VTR Xchange
User Guide

525i29.97 8 Bit (720x486) Apple FCP Uncompressed 8-bi...

VTR OK   00:01.47:08   drop

Clip NUMBER 3   ◀◀ ◀ ◀❙ ■ ❙▶ ▶ ▶▶
Reel 001

capture
  ☑ video   capture now   capture :   cue to   00:01:47:08
  ☑ audio   grab now   grab :   cue to   00:01:51:26

AJA®
VIDEO SYSTEMS
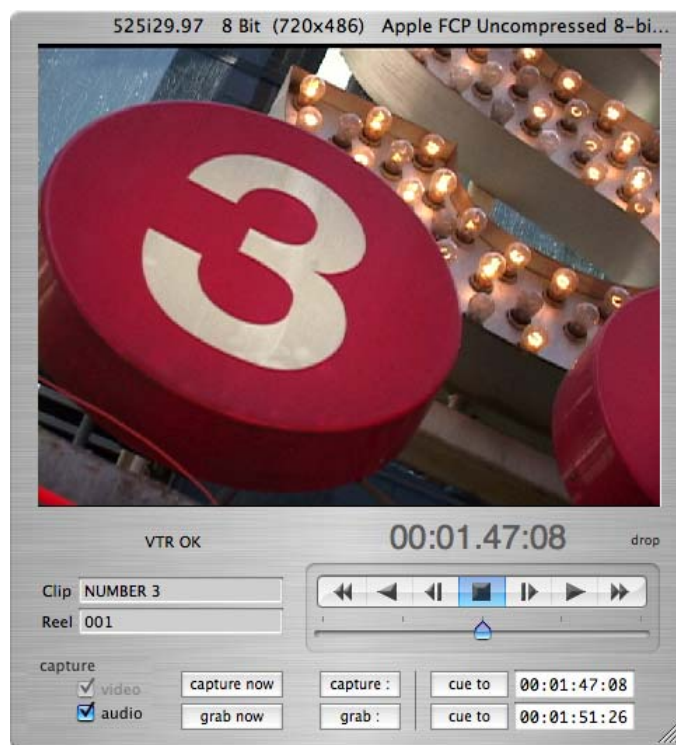
July 25, 2008

Version 4 Software

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Notice

Contacting Support

To contact AJA Video for sales or support, use any of the following methods:

443 Crown Point Circle, Grass Valley, CA. 95945 USA

Telephone: 800.251.4224 or 530.274.2048
Fax: 530.274.9442

Web: http://www.aja.com
Support Email: support@aja.com
Sales Email: sales@aja.com

When calling for support, first read the Chapter on *Troubleshooting* at the back of this manual. You can often save time and effort by looking there first for simple remedies and information on how to get support from AJA and Apple Computer Inc.

Table of Contents

Overview

AJA VTR Xchange is a Macintosh OSX software application that allows users to capture from and record to any deck that can be interfaced with supported AJA capture and playback devices.

The software consists of a main control/view window and several setup screens. Keyboard shortcuts are available for most functions.

Note: For deck control with VTR Xchange, an RS-422 cable must be connected between the RS422 9-Pin ports on the AJA device (KONA, IoHD or Io) and the deck.

System Requirements

AJA VTR Xchange works with the following AJA products:

- Io HD
- KONA 3
- KONA LHe and LH
- KONA LSe and LS
- KONA 2
- Io (limited functionality)
- IoLA (limited functionality)
- IoLD (limited functionality)

This software application will run on any Macintosh approved for use with the AJA products listed above. For optimum operation, all of the aforementioned products should have their latest drivers and firmware installed. These can be obtained from the AJA website, www.aja.com

Initial Set Up

1. Launch AJA VTR Xchange

2. On the top menu bar, select *Capture>Video Settings*.

> Capture Now   ⌘K
>
> Video Settings...
> Audio Settings...
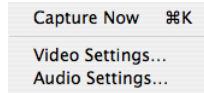
3. On the Compression tab of Video, select the desired codec from the *Compression Type* drop-down box. In the Motion drop down box, select the desired frame rate for the destination files. Note: The *Best* setting will match the destination frame rate to the source frame rate, but in some applications, such as 2K ingest, you must set this to the desired frame rate. You may find it useful to consult the AJA Control Panel application's Input tab to decide which codec and frame rate is appropriate to the media you want to ingest.

4. On the *Source* tab of *Video*, select the video format in the drop-down box that best matches the format of the source video. (If you are using the AJA Io, the capture settings will say *ProIo* and is located further down the list of choices.)

   If desired, select one of the tools from the drop-down box in the *Preview* pane on the right to verify the legality of the source video, etc. Select the *Okay* button to confirm selections.

5. On the menu bar, select the menu: *AJA VTR Xchange…Preferences*. There are two tabbed preferences screens that you can then select: *Deck* or *Capture*.
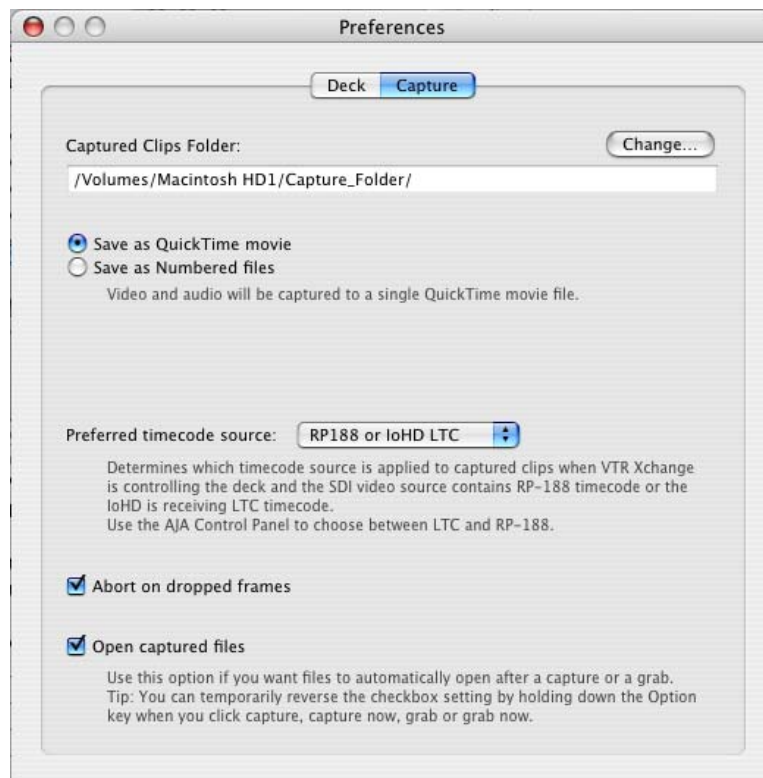
Preferences, Capture Tab

Preferences

Preferences, Deck Tab

Clicking on the *Deck* Tab button at the top, selects the deck preferences screen. Here you can select the appropriate Serial Port from the drop-down box (*IoHD Serial*, *Kona Serial* for KONA cards and *Firewire* for AJA Io/LA/LD devices).

The deck screen also displays live information from the deck connected to the KONA or IoHD's serial port. When the deck is powered on and connected, the information will be detected by VTR Xchange and displayed similar to this:
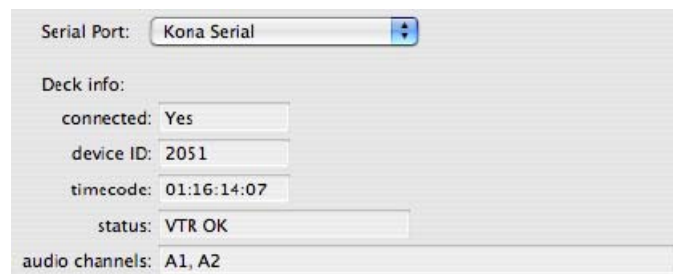

When capturing from a deck being controlled by VTR Xchange, you begin by selecting a section of the tape you wish to capture by marking an in-point and an out-point. You then click the *Capture* button and wait while the deck pre-rolls the tape and captures the video to a QuickTime movie file. If the captured video clip begins its timecode a frame or two before or after the frame selected as the in-point as compared to the tape's timecode/image relationship, you can use the *Captured Frame Calibration* slider to compensate for this offset. Since devices vary it is a good idea to proof an initial capture before capturing numerous clips.

The easiest way to set the Captured Frame Calibration slider is to capture a short clip of video that has burn-in timecode.

When the capture is complete, the clip will open up in a VTR Xchange player window. You should then see the burn-in timecode in the clip as well as the timecode displayed below the clip. If the timecode displayed below the clip is less than the burn-in timecode, decrease the *Captured Frame Calibration* number by moving the slider to the left. After adjustment, repeat the capture and compare operation again, repeating this process until the two timecodes agree.

