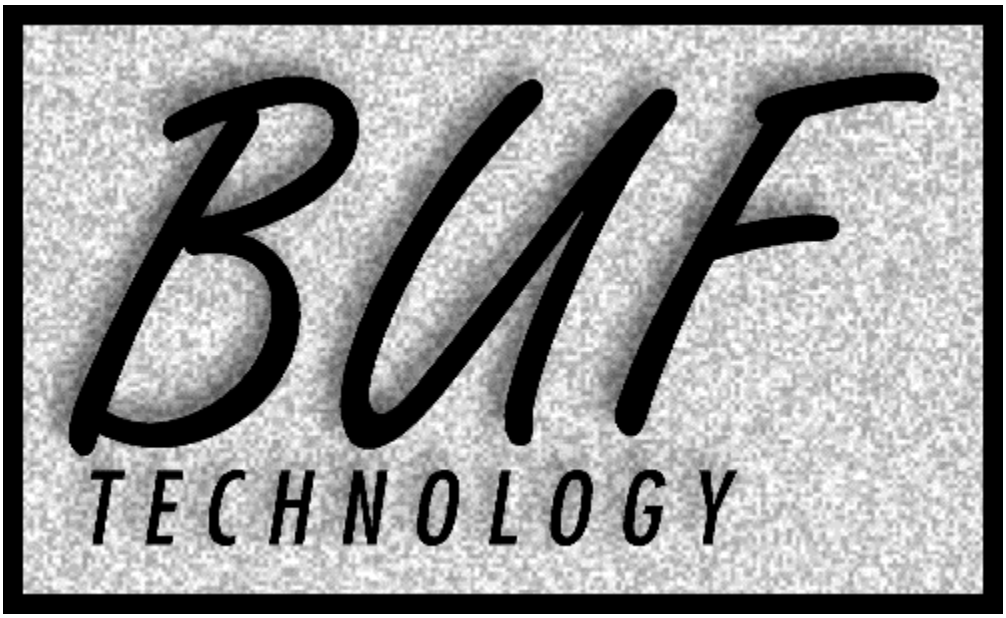

VTC-4000

VTR REMOTE CONTROL SYSTEM
SINGLE VTR CONFIGURATION

INSTRUCTION MANUAL

VERSION: 100118

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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 VTC-4000 Videotape Control System provides a user friendly vehicle for the remote control of professional and broadcast Videotape and Videodisk Recorders. Any VTR or other device that conforms to the SONY (Japanese) or AMPEX RS-422 protocols can be controlled. Cue points are stored in the unit's non-volatile memory, timecode or tape timer may be selected, and a Loop Play mode allows segments to be replayed automatically. Single machine assemble and insert editing is supported. An animation mode is included to simplify repetitive record operations.

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 status and timecode display so that VTR control is always instant regardless of where the operator may be in the menu system. The VTR transport control keys are placed within easy reach of the high quality optical encoded 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 VTR 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 VTR timecode information and Play, Stop, and Cueing functions.

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, RS-422 router or patch bay via a pin-for-pin DB9M-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.

OPERATION

BASIC OPERATION

Separate keys control the basic VTR transport functions: Play, Stop, Rewind, and Fast Forward. The SHTL key puts the VTR in 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 puts the VTR in the Jog mode; tape moves at a speed relative to Knob rotation, and stops when the Knob is released. The SLOW key puts the VTR in the Variable Play mode at still speed. Turning the Knob changes the speed. The STAND BY key spins the tape scanner down to reduce tape and head wear; 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.

RECORD

First you must select a record or edit mode using the RECORD SETUP menu. Recording is then performed by holding REC and tapping the PLAY key. For editing, the current cue point's IN and OUT registers are used for the record IN and OUT points. Hard (Crash) recording is generally used for slow motion applications as it is the fastest and simplest way to put the VTR into record. In nonlinear mode (see MISCELLANEOUS MENU ITEMS, CHANGE DDR MODE), there is no RECORD SETUP menu; Hard recording is always enabled.

