videography

FOR VIDEO PROFESSIONALS IN THE PUBLIC SERVICE

Government★Video

PRODUCTION | AV SYSTEMS | EDUCATION | LAW ENFORCEMENT

VelocityHD is not intended for the occasional rough cut — it's a robust editing solution that offers editing of dual uncompressed HD streams in real time.

BY
WAYNE
COLE

Gaining
Velocity

Gaining

Velocity

Leitch offers serious system for editing HD

Leitch VelocityHD combines software with the Altitude digital video capture card to create a powerful digital HD and SD nonlinear editor available in turnkey or "boards-plus-software" packages through Leitch dealers. The base package ships with VelocityHD, Inscriber TitleMotion Pro, Sony Sound Forge Studio, Ulead DVD Workshop 2 SE, and eyeon DFXPlus effects software, plus the base Altitude board with a "medusa" breakout cable for digital audio and video I/O.

The turnkey review system consisted of an older IBM Intellistation Z-Pro with dual 2.8 GHz Pentium Xeon processors, 1 GB of RAM, a 32 GB internal system drive, and an internal 72 GB drive for audio and project data. Both of these drives were connected to the system's internal SCSI Ultra320 controller.

Video storage consisted of an external Huge Systems 1.2 TB striped set (four-way) attached to the Altitude's optional SCSI Ultra320 dual-channel controller card. User interface output appeared on dual IBM P96 19-inch CRT monitors driven by a dual-head nVidia Quadro4 980 XGL display card. Leitch also provided a Sony SDM-P234 23-inch LCD monitor for viewing HDTV output from the system.

The 3-D DVE daughter card option was installed. Leitch also included the BOB-7000 breakout box, which provided a nice complement of digital SD, HD, and audio I/O connections. The only analog connections available were one composite output and one stereo channel (dual RCA connectors) of unbalanced analog audio for down-converted program bus monitoring.

PRODUCT Review

Format And I/O Support

Using either the break-out cable or BOB-7000 breakout box, the Altitude hardware provides two switchable HD/SD SDI inputs that support embedded audio, two AES digital audio inputs, one LTC, and one VITC time code input. Output support is provided by two switchable HD/SD SDI connections, four AES outputs, one LTC out, one SD analog composite out, and an unbalanced stereo output for monitor purposes. The BOB-7000 adds a VGA connector that can pass-through a separate VGA signal connection direct from the Altitude for HD monitoring on less expensive LCD displays. It also supplies a USB to RS-422 pass-through connection for deck control.

Currently, VelocityHD supports 1080i at 60, 59.94, and 50 fps, 1080p at 24, 23.98, 24sF, and 23.98sF, 720p 60, 59.94, 24, and 23.98, and ITU-R BT-601 SD for both NTSC and PAL. The version 9.1 release also supports NTSC and PAL-friendly HDV 1080i and 720p input via an OHCI compliant FireWire port. (No FireWire output is supported.)

On input, you can select to capture to any of these formats in eight or 10-bit uncompressed, or compressed to a user-settable bit rate using the Leitch .LTA or .LTV format. The format, new for the Altitude hardware, continues the dps tradition of a multi-format virtual file system. That is, any .lta/.ltv media can be viewed and accessed as image sequence files in formats such as .bmp, .tga, .jpg, .dpx, etc. without the media actually being duplicated into all the various formats. The conversion happens (on the fly) through the virtual file system when the media is accessed using any of the "non-native" Leitch file extensions. This is a tremendous advantage when working with multiple tools that prefer to view media files in different default file formats.

The Capture tool itself is one of the most integrated, full-featured capture interfaces I've seen on any NLE. It supports capture, logging, and batch capture operations with a full set of deck transport controls, clip marking, naming and annotation controls, storage location, audio level meters, video input monitor, vectorscope access, and capture list controls.

