Canon

XL H1
CONSOLE IMAGE CONTROL & STORAGE SOFTWARE

INTRODUCTION

The Canon CONSOLE software is the next generation of product developed by Canon in response to the practical needs of broadcasters in ENG, documentary and reality/episodic TV production and filmmakers. This software can be used with either the Canon XL H1 or the Canon XL2.

With this amazing software, you can control multiple functions of the camera remotely from your laptop. Whether you're changing camera settings like f-stop and white balance, capturing your footage directly onto your hard-drive, or monitoring a live video signal using the built-in Vectorscope and Waveform Monitor, the CONSOLE software puts all of the necessary professional functions at your fingertips.

CONSOLE is very simple and conveniently laid out in TWO basic environments: "Rec Panel" and "Play Panel". All the other windows are contained in one of these two environments. When capturing footage, the "Rec Panel" contains all the options you'll need to control camera functions and tweak the "look" of the image. When you are playing back footage, you'll be in the "Play Panel". It's that simple. These basic environments can be displayed or hidden by the first two buttons on the toolbar, or through pull-down menus at the top.

The four basic sections that comprise this overview of CONSOLE are as follows:
1. PULL-DOWN MENUS AT THE TOP OF THE SCREEN
2. EASY-ACCESS BUTTONS ALONG THE TOOLBAR
3. THE "REC PANEL" (THE "RECORDING" ENVIRONMENT)
4. THE "PLAY PANEL" (THE "PLAYBACK" ENVIRONMENT)

SECTION 1: PULL-DOWN MENUS

As in most programs, the pull-down menus at the top of the screen provide alternate methods of accessing the functions controlled by buttons on the Toolbar (which we'll discuss in the next section), with the notable exception of the "Work Space (W)" option, which is not duplicated on the Toolbar. This option can be found under "View (V)", and allows you to save a customized workspace, in case you'd like to re-arrange the windows on your desktop.

The screen-grab above shows the windows that open in the "Standard" default mode when you open the CONSOLE software for the first time.

Below is an example of our customized workspace for the "Rec Panel" environment. We've closed the "Play Panel" until it's needed. We've also dragged our "Custom Preset", "Camera Control", and "Focus Assist" windows to the far right, and have enlarged the "Rec Viewer" and the "Vector and Wave Monitor" windows.
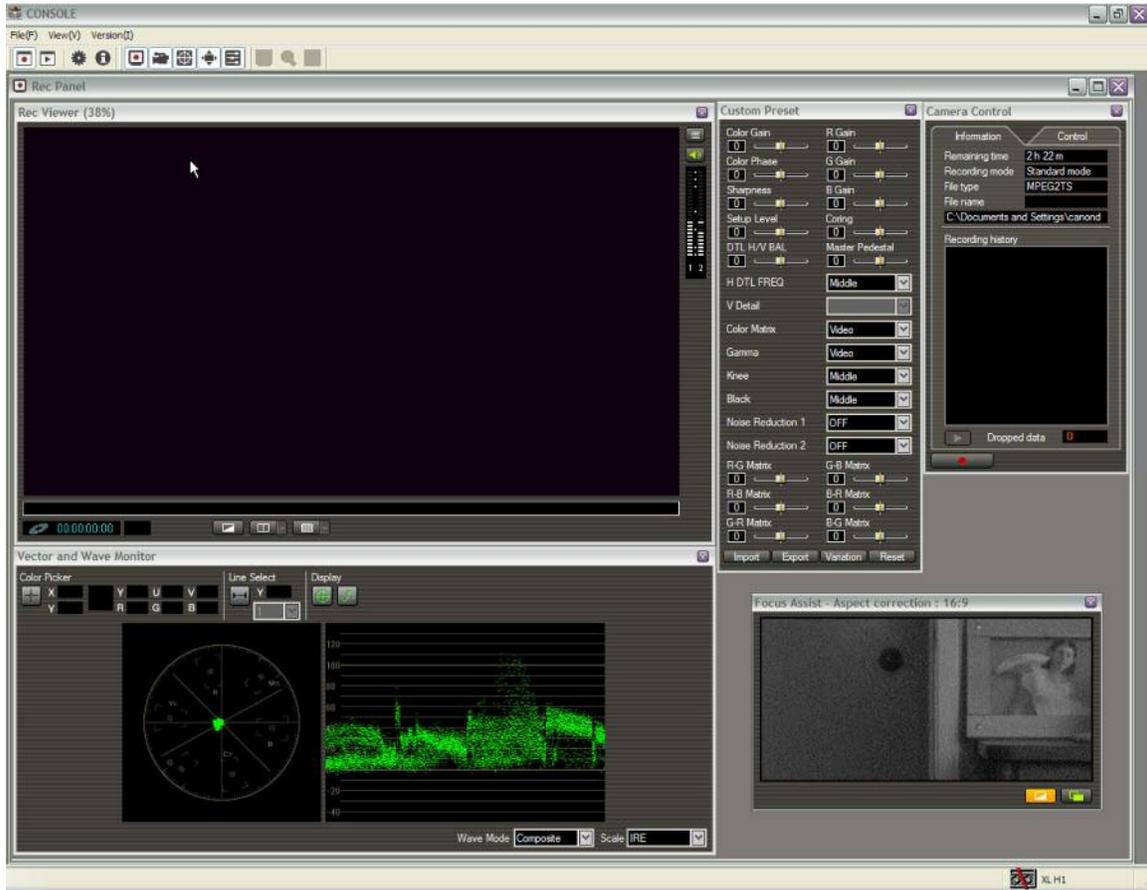
SECTION 2: TOOLBAR BUTTONS

While these buttons can be re-arranged, we will discuss them left to right as they initially appear using the program's default settings.

REC PANEL: Accesses the "record environment" as a whole. This is the environment you will be in when controlling the camera functions, manipulating the image, or capturing video onto the hard-drive. This function can also be controlled through one of the pull-down menus.

PLAY PANEL: Accesses the "playback environment" as a whole. These are the windows you'll need in order to playback footage captured to the hard-drive, or manage the storage of any video or photo files. This function can also be controlled through one of the pull-down menus.

OPTION SETTINGS: Accesses the following three pages of options.

1. GENERAL: Allows you to customize storage and name your files and folders. It also features a handy "cache time" option. With this feature, the hard-drive can capture up to 10 seconds of material BEFORE the "record button" is pressed. You can set the time-length of the cache, from "0 seconds" up to "10 seconds". This is a great option to use when recording live events, when you have no way of knowing when the action is going to begin. With this feature, you don't have to be hovering over the record button. As long as the camera's been pointed in the right direction for the given timeframe, you have up to 10 seconds AFTER the action has begun to push "record".

