



# Clipper

Frame Accurate Capture and Recording Application

## User Manual

© 1999 Diaquest Inc

All Rights Reserved

## CONTENTS

|   |    |
|---|----|
| Introduction .....  | 3  |
| Video Machines Supported By Clipper.....                    | 4  |
| Quick Start.....  | 6  |
| To capture movie files from tape:.....                      | 6  |
| To record files to tape: .....                              | 7  |
| Setting Up Clipper .....                                    | 9  |
| Enabling Clipper with your Software Key.....                | 10 |
| Connecting Cables.....                                      | 11 |
| Setting Clipper Program Preferences .....                   | 15 |
| Using Clipper To Capture From Tape .....                    | 16 |
| Overview .....  | 16 |
| Making and Executing a Capture List .....                   | 16 |
| Capture Accuracy and Capture Options .....                  | 22 |
| Manual Capture .....  | 23 |
| Using Clipper To Record To Tape .....                       | 24 |
| Overview .....  | 24 |
| Making and Executing a Record List .....                    | 24 |
| Recording Accuracy .....                                    | 31 |
| Time Code, Tape Formatting, Genlock And Video Cabling ..... | 33 |
| Video Tape Formatting for Clipper.....                      | 34 |
| Video Cable Hook-up and Genlock.....                        | 34 |
| Troubleshooting And Technical Support.....                  | 37 |

## Introduction

Clipper is a powerful, user-friendly application designed for post-production, video, TV and rich media professionals. When combined with Optibase's VideoPump HD or VideoPump D1 I/O boards, Clipper enables an open systems Windows computer to acquire uncompressed QuickTime video files from a VTR in real-time. Clipper also records uncompressed QuickTime movie files from the hard disk to a VTR according to a clip list. When used as a real-time recording and playback tool, Clipper extends the capabilities of your system, adding play, stop, cue to a frame, scrub, and single step through stored clips.

Clipper is available in two configurations: Clipper HD<sup>a</sup> and Clipper SD<sup>a</sup>. Clipper HD works with the Optibase VideoPump HD<sup>a</sup> and VideoPump SD<sup>a</sup> boards. Clipper SD works only with the VideoPump SD. Clipper automatically detects the appropriate video standard (NTSC, PAL, 1080I/29.97, 720P/60 etc.).

## Clipper System Requirements

1. Clipper works only with the products described above, and requires that an appropriate board be fully installed, configured and operational. For installing these boards, refer to their installation manuals.
2. Windows NT 4.0 SP 3 or higher.
3. QuickTime 4.0 or higher. Windows NT and QuickTime must be installed and fully functional on your system.
4. For best results, your graphics display should be set to a resolution of 1024x768 24-bits or higher. However, 800x600 24-bit operation will also work.
5. Clipper can be used with or without a remote controllable VTR. However should frame accurate remote controlled capture or output be desired, a suitable, frame accurate RS-422 serial controlled VTR is required. See page 4 for a list of supported VTRs.

## Video Machines Supported By Clipper

**Clipper** controls most professional and broadcast RS-422 serial protocol video recorders and source machines (VTRs). **Clipper** works with a full range of video tape formats including Digital Betacam, D-1, D-2, D-3, DVCPRO, DVCAM, Digital-S, Betacam, MII, 1Ó Type C, S-VHS, HDCam, D-5 and others. **Clipper** also works with machines in NTSC, PAL and various HD formats, and automatically configures itself to the appropriate video standard.

### To use with Clipper, your video machine must:

- have a standard 9-pin RS-422 remote control port;
- have an internal time code reader board; and
- be capable of frame accurate cueing and playback (for digitizing) or frame accurate insert editing (for recording).

**Clipper** reads time code through the video machine's serial port. If no time code reader is present in the video machine, no time code will be passed through the PC serial COM port to **Clipper**, and any kind of frame accurate performance is impossible.

### Notes

When connecting your VTR, check with the documentation which came with your VTR or VTR manufacturer about the insert editing capabilities of your specific model. A VTR designed by the manufacturer as a source machine will not support frame accurate recording. A source machine can be used for capture applications with Clipper, but will not work properly for recording applications. An editing recorder will work for both.

#### About time code readers and TBCs:

Internal time code readers are circuit boards which plug into the video machine. The time code reader reads time code data from the tape and communicates this data through the remote control port. Time code readers are standard equipment on some machines and available as options for other equipment. Clipper requires an internal time code board to be present in the video machine.

TBCs stabilize the video signal coming out of the VTR during playback. TBCs are standard equipment on some machines and available as options for other equipment. TBCs are also available as stand alone units. A TBC is recommended but not required for use with Clipper.

Most professional video machines appropriate to use with Optibase serial digital video products will have both an internal time code board and TBC, but it is worth verifying this.

## Quick Start

This section is a quick introduction to installing and running Clipper.

1. Run Setup.exe on the installation CD-ROM to install the Clipper software.
2. Connect the Clipper Cable between a serial COM port and the 9-pin Remote port on the VTR.
3. Launch Clipper by running Clipper.exe.
4. Enter your special Clipper Software Key. This is only necessary the first time Clipper is run.
5. Choose the appropriate serial COM port for VTR control under Config / Device Control. This also is only necessary the first time Clipper is run, as the port number used is saved.
6. Put a properly formatted tape in the VTR (both time code and video) and switch the VTR to 9-pin remote control mode.

### **To capture movie files from tape:**

1. To create a new Capture List, on the File menu, select New Capture List.
2. To set capture file type, On the Config menu, select Capture Options.
3. To add an entry to the list, click Add. Select a name and location for the captured movie file.
4. Select VTR Inpoint and Outpoint points for the List entry. Use the VTR controls to cue through the tape and mark In and Out points. Alternatively, enter frame numbers directly into the List. You can also set the Movie End point to duration if desired.
5. To view clip you've selected for capture, click View VTR. To cue the VTR to the Inpoint or Outpoint, use the Go To menu.


6. Add as many List entries as desired. The Insert button adds an entry above the currently selected one. The Change button replaces an entry with another file. The Delete button removes an entry. You can also click and drag an entry to a new position on the List.
7. To enable or disable a List entry for capture, select the Capture Enable menu. Capture enabled entries have a dot; capture disabled entries have no symbol. Once captured successfully, entries have a check mark.
8. When the List is assembled, click the Capture button to begin capturing all enabled entries. A List can be saved and recalled for later capture, manipulation or archiving.
9. When the List has been captured, an individual entry can be reviewed by selecting it and clicking the Play button in the Movie Controls section.

