The FORMAT LED will stop flashing and remain lit to indicate that the format mode will be entered if recording is started. Also, all eight track record enable LEDs plus the TC record enable will be flashing to indicate that all eight plus the TC track will be recorded on. Pressing any RECORD ENABLE buttons will have no effect while the format LED is lit solid.

If it is desired to record audio while formatting, tracks must be record-enabled before pressing the FORMAT button. Any audio present on those inputs will be recorded while formatting, while tracks not enabled before pressing the format button will be recorded with silence.

If RECORD is held down and PLAY is pressed (normal record mode entry), the RD-8 will enter format mode. When beginning format, the

RD-8 will actually enter play for a short period of time to achieve proper speed and to determine whether or not valid format information is on the tape already.

When FORMAT is enabled (FORMAT LED lit) and the RD-8 is placed in record, the type of format that is performed depends upon the current tape status as follows:

- The tape is unformatted:

1 If at the start-of-tape (i.e. rewound to the very beginning), then a complete format will be performed.

2 If not at start-of-tape, then format will be disabled and no recording will take place.

- The tape has been previously formatted:

1 If in the data portion of tape (before 00:00:00), then the tape will be automatically rewound to the start-of-tape and a complete format will be performed. While the tape is being auto-rewound, the display will read "Rewinding for Format" and the REWIND LED will flash

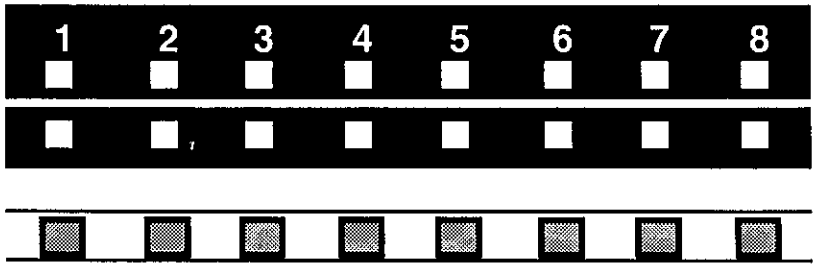
2 If in audio portion of the tape (from 00:00:00), then the tape will be format extended after entering record.

The only way to stop formatting is to stop (i.e. cannot punch-out).

When in format mode, all previous information on the tape portion being formatted will be lost.

When performing a complete format, the RD-8 places 15 seconds of leader (display reads "LEAd") at the start of tape, followed by 2 minutes of data (display reads "data"). Also note that any record-enabled tracks will not go into record until the tape counter reads 00:00:00.

When performing a format extend, the RD-8 begins "time-stamping" from the last valid time-stamp read from the formatted tape. This allows a partially formatted tape to have its format extended by entering format mode before the end of the previously formatted section.



Record Enables (1—8)

There is one RECORD ENABLE button for each track, for a total of eight buttons. Each button has an associated red RECORD LED. Any time a RECORD ENABLE button is pressed, its associated RECORD LED will flash to indicate that this track will start recording if record mode is entered (by pressing PLAY and RECORD). When a track starts recording, its RECORD LED will stop flashing and remain lit. After stopping recording, the LED will begin flashing again. To turn off the record enable, the button is pressed again. If PLAY is pressed while recording, then the recording tracks are punched out of record. Any track that is in record will also have its green INPUT LED lit , since while recording, the input signal is automatically monitored (see AUTO INPUT below).

Anytime PLAY and RECORD are pressed when not in record, the PLAY and RECORD LEDs will be lit, if at least one of the nine tracks (counting the TC track) are record-enabled. If none of the tracks are record enabled, the RECORD LED will flash, indicating that any track or tracks selected will immediately enter record. While the RECORD LED is lit or flashing, the RECORD ENABLE buttons can be pressed to punch in or out individual tracks independently. The RECORD LED will remain lit or flashing until PLAY is pressed (to punch out of record), or any other transport function is executed.

Any number of channels can punch in or punch out simultaneously, and any channel (s) can punch in or out while other channels are in record. However, channels cannot punch in or out while other channels are still crossfading, and channels cannot punch in while others are punching out, and vice-versa. This will not be a problem, however, since this would only have an affect if a channel is punched in or out in less than 11 milliseconds (or 43 ms at the slowest crossfade) after another channel has been punched in or out. This is very unlikely, and at worst would cause the second channel's punch in to be delayed by 43 ms.

Gen Setup

This is the Record enable button for the timecode (TC) track. The TC track's RECORD LED will blink when enabled. This LED will stop flashing and remain lit during record.

Enabling the TC track for recording timecode

1 **Press GEN SETUP button - the LED lights**

2 **Press RECORD and PLAY simultaneously.**

Auto Input Monitor

The AUTO INPUT MONITOR button is used to toggle between two tape/input monitor schemes. The tape is always monitored from input for record-enabled tracks. When the Auto Input function is off (AUTO INPUT MONITOR LED off), all record-enabled tracks are in input monitor and all other tracks are in tape monitor. When the auto input function is on (AUTO INPUT MONITOR LED on), the tape/input monitor is automatically set as follows: All record-enabled channels are monitored from tape when playing, and from input when not in play, and all non-record enabled channels are always monitored from tape.

All Input Monitor

The ALL INPUT MONITOR button is used to place all 8 audio channels into input monitor, regardless of the auto input status. When this button is pressed, its LED will light to indicate that this function is enabled and all 8 channels will be put into input monitor (all 8 green INPUT LEDs lit). This means that the audio at all 8 outputs is being monitored from what is being received from the 8 inputs and not from tape. When this function is disabled (ALL INPUT MONITOR LED off), monitoring is determined by the auto input status. The TC track input status is not affected by this function.

Digital In

The DIGITAL IN button is used to select between the eight analog inputs or the digital input for recording to tape. It has no effect on the digital or analog outputs, since both are always active. When the DIGITAL IN is selected, the LED will light, and the digital input can be recorded to tape (all eight channels are received through the one fiber optical connector) and the analog inputs will be ignored.

If the digital input is not being used, this switch can be used as a record mute feature, since it will disconnect the analog inputs.

Chase On/Off

The CHASE ON/OFF button is used to turn the Chase function on and off. When the Chase function is ON, the LED is lit. If the Chase function is OFF, the LED is extinguished.

The CHASE on/off status is not backed up. On power-on, this function is OFF.

Data Edit

The DATA EDIT button is used in conjunction with the function buttons for the purpose of editing and displaying currently stored values. The function buttons are distinguished from other buttons by color (gray) and include: FORMAT, RECORD ENABLES 1—8, GEN SETUP, CHASE, VARISPEED, DIGITAL IN, REMOTE/LOCAL, AUTO REC, MARK IN, and MARK OUT.

The DATA EDIT button is used to toggle in and out of Edit mode as described below:

- To enter Edit mode, press the DATA EDIT button (DATA EDIT LED will light). Once in Edit mode, the user can display/edit the currently stored value(s) of a function by pressing the desired function button. This will take you to the set of pages associated with the function selected. As long as you are in edit mode, pressing a function button will display the currently stored value(s) for that function (or access its related menu of functions) and will not toggle that function on and off.

- To exit from Edit mode, press the DATA EDIT button again (the LED will turn off) and the LCD will return to its state prior to entering Edit mode. Pressing a gray function button now will toggle that function on or off.

While in Edit mode, only the currently selected function's LED will be lit (along with the DATA EDIT LED). The current on/off status of all of the functions is retained, but is not visible on the LEDs until edit mode is exited.

All functions will retain their last displayed data edit page, so that when data edit is re-entered, the previously displayed page will be immediately available.

The LCD EDIT LED (TIME display) is lit whenever in Edit Mode.

▲ and ▼

These buttons are used to raise and lower parameter values, as well as scroll through a list of parameter values. By holding one of these buttons, the speed at which the values change increases.

F1, F2, F3

The F1, F2 and F3 function buttons correspond to choices on the bottom line of the LCD display.

Home

Pressing the HOME button displays the Home (first) page of the current group of pages. Simultaneously pressing HOME and NEXT takes you to the first page of the Main Function menu.

Next

Pressing the NEXT button displays the next page. Holding NEXT and pressing the UP button, displays the previous page. Simultaneously pressing HOME and NEXT takes you to the first page of the Main Function menu.

Vari Speed

Pressing the VARI SPEED button toggles between fixed and Vari Speed. In fixed mode, the VARI SPEED LED is off. In Vari Speed mode, the VARI SPEED LED is lit and the RD-8 runs at the specified Vari Speed pitch. When changing from fixed to Vari Speed or vice versa, note that the pitch change is not immediate, but will ramp to the target speed in order to maintain glitch-free audio.

The VARISPEED status is not backed up. On power-on, this function is OFF.