2. DV REC: Select your options for recording in STANDARD DEFINITION miniDV. Choose from three different file types, and three different recording modes.

   In the "Standard" mode, you will be creating a new file each time you press "stop" at the conclusion of a recording.

   In the "Sequence" mode, you can effectively edit in-camera by pressing "record" and "stop" any number of times within the same file. The software will not close this file until you hit the "file folder" button located next to the "record" button.

   In the "Frame" mode, you can literally grab a single frame from the camera over a selected interval of time (from 1 second up to 999 seconds). This is great for smooth time-lapse photography, or even for STOP-MOTION ANIMATION. Unlike time-interval recording on tape, which typically grabs a minimum of 15 frames, this

mode allows you to work one frame at a time. It is similar to the "Sequence" mode in that you can stop and start again an unlimited number of times within the same file. If you do want to shoot stop-motion animation, for example, you can select a longer interval, and then control the "stopping and starting" at your own pace. NOTE: This interval option is only found in STANDARD DEFINITION due to the manner in which the HDV signal is compressed.

3. HDV REC: Select your options for recording in HDV. These options only affect the HDV signal that is coming into your computer and will NOT affect material being recorded on the video cassette in the camera. They will also NOT affect the uncompressed HD signal (which can only be accessed from the HD-SDI terminal).

Select the file type and resolution of the image being recorded to your laptop.

The choices you make for "preview resolution" and "preview picture" will affect the files that you actually capture. If you want to capture the full motion range of the compressed HDV, "Preview picture" should be set for "All pictures".

The "I picture only" option will allow you to capture the "I Frames" of the signal (otherwise known as "Key Frames") without any of the intervening Predictive or Bi-directional frames that complete the illusion of seamless motion. In this "I picture only" mode, due to the manner in which HDV is compressed, you will only capture a new image every 15 frames.

PERFORMANCE CHECK: Whatever you choose within these "Option Settings" windows, you should run a "Performance check" using the button in the lower left corner of the window, to ensure that your hard-drive is capable of capturing video with no loss of information.

ABOUT CONSOLE: The "i" button will bring you to the standard legal page regarding the copyright information, software license agreement, product identification, plug-ins, etc. This page can also be accessed by one of the pulldown menus.

FIVE "RECORD MODE" BUTTONS: The next five buttons all open and close windows within the "Rec Panel" environment. Each button controls a different window, and each of these windows will be discussed in depth in the "REC PANEL" section of this article.
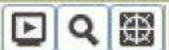
THREE "PLAY MODE" BUTTONS: The final three buttons all open and close windows within the "Play Panel" environment. Each button controls a different window, and each of these windows will be discussed in depth in the "PLAY PANEL" section of this article.

# SECTION 3: REC PANEL (THE RECORDING ENVIRONMENT)

The Rec Panel is comprised of 5 windows that allow you to have total control over all aspects of the image and camera functions. It is important to note that, unlike the "Option Settings" controls discussed in the "Toolbar" section of this article (which only affect the HDV image captured onto your computer's hard-drive), the controls offered within the "Rec Panel" actually affect the image WHEREVER THAT IMAGE IS BEING CAPTURED. In other words, the image will be affected whether it's going to an on-board tape in the HDV format or coming out uncompressed through the HD SDI Terminal. It is highly recommended that you have a master monitor connected to the camera in order to correctly view the results of the color, motion, and luminance choices you'll be making.

"REC VIEWER" WINDOW

VIDEO MONITOR: The video monitor window displays the "almost live" image coming from the camera. It is called "almost live" image because there may be a delay of up to two-and-a-half seconds. This is another good reason to have a studio monitor on hand, hooked directly to the camera. While the image in this window is delayed, the camera controls (which we will discuss later) are not.

COUNTER: This is a standard counter denoting hours, minutes, seconds, and frames. These numbers reset to zero at the beginning of each clip, and do not reflect the timecode of the camera.
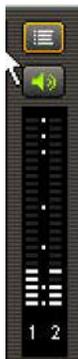
AUDIO METER AND CONTROLS: The Rec Viewer also contains the Audio Monitor, a Mute option, and an additional button that opens the Audio Monitor Settings (to control volume, channel selections and balance).

COLOR/MONOCHROME BUTTON: The first of the three buttons along the bottom of the Rec Viewer converts the image to a black and- white "monochrome" mode. This does not affect the image being recorded.

SPLIT BUTTON: The middle button along the bottom of the "Rec Viewer" window allows you to split-screen the live image coming from your camera with another video or still image that you have stored on your hard-drive or Memory card.

When using this feature in conjunction with the "Color Picker" (which is explained in the "Vector and Wave Monitor" section), you can numerically color-match your shots on-set, eliminating potential problems in the editing room. It will also come in handy if you need to re-shoot something that you may have shot a month or a year ago. While all your on-camera Custom Presets might be the same, this helpful feature will help you match your previous lighting.

Clicking on the "split" button will bring up a white split-screen line. The arrow to the right of the button will bring up the following options.
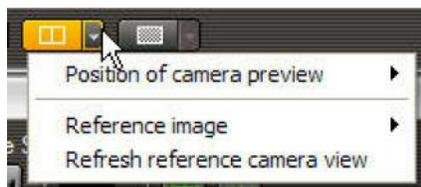
1. REFERENCE IMAGE: Allows you to call up a pre-existing image you're going to match, from one of three different sources.

   "Capture camera view" will allow you to freeze a "live" image from the camera on the reference side of the split-screen, with one easy click!

   "Play viewer" will allow you to call up a frame from a video clip that you have on file. Before activating this option, you must find the clip and select the exact frame you want by using the controls on the CONSOLE software's "Play viewer" (discussed in the "Play Panel" section of this article). Once the exact frame has been selected, you may activate this menu item so that the desired image will appear on the reference side of the split screen.

   "Still image file" will allow you to search for and call up a still image from your hard-drive or from an SD card.

2. POSITION OF CAMERA PREVIEW: Once you have loaded a reference image, you may find that there's one specific juxtaposition of the two images that might be more helpful than another, for the sake of comparison. For example, you may not want

your "live" image to be on the left side of the split-screen; it may be more useful on the right, or on the top. This option allows you to move the "live" image to wherever you'd like it.

3. REFRESH REFERENCE CAMERA VIEW: This option is only activated if you have selected the "Capture camera view" option within the "REFERENCE IMAGE" menu. It allows you to update the static frame that you're using on the reference side of your split-screen.