### **Important**

To establish frame accuracy for captures, you must follow the procedure outlined in the section Capture Accuracy and Capture Options later in this manual. Once calibrated, future captures will be frame accurate.

### **To record files to tape:**

1. To create a new Record list, on the File menu, select New Record List.
2. Click the Add button to add an entry to the List. Load a desired Quicktime file into the List.
3. In the Movie Controls section, set a movie Start and End frame (if different from the default first and last frames of the movie). Use the movie Slider control to cue through the movie, and the Set Start and Set End buttons to set the Start or End frame to the current movie location. Alternately, double-click on the Start Frame or End Frame registers in the List to type in a specific frame number.
4. In the VTR Controls section, choose the VTR Inpoint frame, i.e. the location on the tape where recording the movie begins. The first List entry default is to use the current tape location (subsequent List entries start a movie contiguous to the previous entry's Outpoint). Use the VTR controls to cue through the tape, Mark a location and transfer it >Inpoint, or type a number directly into the List.
5. Enable or disable audio and video tracks for recording (if different from the default setting) by double-clicking in the Tracks column for an entry. Select the appropriate tracks to record.

6. To view the movie from the set Start to End points, click the View Movie button. To view the VTR from the set Inpoint to Outpoint, click the View VTR button. To cue the movie or VTR to the Start, End, Inpoint or Outpoint, use the Go To: pull-down. Right-click on any List item for more options.
7. Continue to Add entries to the end of the List as appropriate. Use the Insert button to add an entry above the currently selected one. Use the Change button to replace an entry with another file. Use the Delete button to remove an entry. Click on any entry and drag it to a new position in the List.
8. Enable or disable a List entry for recording by using the Record Enable: pull-down. Record enabled entries will have a ; record disabled entries have no symbol. (Once recorded successfully, entries have a check mark.)
9. When the List is assembled, click the Record button to begin recording all enabled entries. A List can also be saved and recalled for later recording, manipulation or archiving.

### **Important**

To establish frame accuracy for coordinating recordings with movie playback, you must follow the procedure outlined in the section Recording Accuracy later in this manual. Once calibrated, future recordings will always be accurate.

The following sections of this manual contain more detailed information on installing, configuring and using Clipper.

## Setting Up Clipper

To install **Clipper**, run the **Setup.exe** file from the installation CD-ROM. Follow the on-screen instructions to create or choose a directory and install the software. If the default installation path is used, **Setup.exe** will create a **Program Files\Optibase\Clipper** directory on the hard drive from which Windows is run and copy the following files into this directory.

1. Clipper.exe is the basic executable program file. Run this file to launch Clipper.
2. VcrCtrl.dll is a program library used by Clipper for VTR control. This file should be in the same directory as the executable program.
3. dq\_vp.dll is a program library used by Clipper for loading and playing files to the Optibase video board. This file should always be in the same directory as the executable program.
4. p\_DLL.dll is a Optibase program library used by Clipper. This file should also always be in the same directory as the executable program.
5. Optibase\_Clipper.pdf is a copy of this manual in Adobe Acrobat format.

To start Clipper, select the Optibase Clipper icon on the Start menu.

## Enabling Clipper with your Software Key

Once **Clipper** is installed, you must enable the software with a software key provided by Optibase. The software key is based on your Optibase video board serial number.



Your board serial number is shown in the **Serial Numbers Found** box. To obtain a key report the serial number(s) to Optibase at **ts@Optibase.com**.

If you have multiple Optibase boards, multiple serial numbers will be shown in Serial Numbers Found box. **Clipper** is licensed using the serial number of only one of your Optibase boards. Optibase will assist you in choosing the appropriate serial number to use for licensing purposes.

Once you have an appropriate software key, type it into the **Enter your new key here:** box and click **OK**. **Clipper** will now start. If you have multiple boards installed, make certain to select the appropriate board from the list before entering your software key.

Save your software key for future use, should you wish to move **Clipper** to another computer platform or need to reinstall your OS.

### Note

You can force the Enter Your Software Key window to open by holding down the Ctrl key on the PC keyboard when launching Clipper. This is useful when changing the board hardware.

## Connecting Cables

1. Connect the Clipper Cable between your selected PC serial COM port and the 9-pin RS-422 serial Remote port on your video machine.
2. Connect the 9-pin male end of the Cable to the video machine Remote port.

### Important

Although other VTR control cables may work with Clipper, Optibase cannot guarantee proper operation of Clipper when cables other than the provided Clipper Cable are used.

There may be other 9- or 25-pin D-Connectors on your computer. Make certain to connect the Clipper Cable only to a serial COM port.

Once the Cable has been installed on a COM port, note which COM port was used. You will need this information later for configuration inside the Clipper software.

### Note

Some VTRs have multiple 9-pin ports labeled "Remote". For example, some VTRs have Remote In and Remote Out. Some VTRs have Remote In, Remote Out, and Remote In/Out. We recommend that you consult your VTR documentation to find out which port is intended for connection with an edit controller. This is the port that should be connected to your Clipper-equipped PC.

If you have a 9-pin COM port, connect the 9-pin female end of the cable directly to the COM port. If you have a 25-pin COM port, use an appropriate 9-25-pin RS-232 serial port adapter. In this case, connect the 9-pin female end of the cable to the 9-25-pin adapter, and connect the 25-pin end of the adapter to the COM port. A suitable adapter can be purchased from Optibase, or is usually available at any computer store.

### Serial COM Port Setup and Windows COM Port Configuration

Clipper uses a serial COM port on the host computer to control a suitable video device. Therefore, before attempting to install or run Clipper, make certain the selected serial COM port on your computer is configured properly. Windows NT must also be configured to properly support the selected COM port.

## Important

Normally, no special COM port or Windows configuration is needed to run Clipper. If you have successfully used the selected COM port under Windows before, or if both Windows and your serial COM ports are set to common default settings, you should not need to perform any configuration.

The remainder of this section is provided to review the basics of setting up serial COM ports in your PC, and properly configuring Windows to support them. These issues relate to PC hardware and Windows configuration. If you do not succeed in selecting a COM port, you may find the following information helpful.