Remote Local

The REMOTE LOCAL button has three options: Remote, Local or both Local & Remote The first press accesses REMOTE control (upper/ red LED lights). The second press accesses LOCAL control (lower/ green LED lights). The third press accesses both LOCAL & REMOTE control (both upper and lower LEDs light).

While the RD-8 is under REMOTE control, and the STOP or PAUSE operation is executed, you will be able to use the EJECT button. Also, all front panel buttons are disabled, except the EJECT button (as described above) and this Remote Local button. The LCD will read:

REMOTE ONLY MODE

The remote commands can only come from an ADAT, RS422, or MIDI device, as specified by the Remote Input selection.

Exiting Remote Only mode will cause the LCD to return to its previously displayed page, and enable the front panel controls.

The REMOTE LOCAL status is not backed up. On power-on, this function defaults to LOCAL.

LOCate

The LOC button is used to select the Locate Point edit window and to execute locate commands. The Locate Point edit window is the default page displayed when not in Data Edit mode or Main Menu mode.

When the LOC button is pressed while in Edit mode (DATA EDIT LED lit), Edit mode will automatically be exited (DATA EDIT LED will turn off) and the LCD will display the Locate Point edit page.

```
00:00:00:00.00
EDIT LOC00  XFER
```

- Press F1 to select a timecode field to edit, then use the ▲ and ▼ buttons to edit value.
- Press F2 to select the Locate Memory field for edit, then use the ▲ and ▼ buttons to select a number from 00—99.
- Press F3 to transfer the current tape location to the current locate memory (00—99).
- If the LOC button is pressed while the locate edit page is displayed, the RD-8 will begin locating to the currently displayed locate point.

LOC 0

Press the LOC 0 button to locate the tape to the 00:00:00 position.

Reset

The RESET button sets the 00:00:00 (zero) position of the ABS Relative time to the current position of the tape.

Auto Rec

The AUTO REC button is used to activate the Auto Record function.

Activating Auto Record

1 Press the AUTO REC button (AUTO REC LED will light).

If the AUTO REC button is pressed when the Mark In/Out points are incorrectly set (Mark In point after Mark Out point), the AUTO REC LED will not light and the display will temporarily read "Mark In is not before Mark Out".

If Auto Rec is already enabled and the Mark In/Out points are then incorrectly set, Auto Rec will automatically be disabled.

2a To initiate a rehearse, press PLAY.

Rehearse mode: PLAY LED will light.

2b To initiate a take, simultaneously press PLAY and RECORD.

Take mode: PLAY LED will light and RECORD LED will flash.

3 When the Mark In point is reached, both the MARK IN and MARK OUT LEDs will turn on.

Rehearse mode: Record-enabled tracks will monitor input.

Take mode: Record-enabled tracks will monitor input and enter record (punch-in). RECORD LED will stop flashing and light solid.

4 When the Mark Out point is reached, both the MARK IN and MARK OUT LEDs will turn off.

Rehearse mode: Record-enabled tracks will monitor tape (if Auto Input is on) or continue monitoring input (if Auto Input is off or All Input is on).

Take mode: Record-enabled tracks will exit record (punch-out) and monitor tape (if Auto Input is on) or will continue monitoring input (if Auto Input is off or All Input is on). RECORD LED will turn off.

5 If A-RTN is enabled and Auto Return End point is set to M-OUT, the RD-8 will return to the Mark In point minus Pre-Roll time. PLAY LED will turn off and REWIND LED will flash.

6 If A-PLAY is disabled, the RD-8 will enter STOP (wrapped) mode. If A-PLAY is enabled, RD-8 will enter a mode depending on the mode that it was previously in:

If previous pass was in rehearse mode, the RD-8 will automatically enter rehearse mode. PLAY LED will light.

If previous pass was in take mode, the RD-8 will automatically turn AUTO REC off, and enter PLAY mode.

- If no tracks were record enabled when the Mark In point is reached during take mode, the RECORD LED will continue to flash while both Mark In and Mark Out LEDs will turn on. At any time before

the Mark Out point a track record enable can be selected, which will cause that track to immediately enter record and the RECORD LED to light solid.

- If the RD-8 is not locked when the Mark In point is reached during a take, no punch in will occur, and the LCD will read "Not locked at Mark In". The RECORD LED will turn off.

Mark In/Mark Out

When not in DATA EDIT mode (DATA EDIT LED off), press the MARK IN or MARK OUT button. The transport will begin locating to the corresponding Mark point and the display will remain at its currently displayed page. The MARK IN or MARK OUT LED will remain lit until the locate is complete.

- During any locate function, the front panel can still be used to select any page or function. If DATA EDIT is pressed while locating to Mark In or Mark Out, the locate will continue, but the MARK IN and MARK OUT LEDs will now be on or off depending on whether it is the current data edit function, just like the remaining function LEDs.

- If MARK IN or MARK OUT are pressed on the 8312 Remote, they will always perform the same as the front panel buttons with DATA EDIT off (they will execute a locate). If DATA EDIT is on, it will automatically turn off if the 8312's MARK IN or MARK OUT buttons are pressed.

Cursor

The CURSOR button is used to select the next field in the LCD display to be edited. It only functions if there is a parameter underlined, and there is at least on additional parameter in the current display that can be selected.

DISPlay

This button is used to advance the TIME display through seven different modes. Successive presses of the DISP button changes the TIME

display mode. The mode cycle is as follows: TIME-ABS > TIME-REL > LTC-TAPE > LTC-EXT > OFFSET-ABS > OFFSET-REL > GEN. The five LED dots along the top of the TIME display indicate which mode is currently selected. For more information, refer to the section entitled *TIME Display*, earlier in this chapter. Locate point addresses will always be displayed in the TIME format you have selected.

Main Function Menu

The Main Function menu is where you'll find many parameters that govern the entire RD-8. You can access the Main Function menu by simultaneously pressing HOME and NEXT. This always takes you to the first page of the menu. Subsequent presses of the NEXT button will step you through the remaining 8 pages. If you wish to return to a previous page, press the ▲ button while holding the NEXT button. Pressing the HOME button will return you to the first page.

Use either F1 or F3 to select a function from any of the 9 pages of the Main Function menu. Once you select a function, you can return to the original page of the Main Function menu by pressing HOME. Or, you can advance directly to the next function page by pressing NEXT. If you wish to return to a previous function page, press the s button while holding the NEXT button. Here are the 9 Main Function menu pages:

```
MAIN MENU      1
SmpRate  Pull+/-
```

F1: Sample Rate Set
F3: Sample Rate Pull Up/Down

```
MAIN MENU      2
MIDIDmp        TOC
```

F1: MIDI Sysex Dump
F3: TOC

```
MAIN MENU      3
TCLevel  TCFrame
```

F1: TC Output level
F3: TC Output frame rate

F1: TC rewind/fast forward output enable
F3: Tape timecode user bits display (info only)

F1: Zone Start point
F3: Zone length

F1: Crossfade time
F3: MIDI Machine Control output

F1: Date Set
F3: Real Time Clock Set

F1: Set tape size (T-120 vs. T160)
F3: LCD Contrast

F1: Error Rate - info only
F3: Version - info only

Sample Rate

The Sample Rate page determines the RD-8's internal sample rate. You can choose between 48 KHz or 44.1 KHz.

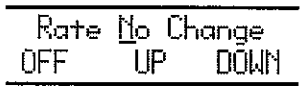
F1: Selects 44.1K
F3: Selects 48K
Default: 48K

The FS (sample rate) LED will change to reflect the current sample rate setting.

All time displays are corrected to reflect the current sample rate as a reference to real time.

Pull Up/Pull Down

The Pull Up/Pull Down function lets the tape play faster or slower with respect to timecode. It is used for transferring between film and video formats where the timecode rates run at slightly different speeds.



F1: No sample rate change
F2: Sample rate pull up 0.1%
F3: Sample rate pull down 0.1%
Default: OFF

MIDI Dump

This page is used to initiate a MIDI dump of the entire RD-8's memory contents. This is the same memory data that is saved to the beginning of tape when creating a TOC. The data in this case is transmitted as MIDI system exclusive out of the MIDI OUT connector.

F3: Initiate a MIDI sysex dump

TOC

The TOC is a data file recorded to the beginning of tape which stores all the RD-8's settings. This can be loaded back in from tape in order to setup the RD-8 for a particular session.

F1: Load
F2: Save

After depressing the SAVE or LOAD keys, the LCD display will change to the next page.

F1: Yes
F3: No

When the Yes key is pressed, the RD-8 will return to the beginning of tape immediately. The LCD display will then indicate a NOW LOADING or NOW SAVING message, and transport control keys will not function during this period.

When the NO key is pressed, the LCD display will return to the previous page.