   NOTE: Once the desired reference image has been selected, you can simply click and drag the split-screen line from side to side (or up and down, if you've gone horizontal with it) to reveal different portions of the two frames. Also, if you click on the images themselves, you can grab and drag them around within their split-screens until the desired part of the frame is visible for comparison. For more information about how to use this split-screen feature, please see the "Color Picker" section, under "Vector and Wave Monitor".

ZEBRA BUTTON: The third button under the "Rec Viewer" turns on and off the "zebra" pattern. Once the zebra is turned "on", you can adjust your zebra levels (from 70% to 100%) by clicking the arrow to the right of the button. The zebra pattern indicates areas of the frame that may be approaching over-exposure. "100%" represents the level at which the video signal can no longer handle the over-exposure, and will contain no detail. Camera operators typically set the zebra pattern at some level below 100% to alert them to an overexposed area before detail is lost.

"CAMERA CONTROL" WINDOW

This window allows you to remotely control most of the functions of the camera, and is divided into two separate sections: "Information" and "Control".
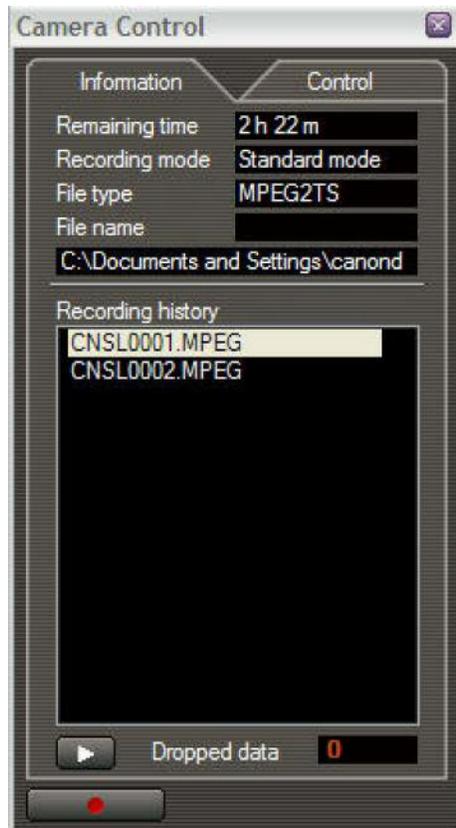
INFORMATION: Offers details about recording format and storage files. It also features a helpful "recording history" window, which lists all of the latest material committed to hard-drive. If you highlight a particular clip and press the play button at the bottom, the "Play Panel" viewer will automatically open, and the selected clip will begin. Next to this play button, there is a "Dropped Data" counter that keeps an eye on the integrity of your signal.

The "Record" button is located at the bottom of the "Information" window. If you are shooting in Standard Definition and have selected the "Sequence" or "Frame" modes within the "Option Settings" menus (see "Toolbar Buttons"), pressing this button during recording will only PAUSE the capture and will NOT immediately create a new file. You may start recording again within the same file. To finish (or "close") the clip, you must press the "File Folder" button located next to the record button. This "File" button is available only when you have activated the "Sequence" or "Frame" modes.

It is also important to note that the "Record" button will simultaneously start the camera recording to an on-board tape, if you have one loaded. This remote control is a great feature to have when your camera's up on a jib arm.

If you've activated your "Cache Time" feature in the "Option Settings" menus (see "Toolbar Buttons"), pressing "Record" will lay down extra information onto the head of your clip—on your hard drive—for whatever length of time you've programmed (up to 10 seconds). Of course, this extra cache footage will not be recorded onto tape.

CONTROL: Complete control over the key camera functions is now at your fingertips. The dials are most easily manipulated by clicking once on the desired selection, NOT by trying to drag the dial around.

1. AE SHIFT and EXPOSURE LOCK: These options are active when you're in any camera mode other than "Manual" (which is accessed through the "Option" button, discussed below).

   "AE Shift" allows you to adjust the way the camera is metering a scene. For example, if you're in the "Auto" mode, but want a scene to be generally darker and more moody than the camera is making it, dial the "AE Shift" into the negative numbers.

"Exposure Lock" can be used if you're in any mode other than "Manual", but still want to maintain a specific exposure. This is useful, for example, if you're in a relatively dim room with a bright window. If you don't want the exposure to radically change as you pan across the window, kick in this Exposure Lock feature. Once this button is activated, you can further adjust your exposure by dialing up or down the "Iris" control, even if you're not in "Manual" mode.

2. WHITE BALANCE: Offers the standard "White Balance" options, including 2 separate programmable pre-sets. Also replicates the fantastic "Degrees Kelvin" feature of the XL H1. If you select this "K" option, you can actually dial-in the specific value (in degrees Kelvin) of your white balance, from 2800 to 12,000. This is a crucial tool if, for example, you want a sunset scene to have a nice warm quality to it. If you simply white balance the scene, then the light you're shooting in will become white, and you'll be taking out all the dusky quality that you want to keep. In the past, camera operators would have to "fool" the camera by white balancing through a colored gel, or against a blue card. Now, you can dial whatever amount of warmth or coolness you want.

3. GAIN: Exactly re-creates the on-board camera controls, and allows you to electronically enhance your camera's ability to see in low light. Of course, the higher the "Gain" number, the more noise and "graininess" you're going to add into the mix. The Gain function on the XL H1 is particularly good, and you can usually go up to about 6dB of Gain without adding too much noise. If you need to go higher, or just need to get rid of some of the extra graininess, then "Noise Reduction 1" (in the "Custom Preset" window) is an excellent solution.

4. IRIS and SHUTTER: These are the standard, familiar camera controls. "Iris" will only be accessible if you're in the "Av" or "Manual" camera modes, or if you're in any mode with the "Exposure Lock" activated. The "Shutter Control" will allow you to access the "Clear Scan" option, as it does on-board the camera, but you will not be able to get to the on-camera menu in order to adjust the frequency. You will be limited to the default value (60.1 Hz), or a value that you have preset before hooking up to CONSOLE.

5. ZOOM and FOCUS: There are two ways to use these "wheels". For fluid, continuous movement, you can grab the centerline and drag the wheel in either direction. For fine-tuning, you can click either side of the centerline. The closer you click to the line, the more subtle the adjustment will be.

6. OPTION: This button will open up a window labeled "Option Settings" that is NOT the same as the "Option Settings" window you'll find on the Toolbar. Within this window, you can select the camera mode (labeled "AE mode"), change the aspect ratio (if you're in STANDARD DEFINITION), frame rate, and zoom and focus speeds. You can also activate the color bars, which are essential when setting up your well-calibrated studio monitor. When the color bars are "on", you can also choose to generate a reference audio tone, and select the desired level of the tone (-12dB or −20dB).

