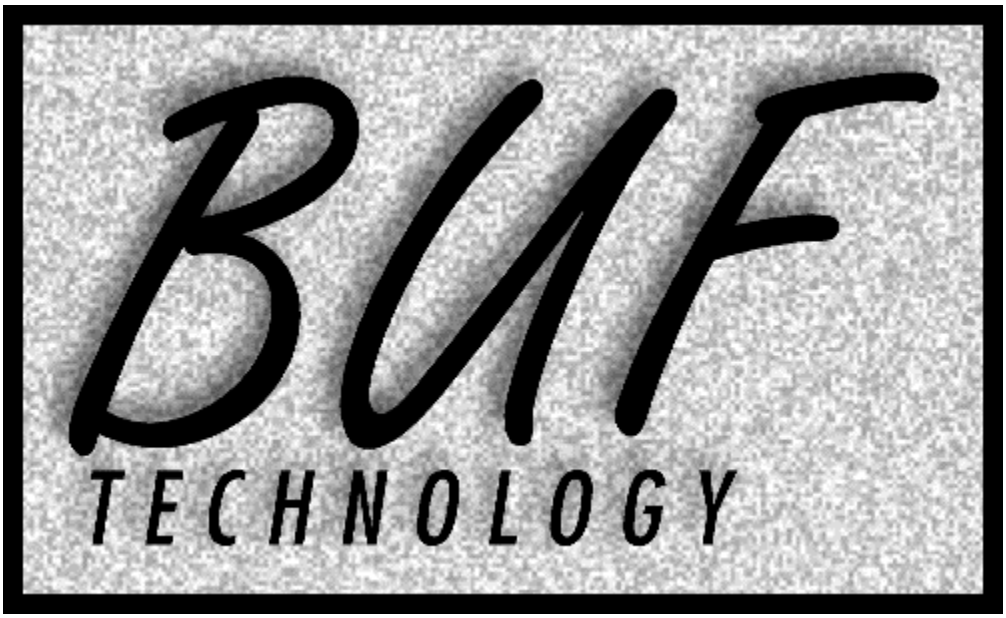


# VQC-3000

# VIDEO QUALITY CONTROL SYSTEM

# INSTRUCTION MANUAL

**VERSION: 110616**

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# INTRODUCTION

### FCC RADIO FREQUENCY INTERFERENCE STATEMENT

This device complies with part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications not expressly approved by BUF Technology could void the user's authority to operate this equipment. Shielded cables must be used with this equipment to maintain compliance with FCC regulations.

### WARRANTY STATEMENT

BUF Technology warrants that the equipment it manufactures is free from defects in materials and workmanship. Equipment that has been operated within its ratings and has not been subjected to mechanical or other abuse or modification and has failed because of such defects, will, at the option of BUF Technology, be repaired or replaced if it is returned, freight pre-paid, to BUF Technology within two years from the date of shipment. Equipment that fails under conditions other than described herein will be repaired at the price of parts and labor in effect at the time of repair.

This warranty is in lieu of all other warranties, express or implied, including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose. BUF Technology is not liable for any consequential damages.

### OVERVIEW

The VQC-3000 Video Quality Control System provides a user friendly vehicle for the remote control of broadcast and professional videotape recorders and video servers. It has been optimized for video quality control applications. The system controls devices via RS-422 "9-pin" serial remote connection using the "SONY" VTR remote control protocol (most brands and models of broadcast and professional studio VTRs) or VDCP (Video Disk Communications Protocol). The controller has many features and operational adjustments including non-volatile memory for 1000 cue points and timecode or tape timer selection. Special attention has been paid to the coordination between the high resolution knob and jog/shuttle picture motion to provide a natural feel for control.

VDCP clip based control of video servers is functional only when used in conjunction with the optional BUFclips clip management software (see BUFCLIPS SOFTWARE and the www.buftek.com web site for more information). When using VDCP, the operational characteristics are virtually identical to VTR control. See the BUFclips documentation for clip related functions. Many video servers support "Sony" or "Odetics" protocols, including the GV "AMP" protocol, all of which are compatible with the VQC-3000 implementation of the "Sony" protocol. Transport functions (those not related to clips) are supported by the controller without the BUFclips software.

The BUFclips software operates in "free" mode when used without the optional USB "Dongle" security key. In "free" mode, timecode can be captured by the controller and "typed", as though from the keyboard, into any running application on the PC running BUFclips. The timecode can be formatted in two separate flexible ways. Other free features include cue to clipboard timecode, automatic "typing" of miscellaneous strings. For more information, download BUFclips from www.buftek.com, launch the program, then quit and read the XML file that is created.

The VQC-3000 has ten user macro keys that recall any sequence of programmed keystrokes. Some examples of user macros are selecting TC type (LTC vs. VITC), entering timecode numbers, and quickly recalling personality registers for different users. Macros hold up to 20 keystrokes and can be tied for longer sequences. See the USER MACROS menu for more information. Macro F10 is preprogrammed to send TC out the RS-232 port.

**PHYSICAL**

The control panel is 8” (W) x 8” (D) x 3.625” (H), and slopes from 1.250” height in front to 3.625” height in the rear. Two backlit alphanumeric displays separate cueing and menu operations from VTR or video server status and timecode display so that control is always instant regardless of where the operator may be in the menu system. The transport control keys are placed within easy reach of the high quality optical encoded jog/shuttle knob. A numeric keypad allows quick entry of timecode and random access cue point selection and can be changed from the standard telephone style to calculator style (see PERSONALITY REGS). A Mark key copies timecode into the active cue point for subsequent cueing with or without preroll.

To keep cable clutter off the console, a standard 8 pin modular telephone cable connects the control panel to the included VTA-2001 adapter. The VTA-2001 adapts the modular cable to industry standard 9 pin 'D' connectors for VTR or video server interface, and to the included UL and CSA Listed Power Supply.

The optional VTA-2001-RS adapter provides an RS-232 interface connector that allows external computing equipment access to timecode information and Play, Stop, and Cueing functions. The RS-232 port also connects to a PC computer running the BUFclips clip management software program (see BUFCLIPS SOFTWARE) to add clip related features including VDCP protocol to the controller's capabilities.