Timecode Level

This page lets you adjust the output level of timecode coming out of the RD-8's TIMECODE OUT connector.

F1: Reference (nominal) level from this unit per the specifications (reference voltage will be displayed when this button is pressed)

▲/▼: Edit output level in 0.1 volt increments (range 0.0V—3.0V)
Default: 2.4V

Timecode Frame Rate

This page lets you determine the frame out of the timecode being output at the TIMECODE OUT connector (or that of MIDI Timecode on the MIDI OUT connector, if enabled). Normally, this will be the same frame rate used when timecode was recorded to the TC track on tape, but it doesn't have to be the same. When this is set to TAPE, the frame rate used on tape will be shown in the lower part of the display.

▲/▼: Select frame rate of 24, 25, 29.97, 29.97df, 30, or 30df
Default: TAPE

Timecode Rewind/Fast Forward Output

This page lets you determine when timecode should be transmitted at the TIMECODE OUT connector (or MIDI Timecode at the MIDI OUT connector, if enabled). When On, then tape playback of timecode at the TIMECODE OUT and MIDI OUT connectors will output whenever the RD-8's tape is moving (i.e., play, rewind, fast forward, cue, review, etc.). When Off, the timecode playback will only occur while in play.

▲/▼: Toggle between Off and On.
Default: Off

User Bits Display

This page exists so that the current user bits of the tape timecode track can be viewed. While in play, the display will be continually updated by the user bits data being read off tape. No parameters are editable. If this page is entered while not in play, the last valid user bits read from tape will be displayed. If no timecode user bits have ever been read from the current tape, or the tape is in play but there is no current timecode track, the bottom line of the display will read "(no timecode)".

Zone Start

This page lets you set the Zone Limit start point, and toggle the Zone Limit function on and off. If the Zone Limit function is turned On, the RD-8 will automatically locate to the start or end of the zone (whichever is closest) if the current tape location is outside the zone limits.

F3: Zone Limit ON/OFF toggle
▲/▼: Select zone start locate number (LOC00 — LOC99)
Default: LOC00, OFF

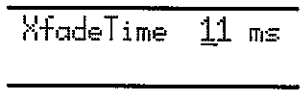
Zone Length

This page lets you determine the Zone Limit length, and toggle the Zone Limit function on and off. If the Zone Limit function is turned On, the RD-8 will automatically locate to the start or end of the zone (whichever is closest) if the current tape location is outside the zone limits.

F1: Selects minutes field
F2: Selects seconds field
F3: Zone Limit ON/OFF toggle (same as F3 of previous page)
▲/▼: Edit current field (minutes or seconds) of zone length
Default: 5:00, OFF

Crossfade Time

This page lets you select the recording Crossfade Time the RD-8 will use. This is the amount of time it takes to smoothly cross from the audio already on tape to the audio at the inputs when recording begins or ends. The crossfade times available for selection differ depending on the current sample rate setting.



▲/▼: Cycle through crossfade choices:
For sample rate = 48K: 11ms > 21ms > 32ms > 43ms
For sample rate = 44.1K: 12ms > 23ms > 35ms > 46ms
Default: 11ms @ 48 KHz; 12ms @ 44.1 KHz

MIDI Machine Control Output

This page lets you determine whether or not MIDI Machine Control (MMC) messages shall be transmitted at the MIDI OUT connector. These messages include transport functions (i.e., play, fast forward, reverse, stop, record) and other functions like record enables, etc. When Off, then MIDI Machine Control output is disabled. This function does not affect the outputting of a sysex dump or MIDI Time Code. MTC will always output exactly like the LTC output.

▲/▼: Toggle between Off and On.
Default: ON

Date Set

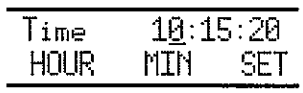
This page allows you to set the current date. This information can be used to create user bits which can be embedded into timecode when recording onto the TC track.

F1: Select month field, then use ▲/▼ buttons to change the month
F2: Select day field, then use ▲/▼ buttons to change the day
F3: Select year field, then use ▲/▼ buttons to change the year

The clock is operational during power OFF. Minimum year is 1993.

Clock Set

This page allows you to set the current time of day. This information can be used to create user bits which can be embedded into timecode when recording onto the TC track.



F1: Select hour field; use ▲/▼ buttons to change the hour (0—23)
F2: Select minute field; use ▲/▼ buttons to change minutes (0—59)
F3: Pressing this button starts counter at "00"

The clock is operational during power OFF.

Tape Length

This page lets you indicate the tape length format you are currently using. You can choose from either the standard T120 or extended T160 format.

F3: Toggle tape length display between T120/E180 and T160/E240
Default: T120/E180

We recommend that you use only premium quality name brand SVSH tape--T-120 or 3M ASD 44+.

LCD Contrast

This page allows you to adjust the contrast of the LCD display.

```
LCD Contrast  5
```

▲/▼: Adjust LCD contrast; range: 0—9
Default: 5

Error Rate

This page will display the current error rate of the tape. This Error Rate is viewed as a count of the number of sync block errors per 14 drum revolutions (280ms). Since there are 30 sync blocks per sector, 8 sectors per track, and two tracks per revolution, the maximum number is 6720. If this page is displayed during any other mode than play or record, the number will always read 0000.

```
Error Rate:  0000
```

Software Version

This page will display the current version of the RD-8's operating system.

```
Version  V 1.2
```

Data Edit -> Format

To access the End of Format Search function, press FORMAT while in Data Edit mode (DATA EDIT LED lit).

End of Format Search

This page allows you to execute an end of format search. This involves the RD-8 locating the position of tape where formatting ends.

When an end of format search is executed, one of two things will happen, depending on where the tape is currently positioned:

- If the current position is located within the formatted section of tape: Forwards tape until an unformatted section of tape is reached, whereupon the tape is rewound 10 seconds and stopped.
- If the current position is located within the unformatted section of tape: Rewind tape until formatted section of tape is reached, whereupon the tape is stopped.

F1: Initiate an End-Of-File search.

Data Edit -> Record Enable 1–8

To access the Track Slip function, press one of the RECORD ENABLE buttons (1—8) while in Data Edit mode (DATA EDIT LED lit).

Track Slip

This page lets you delay each of the eight tracks by up to 170ms, in .1ms increments. The tracks are selected with the RECORD ENABLE buttons (when in Data Edit mode, pressing the track buttons does not

toggle the record-enable status). Use F1 to cursor through each digit of the delay time (100s, 10s, 1s, and 0.1s). Use the ▲/▼ buttons to adjust the Track Slip value. When editing the time value, raising will rollover and lowering will roll under (i.e. 100.9ms -> 101.0ms if cursor in .1s field, 109.4ms -> 110.4ms if cursor in 1s field).

F1: Select field to edit (cursor through each digit), then use ▲/▼ buttons to edit value

F2: Clear current delay time to 000.0ms

F3: Compare new and original value. Pressing this button will toggle between the new value and the original value. (The original value is defined as the value the parameter was set to when the page was entered)

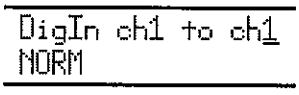
▲/▼: Track slip range 0—170.0 ms in 0.1ms increments
Default: 000.0ms (all tracks)

Data Edit -> Digital In

To access the Digital Input Routing function, press DIGITAL IN while in Data Edit mode (DATA EDIT LED lit).

Digital Input Routing

This page lets you transpose the routing of the eight digital input channels to the eight tracks. Normally the input channels go to the same number track so that channel 1 goes to track 1, channel 2 goes to track 2, and so on. The digital input channel routing rotates the assignments so that if the destination channel is set to 3, then channel 1 goes to track 3, channel 2 goes to track 4, channel 3 goes to track 5, etc. Channel 7 wraps around and goes to 1, and 8 goes to 2.



F1: Assigns digital input 1 to channel 1 (normal mode)
▲/▼: Change channel from 1 through 8
Default: Channel 1

By connecting the optical input to the optical output, this feature can be used to digitally bounce from one track to another within the RD-8, as long as you do not select WordOpt as the clock source.

Data Edit -> Auto Rec

To access the Auto Record menu, press AUTO REC while in Data Edit mode (DATA EDIT LED lit). To advance through the various pages in the menu, press NEXT. To move backwards to a previous page, hold NEXT and press ▲.

Auto Play/Auto Return

This page allows you to turn either the Auto Play or Auto Return functions on and off.

AutoPlay	AutoRtn
OFF	OFF

F1: Auto Play ON/OFF toggle
F3: Auto Return ON/OFF toggle
Default: OFF (both)

Auto Return Start/End Points

This page allows you to determine the Auto Return function's Start and End points.