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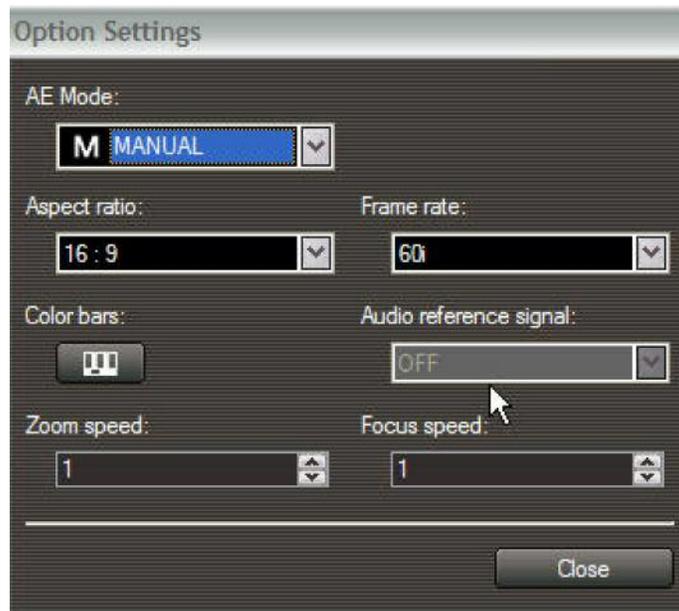
"VECTOR AND WAVE MONITOR" WINDOW

This window is one of the major reasons why the CONSOLE software is so great for professional shooters. The Vectorscope and Waveform Monitor are two tools that no video shoot should be without.
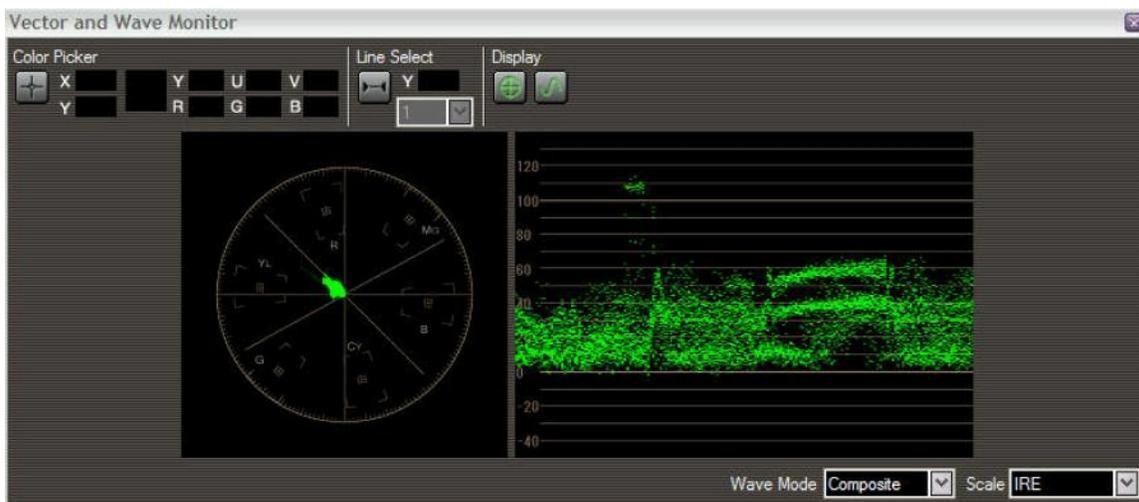

VECTORSCOPE: This is a circular oscilloscope that measures color saturation and hue. Basically, the farther from center the measurement, the more saturated the color. If you were to pull the "color gain" on your camera's Custom Preset all the way down to −9, for example, you would see the Vectrascope measurement become nothing more than a green dot in the dead center. This indicates the total absence (or desaturation) of color.

The scope itself is divided into six sections, for the primary colors (Red, Green, Blue) and their compliments (Yellow, Cyan, Magenta). The small boxes in each of these subdivisions indicate where the fully saturated colors would fall. To see a graphic demonstration of this, you can activate the color bars (see the "Option" button on the "Camera Control" window). The dots representing each of the colors will fall cleanly into their respective boxes.

In general, the Vectorscope is essential when making bold color choices, to double-check that you are not "over-saturating" any particular color. It's also extremely effective when trying to dial-in a certain color style. Since you can actually see the measurements shift around the "wheel" as you work, and since you can also see the clear graphic relationship between one color and another, you can therefore strategically plan which color gains and matrices you want to manipulate on your camera's Custom Presets in order to achieve the desired result.

WAVEFORM MONITOR: This is an oscilloscope that technically measures the voltage of the signal, but for practical purposes we can say that it measures the luminance (or "brightness levels") of the image.
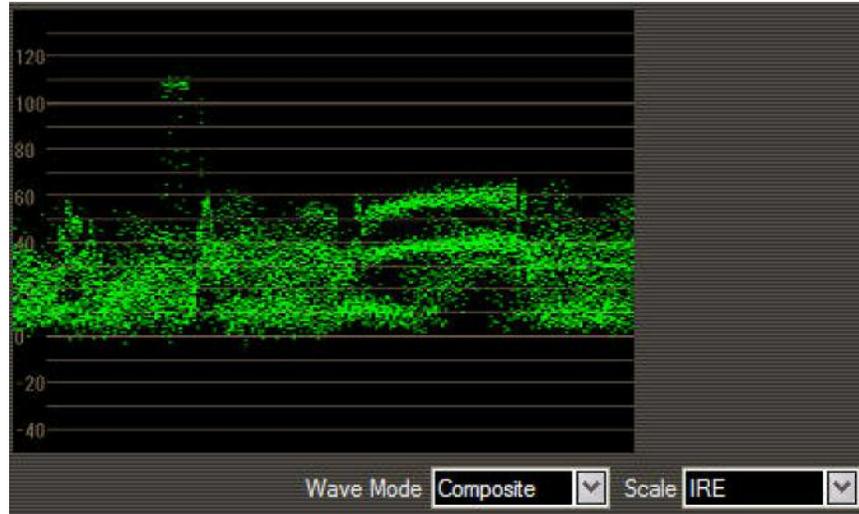
Basically, the "100%" line on the scale is the point at which a portion of the image becomes so "bright" that it no longer contains any detail. It's best, therefore, to try to keep whites at the 100% level or below. Similarly, the low end of the scale deals with shadow detail and black levels. According to NTSC standards, to be considered "broadcast safe", the white areas should not be above 100%, and the black areas should not drop below 7.5% on the scale. When you look at this Waveform Monitor, it can be difficult to tell where 7.5% is, so you should generally make sure that your black levels aren't crushed down too hard against the "0%" line.