The PC serial port to which you plug the **Clipper Cable** must be available for use by **Clipper**. On some PC configurations, one or more serial ports can be claimed by the PC platform itself, the operating system, or other applications. Here are some examples of things to watch out for:

1. Some PC server systems claim a serial port for use as a remote boot console. If you experience any problems, consult your PC's BIOS menu (boot menu) to see if your PC system is using a serial port. Note that if your PC system is using a serial port, then the first serial port which your PC is *not* using often becomes labeled COM1 in Windows NT. For example, if your system has two serial ports labeled 1 and 2 on the computer's back panel, and your PC system is configured to use port 1 as a remote console, then often the port labeled 2 will appear as COM1 to Windows NT. This can lead to confusing results when troubleshooting problems. In most cases, the remote console feature of PC systems can be disabled to give NT applications access to all of your serial ports. Consult your PC documentation.
2. The Microsoft Windows NT Kernel debugger claims a serial port if remote debugging is enabled in **boot.ini**.
3. Other applications could already be using a serial port when you run **Clipper**. For example, modem communications programs or other remote communications programs like Symantec PCAnywhere<sup>a</sup> or Traveling Software LapLink<sup>a</sup> may be holding open a serial port without your knowledge. Check the documentation for these programs.
4. The Base I/O Address and IRQ number used by the serial COM ports are usually determined by software configuration of the CMOS BIOS Setup. Sometimes, these settings are also determined by physical jumper or switch settings on the serial board itself. Consult the documentation which came with your computer mother board or serial port card for details on how to configure your serial ports, and what their default settings are. You should know the Base I/O Address as set by these

jumpers, switches or BIOS settings when configuring Windows to run **Clipper** on the selected COM port.

Typical Base I/O Address and IRQ settings for each COM port are listed as follows. However, there is no guarantee that your computer is set according to these common conventions.

| <u>COM Port</u> | <u>Base I/O</u> | <u>IRQ</u> |
|-----------------|-----------------|------------|
| COM1:           | 0x3F8           | IRQ4       |
| COM2:           | 0x2F8           | IRQ3       |
| COM3:           | 0x3E8           | IRQ3       |
| COM4:           | 0x2E8           | IRQ4       |

Once you have selected the physical COM port for **Clipper**, and have determined its COM port number, Base I/O Address and IRQ number, Windows must be configured to properly support that COM port. Usually this step is unnecessary. However, if you cannot get **Clipper** to run on the selected COM port, make certain Windows is properly configured as detailed below.

1. Start the configuration procedure by going to the Windows **Control Panel**. In Windows NT, select **Start/Settings/Control Panel**. Now follow these instructions:
2. Double-click on the Ports Control Panel icon to open it. The Ports window will now open.
3. The Ports window may contain icons for Windows COM1: through COM4:. Select the appropriate COM Port for use with Clipper. In the following, we will assume that you are using COM2:. Double-click on the COM2: icon. The Settings for COM2: window will open.
4. The Clipper software will automatically configure the Baud Rate, Data Bits, Parity, Stop Bits and Flow Control as necessary for proper Clipper operation. No user configuration for these items is required. Click on the Advanced Button to open the Advanced Settings for COM2: window.
5. Use the Advanced Settings for COM2: window to configure the Base I/O Port Address and Interrupt Request Line (IRQ) to match what is set by the jumpers, switch or BIOS settings of the serial port. For COM2:, this is usually Base I/O 2F8 and IRQ3. When configured appropriately, click the OK Button.

6. Click the OK Button in the open Settings for COM2: window, then the Close Button in the open Ports window. Also close the Control Panels window. Finally, restart the computer to make any above changes active.

### Choosing a Serial COM Port

After enabling with your Software Key, when Clipper is launched for the first time, the PC serial COM port used for VTR communications should be specified. This will always be the same physical COM port to which the Clipper Cable is attached.

1. To configure Clipper to use that COM port, select the Config pull-down menu and choose Device Control... The Optibase VTR Control window will open.



2. Choose the appropriate COM port from the VTR Connection: pop-up list, then click the OK button.

All PC COM ports which are not currently being used by other devices (e.g. mouse, tablet, modem, etc.) will appear in this pop-up list. If a COM port does not appear, it is in use.

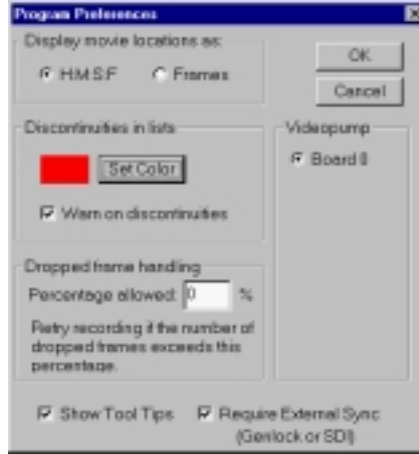
### Note

Selecting the COM port is usually necessary the first time Clipper is run. You can choose to change the previously configured COM port if desired.

## Setting Clipper Program Preferences

You can configure Clipper program preferences as described below.

1. On the Config menu, select Program Preferences.



2. Movie locations and durations within Lists throughout the program can be displayed in either time code (HH:MM:SS:FF) or frame count. Use the H:M:S:F or Frames radio button to set this.
3. You can choose the color of a discontinuous or non-contiguous entry in a List. You can also choose whether or not Clipper displays a warning window whenever a discontinuity is first entered into a Record List.
4. Clipper is designed to record and play continuous, real-time uncompressed video without dropping or repeating any frames. The Percentage allowed register should therefore always be set to 0. If any frames are dropped during a capture or playback, Clipper will automatically try to record or capture that movie again at the same tape location. It will retry up to 5 times before going on to the next item in the List.
5. Tool Tips for Clipper can be turned on or off with the Show Tool Tips checkbox.
6. When the Require External Sync checkbox is ON, Clipper will prevent recording to tape if the SDI output is not properly locked to an external sync source (e.g. Genlock or the SDI input).

## Using Clipper To Capture From Tape

### Overview

**Clipper** can be used to automatically and frame accurately capture video and audio clips from a serial RS-422 remote controlled VTR and save them as standard, uncompressed '2vuy' (8-bit) or 'v210' (10-bit) QuickTime movies. **Clipper** can also be used to manually capture single clips without doing frame accurate remote controlled capture. In each case, capturing takes place in real-time. Therefore the computer and hard drive subsystem must be able to adequately support real-time data rates. The following section discusses capture from tape.