Start > End
M-Out > M-In

F1: Selects Auto Return point field, then use ▲ and ▼ buttons to edit (will cycle through M-IN, M-OUT , LOC00 — LOC99)

F3: Selects AutoPlay point field, then use ▲ and ▼ buttons to edit (will cycle through M-IN, M-OUT, LOC00 — LOC99)

Default: M-OUT > M-IN

Pre-Roll Time

This page lets you adjust the Pre-Roll time (up to 25 seconds), and toggle the Pre-Roll function on and off. If the Pre-Roll time is changed while performing a locate, the new value will not take effect until the next locate is initiated.

F1: Pre-Roll ON/OFF toggle.

▲/▼: Use to edit the Pre-Roll value in one second increments

Default: 5s, Off

Post-Roll Time

This page lets you adjust the Pre-Roll time (up to 25 seconds), and toggle the Pre-Roll function on and off. If the Post-Roll time is changed while performing a locate, the new value will not take effect until the next locate is initiated.

F1: Pre-Roll ON/OFF toggle.

▲/▼: Use to edit the Pre-Roll value in one second increments

Default: 5s, Off

Data Edit -> Mark In

To access the Mark In function, press MARK IN while in Data Edit mode (DATA EDIT LED lit).

Mark In Point

This page lets you adjust the Mark In point.

```
00:00:00:00:00
EDIT  M-IN  XFER
```

F1: Selects timecode field to edit; use ▲/▼ buttons to edit value
F3: Transfer current tape location to current Mark In memory.

When specifying MARK IN and MARK OUT, it is imperative that MARK OUT always have a higher tape position than MARK IN in order for the Auto Record feature to work.

Data Edit -> Mark Out

To access the Mark Out function, press MARK OUT while in Data Edit mode (DATA EDIT LED lit).

Mark Out Point

This page lets you adjust the Mark Out point.

```
00:00:00:00:00
EDIT  M-OUT XFER
```

F1: Selects timecode field to edit; use ▲/▼ buttons to edit value
F3: Transfer current tape location to current Mark Out memory.

When specifying MARK IN and MARK OUT, it is imperative that MARK OUT always have a higher tape position than MARK IN in order for the Auto Record feature to work.

Data Edit -> Vari Speed

To access the Vari Speed function, press VARI SPEED while in Data Edit mode (DATA EDIT LED lit).

Vari Speed Adjust

This page lets you adjust the amount of Vari Speed when playing.

F3: Toggle between CENTS and PERCENT display mode
▲/▼: 1) Percentage range is -6.0% — +6.0%, in 0.1 intervals
2) Cents range is -107 — +101, in 1 cent intervals
Default: 0.0%, PERCENT

Vari Speed setting is retained; however, the RD-8 will always power-up with Vari Speed turned off.

Data Edit -> Remote Local

To access the Remote Input function, press REMOTE LOCAL while in Data Edit mode (DATA EDIT LED lit). Depending on the Remote Input setting, a second page may be available. To advance to the second page in the menu, press NEXT. To move backwards to the previous page, hold NEXT and press ▲.

Remote Input

This page lets you select the Remote Input source. There are three remote control sources for the RD-8: ADAT, RS422, and MIDI. Pressing the LOCAL REMOTE button when Data Edit is off causes the LEDs to cycle between three modes: Local, Remote, or Local and Remote.

When in any of the three Remote only modes (ADAT, RS422, or MIDI), none of the front panel buttons will function with the exception of

the Remote/Local switch, and the Eject switch when the transport is stopped. The LCD will read:

```
REMOTE ONLY MODE
```

Exiting Remote only mode will cause the LCD to return to its previously displayed page.

When not in Remote only mode, the remote functions can be edited using the Data Edit function. The Data Edit Remote/Local page display is as follows:

```
Remote in: Adat
ADAT  RS422 MIDI
```

F1: ADAT sync input
F2: RS422 input
F3: MIDI input
Default: ADAT

When Local and Remote mode is selected and the Remote Input is set to ADAT, the RD-8 functions as a slave ADAT, but can also function as an "independent slave" from its own front panel. No synchronization to video, RS422, LTC, VITC, word clock, or digital in is possible. All synchronization comes from the ADAT Sync In connector.

When the Remote Input is set to MIDI, the Remote function simply enables or disables MIDI Machine Control (MMC) input to the RD-8. The synchronization capabilities are identical whether set to Local or Remote MIDI control. The Local and Remote mode setting is also allowed.

When the Remote Input is set to RS422, then all machine control commands will be received via the RS422 connector. The synchronization will be dependent on the user's selections under the Chase data edit pages, described later.

The synchronization controls are accessed with the Data Edit Chase pages. The choices available on these pages will be dependent on the currently selected Remote/Local mode.

If the Remote Input is set to ADAT, then the Chase on/off LED will always be on any time the Remote/Local mode is set to Remote, or Local and Remote. In this case, no LTC, VITC, or RS422 synchronization is allowed. Also, no external clock (digital, word, LTC or video) can be used. The clock and location information is all provided by the ADAT sync input connector. All of the clock select LEDs will be off to indicate that the sync in is providing the clock. Turning the Remote/Local mode back to Local will automatically turn off the Chase LED. If the Chase mode is set to any other mode (LTC, VITC, etc.) while in Local mode, setting the mode back to Remote ADAT or Remote and Local ADAT will cause the chase mode to also be set to ADAT, and to turn on.

MIDI Device ID

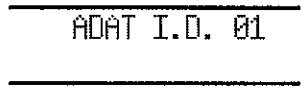
If the Remote Input is set to MIDI, pressing NEXT will access the following page:

▲/▼: Select between device ID numbers 000 through 126, and ALL. Default: ALL

This page allows you to set the RD-8's MIDI device ID number. This is to allow for other MIDI devices to send and receive system exclusive information between the RD-8.

ADAT ID

If the Remote Input is set to ADAT, pressing NEXT will access the following page:



This page displays the ADAT ID number that has been assigned to the RD-8 by the BRC or another ADAT that is connected to the sync input. It cannot be adjusted, and is displayed for informational purposes only. If nothing is plugged in to the sync input, the ID will be 1.

Data Edit -> Chase On/Off

To access the Chase menu, press CHASE ON/OFF while in Data Edit mode (DATA EDIT LED lit). To advance through the various pages in the menu, press NEXT. To move backwards to a previous page, hold NEXT and press ▲. However, some pages of the menu will be unavailable depending on how other functions (like the Remote Input) are currently set.

If the Remote Input is set to ADAT and the Remote/Local mode is set to Remote or Local & Remote, the Chase function automatically turns on (CHASE ON/OFF LED lit). If the If Data Edit mode of the Chase function is entered while in Remote & Local ADAT mode, the display will read:

```
+00:00:00:00.00
EDIT  ADAT   CMP
```

F1: Selects timecode field to edit; Up/Down is used to edit value
F2: Nothing ("ADAT" is displayed only)
F3: Compare new and original value. Pressing this button will toggle between the new value and the original value. (The original value is defined as the value the parameter was set to when the page was entered)
Default: 00:00:00:00.00

In this page, only the DATA EDIT and the OFFSET LEDs are lit. This page is similar to the last Chase On/Off data edit page when not set to remote ADAT, which is described later. The display shows minutes, seconds, frames, sub-frames (0—29), and fractions of a sub-frame (.00—.95 in .05 steps).

No additional Chase menu pages are available in this mode, and the Chase function cannot be turned off, since the RD-8 will always chase to the ADAT sync input while in Remote ADAT mode.

If the Remote Input is set to MIDI or RS422, the Chase function does not automatically turn on or off with the Remote/Local switch. Instead it functions independently, and has the same functions as when in Local mode. All following functions are accessible while in Local mode, Remote & Local RS422 and Remote & Local MIDI mode. The settings are

retained if in Remote MIDI or RS422 mode, but cannot be accessed, since the buttons are disabled.

When the CHASE button is turned off, the RD-8 ignores any locate information provided by LTC, VITC, or RS422. The Data Edit functions of the Chase button allow access to these selections as well as other chase and clock settings. The clock settings, however, remain valid even when Chase is off, and are reflected by the clock LEDs on the front panel.

Clock Select

The first Data Edit page of the Chase functions menu is used to select the clock source. The setting of the clock source determines the pages that are to follow. The display first shows:

```
ClockSel Internal
```

▲/▼: Selects clock source; cycles through the following choices: Internl, LTC, Video, WordOpt, and WordBNC.

The CLOCK LEDs will light in accordance to the currently selected clock source. If the selected clock source is not present, its associated LED will flash. The WORD clock LED will be lit for both the WordOpt and WordBNC selections.