Accepted shooting styles and aesthetics have been changing radically over the years, spurred on by advancements in digital video formats and the success of reality TV shows, so you shouldn't feel that either end of the scale is an "absolute". Some "blown out" areas of the frame that measure over 100% are oftentimes desired. The same holds true for crushed black levels, if that's the style you're going for. Use the Waveform Monitor as a guide, and be educated about the choices you're making. Be aware that if you have portions of the frame that are over 100% or crushed down below 0%, no amount of manipulation in post-production is going to get any detail back in those particular areas. You can, however, make adjustments in post that will bring an overly bright signal (over 100%) back to being "broadcast safe", but you will not be able to retrieve any lost picture information.

The "Wave Mode" control beneath the oscilloscope offers four different options for measurement. "Composite" is the most common, since it combines the separate attributes of luminance (Y), chrominance (U), and phase (V). Just to be clear, however, this scope is NOT actually measuring color saturation. That's the duty of the Vectrascope. The Waveform

Monitor deals only with attributes of color that factor into the overall luminance of the image. If you select "RGB", the monitor will divide into three sections, separately mapping the luminance of each of the three primary color signals.

The "Scale" control toggles between "IRE", "Voltage 1", and "Voltage 2". These are merely different scales by which you can measure the same information. "IRE" is the most common scale we've discussed (from 0% to 100%) and was developed by the "Institute of Radio Engineers" (hence the name "IRE").

COLOR PICKER: The "Color Picker" is a great asset to any production. This amazing tool will allow you to match the color values of a live image with an existing video frame or still photo using the "Split" function of the "Rec Viewer". In essence, you can color correct your images as you shoot, saving potential problems and time in the editing room!

Simply click on this icon and a crosshair will appear on your image in the "Rec View". The X and Y values indicate the specific location of the crosshair, based on 1440 horizontal pixels (the X value) and 1080 vertical pixels (the Y value).

To the right of the X and Y boxes, there is a small color swatch which displays the color of the pixel selected by the crosshair. This color is then defined by a series of numerical values representing YUV (luminance, chrominance, phase) and RGB (red, green, blue). Below is an example of what the "Color Picker" and numeric values may look like when sampling a light brown part of a wall.

To use this feature, drag the crosshair onto a specific pixel within the reference image, log all of the numerical values assigned to that particular color, and then drag the crosshair to the similar area of the live image and take a look at how the color numbers compare. By manipulating your lighting (using colored gels, dimmers, etc.) or your on-camera Custom Preset controls, you can tweak your live image until it better matches the reference image.

LINE SELECT: When activated, this feature will limit the area of the image that is being measured by the Vectorscope and Waveform Monitor, so that you can more selectively read what a particular portion of your image is doing. Maybe you need to see where that bright sky is falling on the Waveform Monitor, independent of the hot "dings" of light reflecting off car windows. Activate "Line Select", click on the line, and drag it up and down within the image until you've selected the desired portion. The Y value will indicate the line's location, showing a vertical pixel number from 0 to 1079. In the box beneath the Y value, you can select how wide your line is, measured in pixels. A value of 10 will select an area within your image that is 10 pixels high and the full 1440 pixels across.

DISPLAY: Simply displays or hides the two scopes.

"FOCUS ASSIST" WINDOW
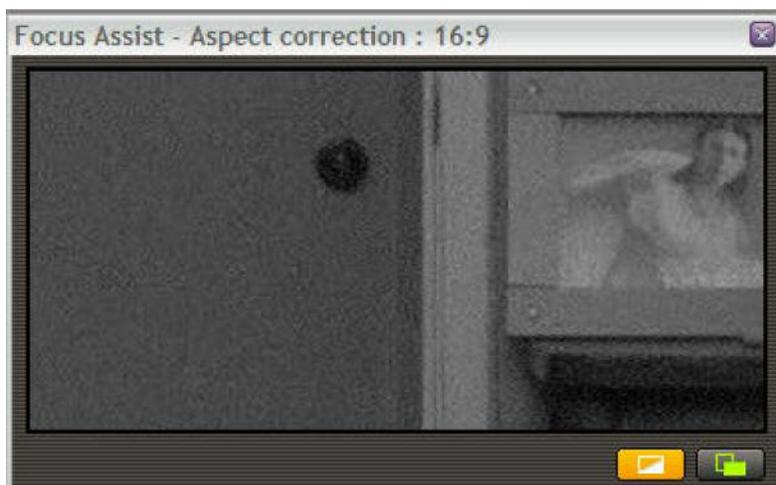
This window electronically "zooms in" to the center of the image, to help with eye-focus. From there, you can "grab and drag" the image within the viewer until you've found a more desirable part of the frame. The two buttons at the bottom of the window allow you to switch the mini-viewer to a black-and-white "monochrome" mode (which oftentimes helps when focusing), and an uncorrected "squeezed" mode, which will bring more details into the frame.

"CUSTOM PRESET" WINDOW

This window gives you total image control, made even more effective when used with the "Vector and Wave Monitor" window. All of the image variables that you can manipulate within the camera (using the on-board "Custom Preset" menus) are recreated here, laid out in a user-friendly manner that is much more conducive to experimentation.

You should definitely have a well-calibrated studio monitor hooked up to the camera when adjusting any of these parameters, and should not make final decisions based solely upon the image in the CONSOLE's "Rec Viewer".

COLOR GAIN: Affects the saturation of the colors. A value of −9 will make the image monochromatic.

R GAIN, G GAIN, B GAIN: Separate controls adjust the individual saturations of the three primary color components of the video signal.

COLOR PHASE: Similar to the "hue" control on your television set; negative numbers shift the image toward green, positive numbers shift the image toward magenta.

SHARPNESS: Increases or decreases the overall sharpness. A little less sharpness might be a bit more flattering for your actors, or look a little more "film-like", or even help hide the presence of grain in a situation where you may have had to turn on the "Gain" function. A little more sharpness, on the other hand, may be required to make those spectacular nature shots leap off the screen.

DTL H/V BAL and H DTL FREQ: These controls can help adjust image noise that may occur if you have a lot of strong vertical or horizontal lines in the frame. (NOTE: "V DETAIL" is an option compatible only with the XL2 camera, and is that camera's equivalent of these two "detail" controls)

CORING: Can be helpful in dialing out image noise that may be present in densely detailed objects. Can specifically help reduce some of the "stairstepping" that can occur along diagonal lines.