A pick-up record feature exists that begins recording where the last recording left off. By holding the STOP key while tapping the REC key, the VTR will first cue to the end of the last recording before going into hard record. In nonlinear mode, pick-up recording is always used, except that recording is picked-up at the end of the last saved segment, so disk space can be reused over and over until something worth saving is recorded. A segment is then saved by a double-tap of the REC key.

To end a recording, you must tap the STOP key unless ANY VTR KEY has been set in the OPER PREFS, RECORD END MODE menu, in which case any transport key (STOP, PLAY, CUE, JOG, SHTL, etc.) stops a recording.

When Hard recording is used, a record protect feature is activated unless deactivated in the SLO-MO ITEMS, RECORD END STILL menu. Any cue points that are marked during or directly after recording, are assigned the record protect register for that recording. When recording is stopped, the record end point is stored, and when normal or slo-mo playback nears the end of the recording, the speed is ramped to zero before the recorded segment ends. Each time a cue point is recalled, it's record protect register is recalled and used as well. Any time a cue or preroll is executed that has a record protect register assigned, subsequent marking or setting of other cue points, provided the timecode is between the beginning and end of the recorded segment, also are assigned the record protect register for that recorded segment.

Input video and audio (EE mode) can be selected to pass through the VTR by a single tap of the REC key. Any other transport control key returns the VTR to Tape mode. EE is not selectable in nonlinear mode. If an insert edit mode is in effect when EE mode is selected, only enabled channels will enter EE.

A nonlinear mode is provided for timecode based Digital Disk Recorders (DDRs). If the DDR has a record pick-up mode, make sure it is turned off, or the disk conservation features of the nonlinear mode will not work. In nonlinear mode, the hard record mode is always used and there is no RECORD SETUP menu. Any time PLAY is tapped while REC is held, a cue command is sent before a record command is sent. The cue command cues the DDR to the end of the last saved segment so that unsaved disk space is reused over and over again until saved. Double-tap the REC key to save the currently recording segment; when you end the recording by tapping STOP, the saved segment's OUT point is automatically marked, and the next recording will pick up at that location. The REC key can be double-tapped to save a recorded segment after the recording is stopped also.

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 VTC-4000 VTR Slow Motion Controllers come equipped with a powerful autolocation capability. One thousand timecode locations may be marked to VTR timecode or may be set explicitly using the numeric keypad. VTRs may be cued to any location, with or without preroll. See the CUE POINT MANAGEMENT menu for more information about locating operations.

PERSONALITY REGISTERS

The VTC-4000 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 out OK 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, UP 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 VTC-4000 back to the factory preset configuration, a 'COLD BOOT' may be performed. This operation erases all cue points, and some internal registers; personality registers are not affected. A cold boot is accomplished by unplugging the modular cable from the rear of the panel, and holding the MARK and PLAY keys down while plugging the cable back in.

MENU

A simple yet powerful menu system is provided that serves three basic functions. All menu operations use a separate MENU display so VTR status and timecode display are always visible on the VTR STATUS display. All VTR 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.
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 item. There are 1000 cue points. Each cue point contains separate IN and OUT points and a Variable Play speed memory. 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 VTR is cued to the current cue point's IN point by tapping the CUE key. Tap the PREROLL key to cue with a five second preroll. The preroll period can be changed using the CUEING ITEMS, SET PREROLL menu item. If in SET OUT or SET DURATION modes, the CUE and PREROLL keys cue the VTR 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 only after 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 keys instead of the ENTER key. Tap HOME or SETUP 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 define the edit length by DURATION rather than by an explicit OUT point.

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

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 VTR TIMECODE AS IN OR OUT POINTS

Anytime the MARK key is tapped, either the IN point or the OUT point of the current cue point will be set to the timecode being read from the VTR. When SET OUT, SET DUR, or PGM STILL ENABLED is shown on the upper display line, the MARK key copies VTR timecode into the OUT point. Any other time, the MARK key copies VTR 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), VTR 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. This feature is always enabled when operating in nonlinear mode.