Once calibrated, capturing should remain frame-accurate for the attached deck and compression settings selected. If you change video formats, decks or compression, be aware that you may have to re-calibrate.

The *Record Frame Calibration* slider calibrates "edit to tape" in a manner similar to the *Captured Frame Calibration*. To calibrate recording, open a short video clip with burn-in timecode in VTR Xchange's player window. Set an in-point for the clip that ends in the same frame number as the burn-in timecode on the first frame of the clip. This will make it easier to compare timecodes. Press *edit to tape* and wait for the recording to complete. Shuttle the deck to the location just recorded to. You may have to shuttle the tape a few frames past the in-point before the burned-in timecode begins to change. If the timecode displayed below the decks video is less than the burn-in timecode, decrease the *Captured Frame Calibration* number by moving the slider to the left. After adjustment, repeat the compare operation again, repeating this process until the two timecodes agree.
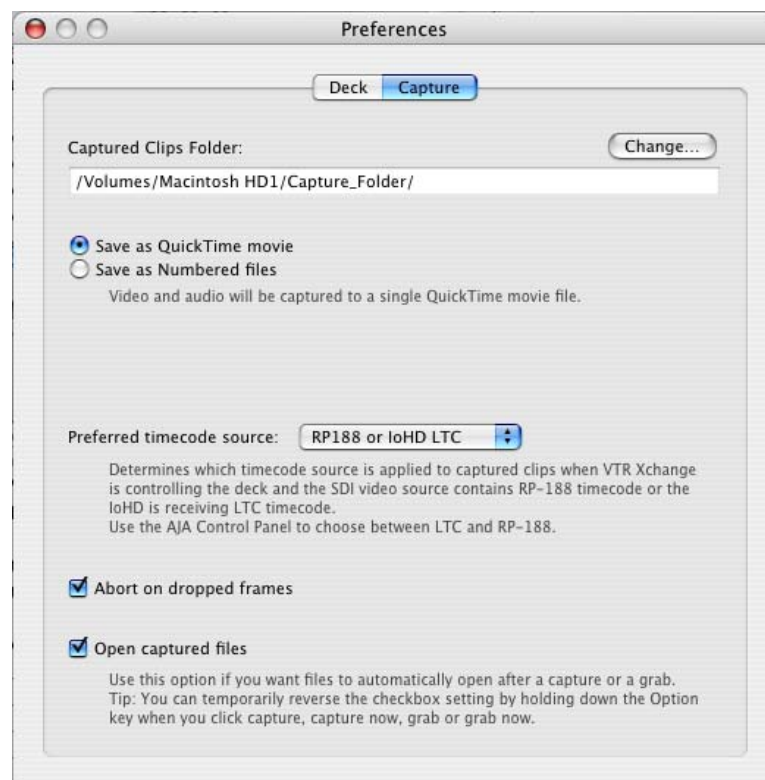

Preferences, Capture Tab

In the Capture area of the preferences screen, select the default destination folder for the captured files by clicking *Change…* You may also use this *Change* button to later specify a different drive and/or folder. The *Captured Clips Folder* is initially blank so that you can specify exactly where you want your content placed after capture. If you make no selection, VTR Xchange will prompt you to set a destination for your media.

Note: In order to ingest specific types of media, such as uncompressed HD, the destination for the media must provide sufficient bandwidth to avoid dropping frames.

The default state for the VTR Xchange preferences sets the radio button selection to *Save as QuickTime movie.* Users can also capture sequential images or single still images. Details on these functions are covered later in this manual.

The default state for *Preferred Timecode Source* sets the preferred clip timecode source to *Deck*. *Deck* should be selected for devices that can be controlled via RS422 serial protocol. Another option, *RP-188 or IoHD LTC* allows users to write the embedded timecode (RP188) information from an HD-SDI signal or LTC timecode. Either the KONA or IoHD products may be used for ingesting RP188 timecode information. The LTC timecode support is only offered for the IoHD via the IoHD's LTC timecode input BNC. Users can select between the IoHD RP188 timecode or the LTC timecode as the timecode source in the AJA Control Panel, Timecode tab. RP188 and LTC timecode might be used to obtain timecode from a device that cannot be controlled such as a camera.
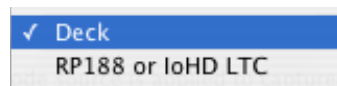
The capture window displays timecode coming from a deck connected to the KONA or IoHD's 9-pin serial port. It can also display RP188 timecode from an SDI video source or LTC timecode from an IoHD. If deck control is also present, the timecode displayed will be determined by the Preferred timecode source preference setting.

If the *Abort on dropped frames* checkbox is set, the capture will stop on the first dropped frame, a warning prompt will appear, and the captured movie file will be deleted. If *Abort on dropped frames* is not checked and dropped frames are detected during a capture, the capture will continue and a prompt will appear after completion making the user aware that dropped frames occurred.

Checking a checkbox in the preferences window labelled *Open captured files*, will result in the automatic opening of captured files after a capture or a grab.

Note: You can temporarily reverse this preference by holding down the *Option* key when you click *capture, capture now, grab* or *grab now.*
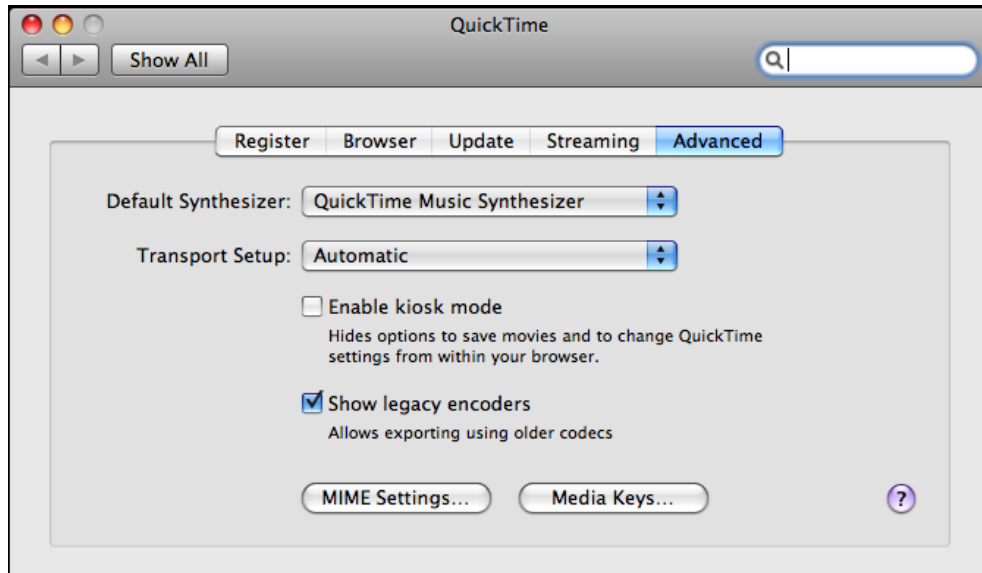
Sequential Image Captures

Preferences, "Save as Numbered Files" Set (for file-per-frame formats)

The rules for sequential image captures such as JPEG, TGA and TIFF are outlined in the Preferences window (Capture tab) of VTR Xchange after the *Save as Numbered files* option is selected.

Each frame of video will be captured to a sequentially numbered file. A QuickTime reference movie which allows playback of the captured files will also be created. *Hint:* Choose *10 bit RGB* or *10 bit Log RGB* video compression to create DPX files or choose *Photo-JPEG, TGA* or *TIFF.*