SETUP LEVEL: Basically raises and lowers the Gamma Curve while maintaining the same "shape". You can see it take effect on the Waveform Monitor. A lower setup level can help the image look a little more "rich", as long as you're not in danger of crushing the shadow detail into the 0% line of the Waveform Monitor. Higher setup levels will bring more detail into the shadows, but may also "wash out" the image. Be careful not to shift the curve so far that you cannot deliver a product that is considered "broadcast safe" under NTSC guidelines.

MASTER PEDESTAL: Raises and lowers only the bottom portion of the Gamma Curve, thus changing the actual shape of the curve. Like the Setup Level, lowering the Master Pedestal can give a little more richness to the overall image, while raising it will allow more detail in the shadows. Unlike the Setup Level, manipulation of the Master Pedestal will not affect the brighter objects in the frame (the upper portion of the Gamma Curve).

This option is helpful when used (carefully) in tandem with the Setup Level. For example, you can adjust the shape of the Gamma Curve (and how much latitude your image is capturing) with the Master Pedestal, and then use the Setup Level to move that newly shaped curve "up or down".

COLOR MATRIX: Affects the overall "look" by altering how the camera is interpreting the relationship between colors. Select a traditional "video" look (in which the colors tend to "pop" a little more) or one of two "cinematic" settings (which tend to offer additional nuances within their color palettes).

GAMMA: Selects the shape of the Gamma Curve, which determines the luminance range of your image. Every film stock and every video format has its own unique Gamma Curve. Simply put, it's a graphic representation of how the capture medium will handle the light.

You can clearly see the differences between the three Gamma Curve options by watching the Waveform Monitor as you select them. The Wave Monitor's depiction of the Cinema Gamma Curves appears to be more "squashed" than the relatively "wider" representation of the Video Curve. This means that, with the Cinema curves, more picture information is actually being captured between the 0% black level and the 100% overexposure level. Thus, they offer wider latitude than the Video Curve, and will feature more information in the highlights and shadow areas. In practical terms, this makes the Cinema Curves appear "richer" and more film-like.

The "Cinema 2" curve was specifically designed with an eventual film output in mind. Its particular latitude should provide the most faithful translation to celluloid, though it makes for a "darker" image on video. In general, if your image is going to remain in the digital realm but you want the richer look of film, the "Cinema 1" curve is probably the best choice.

KNEE: Raises or lowers the top of the Gamma Curve (otherwise known as the "knee"), giving you either greater or less detail in the highlights. For example, the "low" setting will bring down the top "roll off" portion of the Gamma Curve, lowering those overexposed details that have IRE values just over 100% (on the Wave Monitor) back into range. The "high" setting may push more details over the 100% overexposure level.

BLACK: Raises or lowers the bottom portion of the Gamma Curve (otherwise known as the "toe"), giving you either greater or less detail in the shadow areas. For example, the "stretch" setting will bring up the lower "roll off" portion of the Gamma Curve, raising those underexposed details that have IRE values just under 7.5% (on the Wave Monitor) back into range. The "press" setting may push more details below the 7.5% underexposure level.

NOISE REDUCTION 1: This is a highly effective function of the XL H1's new generation of Digic DV II DSP, and is a much more useful tool than previous generations of noise reduction. It's a great way, for example, of eliminating the kind of noisy grain that occurs if you activate the camera's "Gain" controls. The "low" setting will dial out a good deal of graininess without adding any unwanted artifacts to the image. The "high" setting, however, should be used with care on moving images, because it can add a trailing after-image.

NOISE REDUCTION 2: This option was primarily designed to dial out the kind of noise you might find in "flat" colors or surfaces, such as a solid blue sky. It should be used in very specific circumstances, however, as it can tend to soften the whole image. Even the "high" setting of this option will not add a trailing after-image.

COLOR MATRICES (R-G, R-B, G-R, G-B, B-R, B-G): These controls allow you to fine-tune the color of your image on a level previously attainable only with high-end professional gear. With the convenient layout of these controls, along with CONSOLE's built-in scopes and a good studio monitor hooked up to the camera, it's fast and easy to experiment. You can very rapidly start to see what each color matrix is doing, and zero in on just the right look for your project.

IMPORT: Allows you to import a Custom Preset from the camera, a card, or your hard-drive.

EXPORT: Allows you to export the current Custom Preset on the CONSOLE screen. If you choose to send it to one of the camera's six on-board slots, it will ask you to name the Custom Preset you're saving, and then ask if you're sure you want to overwrite the existing preset on the camera. You can also save the preset onto a card or your hard-drive.

VARIATION: This option allows you to see side-by-side mini-previews of what the different Custom Preset controls can do. To accomplish this, the camera takes a series of freeze frames from your live camera image, and applies the different "looks" to those static images.
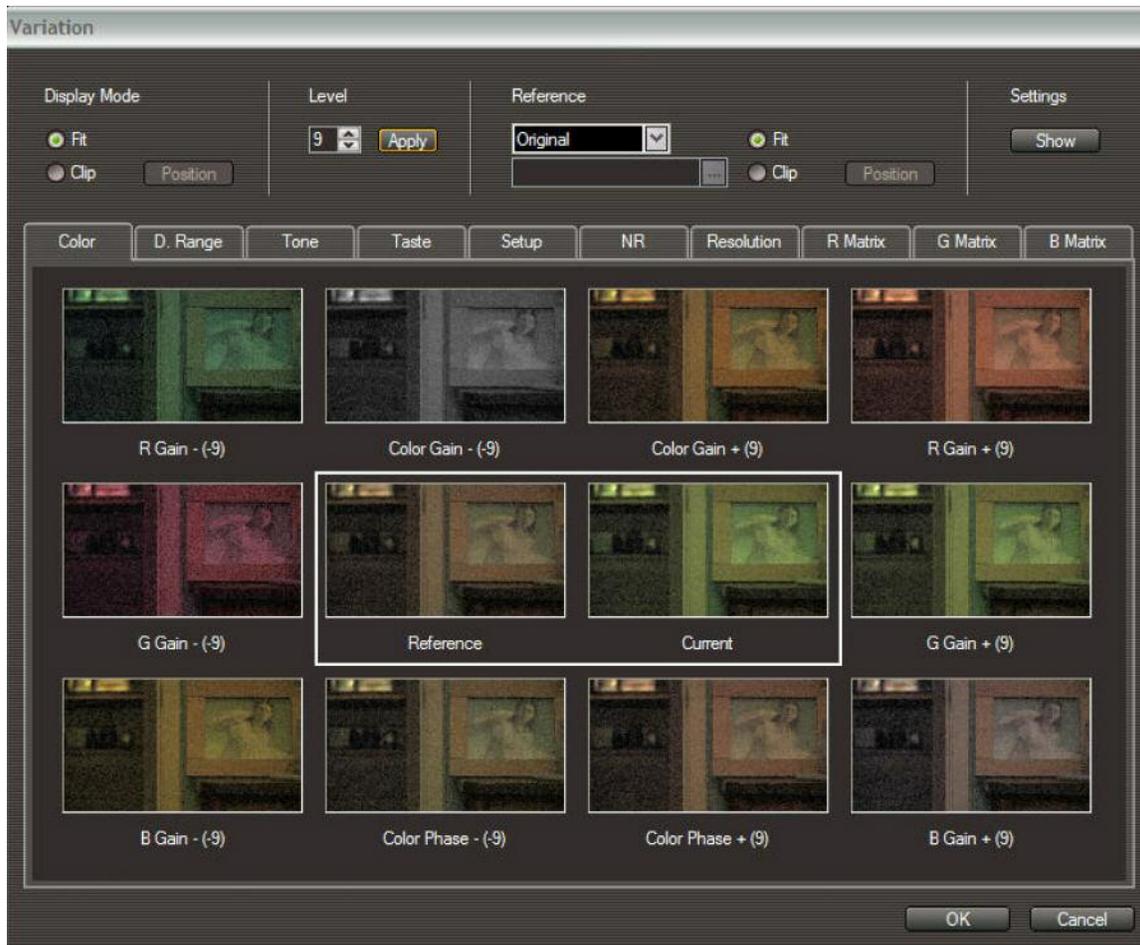