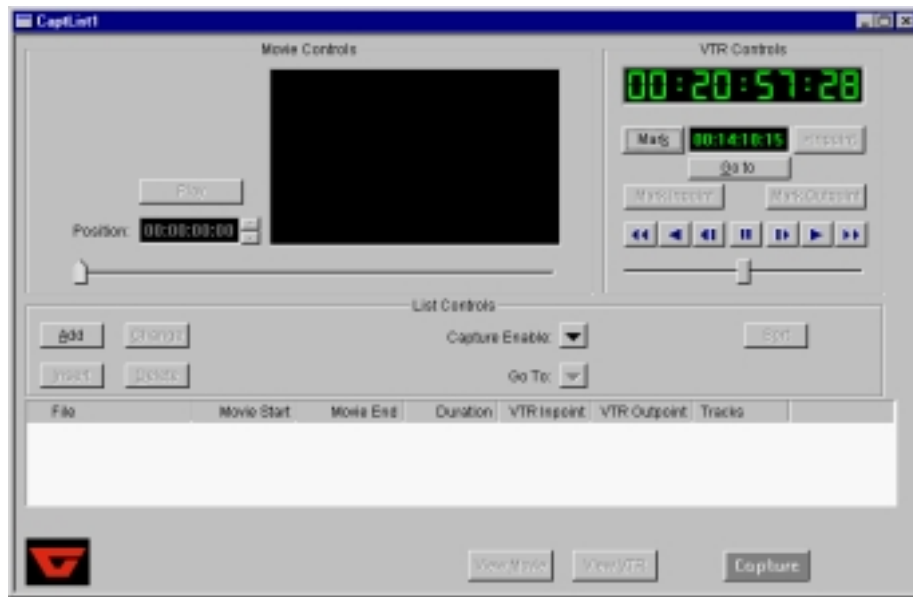
### Making and Executing a Capture List

#### Note

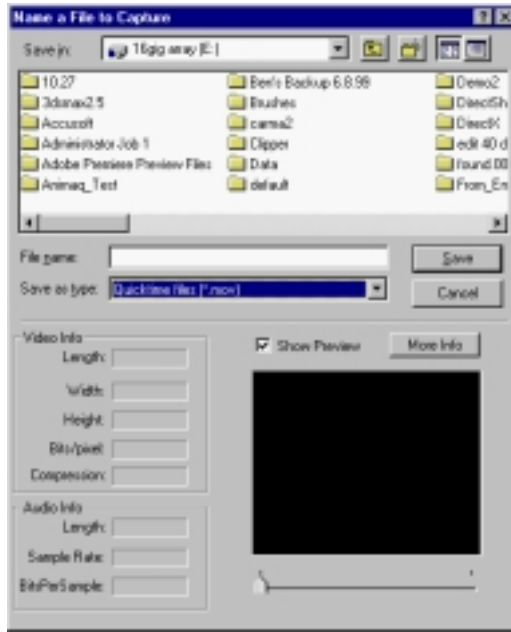
Before proceeding with remote controlled, frame accurate capture, make certain to select the appropriate serial COM port for VTR remote control as outlined in the previous section Choosing the Serial COM Port Inside Clipper.

A **Capture List** is a sequence of video clips to be captured from tape and saved as movie files. Each clip has separate settings for its start and end frames, file name and directory.

1. To create a new Capture List, choose New Capture List under the File pull-down menu. An empty Capture List opens.



2. A Capture List has 3 general areas: a Movie Controls area (upper left), a VTR Controls area (upper right) and a List Controls area (bottom).
3. Before adding any entries to a Capture List, select Capture Options under the Config pull-down menu. In the Audio/Video Capture Options window, check the Capture Audio box ON or OFF as appropriate. Choose a File Type from the drop-down list.
4. To add a new entry to the Capture List, click the Add button in the List Controls area or select Add Item under the List pull-down menu. A Name a File to Capture window will open.



5. Navigate to the appropriate drive and folder in which to save the movie file, and type an appropriate name into the File name: register.
6. If desired, other existing QuickTime movie files in the selected folder can be examined. This is useful when deciding whether to write over an existing file. Choose the file by clicking on it. The name of the file will appear in the File name: register, and information about the file will appear in the Video Info and Audio Info sections. Provided Show Preview is checked ON, the first frame of the file will also be displayed in a Preview window on the computer monitor. Below this, the Slider control allows the user to scan through the file if desired. To actually play this movie on the SDI output screen, right-click on the file in the list, select Properties, click the Preview tab and then click the Play button.
7. Click the Save button to load the entry into the Capture List.
8. When a new entry is loaded into the List, the Movie Start frame will automatically be set to 0, and the Movie End frame will automatically be set to 1. The VTR Inpoint for the first List entry will automatically be set to the current tape location, and the VTR Outpoint 1 frame later. The video and audio capture enable status will be set to whatever was previously configured in the Audio/Video Capture Options window. Obviously, the user can change most of these values as desired.

9. To adjust these parameters, or edit any List entry, make certain the appropriate List entry is selected (highlighted) in the List. This happens automatically when a new List entry is made.
10. The Movie Start column in the List is not user adjustable. It is always set to 0 for capture.
11. The Duration column, which displays the length of the movie clip to capture, is also not directly user adjustable, although it will be affected by adjustment of the Movie End, VTR Inpoint and/or VTR Outpoint columns.
12. The Movie End, VTR Inpoint and VTR Outpoint columns for an entry can all be directly edited by double-clicking on the register to change. Now the desired new value can be typed in.

**Note**

The Movie registers in a List can be displayed in either Frame Count or Time Code HH:MM:SS:FF format. VTR registers are always displayed in HH:MM:SS:FF format. To select the appropriate Movie register display format, use Program Preferences on the Config menu. Select H:M:S:F or Frames in the Display movie locations as: section. When directly typing into a HH:MM:FF:SS box, you must delimit the fields.

When Capture List registers are changed, they follow these rules. If the VTR Inpoint is adjusted, the VTR Outpoint will remain the same and the Duration and Movie End points will change as appropriate. If the VTR Outpoint is adjusted, the VTR Inpoint will remain the same and the Duration and Movie End points will change as appropriate. If the Movie End point is adjusted, the VTR Inpoint will remain the same and the Duration and VTR Outpoint will change as appropriate.

**Setting In and Out Points**

1. The VTR Inpoint and VTR Outpoint columns for an entry can also be set in the VTR Controls area of the Capture List window.
2. Click the Mark button in the VTR Controls area to set the adjacent scratch box to the current tape location or enter a value into the box. To cue the tape to the selected frame, click Go To.
3. The VTR Inpoint is the first frame that will be captured. The VTR Outpoint is last frame in the list that is captured.

4. To set the VTR Inpoint for a selected List entry to the current tape location, click the Mark inpoint. To set the VTR Outpoint for a selected List entry to the current tape location, click Mark outpoint. Hold down the Ctrl key to change the Mark inpoint button to a Mark Outpoint button.
5. When the first movie is added to a List, its VTR Inpoint will automatically be set to the current tape location. You can change this value as desired. Subsequent movies added to the List will automatically have their VTR Inpoint set to be contiguous with the previous entry's VTR Outpoint, so that a continuous tape recording will be made. You can change these values later as desired.
6. To change whether to capture video and audio tracks together or a video track only, first open the Audio/Video Capture Options window by choosing Capture Options under the Config pull-down menu. Check or uncheck the Capture Audio box as appropriate and click the OK button to close the window. Now double-click or right-click on a List item to edit it, and resave the List entry. The new audio/video track enable status will be saved with that entry.
7. Repeat the above steps as needed to continue adding entries to the List until done.