Note: Photo-JPEG, TGA and TIFF are not real-time formats and frames may be dropped. Also note that with version 7.5 of QuickTime, in order to see TIFF and TGA among the compression choices, users may need to make changes in QuickTime *Preferences > Advanced* by selecting the checkbox for *Show legacy encoders.*
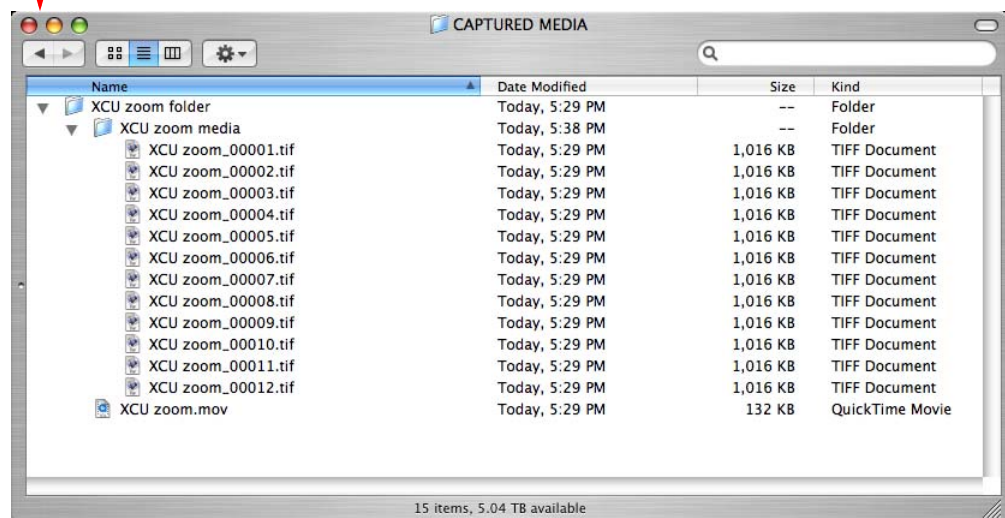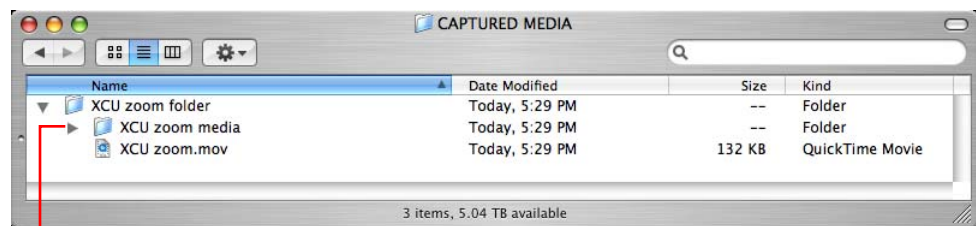
QuickTime Preferences, Advanced Settings
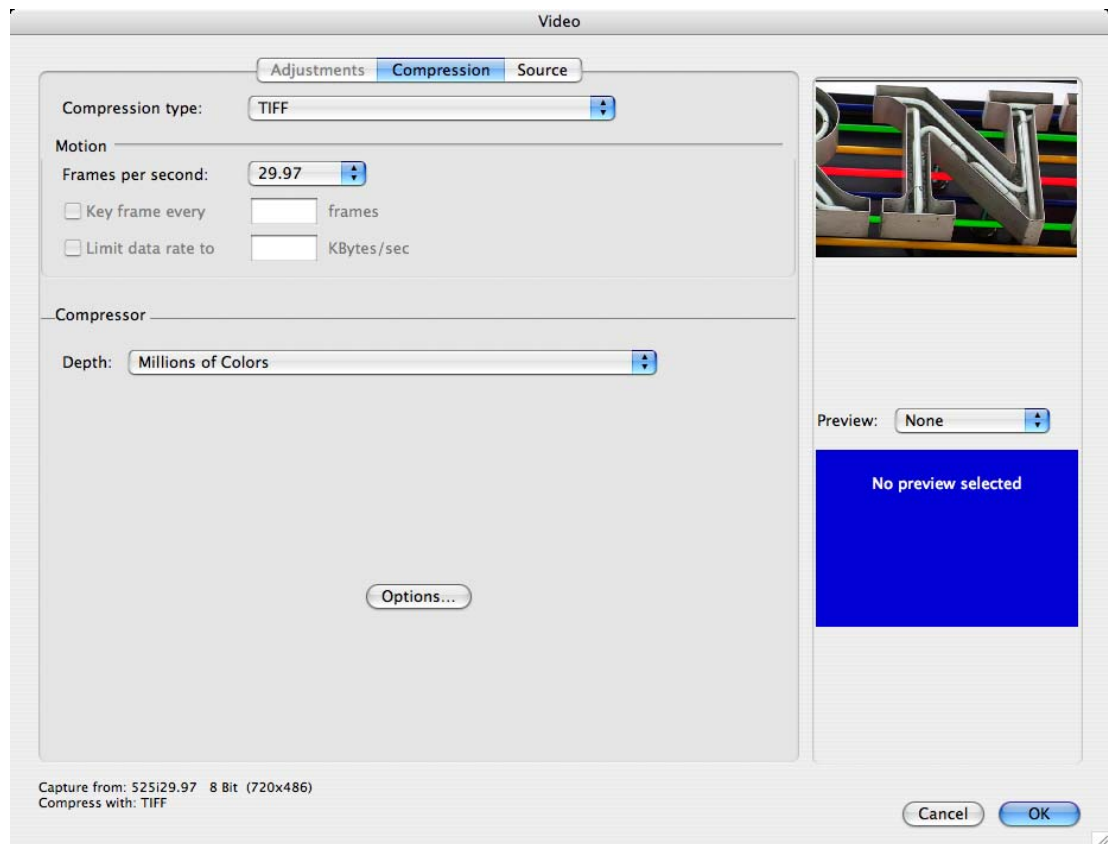
TIFF In Video Settings
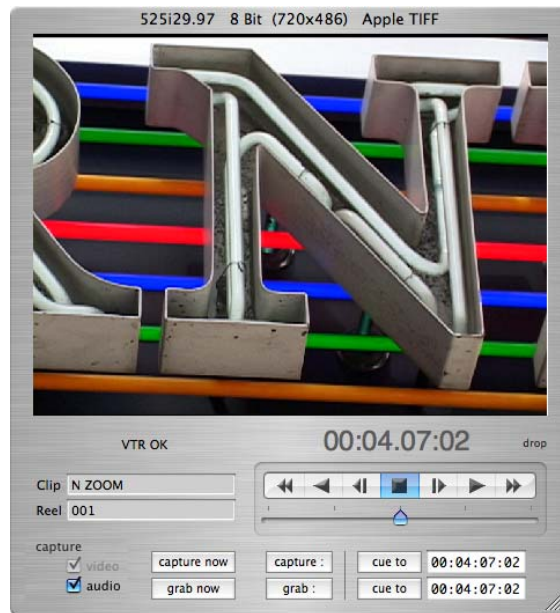
TIFF Compression

The structure of how the files are saved is pictured below:

Sequential Image Folders, How Saved

Special Notes for Using the AJA Io, IoLA and IoLD with Sequential File Captures

While the Io family of products is supported by Version 2 and higher of the VTR Xchange application, certain functions are unique to the KONA cards and cannot be properly performed on the AJA Io/IoLA/IoLD products. First, since the AJA Io/IoLA/IoLD products are standard definition video (SD) only devices, they cannot be used to capture HD signals with the VTR Xchange application. Furthermore, due to the robust PCIe hardware of the KONA 3, it alone is uniquely able to capture sequential DPX files; the AJA IoHD and Io products are not intended for sequential image capture (though users may be able to capture some sequential frames in JPEG or TGA formats—they will likely not be able to do so without dropping frames).

Frame Grabbing

The single frame *grab* and *grab now* functions in the Main Window of VTR Xchange allow a single video frame to be captured to a Photo-JPEG, TGA or TIFF file. To immediately capture one frame of video, click *grab now*. To capture the frame at the selected in-point location, click *grab*. Upon completion of the grab, the captured frame is opened in the Preview application.

Setup

1. In the *Video Settings* window, *Source* tab, make sure that an 8 bit video source is selected.

2. In the *Compression* tab, choose Photo-JPEG, TGA or TIFF. (Remember that if any of these choices do not appear, you may need to select *Show legacy encoders* in the QuickTime Preferences.)

Note: If you hold down the *Option* key when clicking *grab* or *grab now*, the captured file will not be opened in *Preview*. This is useful if you want to do multiple grabs on the fly while the tape is rolling.

Hint: Since a controlled grab uses the same mechanism as a controlled capture, grab is a handy way to determine the best *Captured Frame Calibration*. To find the best *Captured Frame Calibration*, do repeated grabs at different capture calibrations. Make a note of the setting that results in the correct frame being captured and set the *Captured Frame Calibration* to the appropriate setting.

# Ingesting 2K when using VTR Xchange with the AJA KONA 3

VTR Xchange is a powerful tool for ingesting sequential DPX files at 2K resolution along with the simultaneous creation of a 2K QuickTime Reference Movie. To set the KONA 3 up for 2K ingest, the source being fed to the KONA 3 must be from an HSDL (High Speed Data Link) device such as a DDR or a telecine with appropriate connections. If the device sends out 2K data via HSDL, you will be able to tell by looking at the video input on the AJA KONA Control Panel. Full size 2K will appear as 2048x1556 at 14.98 or 15fps. Alternatively, 2K data can be passed over HSDL as 2048x1080 at 23.98 or 24fps. The *Input* tab of the KONA Control Panel application must be configured correctly for VTR Xchange to operate properly. In the *Input* tab, if a 2K format is being detected by the card, you can then set the *Video Input* to *Dual Link*.