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

RECORD SETUP

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, 1-4 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.

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 VTR. 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 is record inhibited, or the record tab is removed from the tape, 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 VTC-4000.

HARD (CRASH) RECORD

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. When the hard record mode is selected and REC is tapped while holding the STOP key, the VTR will cue to the end of the last recording before beginning a new one. A feature is available that prevents playback from rolling past the end of a hard recording, see SLO-MO ITEMS, RECORD END STILL.

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 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.

SET AUTO TAG

Enables/disables the auto tag feature (enabled is the default). If enabled, when an edit is completed, the VTC-4000 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.

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
CUEING ITEMS
TIME CODE ITEMS
LOOPING ITEMS
OPER PREFS
MISCELLANEOUS MENU ITEMS

Menu items are scrolled using the UP and DOWN arrow keys. 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 *

* The numeric keypad style is never erased even by a COLD BOOT or the MISCELLANEOUS MENU ITEMS, INITIALIZE UNIT menu.

Many aspects of the way the VTC-4000 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 (slo-mo) adjustments, various key function options including programmed still and record end protect values.

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

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 when changing this menu item. The keypad style is stored separately in protected memory and is never erased or changed except by using this menu item.

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
SPEED RESOLUTION
VP PRESET MODE
DÉTENTE TIMER
STILL KNOB TRAVEL
FORWARD KNOB TRAVEL
REVERSE KNOB TRAVEL
PROGRAMMED STILL ADVANCE
RECORD END 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 of the VTR, they do not necessarily reflect the 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.

SPEED RESOLUTION

Normally, slo-mo speeds are sent to the VTR using the two byte speed argument form of the Variable Play command. This allows very accurate speeds to be sent to the VTR (Sony protocol VTRs only). Most VTRs dont't operate at accurate speeds so this speed resolution may not be necessary, but it shouldn't cause any harm. If Variable Play does not work with a particular device, you can try changing this item to force the lower resolution one byte form of the command to be used.

VP PRESET MODE

Enables/disables the Variable Play Preset Mode. When disabled (the default), Variable Play (Slow) speeds are sent immediately to the VTR. When enabled, speeds can be preset with the Knob, but are not sent to the VTR 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.

PROGRAMMED STILL ADVANCE

Sets the advance time, in frames, when the still command is sent to the VTR in the programmed still feature. Change this setting if programmed still consistently misses the target timecode. This setting also affects where slowdown is started when nearing the end of a segment in the nonlinear mode.

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 the tape before the end of a crash recording.

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. The programmed still mode is always enabled when in the nonlinear mode, regardless of this setting.

RECORD END STILL

Enables/disables the record end protection feature (default is enabled). This feature 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. Each time a cue point is recalled and used, it's record protect register is also recalled and used. Any time a cue or preroll is executed that has a record protect register assigned, subsequent marking or setting of other cue points, provided the timecode is between the beginning and end of the recorded segment, also are assigned the record protect register for that recorded segment.

CUEING ITEMS

A submenu containing these items:

SET PREROLL
SCROLL CUES
COPY RANGE
ERASE RANGE
FAST CUE MODE
FAST CUE 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.

FAST CUE MODE

Selects the mode used for cueing the tape. Normally, the VTR cue command is used. Some VTRs cue tape slowly using the cue command. By selecting the SHUTTLE or FFWD/REW fast cue modes, these commands are used for cueing until the tape position is within the FAST CUE RANGE (see below), then the cue command is issued.

FAST CUE RANGE

Sets the range within which the cue command will be sent to the VTR. In the fast cue modes, forward or reverse Shuttle or Fast Forward/Rewind commands are used until the tape becomes within this range of the cue point. The cue command is then sent to the VTR to finish the cueing process.

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.

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 for DDR applications. 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. Since timecode numbers are stored internally as hours, minutes, seconds and frames, cue points will show and enter erroneously in this mode when the unit is not connected to a DDR or VTR and the DDR or VTR uses drop frame or 25FPS timecode.