External Timecode Source

The second page of the Chase menu selects the external time code source. The choices are dependent on the currently selected clock mode and remote mode. In Local, ADAT or MIDI remote mode, with the clock set to Internal, Ext TC, Video, WordOpt or Word BNC, the only external time code source is LTC. The display will be as follows:

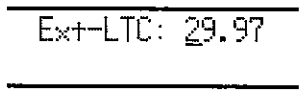
```
Ext-TC:      Ito
```

If the remote mode is set to RS422, and the clock is set to Internal, Ext TC, WordOpt or Word BNC, the display will be as follows:

F1: LTC
F2: RS422
Default: LTC

Timecode Frame Rate

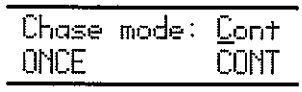
The next page in the Chase menu displays the external time code's frame rate only if the timecode source is LTC and the frame count being received is 0 to 29 (with or without drop-frame), since the RD-8 cannot distinguish between 29.97 and 30 fps. Since all other time code sources (VITC and RS422) have their frame rate implicitly specified, this page is not shown in those modes.



▲/▼: Switches the timecode frame rate between 29.97 to 30

Chase Mode

The next page in the Chase menu displays the chase mode, and is only displayed if the external timecode selected is LTC or VITC.



F1: ONCE
F3: CONTinuous
Default: Continuous

When the mode is set to ONCE, (and Chase is on), the RD-8 will lock to incoming timecode (LTC or VITC) when it first sees valid code, and then will stay locked to the selected clock while ignoring future valid incoming timecode data. If the incoming timecode is stopped for more than 1 second, or is running but not advancing its frame numbers, or starts counting frames backwards, or begins to advance at a non-play speed, the RD-8 will stop and attempt to chase to the timecode location. If the timecode is advancing forward but has a discontinuity in its timecode value, the RD-8 will continue to play without regard to the new timecode location (lock and release). If the chase mode is set to CONTinuous mode, the RD-8 will re-locate anytime the incoming timecode does not match the current location of the RD-8 tape.

Slew Rate

The following page is only displayed if the chase mode is set to CONT and the clock is set to internal:

F1: SLOW
F3: FAST
Default: SLOW

The F1 and F3 buttons are used to select the desired slew rate. This controls how fast the RD-8 will adjust its pitch in order to match the incoming speed of the timecode.

Synchronization Reference

The next page is used to select between the tape time code and absolute tape time as the synchronization reference. It is only displayed if the clock source is internal, LTC, or video:

F1: TAPE
F3: ABS
Default: ABS

The F1 and F3 buttons are used to select the desired synchronization reference. When set to Tape, the time code track recorded on tape is used as the reference for locking to LTC or VITC. The playback mode of the tape time code track will automatically be set to the same frame rate as the incoming timecode. If there is no timecode on tape, and this page is set to tape mode, the LTC TAPE LED will be off and the LOCKED LED will be off.

When synchronizing to optical or external word clocks, only the absolute time can be used since the time code must be synchronous to the sample rate. In addition, the user must insure that the incoming timecode is synchronous to the incoming word clock in order for the RD-8 to lock.

Machine Offset

The last chase data edit page is machine offset:

F1: Selects timecode field to edit; Up/Down is used to edit value
F2: Capture current difference between Ext TC and tape TC, or Ext TC and ABS.
F3: Compare new and original value. Pressing this button will toggle between the new value and the original value. (The original value is defined as the value the parameter was set to when the page was entered)
Default: 00:00:00:00:00

In this page, only the Data Edit and the Offset LEDs will be lit. If F3 (capture) is pressed when no external time code is present, the offset will remain unchanged. The cursor starts on the frame location when this page is entered, since this is used for "nudging" the current offset after it has been captured.

Data Edit -> Gen Setup

To access the Generator menu, press GEN SETUP while in Data Edit mode (DATA EDIT LED lit). To advance through the various pages in the menu, press NEXT. To move backwards to a previous page, hold NEXT and press ▲. However, some pages of the menu will be unavailable depending on how previous pages' functions are currently set. Whenever the generator is running, the GEN LED dot will flash. The data edit functions are only valid when Chase is off.

Whenever Chase is turned on while not in ADAT Remote mode, the Generator timecode output will follow the current timecode input (regenerating), including user bits, and will be recorded as a function of the current chase settings (i.e., if the chase mode is Once, the timecode coming from the generator will ignore forward moving discontinuities in the incoming timecode). None of the Generator edit pages will have any effect while chase is on. If Gen Setup is pressed while Data Edit is on and ADAT Remote mode is selected , the display will read:

```
Gen from chase
```

F1, F2, F3: Nothing

The function buttons do nothing, and no other pages are available.

If the current chase settings are set to synchronize with the tape timecode (from the TC track), then putting the TC track into record would defeat any locking capability, since the timecode can no longer be read from tape. In this case, the synchronization will automatically continue using the ABS timing as a reference, with on offset automatically adjusted so that it continues from where the tape timecode left off. If the TC track is in input mode, the generator will be present at the TIMECODE OUT connector, but the tape TC track still will be read for synchronization purposes.

If Chase is off, or the Remote Input is set to ADAT, the generator data edit pages are used to setup the generator functions. These functions are used to determine what the generator will output while the timecode track is in record. While in play, the timecode output will playback the timecode from the TC track, if it exists. In stop, the timecode output will stop, but the generator internally may still be running (if free run is on). In rewind and fast forward, the timecode playback to the TIMECODE OUT connector is determined by the main menu page that enables or disables timecode output during fast forward and rewind.

Generator Source

The first page of the Gen Setup menu sets the Generator Source.

F1: INTernal
F3: EXTernal
Default: INT

The F1 and F3 buttons are used to select between internal and external time code generation source. When set to external, all of the parameters set up in chase are utilized for the generator functions, regardless of whether chase is on or off. This means that the time code input selected with the chase data edit pages will be recorded on the timecode track and output at the timecode output if the timecode track is put into record. In addition, if the generator is set to external, most of the following additional generator data edit pages are not accessible.

External timecode "Force Jam" is inherently accomplished by having the chase mode set to ONCE. In this case, the Generator will read the incoming timecode and set its address to the same value, and then continue running as long as timecode is coming in. If external timecode stops, the Generator will continue for one second, and then stop. If Chase is on, the RD-8 transport will also stop playing or recording when the incoming timecode stops. The Generator will start again when timecode starts, and will again force jam to the current incoming timecode address, and then continue running from there.

Generator Mode

If the generator source is set to internal, the next page of the Gen Setup menu lets you select the Generator Mode.

F1: Free running mode
F3: Run in record only mode
Default: REC-RUN

The F1 and F3 buttons are used to select the generator mode. If the generator is set to free mode, it will generate timecode continuously, and none of the remaining pages will be accessible. The generator output will still only go to tape and the timecode output when the timecode track is in record. This means that playback will cause the timecode output to follow the timecode track, while the generator is internally continuing to run, possibly at an entirely different location. Switching the mode to REC-RUN while not in record will stop the generator. In REC-RUN mode, the generator will only generate new code while the timecode track is in record. Switching between these two modes allows the user to start and stop the free running generator. While the generator is stopped (REC-RUN mode and not in record), the user can change any of the following parameters.

Address Set

When the Generator Source is set to internal and the Generator Mode is set to rec run, the next page of the Gen Setup menu displays.

F1: The current address on tape becomes the start address for the internal generator.
F2: Generator address matches ADAT absolute time or choose a start address as specified on the next page.
F3: Start address as specified on page 44.
Default: TAPE

The F1, F2 and F3 buttons set the address mode of the generator. If the mode is set to TAPE, then the generator will continue generating the same format code as on the timecode track when record is entered on the timecode track. If no code exists on tape, no timecode will be output or able to be recorded. This will be indicated by not allowing the user to

enter record on the timecode track in this condition. The LCD will temporarily display "No timecode on tape" when the user attempts to enter record.

I you want to extend timecode striping; find the end of the coded section, rewind about 10 seconds, press PLAY, and confirm that the PLAY LED is lit and that the Address is TAPE.Then press REC and PLAY simultaneously.

If the mode is set to ABS, then the generator will output timecode based on the absolute time track of the ADAT. This mode will create the identical timecode output as is generated by the BRC, since it is also based on the absolute time code. In order for this timecode to be output at the rear panel timecode output, the timecode track must be in record, or be playing back a tape that has had the ABS timecode recorded on it. See the next section if you want time code to be offset from ABS time.

If the mode is set to NEW, the generator will output a timecode that is synchronous to the absolute time, but starting at an arbitrary address as defined in the next page. The timecode will only be generated while the timecode track is in record. While not in record, the generator will retain the address it was stopped at, and will continue again when put back into record.

Generator Offset from ABS Time

The next page in the Gen Setup menu is only accessible if the address mode is set to ABS.

```
ABS + 00:00:00:00
 EDIT          CLEAR
```

F1: Selects the edit field (hr, min, sec, frm) by placing the cursor under each field. The ▲ and ▼ buttons change the value.