In the VTR Xchange application, from the *Video Settings* pulldown menu, both the *Source* and *Compression* tabs must be set correctly. In the *Source* tab, choose the appropriate setting that matches the signal that the KONA is receiving; i.e. 1556x2Kpsf14.98 10 Bit (2048x1556).
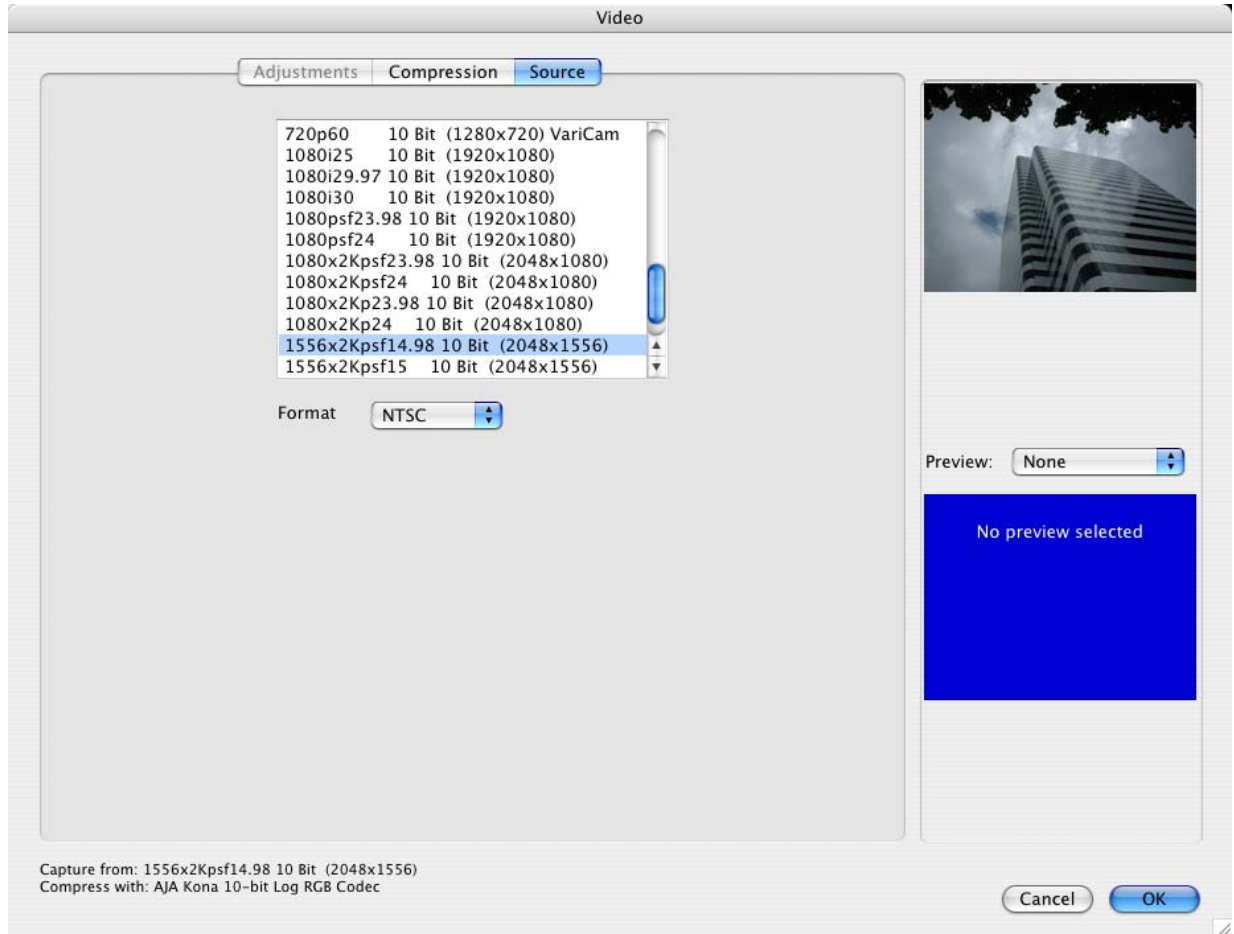
Video Settings, Source Tab

In the *Compression* tab, set the *Compression type* to either the AJA KONA 10-Bit Log RGB or the AJA KONA 10-Bit RGB codec.
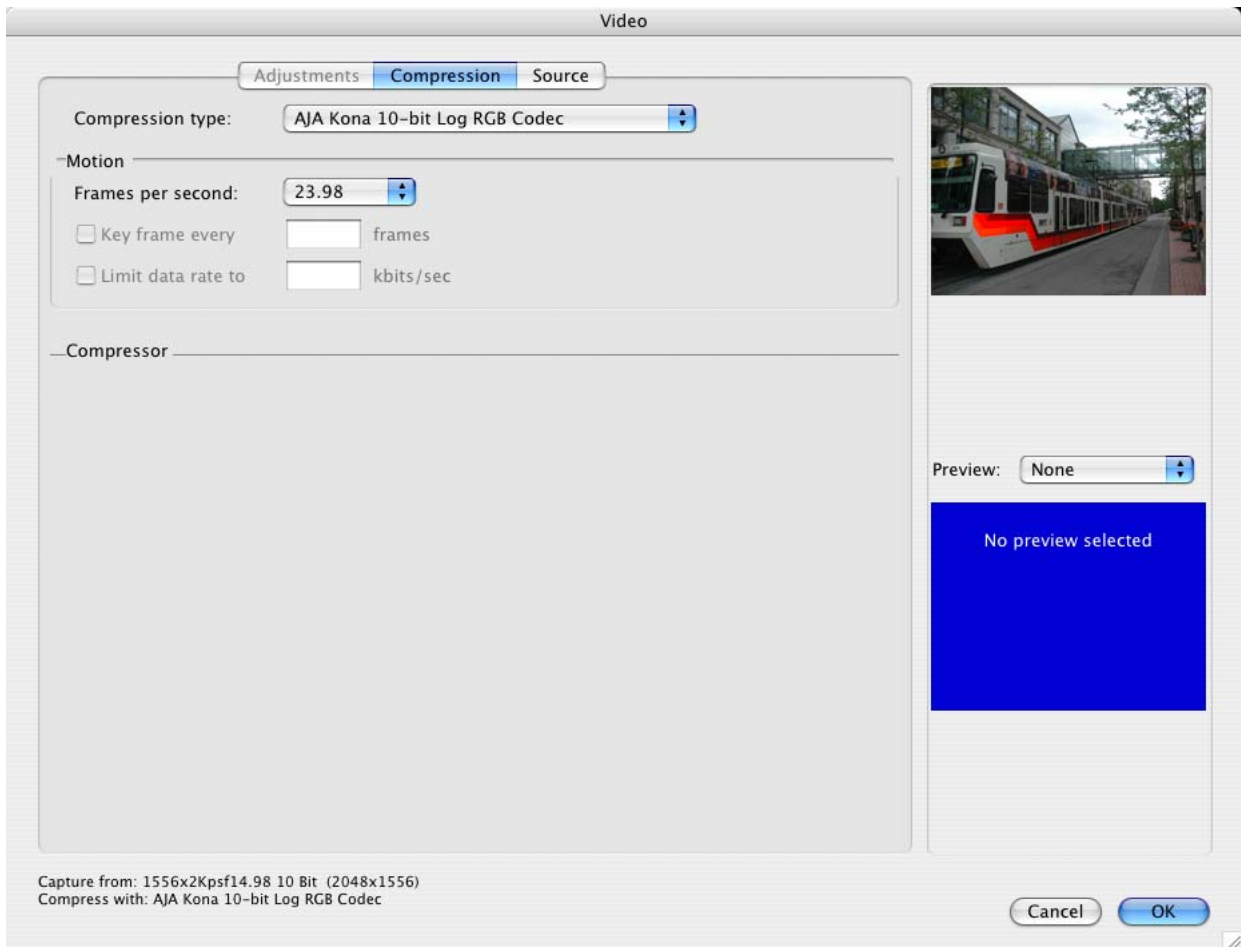
Video Settings, Compression Tab

This selection is dependent upon your source. In the *Motion* section of Compression, be sure to set the Frames per second to 23.98; this sets the timebase of the QuickTime Reference Movie and this is what allows you to work with the material at full frame rate as opposed to the transport stream speed of 14.98fps being transmitted between the HSDL output device and the KONA 3. For 2048x1080psf 23.98 material, the transport speed of the data and the desired frame rate are the same. In order to capture sequential images (in the case of 2K as DPX files) you will need to make the appropriate change in the *Preferences* window of VTR Xchange. In the *Preferences* window, you will notice the *Save as Numbered files* button (see the *Preferences* screen shown earlier). This must be selected for you to write a simultaneous series of DPX files and a QuickTime Reference Movie.