**INSTALLATION**

Connect the included VTA-2001 RS-422 adapter to the control panel via the included 15 foot RJ45 cable. A longer cable may be used, but the maximum length is restricted to about 50 feet (15 meters) by voltage drop from the power supply (9.5VDC minimum at the panel). Note that the connectors are terminated “RJ45 telephone style” not “CAT-5 data style”: both connectors are crimped on the same surface of the flat 8-pin telco cable resulting in a reversal of conductor order. Improper termination will result in failure to operate, but will not cause damage. Connect the 9-pin ‘D’ RS-422 connector on the VTA-2001 directly to a VTR or video server, RS-422 router or patch bay via a pin-for-pin DE9M-M cable; use shielded cable to meet FCC RF emissions standards. Connect the included power supply to the power input pigtail connector on the VTA-2001 and apply power to the power supply.

Connect the VTA-2001 connector labeled VTR (or unlabeled DE09F connector) to the device to be controlled. A straight through wire is normally used, but the only required conductors are:
Pin 4 = Ground
Pins 3/8 = Tx to VTR or video server +/-
Pins 7/2 = Rx from VTR or video server +/-
Note that some systems use pins 1 and 6 for various ground signals, but BUF controllers use only pin 4. In rare cases it may be necessary to connect pins 1 and 4 together to prevent grounding problems.

See the RS-232 OPTION section for connection information about the RS-232 "CONTROLLER" connector on the optional VTA-2001-RS adapter.

The MANUALS page on the www.buftek.com web site (hit the MANUALS button) includes a document (cables.pdf) that provides details on cabling and connector assignments for this and many other BUF Technology products.

# OPERATION

## BASIC OPERATION

Separate keys control the basic transport functions: Play, Stop, Rewind, and Fast Forward. The SHTL key enters high speed Shuttle mode at still speed; the Knob is then used to vary the Shuttle speed. Still Shuttle is resumed anytime the SHTL key is tapped. The JOG key enters the Jog mode; picture motion moves at a speed relative to Knob rotation, and stops when the Knob is released. The SLOW key enters the Variable Play mode at still speed. Turning the Knob changes the speed. In Stop and Jog modes, the STAND BY key spins the tape scanner down to reduce tape and head wear (VTRs only); when in the STOP, READY OFF mode, STAND BY spins the scanner up, preparing for immediate playback. A double-tap of the STAND BY key while in the Stop or Ready Off modes, Ejects the cassette and also ejects clips on many video servers.

**RECORDING** Not available on -NR (no record) option units.

First a Record or Edit mode must be selected using the RECORD SETUP menu (see MENU FUNCTIONS). The recording is then performed by simultaneously tapping the REC and PLAY keys. In other than Open Ended, Animation, or Hard record modes, edits occur from the current cue's IN point to, but not including, the OUT point (the recording lasts exactly as long as the cue's DURATION). Units with the -NR (no record) option are incapable of recording. Assemble and insert edit modes typically will not function with video servers.

To end a recording early, you must tap the STOP key unless “ANY XPORT KEY” has been set in the OPER PREFS, RECORD END MODE menu, in which case any transport key ends the recording.

Input video and audio can be selected to pass through the recorder by a single tap of the REC key (EE mode). Any other transport control key returns to Tape (playback) mode. If an insert edit mode is in effect when EE mode is selected, only enabled channels will enter EE.

## PREVIEW (REHEARSE)

To rehearse an edit mode record operation, double tap the REC key. The VTR will roll as for record, except the selected channels will go into EE mode during the record period instead of entering edit mode. The existing recording will remain unaltered.

## LOCATING OPERATIONS

The VQC-3000 Video Q.C. Controllers come equipped with a powerful autolocation capability. One thousand tape locations may be marked to timecode or may explicitly be set using the numeric keypad. Playback may be cued to any location, with or without preroll. See the CUE POINT OPERATIONS menu for more information about locating operations.

## PERSONALITY REGISTERS

The VQC-3000 is equipped with ten personality registers. There are many user adjustable settings in the system, most of which are stored in personality registers. Saved personality configuration data are protected by an error detection value. When the unit is reset, even if a COLD BOOT (see below) is performed, any personality registers that check correctly are preserved. Once you have configured the unit for how you like to work, you can store the configuration in a personality register and name it as you desire. You can recall a register anytime in the future to restore operation to the way you like it. See the PERSONALITY REGS menu for more information.

## SETTING TIMECODE VALUES

Timecode values for cue points and menu settings are entered using the numeric keypad. When you first begin setting a register, its existing value is shown on the display. As you enter the first digit, the display is reset to zeros and the key’s value shows as units of frames (or as units of seconds when setting registers that do not use frames). Each digit entered shifts the displayed digits to the left, the LEFT arrow key backspaces 1 digit (shifts digits right). The HOME, SETUP, and MARK keys cancel the operation, leaving the register unchanged. The ENTER key replaces the register with the displayed timecode numbers. The UP/DOWN arrow keys act the same as ENTER except they “trim” the register value instead. The UP arrow key (trim up) adds the displayed timecode numbers to

the existing register value. The DOWN arrow key (trim down) subtracts the displayed timecode numbers from the existing register value.

**COLD BOOT**

If for any reason, you wish to reset the VQC-3000 back to the factory default configuration, a ‘COLD BOOT’ may be performed. This operation erases all cue points, and sets most internal registers to default values. Personality registers are individually protected and not affected by a cold boot.

A cold boot is accomplished by unplugging the modular cable from the rear of the panel (powering down the unit), and holding the MARK and PLAY keys down while plugging the cable back in (while powering it back up). Hold the buttons until characters are shown on the displays.

A cold boot can cure erratic operation that sometimes occurs due to garbage in the battery backed RAM. This can be caused by static discharge (ESD sparks) or other extreme events such as lightning. ESD is common in carpeted areas and can cause permanent damage to integrated circuits, especially those connected to the outside world like RS-422 receiver chips. If you can feel a spark when you touch the panel, it is recommended to treat the room's carpet with anti-static spray (available at grocery stores).

## MENU

A simple yet powerful menu system is provided that serves three basic functions. All menu operations use a separate MENU display so status and timecode display are always visible on the VTR STATUS display. All transport functions operate normally while navigating the menu.

NOTE: Some menu items use the Knob. When using the Knob for a menu item, it is not available for transport control until the menu is exited.

The basic menu functions are:

CUE POINT MANAGEMENT Provides quick access to the most used cueing functions.
RECORD SETUP Defines the record mode to be used and allows record related adjustments.
MENU ITEMS A comprehensive set of user settings and operations.