F3: Clear timecode start to 00:00:00:00
Default: 00:00:00:00

This page can be used to enter an offset, or difference, between ABS time and the generator Start time. We recommend that you allow for some working space between the start of ABS time (00:00:00:00) and the start of time code. This allows your system to 'see' the time code coming before the start of your work point.

For example, if you want time code to begin at 1 hour, enter an offset of 59:50:00:00. This gives your system 10 seconds to recognize valid code before the hour start point.

New Start Address

The next page in the Gen Setup menu is only accessible if the address mode is set to NEW.

F1: Selects the edit field (hr, min, sec, frm) by placing the cursor under each field. The ▲ and ▼ buttons change the value.

F3: Clear timecode start to 00:00:00:00
Default: 00:00:00:00

This page can be used to enter in a new start time for the generator. This display will always show the current location of the generator when stopped, and will only reset to 00:00:00:00 if the F3 button is pressed. If the timecode track is currently in record (generator is running), this page will show "—:—:—:—" and the EDIT and cursor will not be displayed. This is because the start time cannot be edited while the generator is running.

Frame Rate

The next page of the Gen Setup menu is only accessible if the address mode is not set to TAPE and Gen Mode is set to FREE.

▲/▼: Set the desired frame rate (24, 25, 29.97, 29.97DF, 30, or 30DF)

If the address mode is set to TAPE, the frame rate recorded will continue at the same setting that was read from the existing timecode track.

Default: 30, or the frame rate recorded on the tape in the RD-8.

Generate User Bits Mode

The next page of the Gen Setup menu is used to set the user bit function of the generator timecode:

F1: Incoming TC data
F2: Real Time Clock
F3: User Memo
Default: EXT-TC

If the user bit mode is set to external timecode, the generator user bits will follow the incoming user bits. If no timecode is being input, the generator user bits will be set to all zeroes. If the mode is set to Real Time Clock, then the current settings of the RD-8's real time clock will be placed in the user bits. The format of the clock is determined by the following page. If the mode is set to user, then the user can place any desired 8 hex characters into the user bits as defined in the next page.

Real Time Clock Mode

The next page of the Gen Setup menu is only accessible if the generator user bits mode is set to RTC.

```
RTC Select: ymdh
YMDH  MDHM  DHMS
```

F1: Year, Month, Date, Hour
F2: Month, Date, Hour, Minute
F3: Date, Hour, Minute, Second
Default: YMDH

User Bits Memo

The next page of the Gen Setup menu is only accessible if the generator user bits mode is set to USER:

```
UBit 00:00:00:00
EDIT
```

F1: Selects edit field by placing cursor under each field; the ▲ and ▼ buttons are used to edit value. Each field has range 0-9 and A-F.
Default: 00:00:00:00

APPENDICES

APPENDIX 1:
Digital Recording Concepts

Analog Recording Basics

Digital recording works very differently from analog recording. With analog recording, tape containing millions of tiny magnetizable particles move past a record head. The magnetic field around this head fluctuates according to the audio signal present at the tape recorder's input. These fluctuations permanently rearrange the particles on the tape to form a pattern that is analogous to the original audio signal.

On playback, the patterns on tape are red by a separate playback head (or from the record head, set up to read instead of record signals) that converts the magnetic fluctuations back into an audio signal.

The biggest problem with analog recording is that the tape itself alters the sound originally recorded on tape. Tape hiss is one problem; it superimposes a low-level rushing noise onto the audio signal. Although there are ways to minimize noise, such as noise reduction circuitry, this colors the sound in the process of masking the noise.

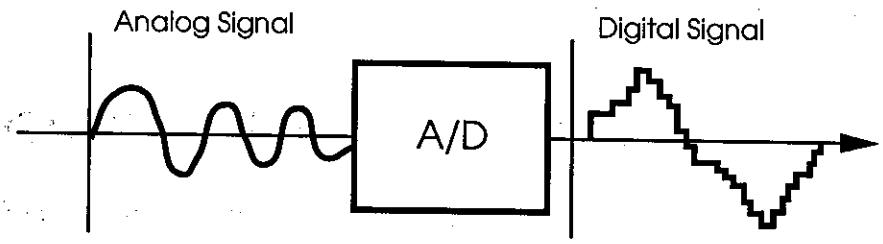
Tape's frequency response is also an issue. Tape has a hard time "absorbing" higher frequencies, which can dullen the sound. moving tape faster allows the heads to magnetize more particles and extends the high frequency response, but the tradeoff is increased tape costs, and heftier transports to move bigger reels of tape.

Digital Recording Basics

With digital recording, the technology is very similar — tape moves past a record head, and plays back through a playback head. However, the signal recorded on tape is very different.

Audio signals entering each channel of the RD-8 first pass through an analog-to-digital (A/D) converter, a device that takes 48,000 samples or "snapshots" of the signal level every second[1]. Each sample is assigned a specific numeric value that corresponds to its level.

[1] 48,000 samples are taken per second at a sampling rate of 48 kHz; 44,100 samples are taken per second at a sampling rate of 44.1 kHz.



These numbers, which represent coded audio, are then converted into an audio signal that can be recorded on tape. fortunately, recording a number on tape doesn't degrade the signal.

During playback, a digital-to-analog (D/A) converter reads the numbers from tape and outputs a corresponding level. This creates a "stairstep" reconstruction of the original signal, which is close to (but not exactly) the same as the original signal. To complete the process, this stairstep signal is smoothed by a low pass filter. The result is natural-sounding audio that sounds virtually unchanged from what was originally recorded.

Digital audio requires lots of numbers to represent an analog version of the same sound. Analog signals may require a 100 kHz frequency response to reproduce 20 kHz faithfully. Digital signals for the same 20 kHz audio requires a frequency response of several million Hertz. Due to the way individual numbers are transmitted, digital audio requires a wide bandwidth[2].

Why S-VHS?

S-VHS recording technology offers more than enough bandwidth to record eight tracks of digital audio. S-VHS tapes are built to higher standards than standard VHS tapes, and can take the tape shuttling required by professional audio applications. S-VHS tape cassettes are also inexpensive compared to reel-to-reel tape, readily available, compact, and easy to transport and store.

[2]Bandwidth is a measure of the lowest to highest frequency a signal path can handle.

APPENDIX 2:
Clock/Sync/Remote Reference

Here is a reference of all the possible combinations of clock sources, sync sources and remote sources.

Clock Source	Locate Master	Locate Slave	Remote/ Local*
Internal	ABS Time	ABS Time	R/M/L
Internal	LTC	ABS Time	R/M/L
Internal	LTC	Tape Timecode	R/M/L
LTC	LTC	ABS Time	R/M/L
LTC	LTC	Tape Timecode	R/M/L
Video - NTSC	ABS Time	ABS Time	R/M/L
Video - NTSC	LTC	ABS Time	R/M/L
Video - NTSC	LTC	Tape Timecode	R/M/L
Video - NTSC	VITC	ABS Time	R/M/L
Video - NTSC	VITC	Tape Timecode	R/M/L
Video - NTSC	RS-422	ABS Time	R
Video - NTSC	RS-422	Tape Timecode	R
Video - PAL/SECAM	ABS Time	ABS Time	R/M/L
Video - PAL/SECAM	LTC	ABS Time	R/M/L
Video - PAL/SECAM	LTC	Tape Timecode	R/M/L
Video - PAL/SECAM	VITC	ABS Time	R/M/L
Video - PAL/SECAM	VITC	Tape Timecode	R/M/L
Video - PAL/SECAM	RS-422	ABS Time	R
Video - PAL/SECAM	RS-422	Tape Timecode	R
ADAT Sync	ADAT Sync	ABS Time	ADAT/Local
Word - BNC	ABS Time	ABS Time	R/M/L
Word - BNC	LTC	ABS Time	R/M/L
Word - Optical	ABS Time	ABS Time	R/M/L
Word - Optical	LTC	ABS Time	R/M/L

* Remote/Local: R = RS-422, M = MIDI, L = Local.

APPENDIX 3:
Pull-Up/Pull-Down Reference

Here is a reference for the Pull-Up and Pull-Down functions with respect to sampling rates and frame rates. When Pull-Up is enabled, the unit will change the sample rate by 1001/1000 (+0.1%). When Pull-Down is enabled, the unit will change the sample rate by 1000/1001 (-0.1%). The actual difference in frequency depends on the frame rate.