If you are connected to a 2K device, such as a DDR that can be controlled, you may typically treat the device as if it were a deck that might be connected. If you are attached to a device that cannot be controlled (like most telecines) you will need to "crash record" to your disk array. You can do this by simply rolling the device's playback and hitting the *capture now* button in the VTR Xchange main window. You will need to hit the *stop* button in the Capturing prompt that appears in order to stop the *capture now* since there can be no out-point timecode set to stop the recording.

Note: If the device's HD-SDI output supports embedded timecode information via RP-188, you may elect to set the "Preferred clip timecode source" to RP-188 in Preferences and capture this timecode value to the QuickTime file.
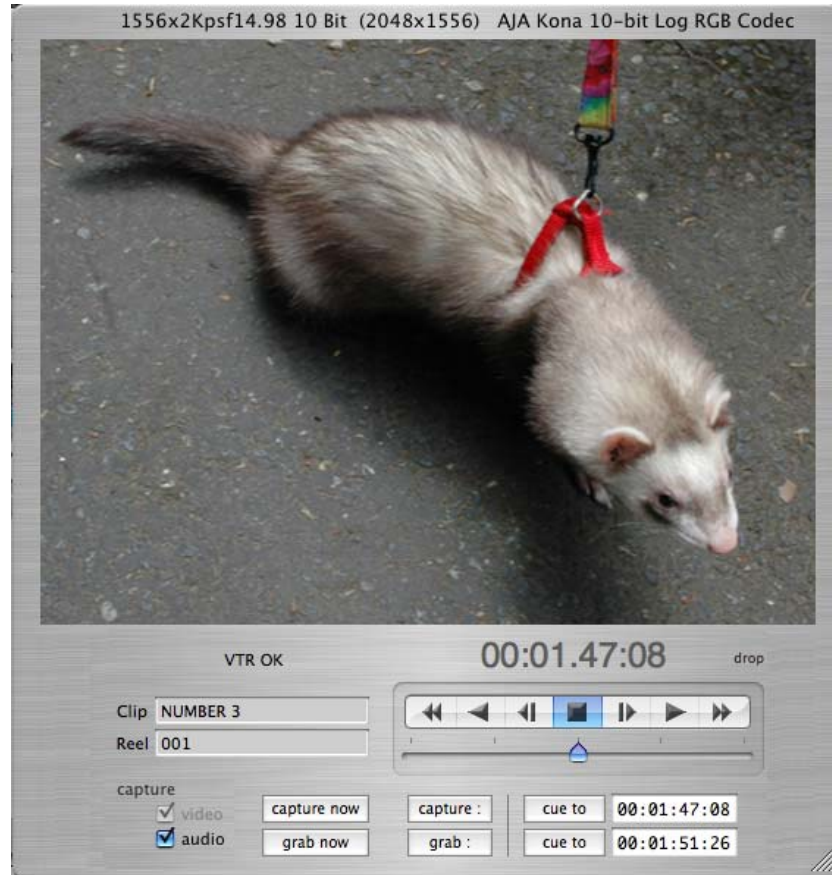
VTR Xchange, Main Window

If you go to the destination folder that you set in the preferences, you will find two items: the media folder which contains the sequential DPX files and outside of this folder—the QuickTime Reference Movie.

Because QuickTime Reference Movies get their "reference" status from the source media which they refer to, you must maintain the relationship between the media and the movie file. For example, you cannot delete the DPX files and expect to have a QuickTime Reference Movie. Moving the files to disparate locations is also not recommended as the link between the two pieces of data can be severed.

The sequential DPX files may be used by applications that accept such files like FX applications and color correction applications. The QuickTime Reference Movies may be imported into applications that will accept the 2K raster such as Final Cut Pro, Motion, and Shake, just to name a few.

Working with Audio

Audio Input

The *Audio Settings* (under the *Capture* pulldown menu) allow the user to select the appropriate Device (Kona, IoHD or ProIo), input, format, etc. The selection of tracks to be digitized is on the right hand side of the *Audio Capture Settings* window. Tracks can be mixed as stereo via a checkbox or left at the default of dual mono. If a tape is set to play in the Main Window of VTR Xchange and then the *Audio Settings* pulldown window is activated while the tape is playing, the signal levels of the audio can be seen in gray in the interface, showing 0 to 100% linearly.

Note: If no audio is seen in the window, KONA users may want to check to make certain that the audio input is set appropriately for embedded audio, AES via XLR or AES via BNC.
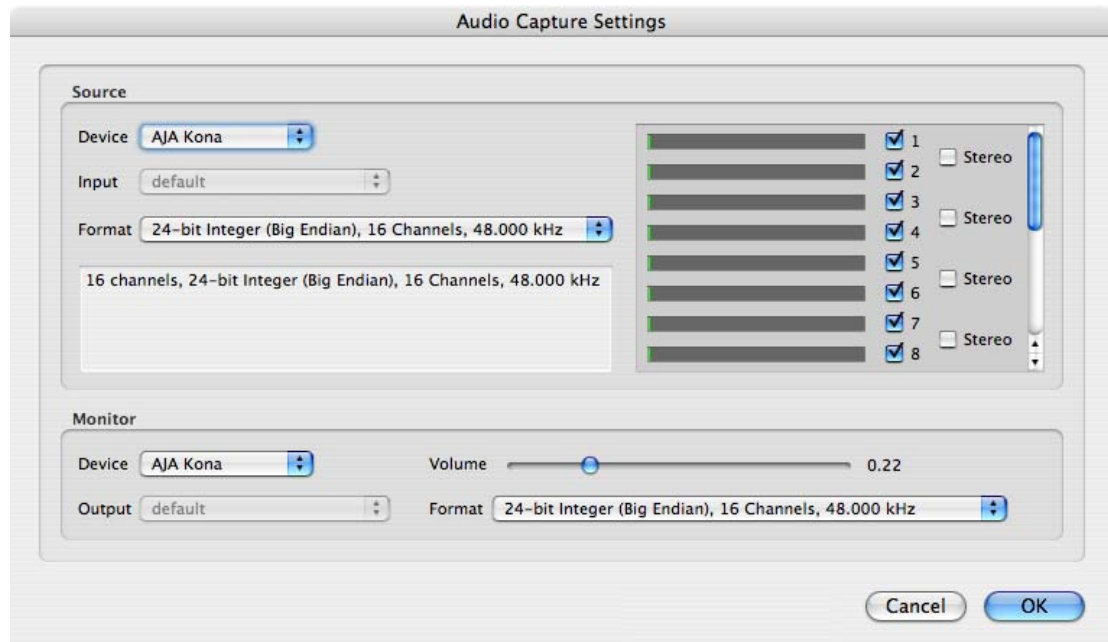
Audio Capture Settings (Capture -> Audio Settings), AJA Kona Shown

Audio Output

When the Player window is open with a clip for layback to tape, the audio output will default to a two channel stereo mix output. In the lower right hand corner of the window is the audio routing button. After selecting this button, a drawer with audio routing options will appear. Audio can be output as a stereo mix or as discrete channels. The source audio tracks for the clip can be mapped to the available recording channels on the record VTR.
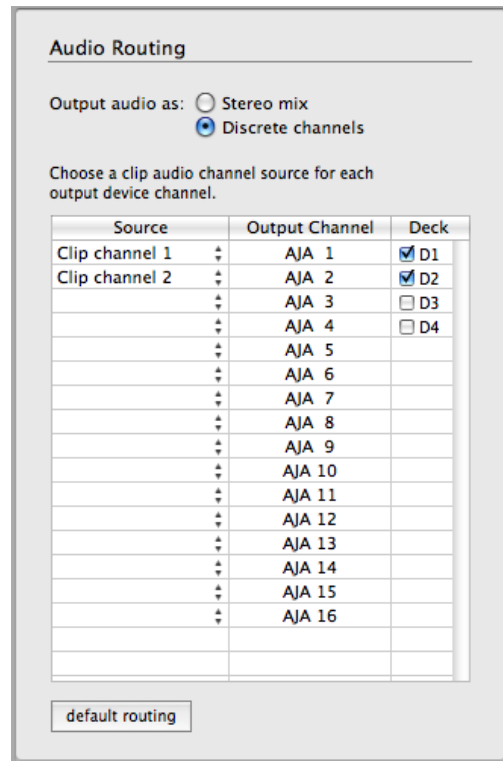
Audio Routing

Menus and Usage

**File…Open:** (command + o) Open a clip for playback through VTR Xchange. Connect a deck to the KONA's outputs to print clips to tape. Open recently opened clips under *File… Open Recent.*

File…Eject Tape: (command + e) If an RS-422 cable is connected from the deck to the KONA, selecting *eject tape* or pressing command + e will eject the tape from your VTR.