Different formats can be mixed on a single timeline. However, only those clips that are in the current format to which you have set the Altitude hardware will play in real time. Other clips will play in preview mode (a lower frame rate, but close to time-correct playback). Clips that are not in the target output format (i.e., the format to which Altitude hardware is set for output) have to be rendered and will be converted between 4:3 and 16:9 as designated by complete, yet easy-to-understand cross-format rendering options.

The Print to Tape dialog is somewhat simpler than the capture tool. Instead of a full set of transport controls, it sports a jog/shuttle, tape in-point, and a tape Go To time code controls. The timeline output range can be set in the print-to-tape control or by timeline in/out-points. This means that, unlike a number of other NLEs, the timeline time code doesn't have to be identical to the time code of the tape location to which the timeline will be inserted or assembled. You can also select to send DVCPROHD to the SDI outputs, and to interpret deck time code as LTC or VITC.

User Interface

About the only feature of the VelocityHD interface that you can't reconfigure is its colors. The default window sizes and positions can be changed and saved as a user-defined "auto tile" layout, which could allow editors to define workspaces based on a particular phase of editing (audio, storyboarding, finishing, compositing, etc.).

Dual 19-inch monitors should be the minimum configuration for convenient operation of VelocityHD. Smaller monitors would make it difficult to have the basic three windows (clip gallery, timeline gallery, and trim window) open at once

and sized to take advantage of all the controls and status displays available in each window. My basic test layout also used the audio VU Meter window, which provided basic audio gain editing functions in addition to the meter display.

User preferences allow fairly liberal control of the look and operation of most windows. For example, VU Meter preferences allow you to set the width of the meter for each track, choose which tracks to monitor, perform SDI and AES channel grouping, and to configure the I/O bussing and patching. Clip gallery window defaults can be set to any of six different views, nine different sort orders, and three different thumbnail sizes. Any window's display options can be changed "on the fly" during an editing session. And, of course, all short-cut keyboard assignments are fully editable.

The clip gallery is a tabbed window where each tab represents a nameable collection of clips, sort of a "sub-gallery." The basic thumbnail gallery view consists of a grid with each square representing a "slot" that can hold a clip. Clips will load into the gallery in the next empty slot. There can be no empty slots between two clips, but clips in the gallery can be rearranged for easy storyboarding.

The "Trim Window" is what some other NLEs might call the source-record monitor window. VelocityHD's trim window can be operated as a traditional source-record window, or configured with two "source monitors" for viewing the in and out-point frames of a clip that's being trimmed. Other preferences allow you to tailor the controls that apply to moving trimmed clips to the timeline, as well as the appearance and operation of some the trim window's own tools.

Probably the coolest user interface feature has been incorporated into the timeline, and should be a part of all NLEs. The "eyecon" is a dynamic thumbnail that can appear by the track header for each track in a timeline. For video, an eyecon acts as a miniature real-time monitor that shows the frame of video on that track that is currently under the play head. For audio clips, a real-time presentation of the audio waveform in the neighborhood of the play head appears. The eyecon view "column" at the head of the media tracks can be expanded to make room for larger eyecon displays or more information like the clip's source time code, file name, title, or source tape name. Eyecons can be turned off when not needed. But when you want to precisely align a stack of clips in a composite or in preparation for multi-cam editing, eyecons prove to be a major productivity enhancement.

Editing Basics

VelocityHD is a "dual-track" or "A-x-B track" editor at heart. It's based on using separate tracks for the A-

The Trim Window set to show the in-point and out-point frames of the source clip. Note the source clip audio waveform display, a feature not found in many other NLE trim windows.

roll and B-roll, with a transition track between them. The overlap of media on the A and B tracks defines the location and extent of available A-to-B or B-to-A transition effects that can be placed on the x track.

More than two years ago, the Velocity developers added "collapsed" views for the timeline where, for example, clips could be placed adjacent to each other on the timeline, then in and out-points could be dragged to provide overlap for clip-to-clip transitions. This approach works just fine, but it takes some getting used to for former Avid, Premiere Pro, or Final Cut users.

The timeline can consist of multiple video tracks that stack like Photoshop layers. By default, the bottom-most layer is the "background" track, and shows through the transparent areas of the tracks above it.