Here are the options offered in the "Variation" window:
1. DISPLAY MODE: "Fit" mode will display the entire image, while "clip" mode will zoom into a small portion of the image. In "clip" mode, you can hit the "position" button, and choose which zoomed-in area you wish to view.

2. LEVEL: This adjusts how much or how little of an effect the preview windows will apply to the tiny freeze-frames, for any of the Custom Preset controls that allow 9 levels of intensity. For example, if you want to see a preview of a radical color change, then you should set this "Level" number to 9. The preview windows will then display R Gain, B Gain, G Gain, etc. at both +9 and -9. (On these tiny preview windows, going "bold" like this is often the only way to see any difference at all.)

3. REFERENCE: Allows you to determine which image you're using as your "control" (or "reference") image. As you experiment with the different variations, this will be the image that does not change. The default reference image is whatever "freeze frame" your camera captured at the moment you turned on the "Variation" feature. You may also choose the "Image File" option, and call up a pre-existing still image from your hard-drive. Again, you can use the "fit" and "clip" features to display the whole frame, or zoom into a small portion.

4. SETTINGS: This button will display your current Custom Preset, and will highlight whichever specific settings you're working with at the moment.

5. TABS: COLOR, D. RANGE, TONE, TASTE, ETC... Select whichever category contains the parameters you want to preview. The headings are self-explanatory except for "taste", which brings up previews of the "Sharpness" and "Coring" options.

RESET: Simply resets the current Custom Preset to the default settings. Don't worry if you hit it by accident; it will ask you if you're sure you want to do it.

# SECTION 4: PLAY PANEL (THE PLAYBACK ENVIRONMENT)
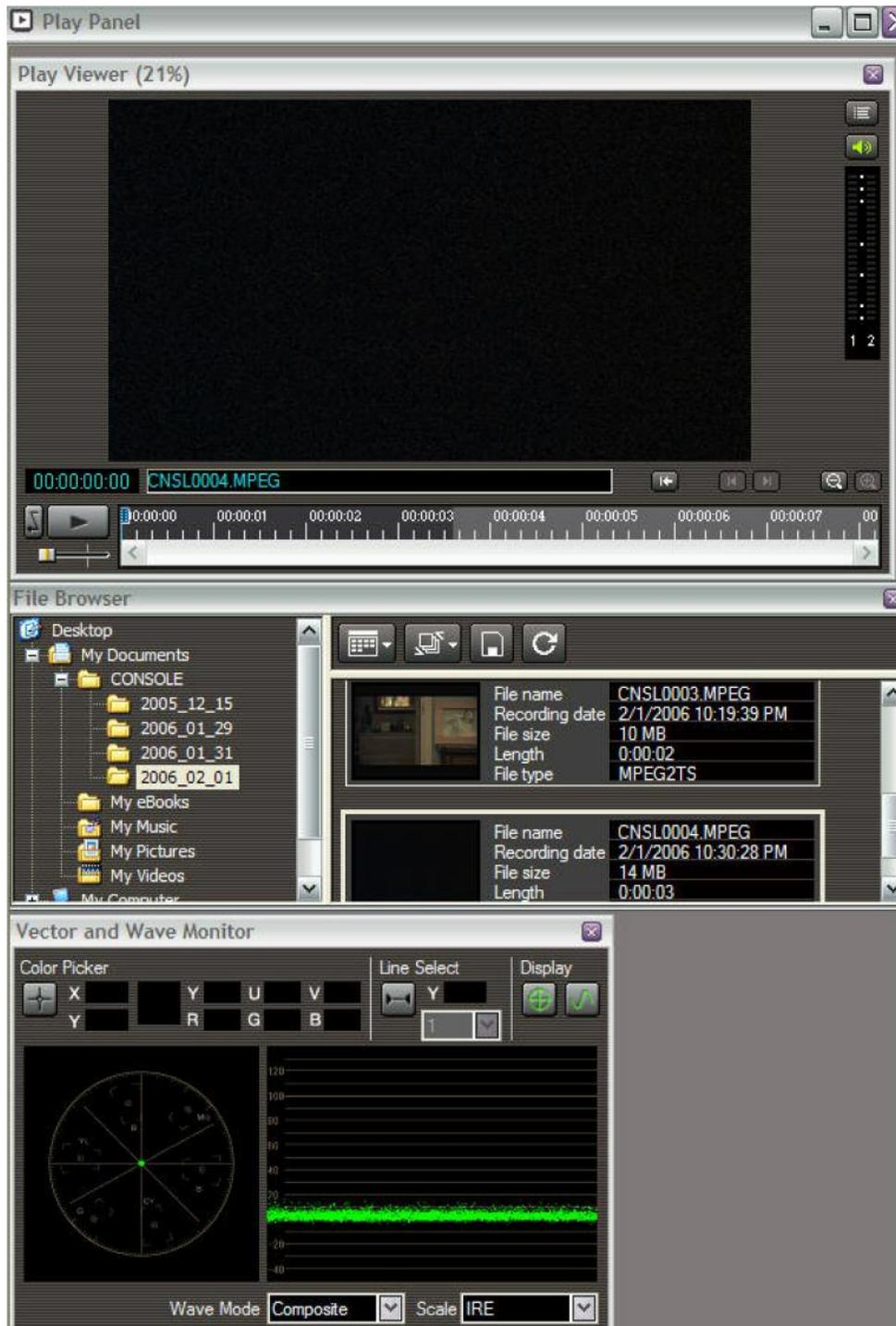
The Play Panel is comprised of 3 optional windows that allow you to review what you've just recorded, or call up any older clips and stills that may be stored on your hard-drive or SD card.

