Using VTR Emulation on Avid Systems

VTR emulation allows you to control a sequence loaded in the Record monitor from an edit controller for playback in the edit room along with other sources. In this scenario the edit controller treats the Avid® system as a play deck.

You typically connect an edit controller to the Avid system using a 9-pin serial connection. Then, you use the Serial (COM) Ports tool (Windows) or Serial Ports tool (Macintosh) to establish the connection to the controller.

The following manuals describes how to use VTR emulation:

- Avid Symphony Editing Guide
- Avid Media Composer and Film Composer Editing Guide
- Avid Xpress User’s Guide
- Avid NewsCutter User’s Guide
- Avid Media Station XL Workflow Guide

For information on using VTR emulation with NewsCutter® and Media Station XL systems, see “NewsCutter VTR Record Emulation and Media Station XL Telecine Record Emulation” on page 7.

Limitations

You can also connect a record deck to the controller and use the controller to record from the Avid system to the record deck. This white paper describes some limitations that you might encounter...
when using the system in this way. Workarounds are provided when available.

The limitations are associated with maintaining frame accuracy between the Avid system and the record deck. Specifically, you can lose frame accuracy when you attempt to using VTR emulation to perform a frame accurate, pre-rolled edit. Frame accuracy depends on the types of commands that the controller sends to the Avid system. VTR emulation works best when the following conditions are met:

- The controller sends cue commands rather than shuttle commands to the Avid system. This ensures that the Avid system can preload the media and begin preroll at the same time as the record deck.
- During preroll, if it is necessary to speed up either the record deck or the Avid system, the controller speeds up the record deck. If the controller speeds up the Avid system during preroll, frame accuracy will not be maintained.

Overview

The following illustration represents the connections between an edit controller, an Avid system, and a record deck.

Using this example, assume that you want the portion of the Avid Timeline between the IN and OUT points to be recorded onto a
specific portion of the tape on the record deck. To accomplish this, the controller must make sure that the Avid system and the record deck reach their respective IN points at the same time. This process ensures a frame-accurate recording. To achieve frame accuracy, the controller performs the following tasks:

1. Positions the play head for both systems at the preroll point.

2. Issues a play command to the Avid system and to the record deck.

3. During the preroll, frequently checks to see whether the two units are at the same relative distance between the preroll point and the IN point. If necessary, the controller instructs either the Avid system or the record deck to temporarily speed up. Increasing the speed is called “bumping.”

If the controller bumps the Avid system, frame accuracy is not maintained. See “Bumping (Speeding Up the Record Deck or Play Deck)” on page 6.

4. Once the IN point is reached, starts recording. The controller stops recording at the OUT point.

The following two sections describe the limitations associated with the types of commands that the edit controller sends to the record deck and to the Avid system.
Cue Commands Versus Shuttle Commands

An edit controller moves the play head on a deck to the preroll point in one of the following ways:

- Issues a cue command with a timecode value. This method gives control to the deck. The deck moves to the specified timecode point and sends a completion command to the controller.
- Sends shuttle commands to the deck to move the play head to the specific timecode. This method is necessary for some older decks that do not recognize cue commands. In this case controller must shuttle the deck until it reaches the correct timecode value.

The controller manufacturer decides whether the controller sends cue commands or shuttle commands.

Cue commands are the preferred way to control the Avid VTR emulation software. When the Avid system receives a cue command, it expects a play command soon afterwards. The Avid system performs the following procedure after it receives a cue command:

1. Moves the play head to the specified timecode
2. Preloads the digital media so that play can begin immediately
3. Sends a completion message to the controller

The need for the Avid system to preload the digital media highlights an important difference between playing media from a deck and playing media from a computer-based editing system:

- When the play head of a deck is positioned on a portion of the tape, the deck can start playing very quickly. There is a short run-up time for the deck to reach playing speed, but it usually takes just a few frames.
- A computer-based editing system, on the other hand, must preload a portion of the digital media into computer memory before it can start playing. The time required to preload the media depends on the complexity of the sequence.
When it receives a shuttle command, the Avid system doesn’t preload the media. This is partly due to the fact that the controller might send several shuttle commands before it issues a play command. Therefore, when the controller finally issues a play command, the Avid system must preload the media before it can begin playing. By the time the Avid system preloads the media, the tape on the record deck might have advanced too far to allow the controller to sync up the two systems.

**Recommendations**

Unfortunately, there is no easy way to tell whether a particular controller issues cue commands or shuttle commands for a particular type of deck. If you cannot perform frame-accurate recording with a particular controller, try selecting a different device code from the VTR Settings dialog box available from the Settings scroll list. This will allow the VTR emulation software to emulate another type of deck. Depending on the controller, it might send cue commands to some decks and shuttle commands to others.

*The Avid system does not perform differently when you change the device code setting. It just allows the edit controller to see a different device code, which might cause the controller to behave differently.*

You can also try adjusting the run-up time in the VTR Settings dialog box. This might help the two devices attain full speed at the same time. However, if the controller is sending shuttle commands, adjusting the run-up time probably won’t help since the amount of time to preload the digital media varies with the complexity of the sequence.

*It is possible to achieve frame accuracy with Macintosh OS 9.x systems. However, on a Windows NT® or Windows® 2000 system, VTR emulation will always be at least one frame off.*
Bumping (Speeding Up the Record Deck or Play Deck)

During the preroll, the controller frequently checks to see whether the record and play decks are at the same relative distance between the preroll point and the IN point. If necessary, the controller instructs either the Avid system or the record deck to temporarily speed up. This is called “bumping.”

If the controller speeds up (bumps) the Avid system, frame accuracy will not be maintained. You should set up your controller so that it bumps the record deck rather than the Avid system.

Different controllers have different names for the settings that determine whether to speed up the record deck or the play deck. On some decks, the setting is called Record Sync. For example, a Sony® PVE-500 controller has the following options to determine whether the controller will speed up the record deck or the play deck:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rec Sync</td>
<td>Bump record deck</td>
<td>On, Off</td>
</tr>
<tr>
<td>P1 Sync</td>
<td>Bump first play deck</td>
<td>On, Off</td>
</tr>
<tr>
<td>P2 Sync</td>
<td>Bump second play deck</td>
<td>On, Off</td>
</tr>
</tbody>
</table>

Using this example, you should set Rec Sync to On and set P1 Sync and P2 Sync to Off. These settings ensure that the Avid system will not be bumped.

Other controllers use a TSO (tape speed override) setting to determine whether to bump the record deck or the play deck. For these controllers, you might have more choices than On or Off. Select the combination of settings that guarantee the play deck will not be bumped.
NewsCutter VTR Record Emulation and Media Station XL Telecine Record Emulation

Avid NewsCutter has a VTR Record Emulation feature that allows you to control the recording of media into the NewsCutter system using an edit controller and a source deck. Avid Media Station XL has a similar feature known as Telecine Record Emulation that allows you to record media into the Avid system during the telecine process.

These features require that the controller send cue commands as described in “Cue Commands Versus Shuttle Commands” on page 4. However, bumping is not a problem for VTR Record Emulation or Telecine Record Emulation. Frame accuracy can be maintained as long as the edit controller sends cue commands. If you have frame-accuracy problems, see “Recommendations” on page 5.

The VTR Record Emulation and Telecine Record Emulation features are used to record media into the Avid system, not out to a record deck.