A typical **Capture List** is shown below.



In the List Controls area, use the Add button to add an entry to the bottom of the List. Use the Insert button to insert an entry above the currently selected List. Use the Change button to replace the movie file in a selected List entry with another file. Use the Delete button to remove the selected entry from the List. An entry can also be selected and dragged to a new position in the List.

Most List fields in an entry can be edited directly by double-clicking on them, e.g. Capture Enable Status, File, Movie End, VTR Inpoint and VTR Outpoint.

Click on the Go To to cue the VTR Inpoint or Outpoint for a selected List entry.

To play an entry in the List from its set VTR Inpoint to Outpoint, select the entry and click the View VTR button. This will cue and play the tape between these set points.

The Sort button in the List Controls area sorts and reorders List entries by ascending VTR Inpoint order. This saves time and tape/head wear when multiple movies are captured from multiple locations in widely separated areas of the tape.

The list displays three kinds of status:

1. Record enabled entries are marked by a dot.
2. Record disabled entries are not marked.
3. Successfully recorded entries are marked by the number a checkmark.

You can double-click an entry to change its status. To begin recording click Record.

You can save a list by clicking Save or Save as on the File menu.

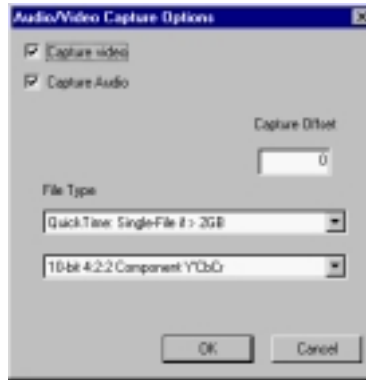
Click the Capture button to begin capturing all enabled items.

**Note:**

The Movie Controls section of a Capture List is not active until after the List has been captured. Once the List has been executed, a captured List entry can be loaded into the Movie Controls section by selecting it in the List. Then the Play button will play the captured movie from beginning to end on the SDI output; the Position box shows the currently displayed Movie frame; and either the Slider or the up and down buttons can be used to scrub through the selected Movie.

## Capture Accuracy and Capture Options

1. Select Capture Options under the Config pull-down menu to open the Capture Options window.



**Note:**

Currently, audio captured with Clipper will always include both audio tracks 1 and 2.

The Capture Offset register is used to calibrate capture accuracy, if necessary. Capture Offset compensates for timing differences that exist in your installation due to video routers, A/D or D/A converters, or VTR timing characteristics (which vary not only by VTR make and model but also VTR firmware version). To calibrate the Capture Offset for your system, it is useful to use a tape with a window dub, or time code burn-in: This is a time code display which is visible in the video portion of the tape. You can also capture by plugging the monitor (also called superimposed) output of your VTR into your Optibase SDI input. Set an easy to remember VTR Inpoint, and capture a short video segment using Clipper. Now compare the VTR Inpoint with the actual first captured movie frame. If these do not match, adjust the Capture Offset register until they do match in subsequent captures. A positive or negative number of offset frames can be entered into the Capture Offset register. Once the offset is adjusted for your system, it will not change if the VTR and video routing configuration does not change.

QuickTime v4.0 (required for Clipper operation) supports single movie files which exceed 2GB in file size. However, many programs, older versions of QuickTime or other OS platforms may not support files larger than 2GB. Clipper can save long captures to a single large file, or can split up long captures into multiple 2GB maximum files. In the File Type register, select either Single-File if > 2GB or Multi-File if > 2GB from the pop-up list.

If the multiple file option is chosen, Clipper will create a master movie file with the movie file name you specified. The master movie file automatically points to your individual 2GB data files; applications will load the master movie file and transparently treat it as if it were a single file containing all of your captured data. Be sure to copy all the individual data files whenever you copy the master file to a new location.

The lower pop-up list register under File Type chooses the kind of file to which captured clips will be saved. The options in this list will depend on your specific Optibase hardware and software versions. Current Optibase software supports the choice between 8-bit 4:2:2 Component Y Cb Cr (2vuy) and 10-bit 4:2:2 Component Y Cb Cr (v210). See your Optibase board documentation for more precise details on these formats.

## Manual Capture

To capture without remote VTR control, choose Manual Capture under the File pull-down menu. Click the Select File button and choose a file name and directory for the captured movie. Click the Capture button to start manual capture, and press the Esc key to end manual capture.

# Using Clipper To Record To Tape

## Overview

**You can use Clipper** to automatically, sequentially and frame accurately record previously rendered or captured standard, uncompressed '2vuy' (8-bit) or 'v210' (10-bit) QuickTime files from the computer to a serial RS-422 remote controlled VTR. Recording takes place in real-time.

## Making and Executing a Record List

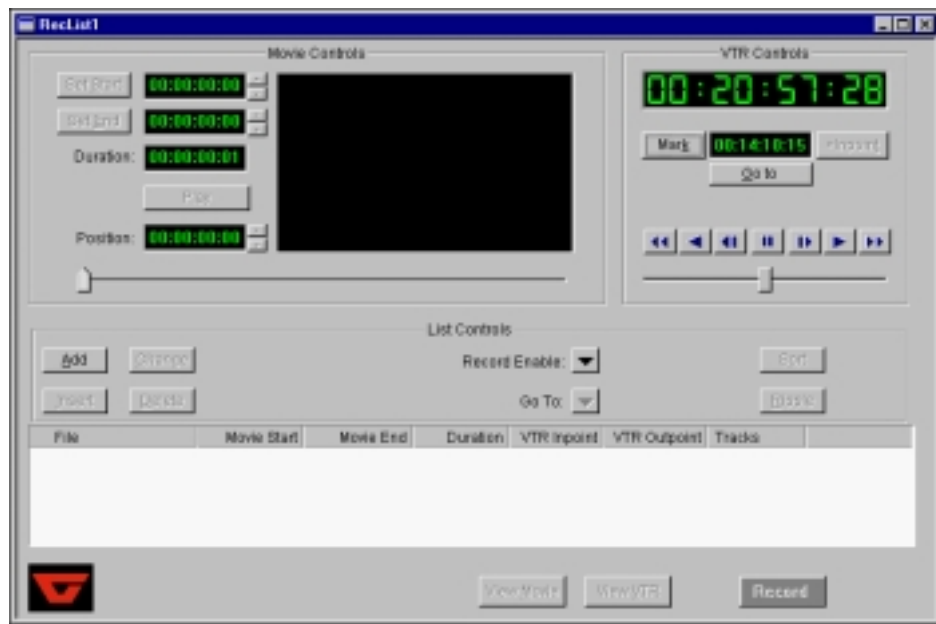
### Note

Before proceeding with remote controlled, frame accurate recording, make certain to select the appropriate serial COM port for VTR remote control as outlined in the previous section Choosing the Serial COM Port Inside Clipper.