### CUE POINT MANAGEMENT

No matter where you are in the menu system, tapping the HOME key returns to the CUE POINT MANAGEMENT menu. There are 1000 cue points. Each cue point contains separate IN and OUT points. When editing, the current cue point's IN and OUT points are used for the edit IN and OUT. The OUT point is also used for the PROGRAMMED STILL feature (see below).

The CUE key cues playback to the current cue point's IN point. The PREROLL key also cues playback, but to a point before the IN point. The preroll period is subtracted from the IN point to calculate the preroll location. The preroll period can be changed from the default five seconds using the CUEING ITEMS, SET PREROLL menu item. If in SET OUT or SET DURATION modes, the CUE and PREROLL keys cue playback relative to the OUT point.

#### CHANGE THE CUE POINT NUMBER

Tapping the HOME key causes the current cue point's IN point to be displayed, with the cursor at the index number. There are 1000 cue points in the system that are referenced by index numbers 000 to 999. Tapping the RIGHT or LEFT arrow keys increment or decrement the current cue point. The numeric keypad keys select cue points randomly, taking effect when the ENTER key is tapped.

#### SET THE IN POINT (CUE POINT)

After tapping the HOME key, tap the IN (UP arrow) key to change the MENU display to the SET IN mode. The current cue point's IN point register is shown and may be set or changed. Enter digits on the numeric keypad and save by tapping the ENTER key. The IN point may be trimmed (entered number added to or subtracted from the existing IN point) by using the UP or DOWN arrow key instead of the ENTER key. Tap HOME to cancel, LEFT arrow to backspace. Changes to the IN point do not affect the OUT point but do affect the DURATION.

#### SET THE OUT POINT

After tapping the HOME key, tap the OUT (DOWN arrow) key to change the MENU display to the SET OUT mode. This works the same as SET IN, but sets the OUT point of the cue point instead. The MARK key marks the OUT point rather than the IN point when in the SET OUT or SET DUR modes.

#### SET THE DURATION

Tap the OUT (DOWN arrow) key while in the SET OUT mode to change the MENU display to the SET DUR mode. This allows you to set the OUT point by entering a DURATION that is added to the IN point to create the OUT point. This mode also allows you to see the duration between the current cue point's IN and OUT points.

Tap the IN (UP arrow) key while in the SET OUT or SET DUR modes to return to SET IN. Tap the OUT (DOWN arrow) key while in the SET IN mode to return to SET OUT.

### TRIMMING TIMECODE VALUES

When setting timecode values, the ENTER key replaces the register with the displayed timecode numbers. The UP/DOWN arrow keys act the same as ENTER except they "trim" the register value instead. The UP arrow key (trim up) adds the displayed timecode numbers to the existing register value. The DOWN arrow key (trim down) subtracts the displayed timecode numbers from the existing register value. Midnight rollover is supported, using the current timecode type (24, 25, 30NDF, 30DF). The LEFT arrow key backspaces 1 digit.

### MARKING CURRENT TIMECODE AS IN OR OUT POINTS

Anytime the MARK key is tapped, either the IN or OUT point of the current cue will be set to the current playback timecode. When SET OUT, SET DUR, or PGM STILL ENABLED is shown on the upper display line, the MARK key copies current timecode into the OUT point. Any other time, the MARK key copies timecode into the IN register. Double-tapping the MARK key leaves the current cue point unchanged, increments to the next cue point and marks it instead. This allows a sequence of cue points to be marked.

### PROGRAMMED STILL

Holding the HOME key while tapping the UP arrow key enables the programmed still feature. The top MENU display line reads PGM STILL ENABLED while this featured is enabled. As soon as the HOME key or other menu key that removes this message from the display is tapped, the feature becomes disabled. To store a programmed still timecode, either tap the MARK key or use the numeric keypad followed by ENTER while PGM STILL ENABLED is shown. Note that programmed still is the same as the OUT point. When programmed still is enabled (indicated on the display), playback or variable speed playback will ramp to still within a frame or so of the programmed still timecode. This feature can be enabled full-time using the SLO-MO ITEMS, PROGRAMMED STILL MODE menu.

See the CUEING ITEMS menu for more cue point related operations.

## RECORD SETUP (Not applicable on -NR option units)

Tap the HOME key followed by the SETUP key to enter the RECORD SETUP menu. The record mode in effect is shown on the upper MENU display line. To change the record mode, use the UP/DOWN arrows until the desired mode is shown on the lower display line, then tap ENTER. The new mode will show on the upper line. If an insert type record mode is selected, channel enable information is also shown on the upper line. Insert channels are enabled/disabled by tapping 0 on the numeric keypad for video, 1-8 for audio tracks, 5 for the cue track and 6 for the longitudinal timecode track.

NOTE: The record mode does not change until the selection shows on the upper display line by tapping ENTER.

Assemble and Insert edit modes use the auto edit feature built into many studio VTRs. Most video servers do not support auto edit, in which case attempting to perform a preview or edit will have no effect. The Hard record mode works on all devices capable of recording, but video servers generally require a record clip to be created and readied for record, then the recording can be started by the controller.

### PREVIEW (REHEARSE)

To rehearse an edit mode record operation, double tap the REC key. The VTR will roll as for record, except the selected channels will go into EE mode during the record period instead of entering edit mode. The existing recording will remain unaltered.

### RECORDING

Recording is commenced by holding REC and tapping PLAY. If the HARD RECORD mode is selected, a record command is sent to the recorder. If an edit mode is selected, the VTR is set to auto edit mode, the edit mode and channel enables are set, the IN and OUT points are preset and an auto edit command is sent. The VTR itself cues to the preroll point and then rolls, enters record at the IN point, exits record at the OUT point and stops after a post roll. If RECORD INHIBIT is selected, the VTR or video server is record inhibited, or the record tab is removed from the tape cassette, holding REC and tapping PLAY has no effect.

The available record modes are:

RECORD INHIBIT
HARD (CRASH) RECORD
OPEN ENDED ASSEMBLE EDIT
ASSEMBLE EDIT
OPEN ENDED INSERT EDIT
INSERT EDIT
ANIMATION

**RECORD INHIBIT**

Makes it impossible to make any type of recording from the VQC-3000.