"PLAY VIEWER" WINDOW

The black information windows immediately beneath the viewer show the name of the selected clip and a running counter (which starts from zero on each clip and does NOT match the camera's timecode). Under the play button, there is a slider that allows you to alter the speed of the playback. The scale of the timeline can be adjusted by using the small "zoom buttons" on the far right-hand side of the viewer. On the far right-hand side of the "Play Viewer", there is an audio level monitor, a mute button, and a button to view the separate window for "Audio Monitor Settings".

"FILE BROWSER" WINDOW
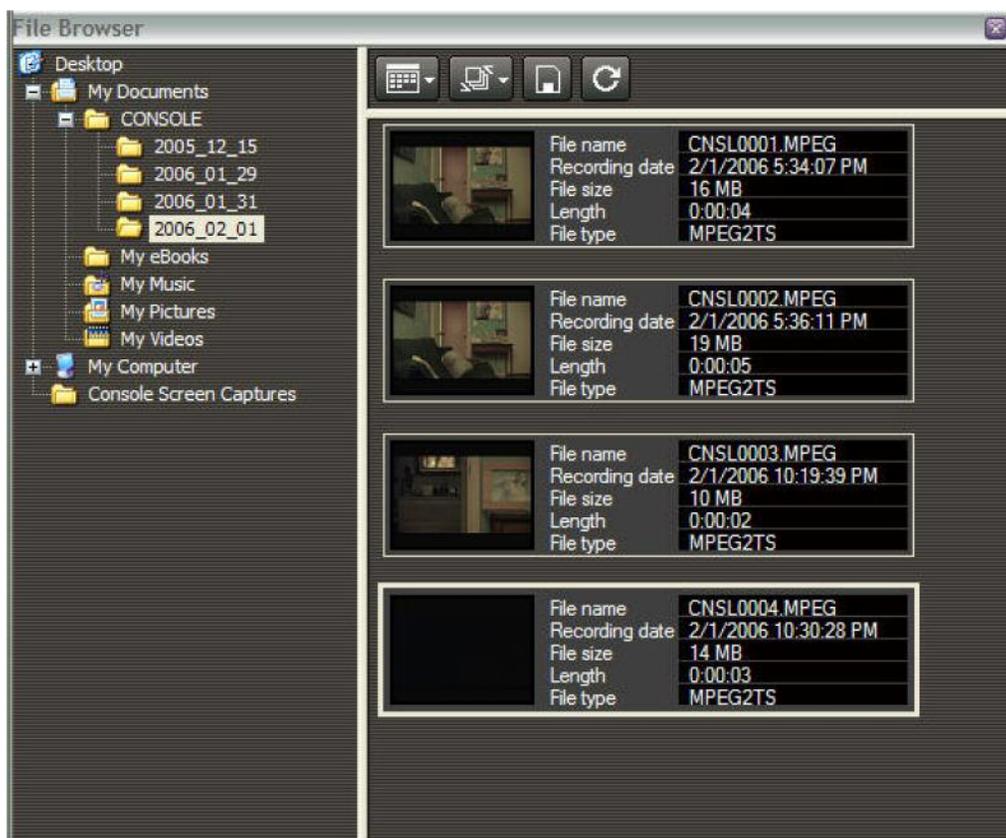
This window allows you to select which clip is playing in the "Play Viewer". On the left-hand side, there is a typical browser so you can find the desired clip on your hard-drive. The first two buttons along the top of the window's "mini toolbar" control the style in which the files are displayed (tile or detail), and the order of the clips displayed (chronological or reverse-chronological). The remaining two buttons allow you to select a still image from a Memory card, or refresh the current list if more clips have recently been added to the selected file.

"VECTOR AND WAVE MONITOR" WINDOW
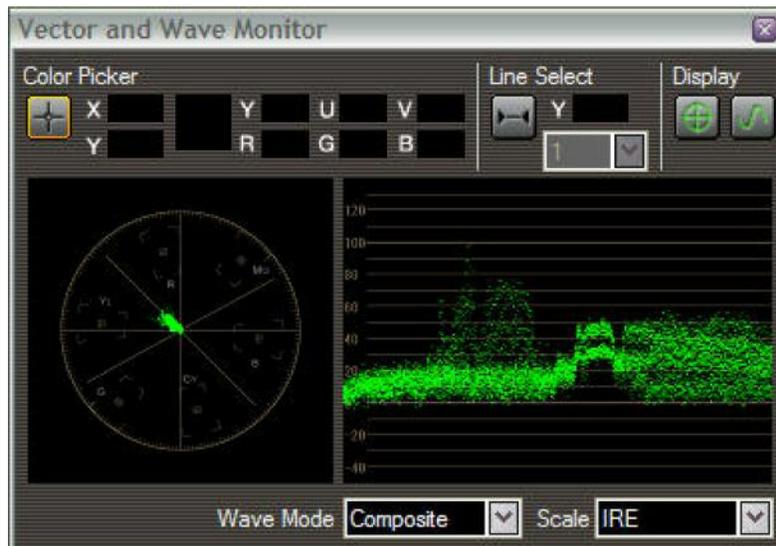
For details on this window, please see the "Vector and Wave Monitor" description under the "Rec Panel" section. The performance of the scopes and controls is identical, but please note that these scopes within the "Playback environment" are measuring values that have already been recorded. Thus, they are "locked in" and "un-alterable" until you take them into a color-correction program in post-production. There is no way to color correct a recorded image within this CONSOLE software.

CONCLUSION

Armed with this CONSOLE software, the Canon XL H1 or XL2 and a well-calibrated studio monitor a production studio, videographer or filmmaker has all the tools they need to embark on a professional production. Veteran camera operators will easily be able to assimilate these new tools into their existing workflow, and those who are new to this level of image control will find a freedom to learn and experiment that has previously been elusive.