When the Altitude's real-time playback capability of two tracks of HD video plus two dynamic graphic tracks or eight tracks of SD video plus eight static graphic tracks is exceeded, a "mix-down" render is required for playback. However, all tracks that contribute a layer to the mix remain visible and available for editing.

The Segment Render Status Bar at the top of the timeline provides color coding to inform you of the render status for each timeline segment. Double-clicking a colored render status bar segment invokes a dialog that provides the rendering options for that segment or informs you that no rendering is necessary.

Clips can be trimmed on the timeline or in the Source Monitor within the Trim Window. On the timeline, you trim by using a CTRL-drag on one of the clip's end points. A pop-up flag indicates whether the in-point or out-point will be relocated, and while dragging, another pop-up connected to the cursor shows the updated source time code and frame offset for the end-point's new position. Other trim operations like Trim to In-point, Trim to Out-point, Trim to Play head, and transition trimming are available in the timeline.

The trim window's source monitor can be set

to display as two monitors, one showing the clip's in-point frame and one showing the clip's out-point frame. The monitors update as the in or out-point markers on the clips video or audio tracks are moved. The media track display below the source monitor, with its scalable waveform display for audio, makes easy work of trimming a clip to an audio cue without having to place it on the timeline. And the audio can be "unlocked" from the video so the editor can set up J or L cuts right in the trim window.

Additional trim window controls aid in placing the trimmed clip on the timeline. Besides drag-and-drop, clips can be inserted, or overwritten to the timeline's in-point, back-timed from the timeline's output, fitted-to-fill, or appended with transition.

Virtually any editing mode or tool you can think of can be accessed via buttons that appear under the VelocityHD menu bar. These include slip, slide, link or unlink clips, extend, group extend, and a razor tool. It also sports a rich set of timeline clip grouping and sync maintenance tools. And, of course, there are hot-key equivalents for almost all the controls found in the trim window and main screen's button bar.

Titles, F/X, And Audio

VelocityHD provides three ways to build titles. The built-in Quick Titler supports the creation of basic stills, rolls, and crawls. However, I found Quick Titler to be finicky, unpredictable and, quite frankly, too frustrating to be of any use.

It relies on the Trim Window preview monitor or the program out monitor for display of the title, but would not display the first title I built in any given session until I saved the title, exited and restarted Quick Titler, and reloaded the saved title. Then, if I had to make any changes, the title could not be saved except as a new title. Often "version 2" of a title failed to show in the clip gallery after being created and had to be manually "collected" into the gallery.

The bundled Inscriber TitleMotion Pro can handle simple stills to reasonably complex animated titles. The bundled DFXPlus text and animation tools can handle virtually any titling need. The integration of these bundled applications provides much more reliable title creation editing and visibility in clip galleries than Quick Titler. Unless Leitch does some serious repair work on Quick Titler, new users will likely eschew its use in favor of Inscriber TitleMotion Pro.

There are quite a number of rendered transitions and F/X included in the VelocityHD software. With the addition of the hardware 3-D DVE option, several banks of real-time dissolves, wipes, warps, page turns, and other choices are added to the real-time set. All the built-in effects are customizable with full-featured, easy to use keyframe editors.

For really complex composites and transitions, the bundled eyeon DFXPlus provides a lot more possibilities on par with Adobe After Effects and AutoDesk Combustion. Simple but very clean motion effects (speed-up or slow-downs) can be applied to video and audio from a button on the main button bar.

Standard audio pan and gain envelopes can be keyframed for audio clips in the timeline by clicking on the volume or pan lines to create nodes. New values for nodes are set by dragging nodes to the desired level or value. Using the VUMeter sliders, it's possible to set volume envelopes during playback for single clips or sync locked clip groups.

There is also an audio F/X button on the main button bar that opens a selector for audio filters and effects that can be applied to selected clips on the timeline. These include decoders, encoders, and a number of DirectX effects from Sony Sound Forge like equalization, normalization, reverb, and time stretch, to name just a few. More complex audio work can be done in the bundled Sound Forge Studio, or by exporting OMF 2 files for audio editing in a Pro Tools workstation.