File…Loop Playback: During playback in the clip window, loop the clip from beginning to end. Pressing the *pause* button at the left of the timeline stops playback (or the spacebar).

Capture…Capture Now (command + k): This will start a capture and save the clip to the location set under AJA VTR Xchange…*Preferences*. Press command + k again to stop the capture. As soon as you begin the capture, you'll see a status dialog telling you the capture is underway. When the capture concludes, the clip will be displayed in a window that allows you to review the clip. *Capture Now* clips do not contain a timecode number relevant to the information on a tape—even when RS422 is connected. The clip in this case, unlike when a standard capture is performed, will begin at 00:00:00:00.

Note: The exception to this rule for *Capture Now* is when the *RP-188* selection has been made in *Preferences* and an HD VTR/DDR is outputting RP-188 on its HD-SDI output.
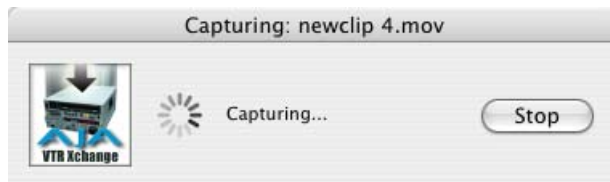
If you want to capture only video, you may elect to uncheck the *Capture Audio* checkbox in the main VTR Xchange window next to the *Capture Now* button.

VTR Xchange, Main Window

Window: These selections allow you to select a size for the VTR Xchange main window and clip window.

Half Size: Select small windows, half *Normal* size.
Normal Size: Standard VTR Xchange window size.
Double Size: Size the window to twice *Normal* size.
Fit to Screen: Size the windows to fit the available display screen on the Mac.

Big Button: This selection displays a small dialog screen with a large easy to read *Capture Now* button. When performing crash captures, this is a nice option to have displayed.

Changing Capture Settings
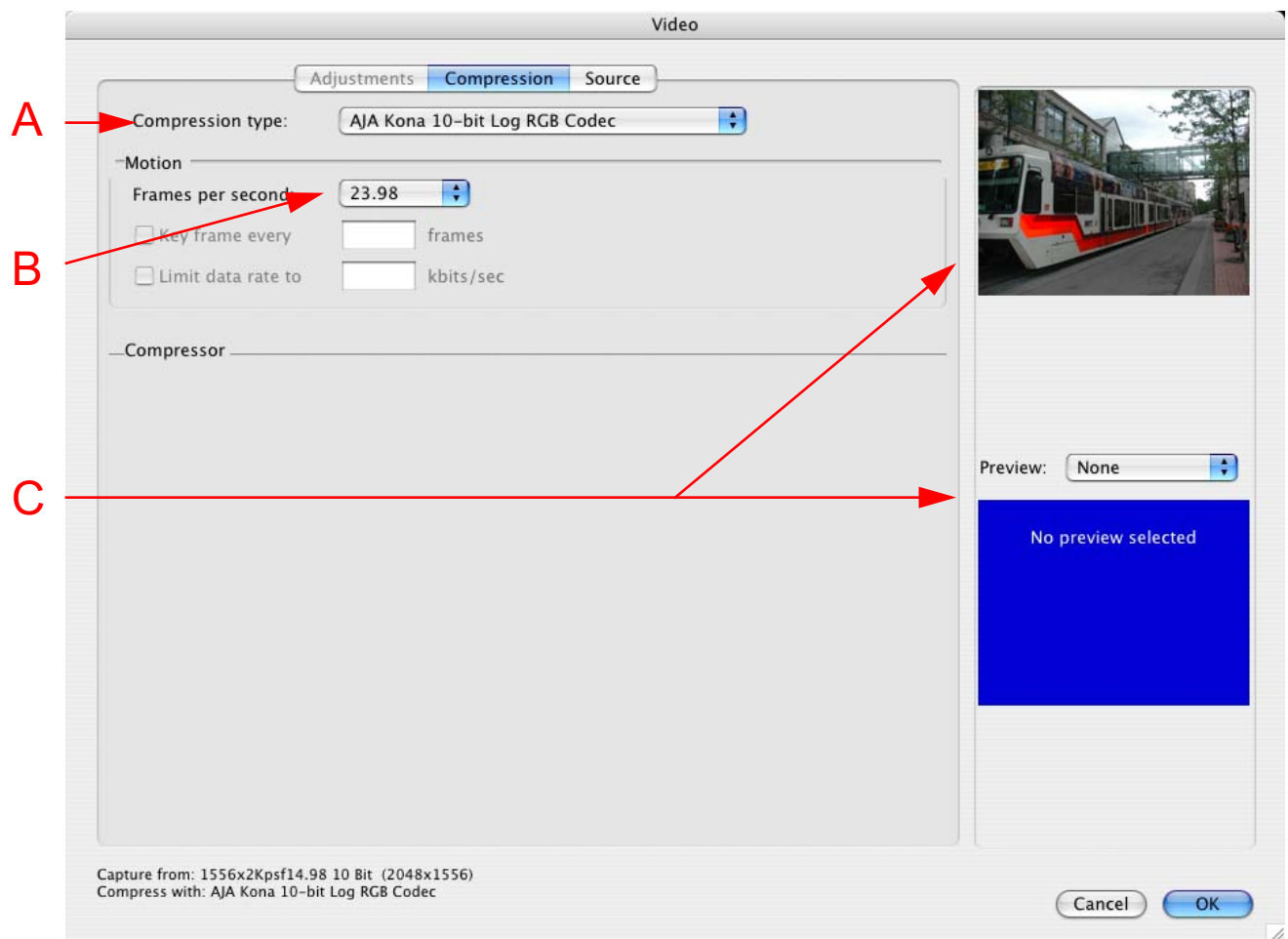
Capture Settings, Compression Tab

To configure capture settings, go to the top menu bar and under the *Capture* menu, select *Capture Settings*.

The first group of settings are the compression settings (*Capture Settings, A*). Codecs installed on the system can be selected from the *Compression Type* drop-down. The *Motion* settings (*Capture Settings, B*) set the frame rate of the capture in Frames per Second. *Best* will capture as close to the incoming source's frame rate as your system will allow. Other frame rates may be selected as appropriate to match the Compression Codec being used. The *Preview* pane (see *Capture Settings C*) has two small display windows. The top window displays the input signal of the KONA card.

The *Preview* selection box is used to verify the legality of the source video and has the following options:

- None (displays blue box, no preview)

- Compressed (displays real-time preview of KONA's input with currently selected compressor applied)

- Vectorscope

- Waveform

- Histogram

- RGB Parade

- RGB Histogram

Use the drop-down box on the *Source* page to set the format of the source video.
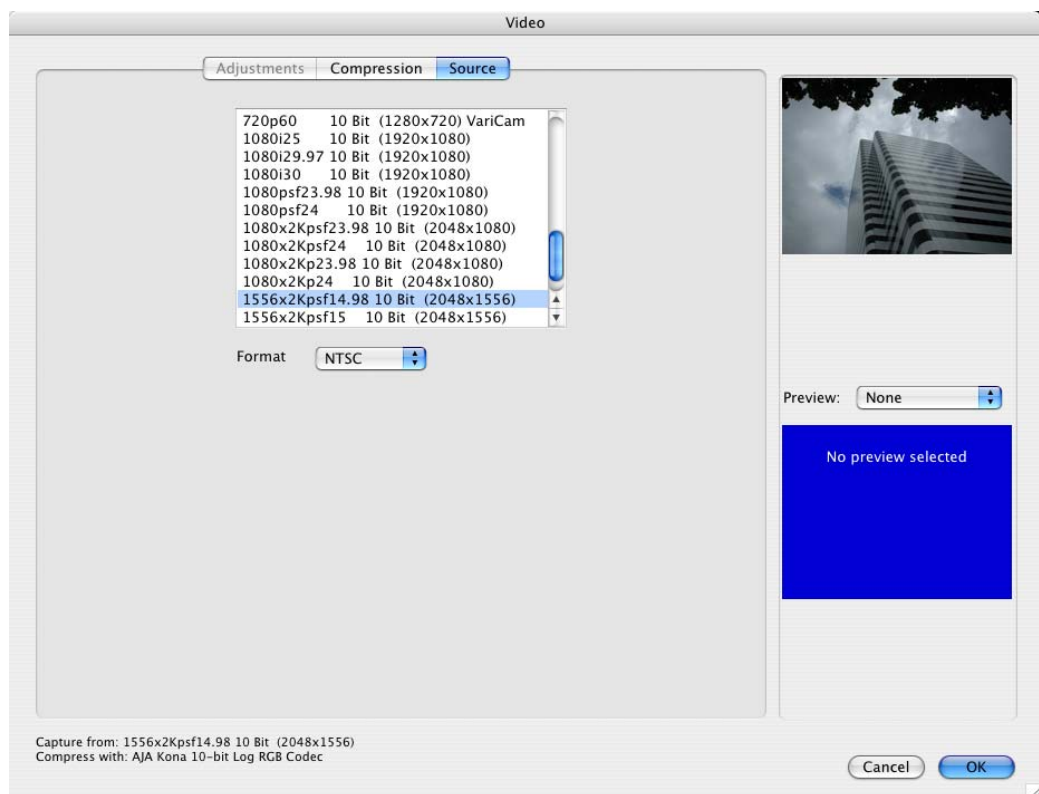
Capture Settings, Source Tab