Pull	Frame Rate	Sample Rate	
		48 kHz	44.1 kHz
Up	29.97fps	47.952 kHz -> 48 kHz	44.056 kHz -> 44.1 kHz
Up	30fps	48 kHz -> 48.048 kHz	44.1 kHz-> 44.144 kHz
Down	29.97fps	48 kHz -> 47.952 kHz	44.056 kHz -> 44.1 kHz
Down	30fps	48.048 -> 48 kHz	44.1 kHz -> 44.144 kHz

APPENDIX 4: Specifications

Transport

Recording Format:	ADAT Rotary head digital recording
Tape:	S-VHS cartridge (T120/E160)
Heads:	4 (2 Read, 2 Writer); Read before Write
Recording Time:	40 minutes typical per T-120 cartridge
Fast Wind Rate:	120 sec, (20 x play speed) Unwrapped 240 sec (10 x play speed) Wrapped

Audio

Number of Audio Channels:	Eight, plus Timecode
Audio Conversion:	
Record (A/D):	16 bit liner audio, Delta-Sigma 64 times oversampling, single converter per chan.
Playback (D/A):	18 bit linear, single converter per chan.
Sample Rate:	44.1 /48kHz, Selectable
Vari Speed Range:	±6.0%
Frequency Response:	20Hz– 20 kHz, ± 0.5dB
Dynamic Range:	92 dB, A weighted
Distortion:	.009% THD
Channel Crosstalk:	90 dB @ 1kHz
Wow and Flutter:	Unmeasurable
Reference Level:	-15dB

Analog Inputs/Outputs

Connectors:	
Balanced:	Two DB25 connector1 (1 in, 1 out)
Unbalanced:	sixteen RCA jacks (8 input, 8 output)
Input Impedance:	
Balanced:	10k
Unbalanced:	10k
Output Impedance:	
Balanced:	600
Unbalanced:	10k

Nominal Input levels:	
Balanced:	+4 dBu (1.23V)
Unbalanced:	-10 dBV (3.17V)
Maximum Input levels:	
Balanced:	+19 dBu (6.90V)
Unbalanced:	+5 dBV (1.78V)

Digital Inputs/Outputs

Connectors:	Two EIAJ fiber optical jacks (1 in, 1 out)
Communications Protocol:	8-Channel Serial Communication

Remote/Sync

Remote Control Connectors:	Two 1/4" phone jacks (Locate/Play and Punch In/Out)
Remote Control Unit:	Model 8312, Wired
Sync Connectors:	Two DB9 connectors (1 In, 1 Out)
Sync Capability:	Automatic Master/Slave syncing up to 16 RD-8s machines (128 Tracks)
Remote Connector:	One DB9 connector configured for RS-422: Sony P2 protocol

Timecode

Timecode Input:	
Input Level:	0.3V—10V p-p, 10k
Nominal level:	3.0V p-p
Connector:	XLR Balanced
Reader Speed	1/30 to 50x times play speed (FF/Rew)
Frame Format:	Automatic recognition at play speed for SECAM, PAL, NTSC. User must select 29.97 or 30 frame rate for NTSC.
Formats:	24, 25, 29.97 DF/NDF, 30 DF/NDF
Reader Speed:	1/30—50 times play speed
Timecode Output:	
Nominal Level:	2.4V p-p
Range:	0.0V—3.0V p-p with 0.1V steps, software selectable
Connector:	XLR Balanced
SMPTE TC Type:	24, 25, 29.97 DF/NDF, 30 DF/NDF
Signal Rise Time:	25µ sec
Formats:	24, 25, 29.97 DF/NDF, 30 DF/NDF

Video

Video Input:	
Connector:	BNC with 75 termination switch
Input Level:	0.3V—10V p-p, unbalanced, 10 k
Format:	Composite video (NTSC, PAL, SECAM)
Word Clock:	
Connector:	Two BNC connectors (1 in, 1 out); TTL level output, 4.7 in series
Phase Differential:	± 20 nsec or less
Output Jitter:	± 2 nsec or less
Data Communication:	RS-422A, DB9 connector

MIDI

Connectors:	Two 5-pin DIN (1 In, 1 Out)
Data Communication:	MIDI Machine Control, MTC

General

Power Requirements:	90V—250V AC, 50/60 Hz
Power Consumption:	50W
Operating Temperature:	10—40° C for specified performance
Operating Humidity:	80% maximum with no dew condensation for specified performance
Dimensions (H x W x D):	5.5" x 19" x 14" (132 x 482 x 355mm)
Weight:	20 lbs. (9 kg)

APPENDIX 5: Troubleshooting

Symptom	Solution
Nothing appears on the display when POWER switch is turned on.	Check the power cable. Check the LCD contrast.
FORMAT LED flashes.	Tape is not formatted.
The record-enabled tracks' meters do not indicate input levels.	Check your audio cables. Is DIGITAL IN turned on?
Doesn't sync properly to composite video.	If using a consumer brand VCR, be sure to only use SP (standard play), not EP (extended play).
Can't change the timecode format.	If in ADAT Remote mode, all timecode data comes from master.
Can't enable AUTO REC.	Mark Out point is before Mark In.
In ADAT Remote mode, CHASE LED does not light.	No ADAT master is detected. Check sync cables.
Cannot F.FWD or REWIND beyond a certain point.	The Zone Limits function is on. Turn off Zone Limits or change Zone Start and Length values.
Doesn't output timecode or MTC.	If using Generator, be sure the TC track is in record-ready. If timecode has been recorded onto tape, be sure the TC track is safe (not in record-ready).
Cannot access Generator menu.	Turn off CHASE, and/or set Remote Mode to ADAT.
Cannot access Chase menu.	ADAT Remote mode is selected.
LED Display does not show TIME.	Press DISP repeatedly until ABS Time mode is selected.
Front panel buttons have no effect.	Re-initialize unit: 1. Power- down. 2. Hold both RECORD and PLAY while powering on.

RD-8 Error Codes

- "du" - Dew Sensor. The unit has been subjected to overly high humidity. Do not operate the unit. Turn on the power without installing a tape. This will allow the unit to warm up and disperse the moisture. If the du message does not go out after 2 hours contact Fostex for service.

- "noFo" - No Format - The tape is located at a point that has not been formatted. Rewind the tape to the beginning. Press play. If the tape is formatted the message will change to "Lead" for 15 seconds then "Data" for 2 minutes prior to the beginning of the audio section. If these messages do not appear, the tape should be formatted.

- "FULL" - Not seen very often. "FULL" occurs when a slave RD-8 is slow to sync to the master RD-8. The serial buffer within the micro controller has become full of data. This could be the result of unlike versions of software within each unit. Sometimes the problem is related to the sync cable itself. It is recommended that only shielded and grounded cables be used as sync cables.

  Finally, this error may occur in slave machines that are playing damaged tapes. The edges of the tape have become damaged. If only one tape is found to cause this problem, don't use it. If the problem is seen with several tapes, the machine should be taken in for service. Contact Fostex for service.

- "Er 0" - This may be a problem with the TAPE LOAD or (insert) switch. This can be caused by labels that have been applied to the cassette outside of the designated area. If this error message is displayed with only one tape, the cassette may be at fault. If the message is displayed with several tapes, with and without labels, you should contact Fostex for service.

- "Er 1" through "Er 4" - These error codes are usually related to tape threading. Eject the tape and load it again. If this error message is displayed with only one tape, the cassette may be at fault. If the message is displayed with several tapes, with and without labels, you should contact Fostex for service.

- "Er 5" - This error points to the head drum and capstan servos. The problem is caused by anything creating extra resistance in the tape path, an unevenly wound cassette or a misalligned cassette shell. You should Fast forward and rewind the cassette from end to end to flex the tape then try the tape again. If this error message is displayed with only one tape the cassette may be at fault. If the message is displayed with several tapes, with and without labels, you should contact Fostex for service.

- "Er 7" - If this error message is seen, it may indicate that the heads are in need of cleaning. Use a high quality VCR head cleaning cassette to clean the heads. Be sparing in the use of head cleaners. You only have to run the head cleaner in the machine for a few seconds to do a good job.

- "Er 8" - Error message 8 normally occurs when the tape reaches the end while formatting or recording. It is caused by the fact that the RD-8 cannot read timing data from the leader. The error is caused by the unit loosing sync. If the unit is being run in the slave mode check the sync cable connection. It is recommended that only shielded and grounded cables be used as sync cables.

GLOSSARY

A

A/D or Analog-to-Digital Converter

The device that converts an analog audio signal to digital audio. Once encoded, all audio is stored or processed as a series of numbers rather than as the audio itself.

AES/EBU Interface

A two-channel, digital audio hardware/software standard. The AES/EBU interface allows for data communication between professionally-oriented digital devices (such as CD players, digital signal processors, hard disk recording systems, synthesizers with AES/EBU outputs, digital audio workstations, etc.).