Test Performance

There are some minor issues with VelocityHD, as there will be with any complex tool. Editors com-

ing from a strictly "single-track" transition style NLE will likely feel a little frustrated by the "dual track" or "A-x-B" approach taken by VelocityHD. Mouse scroll-wheel support is also limited to the timeline window, although its action is user configurable. The fact that scroll-wheel operation does not follow Windows conventions could be a minor irritation for some users.

As for media I/O, at present, neither OMF nor AAF imports will bring contained essence into VelocityHD ready to edit. Import of QuickTime files is a little on the slow side. And the lack of DV, DVCAM, DVCPRO50, and DVCPROHD support via FireWire is a little disappointing. (Leitch has hinted that capture for other FireWire formats may be implemented in future versions of VelocityHD software.)

Potential buyers looking for an SD to HD transitional system should also budget for a good analog-to-digital SDI/AES converter — VelocityHD's Altitude hardware doesn't support analog I/O other than one downconverted composite video output with unbalanced stereo audio.

From a throughput standpoint, the system performed exactly as documented in Leitch's user documentation and advertising. Dual uncompressed HD streams played flawlessly in real time, as did four layers of SD video. Rendering, when required, appears to take a "ganged" approach.

For example, a four-layer HD composite appears to be rendered in three passes, compositing two tracks together each pass. The first pass composites the background layer with the next layer above, the next pass composites the first-pass composite with the third layer in the stack, and so on.

Segments that would need to be software rendered (such as a DFXplus effects stack) will be dependent on the CPU speed and RAM capacity.

In the productivity realm, VelocityHD's pros and cons result from the sheer richness of features and tools incorporated in the user interface. It's a complex editing application that will not be mastered overnight. Features oriented to the basics of selecting, trimming, and placing clips on the timeline are so numerous that even much of the iconography of the VelocityHD keyboard
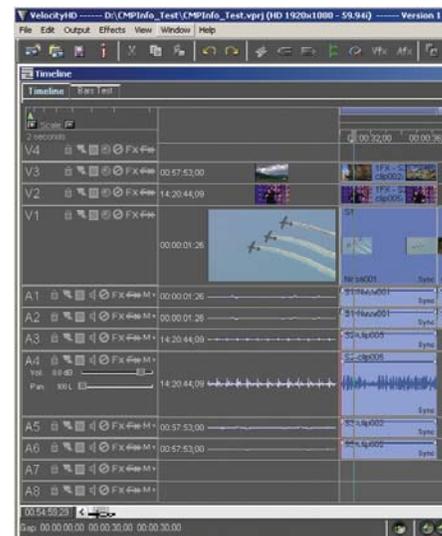
VelocityHD's innovative "eyecon" displays are a real productivity enhancement.

will take some time to fully grasp. Yet, in the hands of an experienced VelocityHD editor, all those tools could make for very efficient editing.

Boards-plus-software bundles list between $9,999 and $17,499, depending on which add-on daughter boards, break-out box, and software options are included in the package. Turnkey systems based on the HP xw8200 system with the 3-D DVE and dual-channel SCSI Ultra320 daughter cards plus the BOB-7000 breakout box will list for around $25,000 without monitors and video storage.

VelocityHD is an application for the full-time editor, not the occasional editor or producer/director who wants to do occasional rough cuts. With OMF and AAF import/export ability, however, VelocityHD can perform as an "online" system for projects that have already been "off-lined" in other systems. Integrated into a Leitch NEXIO media server environment, VelocityHD can support distributed editing operations.

Minor issues aside, VelocityHD, combined with the bundled eyeon DFXPlus compositing and F/X software, makes a first-rate finishing system for HD and SD.

Wayne M. Cole, CCV, CLVI, and member of the AGCV Board of Advisors, is also the owner of IHP, a video production company located Santa Barbara, CA. Contact him at wcole@cmpinformation.com.