Click *OK* after making any changes to your capture settings.
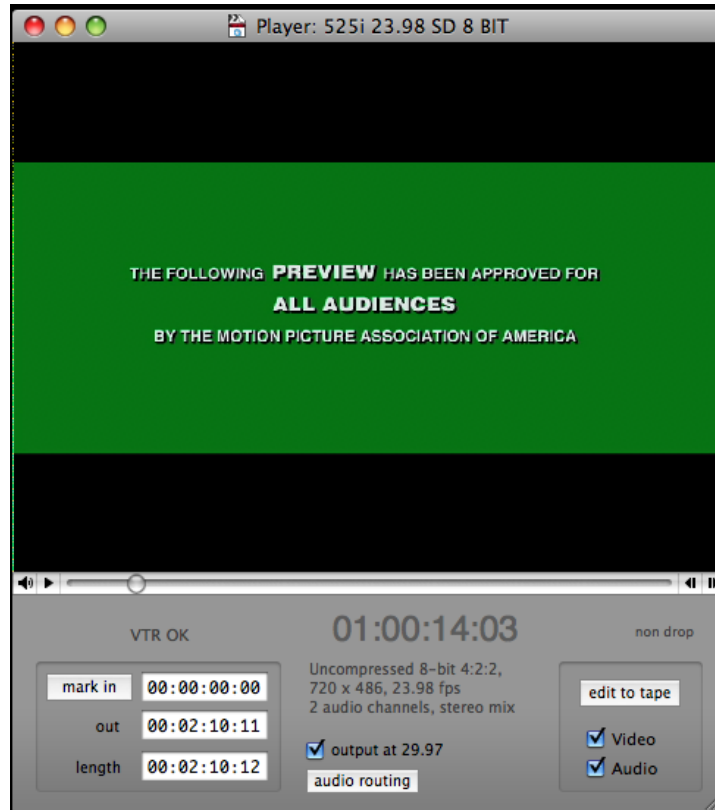
Clip Window

The *Clip* window gives information on the media that is captured, such as format. It also allows for marking an in-point for performing an edit to tape at a specific point, and selecting whether or not video or audio will be included when the edit is performed.
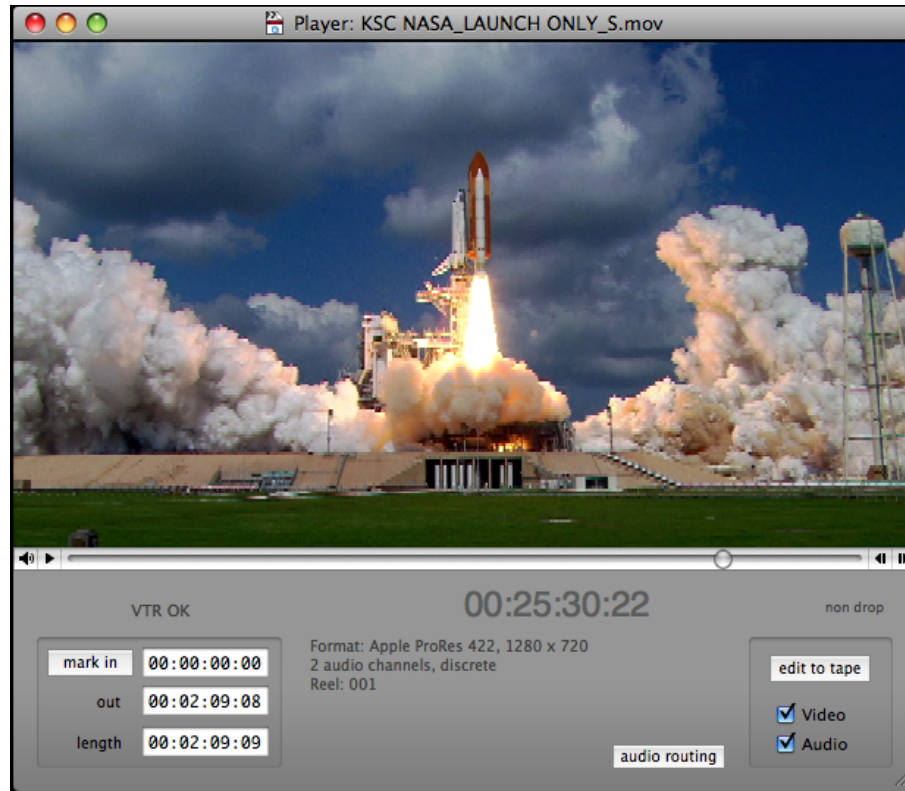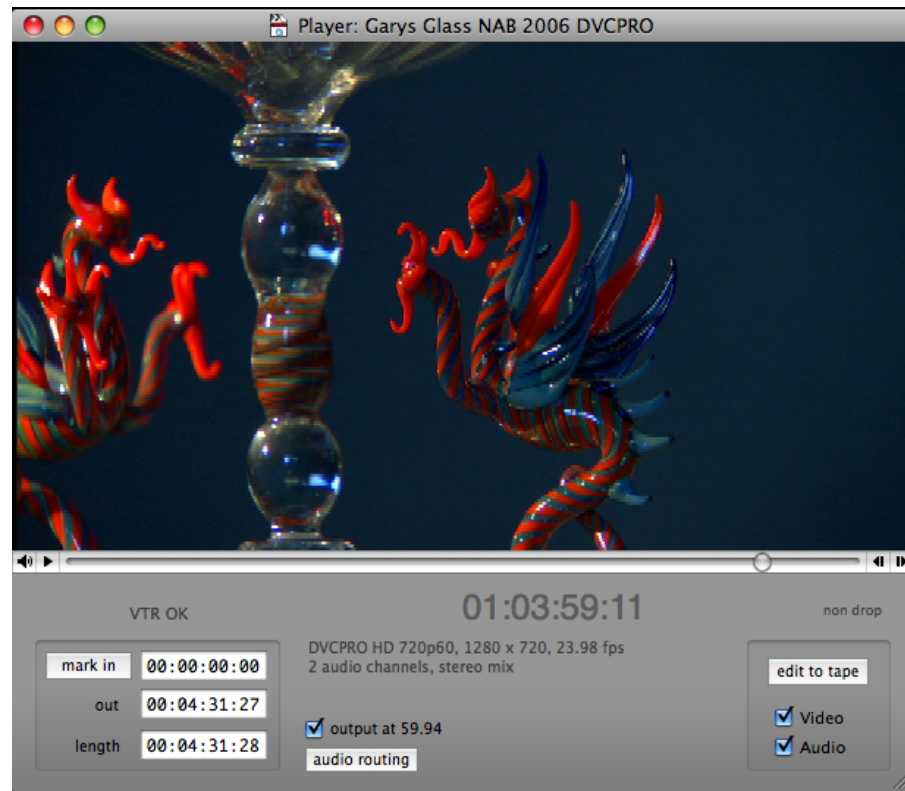

Clip Window

The Clip Window allows you to output compatible framerates by enabling a checkbox at the bottom of the window. In order to output 23.98fps material at either a compatible 29.97fps or 59.94fps (depending on format), enable the checkbox. Examples: A QuickTime movie is 720p 23.98fps, but a 720p 59.94 output is desired.

The next two screens show examples of this checkbox used to enable compatible playout.

*Clip Window checkbox used to enable 23.98 playout at 29.97*

Clip Window checkbox used to enable 23.98 playout at 59.94

Keyboard Shortcuts

The following shortcuts work while in the main capture window.

Key Pressed	Function
Spacebar	Starts and stops playback. When tape is moving, this stops tape.
i	Mark in
Shift + i (I)	Cue deck to in-point
o	Mark out
Shift + o (O)	Cue deck to out-point
right arrow	Step deck to next frame
left arrow	Step deck to previous frame
Shift + right arrow	Play

Key Pressed	Function
Shift + left arrow	Reverse play
J, K, L	Same as Final Cut Pro™: each press steps deck speed to the previous (J) or next (L) speed in this list: -35x, -5x, -2x, -1x, 1x, 2x, 5x, and 35x. Pressing the K key stops the deck. When pressing J while holding down K, deck steps back one frame; continuing to hold down J causes the deck to roll at half speed. The L key behaves similarly in the forward direction. Holding down K, while holding down J or L causes the deck to roll at half speed.