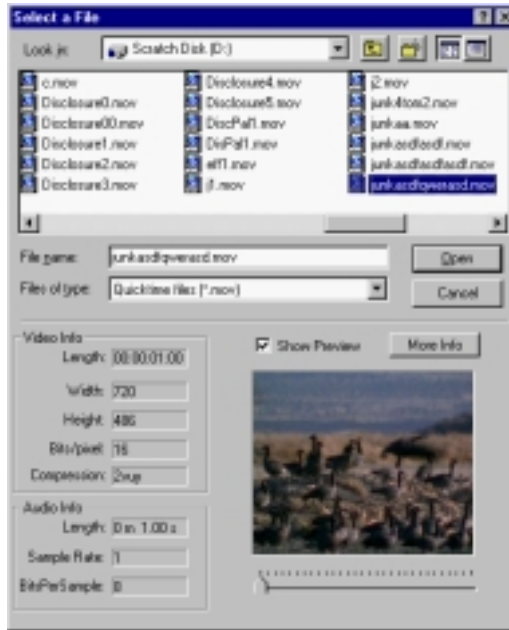
A Record List is a sequence of files to be output to tape. Each file has separate settings for its movie start and end frame, as well as where to begin recording on the tape.

### Creating a Record List

1. On the File menu, choose **N**ew **R**ecord List. An empty Record List opens. A Record List has 3 general areas: a Movie Controls area (upper left), a VTR Controls area (upper right) and a List Controls area (bottom).



2. To add a new file entry to the Record List, click the Add button in the List Controls area or select Add Item under the List pull-down menu. A Select a File window will open.



3. Select an uncompressed '2vuy' or 'v210' QuickTime file and click Open.

#### Note

The **Preview** window in the **Select a File** dialog displays most QuickTime movies, with the following limitations:

- The file must have the '2vuy' pixel format, which is also known as 8-bit 4:2:2 Component Y'CbCr or have the 'v210' pixel format, which is also known as 10-bit 4:2:2 Component Y'CbCr in QuickTime application format dialog boxes
- Dimensions and a frame rate which is appropriate for the Optibase board you are using.
- For the VideoPump SD or SDxstream, the file must have one of these sets of characteristics:
  - i. 525-line (NTSC) standard: 720x486, frame rate 2997/100 or 30/1.001
  - ii. 625-line (PAL) standard: 720x576, frame rate 25

- For the VideoPump HD or HDStore, the file must have one of these sets of characteristics:
    - iii. 1035i standard: 1920x1035, frame rate 30 or 2997/100 or 30/1.001
    - iv. 1080i standard: 1920x1080, frame rate 30 or 2997/100 or 30/1.001
    - v. 1080i/25 standard: 1920x1080, frame rate 25
    - vi. 1080sf/24 standard: 1920x1080, frame rate 24 or 24/1.001
    - vii. 720P standard: 1280x720, frame rate 60 or 5994/100 or 60/1.001
  - New video standards are constantly being added to the VideoPump HD and HDStore. These standards may already be supported on your system:
    - viii. 1080P standard: 1920x1080, frame rates 30, 30/1.001, 25, 24 or 24/1.001
4. You can choose start and end frames, as well as where on the tape the movie should begin recording. To adjust these parameters, or edit any **List** entry, make certain the movie entry is selected (highlighted) in the **List**.
  5. In the Movie Controls area, the Position box shows the current movie frame location. Use the Slider control in this area to cue the movie, or use the up and down arrow buttons adjacent to the current Position box. To cue the movie to a specific frame, click the cursor in the Position box, type in the desired frame number and press Enter.
  6. The Movie Start and Movie End columns display the current Start and End frames. To set either value to the current movie location, click Set Start or Set End. Alternatively, use the up and down arrow. You can also edit the value by double clicking on the **Movie Start** or **Movie End** field.
  7. When a movie is first loaded into the **List**, the **Movie Start** frame will automatically be set to the first frame of the movie, and the **Movie End** frame will automatically be set to the last frame of the movie. You can change these values as desired.

The **Duration**: register in the **Movie Controls** area displays the length of the movie, as set by the movie **Start** and **End** frames. This will match the **Duration** column for the relevant entry in the **List**. This value is not directly editable.

### Note

The Browser screen preview in the Movie Controls area can optionally be turned off by right-clicking on the Browser window and choosing Disable Browser Display. This will provide quicker response from the movie Slider controls, and quicker screen updates on the SDI output screen. To turn it back on, choose Enable Browser Display.

8. Click the Mark button in the VTR Controls area to set the adjacent scratch register to the current tape location. You can also enter a value this box. To cue the tape to the selected frame, click Go To.
9. The VTR Inpoint is the first frame that is recorded. The VTR Outpoint is the last frame recorded. Use the Inpoint button to set an Inpoint. Hold down the Ctrl key to change this button to an Outpoint button. You can also double-click on the Movie Start or Movie End field to edit these values. When the first movie is added to a List, its VTR Inpoint is set to the current tape location. Subsequent movies added to the List will automatically have their VTR Inpoint set to be contiguous with the previous entry's VTR Outpoint, so that a continuous tape recording will be made. You can change this value as desired.

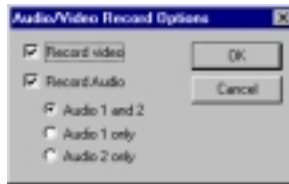
### Record List changes as follows:

1. If the VTR Inpoint is adjusted, the Movie Start, Movie End and Duration will remain the same and the VTR Outpoint will change as appropriate.
2. If the VTR Outpoint is adjusted, the Movie Start, Movie End and Duration will remain the same and the VTR Inpoint will change as appropriate.
3. If the Movie Start point is adjusted, the VTR Outpoint and Movie End point will remain the same and the Duration and VTR Inpoint will change as appropriate.
4. If the Movie End point is adjusted, the VTR Inpoint and Movie Start point will remain the same and the Duration and VTR Outpoint will change as appropriate.