**HARD (CRASH) RECORD**

VTRs: The “hard” or “crash” record mode destroys any control track information that may already exist on the tape at both the IN and the OUT points. Subsequent playback at and around the beginning and end of a hard recording will breakup with noise. Hard recording should be used only for the first recording onto a blank tape, or when it is paramount to get into record quickly such as for instant replay applications.

Video Servers: This record mode sends a record command to commence recording. Generally, a record clip must first be created for recording and the server must be prepared for recording. Actual recording begins after a fixed delay following the record command. The controller will send the record command immediately after hitting the REC and PLAY keys.

**OPEN ENDED ASSEMBLE EDIT**

Same as ASSEMBLE EDIT (see below) except the DURATION is ignored, and recording continues until the STOP key is tapped. At that time, the edit is ended and the timecode shown when STOP was tapped is marked into the cue point’s OUT point. If auto tag is enabled (see SET AUTO TAG below), the cue point is incremented and the new IN point is also marked. This way, sequential edits are accomplished without having to enter successive edit points. A record of all edits is inherently maintained as a sequence of cue points, so replacing any edit is accomplished by changing to the INSERT EDIT record mode, selecting the cue point to replace, and re-editing.

**ASSEMBLE EDIT**

The assemble edit mode destroys any control track information that may already exist on the tape at the OUT point resulting in picture breakup when playing back just after the OUT point. It should only be used to edit sequentially onto the end of an existing recording.

**OPEN ENDED INSERT EDIT**

Same as OPEN ENDED ASSEMBLE EDIT (see above), except the INSERT EDIT mode (see below) is used.

**INSERT EDIT**

When editing onto a tape that already has video recorded on it, the insert edit mode allows you to make edits with clean IN and OUT points. The insert edit modes allow you to define which tracks (video, audio, timecode, etc.) should be replaced with the edit. After selecting this mode, use the numeric keypad keys to toggle the various edit channels. Enabled channels are shown on the upper display line. Tap the HOME key when done.

| EDIT CHANNEL | KEY |
|---|---|
| VIDEO | 0 |
| AUDIO 1 | 1 |
| AUDIO 2 | 2 |
| AUDIO 3 | 3 |
| AUDIO 4 | 4 |

| | | |
|---|---|---|
| AUDIO 5 | 5 | |
| AUDIO 6 | 6 | |
| AUDIO 7 | 7 | |
| AUDIO 8 | 8 | |
| TIMECODE | 9 | TIMECODE & CUE |
| CUE | 9 | SHARE KEY 9 |

**ANIMATION**

Used for multiple fixed-duration edits. Animation is an insert edit mode where a CELL DURATION is specified in minutes, seconds, and/or frames. The CELL DURATION is automatically used as each edit's DURATION. Because auto tagging is used (even if AUTO TAG is disabled), a list of all edits is inherently stored as a sequence of cue points. Any cell may be replaced simply by selecting the cue point of the cell to be re-recorded and re-editing. This mode is useful for recording telecine pin registration, pencil sketch tests, cell animation, etc.

These additional settings may be changed while in the RECORD SETUP menu:

SET PREROLL
SET AUTO TAG

**SET PREROLL**

Defines the preroll period used for editing and for cue with preroll (PREROLL key). Some VTRs will not obey this command, so it may have no effect on edit preroll. It will always affect cue with preroll.

**SET AUTO TAG**

Enables/disables the auto tag feature (ENABLED is the default). If enabled, when an edit is completed, the VQC-3000 automatically increments the current cue point and copies the completed edit's OUT point into the new cue point's IN point. This simplifies the process of sequential editing.

**REC CREATE CUE**

When enabled, a new cue point is automatically created whenever a recording is made with its IN point set to the start of the recording.

**MENU ITEMS**

All other menu items are accessed by tapping the SETUP key twice.

MENU ITEMS contains numerous submenus that allow a multitude of operational settings to be modified according to the user's preferences.

The submenus available in MENU ITEMS are:

PERSONALITY REGS
SLO-MO ITEMS
PROGRAM A MACRO
CUEING ITEMS
TIME CODE ITEMS
LOOPING ITEMS
OPER PREFS
MISCELLANEOUS MENU ITEMS

Menu items are scrolled using the UP and DOWN arrow keys or selected directly using keypad digits. A menu item is selected by tapping either the ENTER or RIGHT arrow key.

Some Menu Items use the Knob for user input, during which time it cannot be used for Jog/Shuttle operation. Tapping HOME, SETUP, JOG, SLOW, or SHTL exits a menu that uses the Knob and returns the Knob to Jog/Shuttle control.

### PERSONALITY REGS

A submenu containing these items:

SAVE PERSONALITY
RECALL PERSONALITY REGISTER
RECALL DEFAULTS
CALCULATOR STYLE # KEYS
HIGH KNOB RESOLUTION

Many aspects of the way the VQC-3000 works are adjustable by the user. Almost all of these settings are stored in registers called Personality Registers. Ten personality registers are provided, allowing different users to store their favorite configurations. A user may wish to use two or more registers to recall different modes of operation depending on the task currently being undertaken. Registers may be named with alphanumeric names up to sixteen characters long. Items stored in the personality registers include: Record mode including channel enables and animation CELL DURATION, timecode type (LTC, VITC, Tape Timer), preroll, Jog and Variable Play adjustments.

#### SAVE PERSONALITY

Saves the current configuration in a personality register. Tap numeric keypad keys after selecting this item to show the names of the various registers. Tap ENTER when an unused register is seen (indicated by the name DEF for default). You may enter any 16 character name you wish by using the Knob to select a letter or number, and the RIGHT and LEFT arrow keys to move to other character positions (the name defaults to "REG n" where n is the Personality Register number). Tap ENTER when done.

#### RECALL PERSONALITY REGISTER

Recalls a previously stored personality register. The last used personality register number is shown along with it's name. Tap numbers on the numeric keypad to show the names of the other registers. Tap ENTER to recall one, or any other key to cancel.

#### RECALL DEFAULTS

Restores the factory default configuration. Tap ENTER to recall defaults, any unsaved configuration settings will be lost. Saved personality registers remain unaffected. Tap any other key to cancel.