Autolocation

the process of automatically rewinding or fast forwarding, as necessary, to find a specific point on tape. Autolocation is usually initiated by pressing a button that tells the machine the point to which you want it to autolocate.

Automation

Generally, automation means using a machine or computer to perform or repeat one or more tasks. In recording systems, automation refers to the process of recording and playing back mixer movements such as faders and mute buttons. In sophisticated systems, all controls can be automated.

Auto Play

A function whereby playback is automatically engaged upon completing a locate.

Auto Record

A function whereby recording is carried out automatically. The point where recording begins is determined by the Mark In point. The point where recording ends is determined by the Mark Out point.

Auto Return

A function whereby the transport automatically begins to rewind once reaching a certain point, and returns to an earlier point. The point at which rewinding begins is called the Auto Return End point. The point that is returned to is called the Auto Return Start point.

B

Balanced Audio Signals

Signals that are carried on three-conductor cables, with two of the conductors carrying the same signal 180° out of phase and third as ground. Balanced connections usually cost more than unbalanced connections, but are less susceptible to picking up hum and interference with low-level signals.

BOT

Beginning of tape.

Bounce

Bouncing means taking audio from one track and placing it on another. The term, sometimes called "bouncing down," also describes the process of mixing several tracks onto one or two.

Buss

A buss generally refers to any common signal pathway. In a mixer, a bus is usually a wire that is or can be made common to the outputs of any or all channels in the mixer. Example if busses are the main stereo mix, sub-mixes, monitor busses and aux sends.

C

Channel

In audio, a channel is an internal audio path maintained separately from other audio paths of identical function. Mixer input strips are examples of channels, but an audio snake also has channels.

Chase/Lock

Chase/lock refers to a tape deck's ability to read incoming timecode, locate its tape to the position indicated by the timecode, and synchronize playback to the incoming timecode.

Clip

In the analog world, clipping occurs when the input to a circuit exceeds the gain of the circuit. The circuit passes the signal at its maximum value. All input values exceeding the maximum value are "clipped." The result is audio distortion. In digital audio, clipping occurs when the input to an A/D exceeds the voltage represented by the maximum number the A/D is capable of transmitting.

Crossfade

A crossfade is a gradual "dissolve" between two portions of audio; one segment of audio fades out while the other fades in. When punching in on the RD-8, the audio on tape is faded out while the new audio at the inputs which is being recorded is faded in.

Cue

Used as a noun, the term "cue" has different meanings for different contexts. In a film, video or theater, a cue is a segment of audio corresponding to a specific segment of the picture or script. For example, a show may have cues for the opening and closing music in addition to sound effects, dialog and other music cues. It generally refers to a finished piece of audio, rather than unedited sound. Used as a verb, "cue" means hearing audio while performing some operation. On analog and digital tape machines, it refers to the ability to hear audio while fast forwarding a tape.

D

DAT

Digital Audio Tape. This term has come to mean specific digital audio tape recorders that use cartridges smaller than those of a standard cassette, and which record two tracks of digital audio (and sometimes timecode).

Digital I/O

Input and output connections where signals passed from one stage to another remain in the digital domain. The RD-8 has a digital I/O connector that carris digital data for all eight tracks.

D/A or Digital-to-Analog Converter

the device that converts digital signals back into an analog format so that they can be heard.

Drop Frame/Non-Drop Frame

Counting methods in timecode systems. In non-drop frame, there are *n* frames counted every second (*n* = 24, 25, 29.97 or 30 fps). In drop-frame, 2 frames are dropped every minute, except every 10th minute. Drop frame timecode was developed to compensate for the fact that 30-frame timecode was running at the NTSC rate (29.97), so that it would match the actual time-of-day clock at the end of the day.

E

EOF

End of format. Whenever an incomplete tape format is executed, this is the point of tape at which formatting ends.

EOT

End of tape.

F

Fiber Optical Connector

A device that transmits signals through light instead of conventional wire. Advantages include higher speed and the ability to carry multiple chanels of information over a single, thin cable.

Frame/Field

In film, a single photographic image on the negative or print. At film speed, there are typically 24 frames in a second. In video, there are two parts to a frame: the positive (A field) and the negative (B field). In the US, which uses the NTSC format, a new field is projected on the screen 59.94 times per second. In the UK, which uses the PAL format, a new field is projected on the screen 50 times per second.

G

H

House Sync

A video signal distributed to any device that requires a reference to maintain proper sync relationship with other devices. The signal comes in several forms: blackburst results in a black video screen when fed to a video monitor; color bars are the standard reference for adjusting video equipment. Color bars can be seen on many stations just before they come on the air.

I

Input

An input is a path through which audio passes from one electronic device into another. types of inputs vary in connector type, level, use (sends, monitor, mix), and electrical characteristics (impedance, balanced or unbalanced). They can be analog or digital.

J
K
L
M

MIDI

Musical Instrument Digital Interface (MIDI). A protocol whereby various MIDI-compatible products can communicate various musical and non-musical messages (such as notes, controls, etc.).

MMC

MIDI Machine Control (MMC). A subset of MIDI messages which correspond to tape machine's transport controls and other functions.

Mute

Used as a verb, to "mute a channel" means to turn off the audio for that channel. Used as a noun, "mutes" are the buttons which turn off a particular channel. Mutes are usually non-destructive, though not always. Mutes are often automated as part of mixer automation systems.

N

NTSC/PAL

National Television Standards Committee (NTSC) refers to the US standard format for color video running at 29.97 frames per second. Phase Alternating Line (PAL) refers to the European standard format for color video running at 25 frames per second.

O

Output

A path through which audio passes from one device to another. Types of outputs vary in connector type, level, use (sends, monitor, mix), and electrical characteristics (impedance, balanced or unbalanced). They can be analog or digital.

Oversampling

the process of taking more samples than is required in order to more accurately reconstruct a digitized signal back into analog audio.

P

Post-production

Begins after the location shoot and is the process of combining, editing and processing audio elements into a final product to be married with the picture.

Post-Roll

The amount of time that a system continues to play after the punch-out point has been reached.

Pre-Roll

The amount of time between the moment playback begins and a pre-defined mark point. Typically, the pre-defined point is used for punching in. Many auto-locators have pre-roll settings which determine how far before a particular cue point the tape deck is positioned. You can also set pre-roll using some machine control protocols.

Punching

the process of entering and/or exiting the record function while the tape is playing. This allows recording over specific pieces of tape, such as recording over a section with bad notes, as opposed to recording over the entire length of the track.

Q

R

Record-Ready

A track mode, often called "armed." When you want to record on a track, you "ready" or "arm" the track. When you push the record button, all tracks that are ready or armed will go into record mode.

Rotary Head

A type of tape head, as used in the RD-8, that spins at a high rate of speed in order to create the same effect as having the tape moving by at rates not physically possible with today's tapes and transports.

S

Safe

A track mode. When a track is safe, it is *not* ready for recording.

Sample Rate

A digital representation of an analog signal created by checking, or sampling, the analog voltage a fixed number of times per second. The greater the number of samples, the more accurate the representation of the analog signal. The CD uses a sampling rate of 44.1 kHz; it checks the analog signal 44,100 times per second.

Sample Rate Conversion

Sample rate conversion is the process by which audio originally recorded at one sample rate is converted to another sample rate. The audio is "harmonized" by shifting its pitch up or down, and then played back at the new sample rate.

SMPTE/LTC

Society of Motion Picture and Television Engineers (SMPTE and Longitudinal Time Code (LTC). A standard for LTC was specified by the SMPTE, and has been adopted by the motion picture and television industries. A complete description of LTC can be found in *The Time Code Handbook*, by Walter Hickman.

S/PDIF Interface

Similar to the AES/EBU interface, but created by Sony and Philips with consumer applications in mind. The optional AI-1 from Alesis offers both the consumer S/PDIF interface and professional AES/EBU format for use with the RD-8.

S-VHS

Acronym for Super Video Home System, an improved version of VHS with greater resolution and dubbing capabilities, as well as improved sound.

T

TOC

Table of contents. This is the data that can be recorded onto and read back from the data portion of an RD-8 tape to store all parameter settings.

Track

An area of tape on which audio is recorded. A track can be thought of as a picture of an output over time.

U

Unbalanced Audio Signals

Signals that are carried on two-conductor cables, one "hot" and one ground. Unbalanced connections save costs, but are more prone to picking up hum and interference with low-level signals.

V

VHS

Acronym for Video Home System, a video recording system introduced for consumer use and using standardized cartridges.

VITC

Vertical Interval Time Code (VITC) is timecode information encoded in the vertical retrace interval of the video signal (this is the time when the beam is getting back to the top of the screen). The advantage of VITC is that the timecode value can be read when the video deck is paused, and is accurate to the frame.

W

X

Y

Z

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