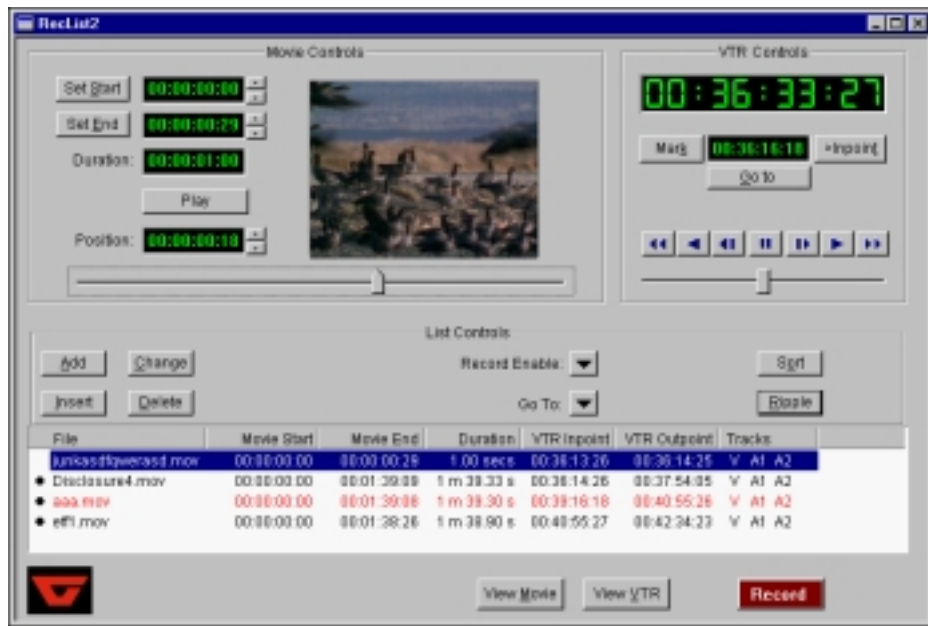
When a movie is added to the **List**, the appropriate audio or video tracks are automatically enabled for recording. If the movie file has a video track only, only the **V** track will be enabled. If the file has video and stereo audio, the **V A1 A2** tracks will be enabled for recording; and so on.

**To change the track recording status for a movie:**

1. Double-click the relevant entry in the **Tracks** column; the **Audio/Video Record Options** window appears.



2. Choose the appropriate tracks for recording and click the OK button to close the window.
3. Repeat the above steps as needed to continue adding entries to the List until done.



4. In the List Controls area, click Add to add an entry to the List. Click Insert to insert an entry above the currently selected List entry. Click Change to replace the movie file in a selected List entry with another file (or choose Change Item under the List pull-down menu). Use the Delete button to remove the selected entry from the List (or choose Delete Item under the List pull-down menu). An entry can also be

selected and dragged to a new position in the List. Most List fields in an entry can be edited directly by double-clicking on them.

5. Right-click on any List entry for additional options. Most options available here duplicate functions available elsewhere in the program.
6. Click Go To to cue the movie to a specific point in the clip.
7. To play a movie in the List, select it and click View Movie. Clipper plays back the movie via SDI video output. To play the movie from its first to its last frame, press Ctrl and click View Movie.
8. To play an entry in the List from its set VTR Inpoint to Outpoint, select the entry and click View VTR.

The Sort button in the List Controls area sorts and reorders List entries by ascending VTR Inpoint order. This saves time and tape/head wear when multiple movies are recorded to multiple locations in widely separated areas of the tape.

The Ripple button resets VTR Inpoints to make all recordings to tape contiguous from the current selection down to the bottom of the List. This means that each entry's VTR Inpoint immediately follows the previous entry's VTR Outpoint. Ripple is useful to maintain recording continuity when items are inserted into the middle of the List, adjustments are made to movie Start and End points once an item is already in the List, or should the you need to change the VTR Inpoint of the first List entry to record the whole List in another tape location.

When a discontinuity in VTR recording points exists, Clipper displays the entry that is non-contiguous in a different color. You can also asked to be warned of the discontinuity in Program Preferences.

The list displays three kinds of status:

- Record enabled entries are marked by a dot.
- Record disabled entries are not marked.
- Successfully recorded entries are marked by the number four.

You can double-click an entry to change its status. To begin recording click Record.

You can save a list by clicking Save or Save as on the File menu.

## Recording Accuracy

Occasionally due to differences in VTR timing, video routing, A/D conversion, etc., Clipper records with a small frame offset. This is shown by repeated frames at either the beginning or ending of the recording, and a corresponding truncation of movie frames at the other end of the tape recording. When this happens, it is necessary to calibrate Clipper's recording accuracy.

Before attempting this calibration, perform the following test to confirm that Clipper is not recording accurately.

1. Record a single movie at a given **VTR Inpoint**. It is helpful if this test movie has frames which are numbered or otherwise uniquely identifiable. Once recorded to tape, carefully examine the tape at the **VTR Inpoint**. Usually, the tape video frame at the **VTR Inpoint** will be the **Movie Start** frame. Now slowly cue or step the tape forward to examine the second frame of the tape recording.

### Note:

Most VTRs display video fields instead of video frames when in still, jog, step or slow display modes. Remember that 2 video fields equals 1 video frame.

2. If the second tape frame is a repeat frame, then Clipper needs to be calibrated. Continue cueing the tape forward a frame at a time and count the number of repeated frames until the movie frame on tape changes. Once the number of repeated frames is known, cue the tape to the VTR Outpoint. The movie usually cuts out on tape early by the same number of frames. If these numbers do not match, carefully perform the test again.
3. Once the number of offset movie frames is known, choose Device Control from the Config menu. In the VTR Control window, type this number into the Movie Start Calibration box and click OK. Now perform the test again. If the number of repeated frames was correctly counted, the new test recording should now be accurate and the calibration procedure is complete.
4. Occasionally, the system timing could be such that a whole number record calibration will produce inconsistent results, i.e. sometimes there will be a repeated movie frame and sometimes not. In this case, the user should use a decimal value in the Movie Start Calibration: field to more precisely fine tune the adjustment. Keep repeating the test until the tape recordings produce consistent and frame accurate results.

Normally, the calibration procedure need only be done once.

**Important**

Never adjust the VTR Calibration: register in the Optibase VTR Control window unless specifically instructed to do so by Optibase technical support!