#### CALCULATOR STYLE # KEYS

When enabled, changes the numeric keypad to calculator style (7-8-9 on the top row, 1-2-3 on the bottom). The default is telephone style with 1-2-3 on top and 7-8-9 on bottom. It is necessary physically to remove these keycaps and swap their positions after changing this menu item.
This setting is stored separately in protected memory with its own validation data and is never erased or changed except by using this menu item (it will not be reset even by a COLD BOOT, a RECALL PERSONALITY REGISTER, or a MISCELLANEOUS MENU ITEMS, INITIALIZE UNIT operation).

#### HIGH KNOB RESOLUTION

When enabled, optimizes the panel for a jog/shuttle knob optical encoder with double the normal resolution of 64 PPR (pulses per revolution). The default setting (DISABLED) supports the newer 64 PPR parts. Enable this setting if the encoder inside the panel is an older 128 PPR model, indicated if it is a round Clarostat brand encoder or a Bourns brand square shaped encoder with the number 00128 on its label. The 64 PPR Bourns brand encoders (with 00064 on the label) have been used since it became apparent that they have a much lower failure rate than the 128 PPR models.
A quick check can verify this setting: With other settings at default (normal knob sensitivity), position the

knob finger hole up, press SHTL, turn knob clockwise to point the hole down. Shuttle speed should be nearly, but not quite full (five right arrows showing on the STATUS display). If so, this setting is correct. This setting is stored separately in protected memory with its own validation data and is never erased or changed except by using this menu item (it will not be reset even by a COLD BOOT, a RECALL PERSONALITY REGISTER, or a MISCELLANEOUS MENU ITEMS, INITIALIZE UNIT operation).

**SLO-MO ITEMS**

A submenu containing these slow motion operational adjustments:

VP DISPLAY MODE
FILM PLAYBACK SPEED
FILM SPEED SLO-MO
MAX FWD SPEED
MAX REV SPEED
VP PRESET MODE
DÉTENTE TIMER
STILL KNOB TRAVEL
FORWARD KNOB TRAVEL
REVERSE KNOB TRAVEL
PROGRAMMED STILL ADVANCE
PROGRAMMED STILL MODE
RECORD END STILL

**VP DISPLAY MODE**

Sets the mode used to show slow motion speed when in the Variable Play mode. NORMAL (ROUNDED) causes the speed to be shown in percent of Play speed, rounded to the nearest percent. ACCURATE causes the actual speed as specified in the SONY protocol to be displayed with nine digits of precision and a floating decimal point. FILM SHOOT FPS causes display in the form: X/Y where X is the intended project or transfer film speed (see below) and Y is the exposure frame rate. This selection allows simulating projection of off-speed cinematography at various frame rates. For example, 100% Variable Play would be shown as: “24/24.00” or “30/30.00”, depending on the setting of FILM PLAYBACK SPEED. Similarly, 50% speed would be displayed as “24/48.00” (or “30/60.00”) indicating an exposure frame rate of 48fps (or 60fps). Note that while the speeds shown are accurately requested in the commands sent, they do not necessarily reflect actual playback speeds. Not many record/playback devices, particularly VTRs, actually perform variable speed playback at the requested speeds but instead round to the nearest incremental speed they support.

**FILM PLAYBACK SPEED**

Specifies the intended project or transfer film frame rate for use with the FILM SHOOT FPS display mode described above. If the film is intended for 24fps theatrical release, the default setting of 24.00 is correct. If intended for transfer to PAL video at 25fps, set this item to 25.00.

**FILM SPEED SLO-MO**

Enables/disables playback speeds to be limited to commonly used film exposure rates.

**MAX FWD SPEED**

Limits the maximum forward speed tape will move while in the Variable Play (slo-mo) mode using the Knob. Use the numeric keypad to set the fastest slo-mo speed you desire. Slow motion speed limits may be set from zero to 9999% Play speed. The default is 100% (Play speed).

**MAX REV SPEED**

Same as MAX FWD SPEED, except it limits slow motion speed in the reverse direction.

**VP PRESET MODE**

Enables/disables the Variable Play Preset Mode. When disabled (the default), Variable Play (Slow) speeds are sent immediately. When enabled, speeds can be preset with the Knob, but are not sent until the SLOW key is again tapped.

**DÉTENTE TIMER**

The Knob has a software détente at still speed that allows you to find still by whipping the Knob in the direction opposite tape motion and letting go. This works by setting a timer when tape is moving faster than a preset speed. Speed will not reverse direction at the request of a Knob turn until this time delay has elapsed. Disabling this item inhibits this feature.

**STILL KNOB TRAVEL**

Changes or eliminates the slo-mo still speed dead band. This is the amount the Knob can be turned between the slowest forward and reverse slo-mo speeds without moving tape. It defaults to 80 (1/6 Knob turn) and can be inhibited entirely by setting it to zero.

**FORWARD KNOB TRAVEL**

Sets how far the Knob needs to turn in the slo-mo mode to change speed from zero to full forward slow speed. Turn the Knob backwards until the display reaches the minimum value of 0001. Then turn the Knob forward the amount you want to have to turn it during slow motion operation to reach maximum slo-mo speed. The default is a count of 240 (1/2 Knob turn).

**REVERSE KNOB TRAVEL**

Same as FORWARD KNOB TRAVEL, but for the reverse slo-mo direction.

**RECORD END STILL ADVANCE**

Sets the advance time, in frames, when the record end protect feature is activated. Change this setting if you don't like where the auto stop feature stops playback before the end of a crash recording.

**PROGRAMMED STILL ADVANCE**

Sets the advance time, in frames, when the still command is sent in the programmed still feature. Change this setting if programmed still consistently misses the target timecode.

**PROGRAMMED STILL MODE**

Causes the programmed still feature always to be enabled. Programmed still is a feature that causes normal or slow motion playback to slow to a still at the current cue point's OUT point. This feature is normally enabled by holding HOME and tapping UP arrow; enabling this menu item makes it always active.

**RECORD END STILL**

Enables/disables the record end protection feature (default is disabled for the VQC-3000). Prevents playback from "rolling-off" the end of a hard recording which would cause picture breakup. When a hard recording is stopped, the end point is stored in a record end protect register. Any cue points that are marked during or directly after recording, are assigned the record end protect register for that recording. After cueing into a hard recorded location, as normal or slow speed playback nears the end of the recording, the speed is ramped down to a still frame.

**PROGRAM A MACRO**

Allows macros to be programmed into any of the ten user macro keys (F1-F10). Macros are simply a series of up to 20 keystrokes that are executed whenever a macro key is hit. Macros can quickly change one or more menu settings with just one keystroke. When a macro is executing, stored keystrokes are executed by the panel as though you are entering them.

The F10 key is preprogrammed with a macro that selects the SEND RS-232 TC menu, which sends timecode numbers to the RS-232 port with a single keystroke (-RS option only). See SEND RS-232 TC and BUFCLIPS SOFTWARE for more information. If desired, the F10 key can be reprogrammed with a different macro.

To assure consistency, there are some differences between normal operation of the panel and when a macro is being programmed or executed:

1. Menu sequence. Normally, menus start at the last item used, but when programming or executing a macro, all menus start at the *first* item. This assures consistency when using macros to affect menu settings.
2. HOME. When the macro program or execute process is started (when a macro key is hit), the panel begins in the HOME condition as though the HOME key is hit before the macro key.

After selecting this menu item, hit the macro F-key to be programmed or any other key (HOME) to cancel. As soon as you hit a macro key, its existing keystrokes are erased and the green LED above the key flashes. Make the keystrokes you want in the macro. If you make an error, you must start over because all keys are assumed to be macro keystrokes. When done, again tap the macro key (the one with a flashing green LED) to save the macro. If you enter the 20th macro keystroke, the macro is automatically stored without the need to tap the macro key again. Red LEDs indicate programmed macro keys. To erase a macro, simply program it with no keystrokes. The red LED will go out.

Tapping another macro key while programming causes the macro you are programming to continue on to the new key's macro during execution. This allows macros longer than 20 keystrokes to be recalled with a single macro key push. While programming a macro, after the 19th keystroke, the green LED stops flashing. This means you have only one more keystroke to program. The 20th key you tap can be another macro key, into which you can separately program up to an additional 20 keystrokes. Because macro execution always begins in the HOME mode, menu selections must be completed before programming another macro. If you know the macro will require more than 20 keystrokes, finish programming a menu setting, then select the next macro key even if the 20th key has not yet been reached. To make menu selections use fewer keystrokes, use the keypad shortcut method of directly selecting menu items as illustrated in the following examples.

It is useful always to program HOME as the last keystroke in a macro. This exits the menu system when the macro is done executing. An exception to this would be if you want to use the macro to *end up* at a particular menu setting, to then make changes manually. An example would be to have F5 go into the TIME CODE ITEMS menu, select the PRESET TIMECODE GENERATOR item, and stay there so you can enter numbers. To preset the TCG, hit F5, numbers, ENTER, HOME - done!

Example macros:

A macro may be used simply as a shortcut to a commonly used menu item:
Program macro key #4 to prepare to copy cue points 0-99 to another location in cue point memory:
Tap SETUP twice, keypad key '3' for PROGRAM A MACRO, then ENTER to select.
Tap F4, SETUP twice, keypad key '4' for CUEING ITEMS, ENTER to select, keypad key '3' for COPY CUE RANGE, ENTER, keypad keys '000', RIGHT arrow, keypad keys '099', RIGHT arrow, keypad keys '000', tap F4 to save. From now on, tapping macro key #4 followed by a 3 digit number and ENTER copies cues 0-99 to the location of the number entered.

A more complicated example would be to program macro key #2 to prepare a VTR to black stripe a tape. Preset the VTR timecode generator to 00:58:00:02 with drop frame on, setup for a Hard Record, and setup the TCG for hard record preset-edit regen (preset when hard recording, then regeneration when editing):
Because this macro requires more than 20 keystrokes, it will consume F2 and F3 macros.
Tap SETUP twice, keypad key '3' for PROGRAM A MACRO, then ENTER to select.
Tap F2, SETUP twice, keypad key '5' for TIME CODE ITEMS, ENTER to select, keypad key '4' for PRESET TC GEN, ENTER to select, keypad keys '580002', ENTER, DOWN arrow for DROP FRAME ON, ENTER, then press F3 to cause the F2 macro playback also to execute macro #3 (also saves the F2 macro).
Program macro key #3:
Tap SETUP twice, keypad key '3' for PROGRAM A MACRO, then ENTER to select.
Tap F3, SETUP, DOWN arrow for HARD RECORD, ENTER to select, SETUP, keypad key '5' for TIME CODE

ITEMS, ENTER to select, keypad key '5' for TC GEN MODE, ENTER to select, keypad key '2' for HARD PSTED REG, ENTER to select, HOME, then F3 to save.
From now on, tap F2, then simply hold REC and hit PLAY to black stripe a tape with drop frame code starting at 00:58:00:02. Also, the TCG will automatically be set to the correct mode for subsequent edit operations.

**CUEING ITEMS**

A submenu containing these items:

SET PREROLL
SCROLL CUES
COPY RANGE
ERASE RANGE
CUEING EE MODE

**SET PREROLL**

Defines the preroll time used for editing and for the cue with preroll command. Some VTRs will not obey this command, so it may have no effect on edit preroll. It will always affect the cue with preroll command.

**SCROLL CUES**

Scrolls through all one thousand cue points by using the Knob. Cue points are displayed very rapidly, allowing you to watch timecode numbers while turning. Cue marking and cueing tape can be done in this mode. Any cue point operation performed while in this menu will use the cue point shown on the display at that moment.

**COPY RANGE**

Moves ranges of cue points between areas within the cue memory. You may want to keep a range of cue points in a reserved area of memory for later use.

**ERASE RANGE**

Clears any range of cue points to zeros.

**CUEING EE MODE**

Causes the VTR to output its input video while cueing. This is useful for dubbing operations: black video input to the source VTR is output to black the record VTR's tails after a dubbing pass while the source VTR is cueing for the next pass. See the LOOPING ITEMS menu for the LOOP AND PARK mode that automatically cues and parks the source VTR for the next dubbing pass. Not applicable to video servers due to their instant cueing capability.

**TIME CODE ITEMS**

A submenu containing these items:

TC DISPLAY MODE
TC SOURCE
SET TAPE TIMER
PRESET TIMECODE GENERATOR
TC GENERATOR MODE

**TC DISPLAY MODE**

Allows the system to operate in frames from midnight in lieu of HR:MIN:SEC:FRM. When enabled, timecode is displayed in frames, with 23 hour times shown as negative frames. When entering time numbers for cue points, preroll, etc., time is entered as frames. For example, tap HOME, IN, 1000, ENTER to set the current IN point to 1000 frames.

**TC SOURCE**

Specifies what numbers should be displayed on the VTR STATUS display and sometimes affects the VTR's character output (if equipped). Choices include Longitudinal timecode (LTC) which is usually recorded on an audio track on the tape, VITC, a timecode recorded on an invisible area in the video track or AUTO (the default), where the VTR or video server decides which timecode type to send. TAPE TIMER creates numbers by counting control track pulses (videotape magnetic sprocket holes), or by measuring tape motion with a tach wheel. Tape timers usually cannot be trusted to keep exactly accurate track of tape position. TAPE TIMER 2 is available on some VTRs and can be selected also.

**SET TAPE TIMER**

Sets the tape timer numbers inside the VTR. Some VTRs will not allow the tape timer to be set, so this item may have no effect. Video servers tend to use the timer synonymously with timecode and/or to denote time since the beginning of a clip, so do not allow setting of this parameter.

**PRESET TIMECODE GENERATOR**

Presets numbers into the TC generator on some VTRs. This is useful if you want an edit or hard record to start the tape timecode at a particular number. Some VTRs don't support this command.

**TC GENERATOR MODE**

Allows control of the timecode generator on some VTRs. Many VTRs do not support the TCG mode commands, so this setting may have no effect. Default is VTR LOCAL CONT, which inhibits sending of any TCG mode commands, allowing front panel control of the TCG mode. HARD PRESET-EDIT REGEN puts the VTR's TCG into internal LTC regen before any edit. Assemble edits (and insert edits with the TC track enabled) will be recorded with contiguous timecode. When a hard (crash) recording is made, a TCG PRESET command is automatically sent which presets and holds the VTR's TCG to the numbers and drop frame status last used in the PRESET TIMECODE GENERATOR menu. This is useful for recording on raw tape stock using hard record for the first recording, then changing to assemble edits thereafter. FREE RUN, RECORD RUN, INTERNAL REGEN, INTERNAL VITC REGEN, EXTERNAL REGEN, and EXTERNAL VITC REGEN modes are also available. See the VTR operation manual for descriptions of these TCG modes.

**LOOPING ITEMS**

A submenu containing these looping related items:

DISABLE LOOPING (OFF)
CONTINUOUS LOOPING (LOOP)
LOOP AND PARK (ONCE)
CUE-PLAY-NOLOOP (Q-PLY)

**DISABLE LOOPING (OFF)**

Disables the Loop Play mode.

**CONTINUOUS LOOPING (LOOP)**

In this mode playback will loop indefinitely between the current cue point's IN and OUT points.

**LOOP AND PARK (ONCE)**

Causes the VTR or video server to cue back to the current cue point's IN point and stop when playback reaches the current cue point's OUT point. This is useful for multiple pass dubbing operations. (Enable the CUEING ITEMS, CUEING EE MODE menu item to output black video while cueing.)

**CUE-PLAY-NOLOOP (Q-PLY)**

Causes the a Play command to be sent after a cueing operation reaches the cue point.

**OPER PREFS**

A submenu containing these operational preference items:

STILL AFTER CUE
KNOB SENSITIVITY
VDCP OFFSET JOG
JOG MAX SPEED
JOG SENSITIVITY
JOG INCH SPEEDS
RECORD END MODE
STOP KEY FUNCTION
SHUTTLE FORWARD LIMIT
SHUTTLE REVERSE LIMIT

**STILL AFTER CUE**

Enables/disables the still after cue feature. When enabled (default), after a cue is complete, the Jog still mode is entered.

**KNOB SENSITIVITY**

Reduces the overall sensitivity of the Knob by two or four fold. If you feel the Knob is too sensitive in all modes, use this item to reduce it's sensitivity.

**VDCP OFFSET JOG**

(BUFclips option only) Changes the method used for jog mode from "speed" (default) to "offset". Normally in jog mode, picture position is adjusted by sending motion commands at speeds relative to the speed the knob is being turned. In offset mode, which is only active when using the VDCP protocol, picture position is changed by jumping forward and backwards by a quantity of frames determined by knob motion. A particular server may respond more or less smoothly using this mode, and the type of file being played may have some effect. Picture position can only be changed by whole frames in this mode (not by a single field), which can be a disadvantage.

It may be useful to change between these modes often. By programming this menu into two macro keys (see PROGRAM A MACRO), it can be changed instantly with just a button push.

**JOG MAX SPEED**

Adjusts the maximum speed used in the Jog mode. Use the knob to make this adjustment may be set from zero to 500% Play speed. The defaults to 500% Play speed

**JOG SENSITIVITY**

Adjusts the speed the Knob must be turned in the Jog mode to reach the JOG MAX SPEED.

**JOG INCH SPEEDS**

Sets the forward and reverse speeds at which tape will be bumped when the ARROW keys are used for Jog Inch. The default is 35 units for forward and reverse which typically results in a 1 field bump.

**RECORD END MODE**

Enables the use of any transport key (such as CUE, PLAY etc.) to end a recording. By default, only the STOP key will cause recording to stop.

**STOP KEY FUNCTION**

Changes the function of the STOP key from the default of Jog still (ENABLED) to an actual Stop command.

**SHUTTLE FORWARD LIMIT**

Specifies the maximum Shuttle speed, expressed in multiples of Play speed. This feature allows Shuttle speed to be limited to that witch provides the best compromise between speed and recognizable picture. It does not affect the Rewind/Fast Fwd speeds. If in Shuttle while using this menu item, the results take effect as you make the adjustment. The best way to set this item is as follows: Set to zero, exit this menu item, tap the SHTL key and turn the Knob to the maximum speed. Since the limit is set at zero, the tape won't move. Then reenter this menu item and adjust the maximum speed as desired.

**SHUTTLE REVERSE LIMIT**

Same as SHUTTLE FORWARD LIMIT, but for the reverse direction.

**MISCELLANEOUS MENU ITEMS**

A submenu containing these items:

VERSION AND TEST
SEND RS-232 TC
LED BRIGHTNESS
MENU DISPLAY ANGLE
STATUS DISPLAY ANGLE
COMM MODE
DEVICE TYPE
JOG INCH
INITIALIZE UNIT

**VERSION AND TEST**

Displays the software version date and performs a test of the program PROM. If the PROM test fails, a PROM FAILED! message appears along with a checksum error number; the program PROM needs replacement. The unused stack space (MEM FREE:) is also displayed and should be a non-zero number, if not, a severe software bug has occurred or garbage has been written into memory, possibly due to ESD (static discharge). Use the COLD BOOT function to reset memory to factory defaults. Tap any key to start the LED and keyboard test. All 24 LED indicators light and characters are written to the VTR STATUS display as each keyboard key is tapped. Turn the Knob to end the keyboard test.