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 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.

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 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 VTR to enter the Play mode when a cueing operation reaches the cue point.

OPER PREFS

A submenu containing these operational preference items:

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

STILL AFTER CUE

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

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.

JOG MAX SPEED

Limits the maximum speed tape will move while in the Jog mode. Use the Knob to set the fastest speed tape will travel by turning the Knob in the Jog mode. The JOG MAX SPEED may be set from zero to 500% Play speed. The JOG MAX SPEED defaults to 300% 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 VTR 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 Stop command to Jog still. The default is still.

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.

SHUTTLE SPEED RESOLUTION

Allows Shuttle speeds to be sent to the VTR using the two byte speed argument form of the Shuttle command. This allows very accurate speeds to be sent to the VTR (Sony protocol VTRs only). Most older VTRs can’t operate at accurate speeds so this speed resolution may not be necessary, but it shouldn’t cause any harm. Some DDR devices do not understand this form of the Shuttle command, so the VTS defaults to the one byte form of the command.

MISCELLANEOUS MENU ITEMS

A submenu containing these items:

VERSION AND TEST
CHANGE DDR MODE
LED BRIGHTNESS
MENU DISPLAY ANGLE
STATUS DISPLAY ANGLE
COMM TEST MODE
VTR 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, please call the factory. 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.

CHANGE DDR MODE

Selects the nonlinear operational modes. NORMAL (VTR) is the default, and is intended for control of videotape recorders. GENERIC DDR is the nonlinear mode referred to in numerous locations in this manual, and is intended for use with simple, timecode based (as opposed to clip name based) DDRs. The nonlinear mode has features that conserve disk space and speed operation when using DDRs in instant replay applications. Many clip based DDRs will operate in timecode space mode, usually emulating a Sony BVW-75 Betacam VTR. FAST FWD VIDEO is a nonlinear mode that uses the Cue Up for Record command to cue up for recording. Some DDRs, specifically the Fast Forward Video Omega series models, operate better using this setting (set the Omega to BVW-75 emulate mode). In all cases, make sure that the “pick-up record” feature that some DDRs are equipped with is disabled.

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 TEST MODE

Allows the automatic protocol identification feature of the VTC-4000 to be overridden. Normally, the unit alternately sends SONY and AMPEX protocol status requests when no VTR is responding. This command allows you to explicitly force only the SONY protocol to be used. Response from the VTR is not required in this mode, so it can be used when responses from the VTR are, for some reason, not able to be received.

VTR DEVICE TYPE

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

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. Warning!: Enemies might be made by erasing the personality registers!

OPTIONS

SWITCH OPTION

The switch option is an active RS-422 switch that allows VTR control to be released to another controlling device such as an editing system, digital audio workstation, or desktop graphics workstation. Simply connect the controlling device to the connector labeled CONTROLLER on the VTA-2001-S adapter module, and connect the VTR to the connector labeled VTR. To release control to the controlling device, tap the F1 key. The timecode display and Play, Shuttle, Jog and Record LED indicators will reflect information transmitted by the controlled device (VTR) as requested by the alternate controller while control is released. The lower VTR Status display line will read “F2 = TAKE CONTROL” to remind the operator how to regain control. Tapping the F2 (actually F2 through F10) key takes control back from the alternate controlling device and gives it to the VTC-4000 panel. The switch option cannot be combined with The RS-232 option.

RS-232 OPTION

The VTC-4000 RS-232 Option (VTC-4000-RS) provides a way to get VTR timecode into a personal computer or other RS-232 equipped device, and gives access to Stop, Play, and Cueing functions. 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 port. The RS-232 option cannot be combined with the switch option.

The pinout is:

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

The communications settings are fixed at 9600 BAUD, 8 bit, 1 stop, no parity. 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.
	P PLAY VTR (No response is sent) - same as pressing Play key
S	STOP VTR (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 VTR (No response is sent) - Cues to timecode sent, space and colons are optional.