JKL keys also work in the player window with speed steps of 1x, 2x, or 4x. Holding down K and J or L plays the movie at 1/3 speed. Hitting J or L with K down steps ahead or back one frame at a time. |
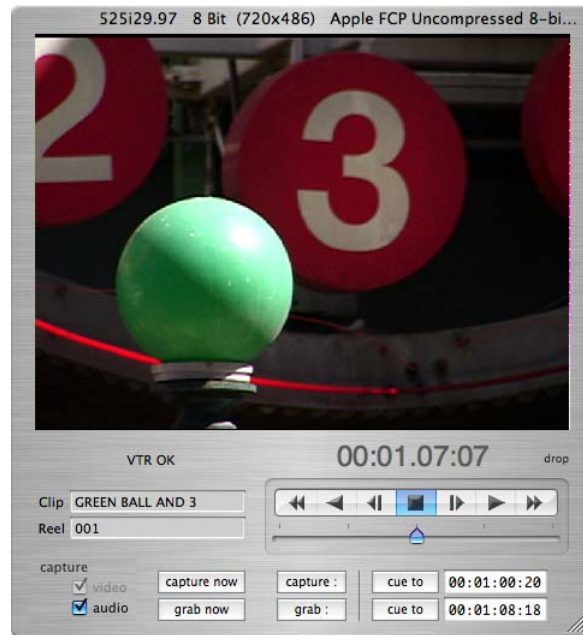
Example of cueing to a desired location in Main Window

Entering Timecode

This topic provides advice about entering timecode into VTR Xchange. You are not required to enter a timecode in strict HH:MM:SS:FF format. Acceptable formats and entry methods are listed below:

- Valid delimiter characters can be a space, period, colon, semicolon, comma or slash.

- Timecode entered can have multiple delimiters like Final Cut Pro. For example, entering "9.." gives 00:09:00:00 when you hit return.

- Leading zeros need not be typed: "1.2.3.4" becomes 01:02:03:04 when you hit return.

- You can type a large number for minutes, seconds, or frames: "200.0" is interpreted as 200 seconds and becomes 00:03:20:00 when you hit return (assuming 30 fps timecode).

- Hitting return while typing converts whatever you have typed into standard HH:MM:SS:FF format.

- Hitting the escape key while typing in timecode restores the previous timecode value.

- You can enter timecode without any delimiters at all—similar to Final Cut Pro. For example, if you enter 01221413, it will be interpreted as 01:22:14:13. This represents 1 hour, 22 minutes, 14 seconds, and 13 frames. When only a partial number is entered, VTR Xchange considers the rightmost pair of numbers frames and puts each successive pair of numbers to the left in the remaining seconds, minutes, and hours areas. Omitted numbers default to 00. For example, if you enter 1223, Final Cut Pro interprets it as 00:00:12:23. Note: when the rightmost pair of numbers is not a valid frame number, the entire number entered will be evaluated as absolute frames.

  Example: If your framerate is 25 fps and you enter 213, VTR Xchange interprets this as 02:13 (two seconds and 13 frames). However, if you enter 398, it will be interpreted as 398 frames. This happens because the frame counter cannot be higher than 24 when you use 25 fps timecode. A value of "03:98" is not a valid timecode number, so VTR Xchange interprets the value as absolute frames.

Batch Captures

Beginning with VTR Xchange version 4.0, the application offers support for opening FLEX files, ALE files and Final Cut Pro Batch Lists and then performing batch captures based on these lists. To open a batch list, simply go to the *File* pulldown menu and select *Open*. Select an appropriate FLEX file, ALE or Batch List. After opening the file, a new interface window will open.
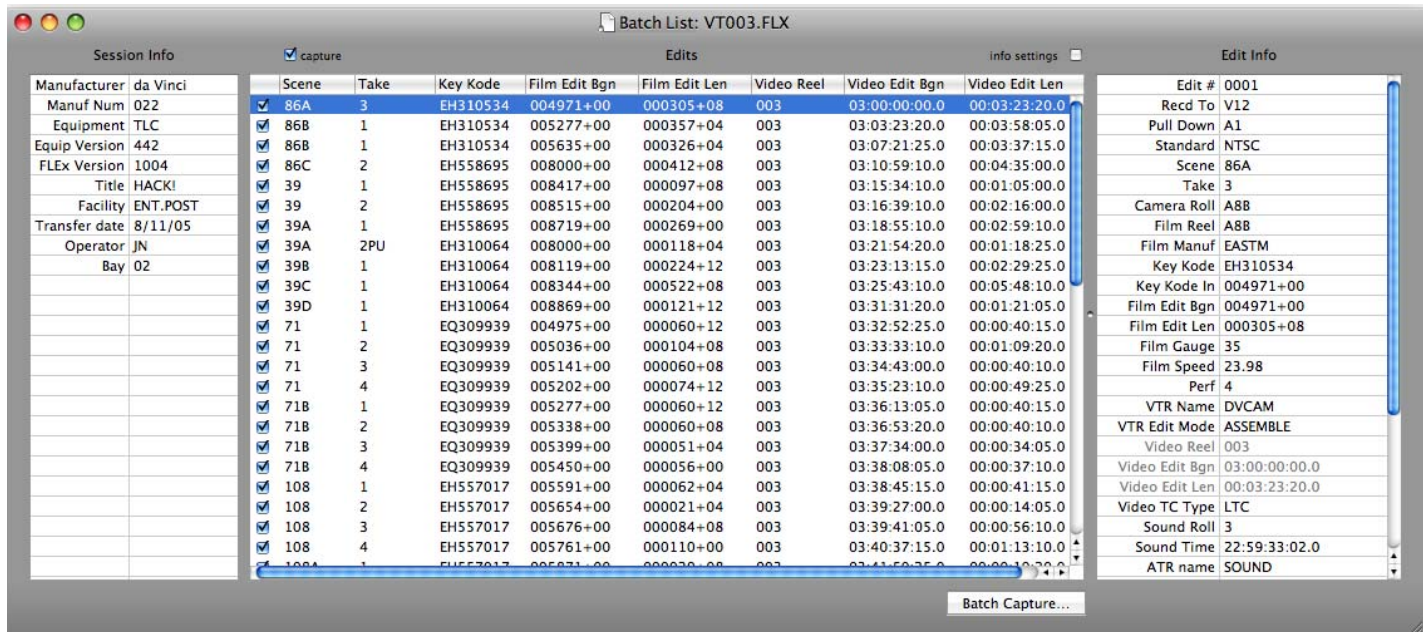
Batch List

This interface provides a large amount of information and also allows the user the option to only capture selected material from the list. This is accomplished by checking only the boxes on the left hand side of the list. Checked boxes represent clips that will be captured. You may use the *capture* checkbox at the top of the window to toggle all of the selections at once if so desired. After making the selections from the list, hit the *Batch Capture...* button.

After hitting the *Batch Capture...* button, a new UI window will open. The *Batch Capture List* window gives you information on only the clips you selected in the previous window. This information includes how many clips total are to be captured as well as the total duration for all of the clips. If you are satisfied with the list and wish to capture the listed items, simply click on the *Capture...* button. If you are not satisfied with the list and want to make changes, simply close the *Batch Capture List* window, amend your choices, and then hit the *Batch Capture...* button again. Remember that captured clips will be written to the location you selected in the VTR Xchange preferences for the *Captured Clips Folder*.

Batch Capture List Window

AppleScript and VTR Xchange

The *Capture Now* function in VTR Xchange can be triggered from an AppleScript. To use this feature, ensure that AJA VTR Xchange is running and that the *Video Settings* and *Audio Settings* (under the Capture menu) are properly configured as desired.

For example, the first sample applescript shown below begins a capture operation. This script performs the same process as manually clicking the *Capture Now* button in VTR Xchange.

Note: When creating such a script, always place an *activate* command before the *capture* command. This ensures that VTR Xchange is the front-most application when it receives the capture command.

Sample applescript to begin a capture operation:

```
tell application "AJA VTR Xchange"
    activate
    capture
end tell
```

You can also specify the name to be used for the captured clip as follows:

```
tell application "AJA VTR Xchange"
    activate
    capture to "snowball"
end tell
```

If a clip already exists with the name you specify, VTR Xchange will append a number to the name you specify. To end the capture, send a stop capture command:

```
tell application "AJA VTR Xchange"
    stop capture
end tell
```

Here is an example of a script that captures a 5 second clip:

```
tell application "AJA VTR Xchange"
    activate
    capture
    delay 5
    stop capture
end tell
```

Sample AppleScripts for Controlling VTR Xchange