**SEND RS-232 TC**

Sends timecode numbers to the RS-232 port (-RS option only). The format is the same as when a TC request (‘T’) is received from the RS-232 port (see RS-232 OPTION). By default, this menu is programmed as a macro in F10, so hitting F10 sends timecode to the RS-232 port (see PROGRAM A MACRO and BUFCLIPS SOFTWARE).

**LED BRIGHTNESS**

Adjusts the brightness of the 24 LED indicators. Turn the Knob until the desired LED brightness is reached, then tap any key.

**MENU DISPLAY ANGLE**

Adjusts the MENU display contrast to optimize for viewing angle.

**STATUS DISPLAY ANGLE**

Adjusts the VTR STATUS display contrast to optimize for viewing angle.

**COMM MODE**

(VDCP option only) allows the automatic protocol identification feature of the controller to be overridden. Normally, the unit alternately sends SONY and VDCP protocol status requests when there is no response from the VTR or video server. This setting allows either protocol to be specified explicitly, preventing the controller from sending commands in the other protocol. It also allows setting of the "SEND ONLY" mode. In this mode, the controller only sends commands and does not expect responses. The STATUS display shows expected status in this mode instead of status being returned from the controlled device, which may give a false sense of correct operation when a problem exists with the wiring or RS-422 receive chip.

**SET VDCP PORT**

(VDCP option only) specifies the port number to use for VDCP protocol communications (default 1).

**SET VDCP DROP FRAME TC**

(VDCP option only) sets the timecode drop frame mode because the VDCP protocol does not report it.

**DEVICE TYPE**

Displays the four digit hexadecimal identification code reported by a connected Sony protocol deivce.

**JOG INCH**

When JOG INCH is displayed and the unit is in the Jog mode, the LEFT and RIGHT arrow keys become Jog Inch reverse and forward keys. The amount of tape movement is adjustable in the OPER PREFS, JOG INCH SPEEDS submenu.

**INITIALIZE UNIT**

Performs a cold boot and restores factory settings to all parameters. All ten personality registers are set back to the factory default configuration. Before initialization occurs, ENTER must be tapped to verify. Factory defaults can be recalled in the PERSONALITY REGS, RECALL DEFAULTS menu without erasing personality registers. Do not erase the personality registers lightly, try a COLD BOOT first!

# OPTIONS

### NO RECORD

The no record version of the VQC-3000 (VQC-3000-NR) has two additional shuttle keys in lieu of the PREROLL and REC keys and cannot issue a record command. The right and left shuttle keys are preprogrammed to plus and minus ten times play speed respectively. To change the speed on one or both of these keys, change to the desired shuttle speed using the knob, then tap the ENTER key followed by a double-tap of the SHTL key being reprogrammed. The new speed will be recalled every time that key is tapped until a Cold Start is performed.

### RS-232 OPTION

The VQC-3000 RS-232 Option (VQC-3000-RS) provides bi-directional communication between the controller and a computing device such as a personal computer. Timecode numbers can be queried and certain commands can be sent. The -RS option also provides a connection to a PC running the BUFclips clip management software, which is required for VDCP protocol operation (see BUFCLIPS SOFTWARE). The 9-pin 'D' connector labeled "CONTROLLER" on the VTA-2001-RS RS-232 interface adapter connects pin for pin to a 9-pin 'D' personal computer RS-232 COMM port. A USB to RS-232 serial adapter (USB-RS) is available for USB connection.

The pinout is:

| PIN | SIGNAL |
|---|---|
| 2 | TX |
| 3 | RX |
| 5 | GND |
| 6,7,8 | (CONNECTED TOGETHER TO ACCOMMODATE HARDWARE HANDSHAKING) |

The communication settings are 9600 BAUD, 8 bits, 1 stop, no parity. Simple commands are effected by sending ASCII characters, uppercase or lowercase. The available commands are:

| COMMANDS | |
|---|---|
| T | TIMECODE CAPTURE REQUEST Returned in ASCII with format: TYP HH:MM:SS:FF*. TYP=LTC, VTC, CTC, TT1, or ATC indicating the type of timecode sent, * = field 2. A <CR><LF> (0D 0A) sequence follows the visible characters. This response can also be sent by using the SEND RS-232 TC menu. The F10 macro key defaults to selecting this menu item, hence can be used to send TC to a PC. |
| L | LOWER MENU DISPLAY LINE REQUEST Sends the contents of the MENU display line 2. |
| P | PLAY (No response is sent) - same as pressing PLAY key |
| S | STOP (No response is sent) - same as pressing STOP key, actually sends Jog unless changed in menu (see STOP KEY FUNCTION). |
| C HH:MM:SS:FF | CUE (No response is sent) - Cues to timecode sent, space and colons are optional. |

### BUFCLIPS SOFTWARE

BUFclips is a software program that adds functionality to the VQC-3000-RS, including the "keystroke" features formerly provided by the BUFkeys utility, which it supercedes. In addition, BUFclips optionally adds support for VDCP protocol, playlists, and other features that are activated by installing an optional USB "Dongle" security key on the PC. BUFclips may be downloaded from the www.buftek.com web site.

BUFclips allows timecode numbers received by the controller to be typed automatically into any program running on the PC. BUFclips works with all versions (98 or later) of MicroSoft Windows operating systems (MicroSoft and Windows are trademarks of Microsoft Corporation). When a "hotkey" is hit on the PC keyboard, or when F10 is hit on the controller (see SEND RS-232 TC), the timecode shown on the VTR STATUS display is entered in whatever program has the keyboard focus as though it is typed on the keyboard. Additional formatting characters can be configured to be sent before and after the timecode, and between the hours, minutes, seconds, and frames of normal and drop frame timecode. Also, miscellaneous strings can be configured to be typed in response to different hotkeys. Cue commands can be sent to TC numbers copied into the clipboard. For more information, download BUFclips from www.buftek.com, launch the program, then quit and read the XML file that is created.