# Time Code, Tape Formatting, Genlock And Video Cabling

## Time Code Tutorial

Time code is a recordable stream of electronic data that provides a unique number or address for every frame of video on a tape. Time code is expressed in the format HH:MM:SS:FF, where H=hours, M=minutes, S=seconds and F=frames. Time code uses a standard 24 hour clock format, with the addition of the Frames field.

The industry standard for NTSC and the HDTV formats used in the U.S., Japan, and others is SMPTE time code; for PAL video and 50 Hz HDTV formats (used in Europe, S. America and others), it is EBU time code. NTSC and SMPTE time code use a frame rate of approximately 30 video frames per second; PAL and EBU time code use 25 video frames per second.

NTSC video is conventionally thought of as running at 30 frames per second. However, in actuality it runs at 30/1.001 frames per second (approximately but not exactly 29.97). Some existing HDTV standards run at exactly 30 frames per second, but others run at 30/1.001 like NTSC. This one frame per thousand average difference in NTSC and some HDTV formats may cause some confusion. For video professionals, the discrepancy has led to the use of two types of SMPTE time code: **Drop Frame** and **Non-Drop Frame**. (Because EBU time code runs at precisely 25 frames per second, Drop Frame time code does not exist in PAL.)

Drop Frame (DF) is used in some broadcast and related applications where precise control over program length is desirable. Drop frame uses a scheme where certain time code numbers are skipped or "dropped" (2 frames per minute, except tens of minutes) to keep elapsed SMPTE and clock time fairly equal. When using DF time code, make certain to always type in frames which actually exist on the tape!

Non-Drop Frame (NDF) SMPTE time code is more commonly used. The advantage is that all time code locations actually exist and time code numbering is continuous. There are no nonexistent or "dropped" frames as with DF time code. The disadvantage is that it actually takes a fraction longer than one second to play 30 frames of video, so over the course of a long program, clock time and SMPTE time code time will diverge.

**Clipper** will automatically sense whether your tape is DF or NDF time code (and whether the VTR is NTSC or PAL standard) and configure itself appropriately.

## Video Tape Formatting for Clipper

Videotapes must be properly formatted or "striped" for use with frame accurate video equipment. This is analogous to the formatting of computer disks and drives. With videotape, proper formatting means that both video and synchronous time code are written on the tape. **Clipper** cannot read time code that is not present on the tape, and your video recorder cannot properly insert edit video onto a tape which does not already have video recorded on it.

The video on a properly formatted tape should be continuous, and the time code should be both continuous and ascending. **Clipper**, or any other device controller, may not function properly if the tape has discontinuities: if the time code on the tape "jumps", or if higher time code numbers precede lower numbers, **Clipper** may not cue the tape properly.

In some cases, previously recorded tapes which do not already have time code information present (or have discontinuous time code) can be "post-striped" with time code. Consult your video machine manual for further information on striping or post-striping your videotape.

## Video Cable Hook-up and Genlock

Proper video cabling is important to ensure satisfactory and frame accurate results. Follow instructions in the Optibase manual for wiring the card into your video environment. Also be sure that the switch settings on your video equipment are set correctly for the actual system wiring (e.g. VTR input select switches).

The most common cause of problems with **Clipper** involves improper video wiring, Optibase board or VTR Genlock, improper video routing and other simple hook-up problems.

Genlock is a means to synchronize or lock together all elements of your video system. It requires having one master sync source (a Sync Generator, or "house sync") and religiously locking all your video gear to that single master sync source.

Optibase **STRONGLY** recommends that you operate **Clipper** in a Genlocked video environment. Although this is not an absolute requirement, it does make the video environment much more stable, reliable and flexible. The means to Genlock each piece of video gear in your system may vary, so consult your manuals for additional details.

You will definitely need to work within a Genlocked environment in order to wire the Optibase board output to a VTR input and the VTR output back into the Optibase board input: if you do not, then you will get a sync feedback loop, and recording and capture may not work properly.

Another reason a Genlocked environment is preferred is because the Optibase board does not output an analog sync reference signal. Some VTRs may not record properly when locked only to the SDI signal coming out of the Optibase board: these VTRs may require an analog Black Burst/Composite Video or HD Tri-level Sync signal to be present at their Reference Video input, and you may see a 0bar0 through the video if this signal is not present (or if the signal is not Genlocked to the incoming SDI video).

Because of the importance of operating in a properly synchronized system environment, **Clipper** can require that the Optibase board be locked to an external sync signal when recording out to tape. Select **Program Preferences...** under the **Config** pull-down menu to open the **Program Preferences** window. When the **Require External Sync** checkbox is ON, **Clipper** will prevent recording to tape if the Optibase board is not locked to an external signal, analog or SDI. Check **Require External Sync** OFF to allow recording even though the Optibase board is 0free running0.

At its simplest, a typical externally locked cabling setup is essentially as follows.

**For capturing ONLY using SDI synchronization:**

1. Connect the appropriate video output of the VTR to the video input on the Optibase board.
2. Connect the video output of the Optibase board to a video monitor. You may need an appropriate D/A converter to view the Optibase board output.

**For recording ONLY using SDI synchronization:**

1. Connect the appropriate video output of the Optibase board to the appropriate video input on the VTR. Set the VTR input select switch or menu to this same input.
2. Connect the video output of the VTR to a video monitor. The SDI output of the Optibase board can then be viewed through the output of the VTR when the VTR is in EE mode, or it can be viewed directly on an SDI input monitor if looped through the VTR or monitor.
3. For capturing AND recording using Genlock:

4. Connect Black Burst or Tri-level Sync from your master sync generator to the VTR Reference Video Input.
5. Connect Black Burst or Tri-level Sync from your master sync generator to the Optibase board Sync Input.
6. Set the Optibase board Control Panel to **Lock Output to Sync Input**.

# Troubleshooting And Technical Support

Optibase authorized resellers and distributors provide technical support for all products. Please contact the reseller or distributor who sold you your Optibase product.

The Optibase Knowledge Base offers technical tips and information about Optibase products. The Knowledge Base is available at <http://support.optibase.com>

**In addition, Optibase offers different customer support programs as detailed below:**

## **Developer Support Programs**

Optibase's developer clubs provide system integrators, OEMs and developers with the support and tools needed to develop digital video applications. By subscribing to a developer club, you'll get direct access to Optibase's support engineers.

## **Software Maintenance Services**

Optibase's software maintenance services are sold per product. They grant you automatic membership to a product's Customer Club and access to an extensive product knowledge base, product patches, upgrades and technical tips.

For more details about these products go to [http://www.optibase.com/customer\\_clubs](http://www.optibase.com/customer_clubs)

If you purchased your Optibase product directly from Optibase Inc., contact Optibase's technical support directly as follows: