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# **Model No. 2034CL-BVW (& 2034CL-BVW-T)**

## **300 CLIP INSTANT ACCESS SYSTEM**

### ***BVW Protocol***

### **For PROFILE Video Servers Only**

### **VERSION 3.0 SOFTWARE**

## **User Manual**

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# 1. REVISION HISTORY

052003	1.0	Original document.
071503	1.1	Corrected document name.
110303	1.2	Added DNF Controls Limited Warranty. Updated Receive Cue List & Transmit Cue List Function description.

## *Getting Started . . .*

### **2. SYSTEM DESCRIPTION**

The 300 Clip Instant Access System consists of the ST300-SSM VTR Controller, STS420 Shotbox, and Shotlist Software.

The Video Server must support BVW Broadcast Protocol and requires that the VDR panel on the Profile be set to BVW.

SHOTLIST provides fast access to existing video clips stored on Grass Valley Group PROFILE, Leitch VR or other DDR, VDR, Video Servers supporting BVW Broadcast Protocol.

The SHOTLIST can contain up to 300 CLIP IDs, stored in non-volatile memory in the ST300.

Remotely view the CLIP IDs that exist in the Video Server under control. Desired clips can be MARKED into the SHOTLIST at a single location or at multiple locations.

Any clip in the SHOTLIST can be quickly loaded by simply entering the associated 3-digit number of its location, then pressing [LOAD]. Press [PLAY] to play the clip. Press [RECUE] to recue to the beginning of the clip or to the “recalled” time if defined.

### **DEFINITIONS**

- ❑ Throughout this document VTR, DDR, VDR & Video Server will be referred to collectively as “Video Server.”
- ❑ The ST300-S/SM as the ST300.
- ❑ The ST420 SHOTBOX is referred to as “SHOTBOX.” “SHOTKEY” refers to the 1-30 switches on the SHOTBOX.
- ❑ Words surrounded by brackets, for example, [ENTER], are keys on the ST300 or the SHOTBOX. [XXX] + [XXX] means hold the two keys down simultaneously.

### 3. SYSTEM INSTALLATION

#### a. SHOTBOX

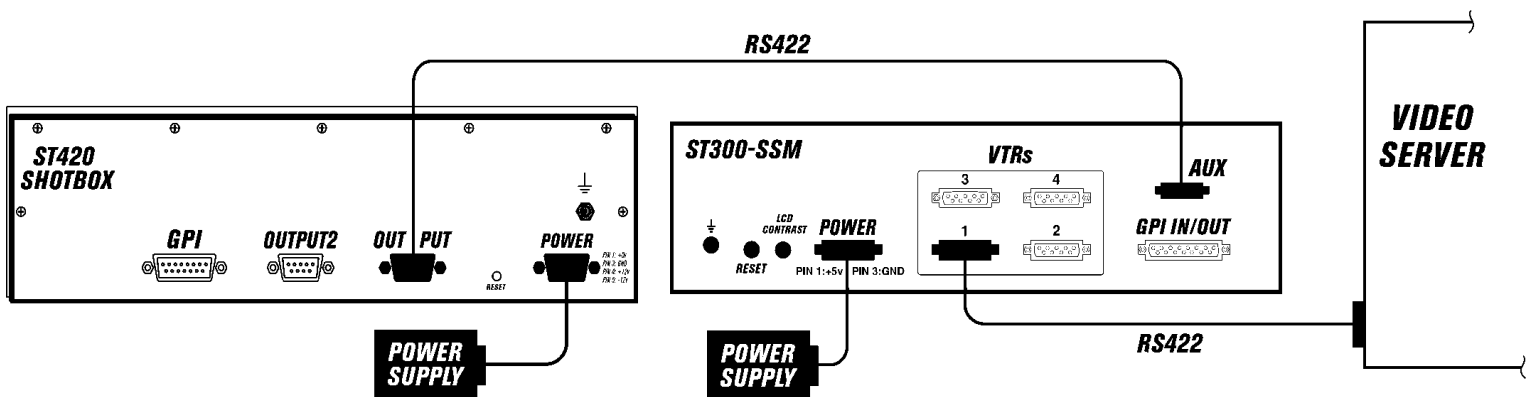
- 1) Plug one end of a standard 9-pin, RS422 serial cable, into the OUTPUT connector on the rear of the SHOTBOX. Plug the other end of the cable into the AUX connector on the rear of the ST300.
- 2) Connect the Ault Model #SW300 POWER SUPPLY into the POWER connector on the rear of the SHOTBOX. Plug the Power Supply into an outlet, 90 VAC – 240 VAC.

#### b. ST300-S/SM, VTR/DDR CONTROLLER

- 1) Plug one end of a 9-conductor, RS422 serial cable into the VTR 1 (2, 3 or 4) connector on the rear of the ST300. Plug the other end of the cable into the REMOTE connector on the Video Server.
- 2) Connect the supplied POWER SUPPLY, APX#4108, into the POWER connector on the rear of the ST300. Plug the Power Supply into an outlet, 90 VAC – 240 VAC.
- 3) Check SETUP MENU prior to using the ST300 to confirm proper Record mode and other User settable modes.

Installation is complete.

### CONNECTION DIAGRAM



## 4. VIDEO SERVER SETUP

- a. Select BVW protocol on the VIDEO SERVER to be controlled.
- b. Assign a serial port on the VIDEO SERVER through which the ST300 will control the server.

Setup is complete.

## 5. LOAD A CLIP

- a. Select a VTR by pressing VTR [1], VTR [2], VTR [3], or VTR [4].
- b. Press [CLIP LIST] to view the list of CLIP IDs that are resident on the Video Server. The CLIP LIST indicator will turn on.
- c. Press [CREATE] to create and load a new clip.  
(Creating a clip is described in the CREATING A CLIP section.)

**OR**

Turn the Wheel to view the existing CLIP IDs on the video server.

Turn the Wheel clockwise to scroll forward, or counter-clockwise to scroll backward, through the list of available CLIPs. Backward scrolling is limited to the last 10 CLIP IDs viewed.

**OR**

Manually enter a CLIP ID using the ST300 numeric keypad, or PC keyboard (if KBIO option).

**OR**

Manually enter a Clip ID using the Qwerty keyboard on SHOTBOX.

- d. Press [LOAD] to load the selected CLIP ID for playout.
- e. Repeat steps a. thru d. to load clips on desired VTRs.
- f. Set the GANG mode, if required.

## 6. VIEW THE CLIP ID OF THE CURRENTLY LOADED CLIP

Press **[SHIFT]** + **[LOAD]**. The bottom line will show the name of the loaded clip.

## 7. LEARN A CLIP OR CLIP COMBINATION

### a. LEARN ON THE SHOTBOX

- 1) Load a clip on the desired VTRs. (See Section 5, “**LOAD A CLIP.**”)
- 2) Press **[LEARN]**. The LEARN indicator will turn on.
- 3) Select the desired BANK and ShotKey.
- 4) Press **[LEARN]** to exit at anytime.  
**NOTE:** The **[LEARN]** key toggles LEARN mode on/off.

The controller will: LEARN (save) the VTR Number (1,2,3,4), loaded CLIP ID and current IN time to the selected Cue Point.

### b. LEARN ON THE ST300

- 1) Load a clip on the desired VTRs (See Section 5, “**LOAD A CLIP.**”).
- 2) Select the desired Cue Point by pressing **[NEXT CUE]**, **[LAST CUE]** or by manually entering the Cue Point using the numeric keypad. The selected Cue Point number is shown on the bottom line of the display.
- 3) Press **[SHIFT]** + **[MARK]** to start the LEARN. The first line of the display will show “Select VTRs:” The second line of the display will show “Mark-Lrn, ESC-cancel.”
- 4) Press VTR **[1]**, **[2]**, **[3]** or **[4]** to select the VTR to be learned into the current Cue Point. If the VTRs are ganged, select one VTR that is part of the Gang. The rest of the Gang will be learned automatically.
- 5) Press **[MARK]** to complete the LEARN.  
**OR**

Press **[ESC]** to exit without LEARNING.

The ST300 will: LEARN (save) the VTR Number (1,2,3,4), loaded CLIP ID and current IN time to the selected Cue Point.



## 8. RECALL A CLIP OR CLIP COMBINATION

### a. RECALL ON THE SHOTBOX

- 1) Select the desired Bank.
- 2) Press the desired shotkey.

The ST300 will automatically load the learned clips on the learned VTRs, cue the clips to the Learned time, then set the Learned Gang Mode.

### b. RECALL ON THE ST300

- 1) Select the desired Cue Point by pressing [NEXT CUE], [LAST CUE].  
**OR**

By manually entering the Cue Point using the numeric keypad.

The selected Cue Point number is shown on the bottom line of the display.

- 2) Press [LOAD] on the ST300.

The ST300 will automatically load the Learned clips on the Learned VTRs, cue the clips to the Learned time, then set the Learned GANG mode.

## 9. RECUE THE CURRENTLY LOADED CLIP

Press [RECUE]. If an IN Point is marked (the IN indicator is on), the clip will RECUE to the IN Point.

If the IN point is not marked, the clip will RECUE to the start of the clip.

**OR**

Press [SHIFT] + [RECUE].

- a. Enter the desired time to search to using the ST300's numeric keypad.
- b. Press [ENTER] to search to the entered time.  
**OR**

Press [ESC] to exit without searching.

## *Advanced Features . . .*

### **10. CREATING A CLIP**

- a. Press [**CLIP LIST**]. The display will show “CREATE NEW CLIP.”
- b. Press [**LOAD**]. The display will show the default CLIP ID.
- c. Press [**LOAD**] to accept the default CLIP ID.  
**OR**

Enter an ID with a maximum of 8 characters using the SHOTBOX’s Qwerty.

**NOTE:** For numbers on the SHOTBOX keyboard, use bank keys 0-9.  
**OR**

Enter a numeric ID with a maximum of 8 characters using the ST300’s numeric keypad.

- d. Press [**LOAD**] on the ST300 to create the selected CLIP ID.
- e. If the selected CLIP ID already exists, a warning message will be displayed. To load the existing clip, press [**ENTER**]. Press [**ESC**] to exit without loading the existing clip.

### **11. TRIM A CLIP**

#### **a. SETTING THE IN (OUT) POINT**

- 1) Locate the clip to the desired IN (OUT) time.
- 2) Press [**IN**] ([**OUT**]) to set the IN (OUT) Point. The IN (OUT) indicator will turn on. The display will show “IN (OUT) xx:xx:xx:xx.”  
**OR**

Press [**SHIFT**] + [**IN**] ([**OUT**]) to manually enter a new IN (OUT) time.

- 3) Press [**ENTER**] to save the entered time or press [**ESC**] to exit without saving.

#### **b. VIEW THE IN (OUT) POINT**

- 1) When the IN (OUT) indicator is on, press [**IN**] ([**OUT**]) to view the existing IN (OUT) Point.
- 2) While viewing the IN (OUT) Point:  
Press [**MARK**] to overwrite the saved time with the current time.  
Press [**RECUE**] to search to the IN (OUT) point.

### **c. CLEARING AN IN (OUT) POINT**

Press and hold **[DEL]** then press and release **[IN]** (**[OUT]**). The IN (OUT) indicator turns off.

### **d. TRIMMING A CLIP**

- 1) Mark an IN (OUT) Point as described in 11.a.
- 2) Press **[SHIFT]** + **[CLIP LIST]**. The display prompts:  
“Save Trim Clip? Load – Save, Esc – Cancel”
- 3) Press **[LOAD]** to save the loaded clip with new IN (OUT) points.  
**OR**

Press **[ESC]** to abort.

## **12. CAPTURE FUNCTION**

The CAPTURE function allows source material from a VTR to be easily and quickly recorded into the VIDEO SERVER. A CLIP ID is also created.

VTR1 is always the Recorder (the VIDEO SERVER).

Select VTR [2], VTR [3] or VTR [4] as the source VTR. Any RS422, SONY protocol compatible VTR can be used.

Use the transport function keys to control the source VTR. Each source VTR has its own set of IN and OUT points.

### **a. SETTING THE IN (OUT) POINT**

Set IN and OUT points as described in Section 11, para. a, b, c.

### **b. ENTER PREROLL VALUE**

- 1) Press **[MENU]** and turn the Wheel to “Enter PREROLL:”
- 2) Enter the desired preroll value using the ST300’s numeric keypad.
- 3) Press **[ENTER]** to save the entered value.  
**OR**

Press **[ESC]** to exit without saving.

### c. EXECUTE CAPTURE FUNCTION

- 1) Press VTR [2], VTR [3], or VTR [4] to select the source VTR.
- 2) Press [SHIFT] + [RECORD]. The display will prompt you for a CLIP ID. A default CLIP ID will be shown.
- 3) Press [LOAD] to accept the default CLIP ID.

**OR**

Enter a name with a maximum of 8 characters using the SHOTBOX Qwerty keyboard.

**OR**

Use [NEXT CUE], [LAST CUE] and Wheel to edit the CLIP ID. Use the [NEXT CUE] and [LAST CUE] keys to position the cursor. Turn the Wheel to select the desired letter.

**OR**

Manually enter a numeric ID using the numeric key pad.

Press [LOAD] to accept the CLIP ID. The ST300 will create the new CLIP ID on the Video Server.

The Source VTR will preroll to the IN Point, then play. At the source VTR's IN point, the RECORDER will go into record.

At the Source VTR's OUT point, the RECORDER will terminate record, post-roll for 2 seconds, then stop.

The Source VTR will search to the OUT point and stop. The OUT point will be cleared. The IN indicator will stay on. The OUT indicator will turn off.

## 13. VIEW SHOTBOX SHOTKEY ASSIGNMENTS

- a. Press and hold [VIEW]. The VIEW indicator comes on.
- b. Press and hold the desired shotkey.
- c. The switch turns RED and the content (CLIP ID) is displayed on a virtual display.

For Example:

VTR 1 Clip 23	VTR 2 Clip 13	VTR 3 Clip 77	VTR 4 No Assignment
------------------	------------------	------------------	------------------------

**NOTE:** All the remaining switches are not illuminated.

- d. Release the keys to return to normal operation.

## 14. SHOTBOX SHOTKEY MAPS

The SWITCHES on the SHOTBOX access the SHOTLIST locations as follows:

BANK 0, SWITCHES 1 → 30 access Cue Point locations 001 → 030.  
BANK 1, SWITCHES 1 → 30 access Cue Point locations 101 → 130.  
BANK 2, SWITCHES 1 → 30 access Cue Point locations 201 → 230.  
BANK 3, SWITCHES 1 → 30 access Cue Point locations 301 → 330.  
BANK 4, SWITCHES 1 → 50 access Cue Point locations 401 → 430.  
BANK 5, SWITCHES 1 → 30 access Cue Point locations 501 → 530.  
BANK 6, SWITCHES 1 → 30 access Cue Point locations 601 → 630.  
BANK 7, SWITCHES 1 → 30 access Cue Point locations 701 → 730.  
BANK 8, SWITCHES 1 → 30 access Cue Point locations 801 → 830.  
BANK 9, SWITCHES 1 → 30 access Cue Point locations 901 → 930.

## 15. SHOTBOX CONTROL SWITCHES

- a. **[PLAY]**: Plays out the selected clip.
- b. **[RECUE]**: Returns to the beginning of the clip.
- c. **[STOP]**: Stops payout of the clip.
- d. **[SHIFT] + [SHOTKEY]**: Clears the contents of the pressed shotkey.

## 16. TRANSFER CUE LIST

### a. TRANSMIT CUE LIST FUNCTION

The TRANSMIT CUE LIST function allows you to transmit your list of Cue Points to a PC, using the provided utility software on the PC, or to another ST300. Transfer to a PC requires OpSuite 3.0 software, which runs on a Windows-based computer. Contact DNF Controls for more information.

#### 1) To Transmit Cue Points to Another ST300

- a) Connect the VTR4 connector on the rear of the ST300 to the VTR4 connector of the receiving ST300 using an RS422 9-pin cable with TX and RX lines crossed. (A “turnaround” cable.)
- b) Press [MENU].
- c) Scroll the Wheel until “Transmit CUE list? YES=Enter, Exit=ESC” is displayed.
- d) Press [ENTER] to start transmitting. The Display shows “Waiting to transmit” on the first line.
- e) When the Receiver is ready, transfer starts automatically. The Display now shows “Transmitting cuelist.”
- f) After the transfer is over, the display shows “Transfer is over” for one second and then shows “Waiting to transmit” again.
- g) Connect another ST300 to transmit the list again.

**OR**

Press [ESC] twice to exit the MENU mode.

#### 2) To Transmit Cue Points to a PC

- a) Connect the VTR4 connector on the back of the ST300 to one of the COM ports on the PC using a RS422 to RS232 adapter.
- b) Repeat steps a) thru g) of “To Transmit Cue Points to Another ST300,” Section 16.a.1).

## **b. RECEIVE CUE LIST FUNCTION**

The RECEIVE CUELIST function allows you to receive a list of Cue Points from a PC or from another ST300. Transfer to a PC requires OpSuite 3.0 software, which runs on a Windows-based computer. Contact DNF Controls for more information.

### **1) To Receive Cue Points From Another ST300**

- a) Connect the VTR4 connector on the back of the ST300 from the VTR4 connector of the transmitting ST300 using RS422 9-pin cable with TX and RX lines crossed.  
(A "Turnaround" Cable)
- b) Press [MENU].
- c) Scroll the Wheel until "Receive CUE List? YES=Enter, Exit=ESC" is displayed.
- d) Press [ENTER] to start receiving.  
The Display shows "Waiting to receive" on the first line.
- e) When the Transmitter is ready, transfer starts automatically.  
The Display now shows "Receiving cuelist."
- f) After the transfer is over the display shows "Done-Success! Press any key..."
- g) Press any key. The display shows "Receive cuelist?" message.
- h) Press [ESC] to exit the MENU mode.

### **2) To Receive Cue Points From the PC**

- a) Connect the VTR4 connector on the back of the ST300 to one of the COM ports on the PC using RS422 to RS232 adapter.
- b) Repeat steps a) – h) of "**To Receive Cue Points From Another ST300,**" Section 16.b.1).

## Reference . . .

### 17. SETUP MENU

Press [MENU]. The MENU indicator will turn on.

Turn the Wheel to select item to change.

Press [MENU] **OR** use the Softkeys to change the desired mode for that option.

Turn the Wheel at anytime to select another item.

Press [ESC] at anytime to exit SETUP MENU. The MENU indicator will turn off.

<u>MENU MODES</u>	<u>(Turning Wheel Clockwise)</u>
<b>RECORD</b>	Press Softkey to select the desired record mode: Assemble, Insert, Lockout or Crash (Full).
<b>WIND MODE</b>	Press Softkey to select: HOLD (fast wind is maintained only while key is depressed). <b>OR</b> LATCH (fast wind is initiated and maintained with momentary key press).  Select fast wind speed (03.9X, etc.) by pressing Softkey.
<b>SLOMO</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>ST300 display shows (Non T-Bar version):</p> </div> <div style="width: 50%; border: 1px solid black; padding: 5px;"> <p>SLOMO with: <span style="float: right;">WHEEL</span></p> <p><b>SpdRange</b> <span style="float: right;"><b>Preset</b></span></p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <p>ST300 display shows (T-Bar version):</p> </div> <div style="width: 50%; border: 1px solid black; padding: 5px;"> <p>SLOMO with: <span style="float: right;">TBAR</span></p> <p><b>Wheel</b> <b>SpdRange</b> <span style="float: right;"><b>Preset</b></span></p> </div> </div> <p>Press Softkey [TBAR] (or [WHEEL]) to toggle between T-BAR and WHEEL.</p> <p><b>NOTE</b> - The T-BAR has a fixed speed range of 0 → +200 with a detent at +100% play speed.</p> <p><b>For Wheel only:</b> Press Softkey [SPDRANGE] to select SLOMO speed ranges:</p> <p>Press Softkey to select 0 → +200 <b>OR</b> -100 → +200. Press Softkey [BACK] to return to SLOMO MENU.</p> <p>Press [ESC] to exit SETUP MENU. <b>OR</b> turn the Wheel to select another item.</p> <p>(Continued on next page.)</p>



	<p><b>For Wheel only:</b> Press Softkey [<b>PRSET</b>] to select the SLOMO Preset Speed Mode.</p> <p>Press Softkey [<b>UPDATE</b>]. When exiting SLOMO mode, the last used speed is saved in the Preset Speed register.</p> <p><b>OR</b> Press Softkey [<b>STATIC</b>]. The Preset Speed register is NOT updated when exiting SLOMO mode. It is only changed by [<b>SHIFT</b>] + [<b>SLOMO</b>] (PRESET SLOMO).</p>
<b>ST300 SETUP</b>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">ST300 SETUP</p> <p style="text-align: center;">Clear Cues                      SetDefault</p> </div> <p>Press Softkey beneath ClearCues to clear all Cue Points to 00:00:00:00. Press Softkey [<b>YES</b>] when asked “Are You Sure?”</p> <p>Press Softkey beneath SetDefault to set ST300 to default settings. Press Softkey [<b>YES</b>] when asked “Are You Sure?”</p> <p><b>IMPORTANT NOTE:</b> Please set these items during initial installation.</p>
<b>DISPLAY SOFTWARE VERSION</b>	<p>The version number and date for the currently installed software is displayed. For example:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">4000CL-O                      V3.0</p> <p style="text-align: center;">072400</p> </div>
<b>RECORD</b>	<p>Press Softkey to select single button or 2-button record. RECORD = [<b>REC</b>] Only.</p> <p><b>OR</b> [<b>REC</b>] + [<b>PLAY</b>].</p>
<b>RECORD DELAY</b>	<p>Enter up to 99 frames record delay (used in Capture Function). Typical value is 3 frames.</p>
<b>ENTER PREROLL</b>	<p>Enter the desired preroll value using the ST300’s numeric keypad. Turn wheel to save the entered value <b>OR</b> press [<b>ESC</b>] to exit without saving.</p>
<b>TRANSMIT CUELIST</b>	<p>Transmit Cuelist to another ST300 or to a PC. See Section 16, “Transfer Cue List.”</p>
<b>RECEIVE CUELIST</b>	<p>Receive Cuelist from another ST300 or a PC. See Section 16, “Transfer Cue List.”</p>

## 18. FUNCTION TABLE

FUNCTION	KEY PRESS	DESCRIPTION
GOTO ENTERED TIME	[SHIFT] + [RECUE]	Search the VTR to the manually entered time.  Use the ST300 numeric keypad. To manually enter the desired time press [ENTER] or [RECUE].  NOTE: GRASS VALLEY GROUP Profile does <b>not</b> support TC or VITC time search.
GANG	[SHIFT] + [VTR #1] OR [SHIFT] + [VTR #2] OR [SHIFT] + [VTR #3] OR [SHIFT] + [VTR #4]	Individually press the VTR keys to be included in the gang; the LED above the key will turn on. Press the VTR key again to remove from gang; the LED above the key will turn off. Press [ESC] to exit.  The VTR LEDs that are on show the gang. The flashing LED shows which VTR is currently selected.
FFWD	[FFWD]	Press and HOLD to FFWD. Release key to stop. Set WIND Speed in MENU.
JOG	[JOG]	Select JOG mode and enable Wheel.
LAST CUE	[LAST CUE]	Step to the previous Cue Point Location.
LOOP	[SHIFT] + [PLAY]	Play the currently loaded clip in a continuous loop.
NEXT CUE	[NEXT CUE]	Step to the next Cue Point Location.
RECORD	[REC]	Places VTR into the Record mode selected by RECORD MODE in the SETUP MENU. Press [RECORD] or [RECORD] + [PLAY].
REWIND	[RWD]	Press and HOLD to REWIND. Release key to stop. Set WIND Speed in MENU.
SHUTTLE	[SHUTTLE]	Select SHUTTLE mode and enable Wheel.
SLOMO	[SLOMO]	Press [SLOMO] to slo-mo the VTR. Turn the Wheel (or move the T-Bar, if available) to change the play speed. Press [SLOMO] to STILL frame <b>OR</b> press any transport key to exit SLOMO.
SLO-MO SPEED PRESET	[SHIFT] + [SLOMO]	For WHEEL <b>ONLY</b> : Press [SHIFT] + [SLOMO] to preset the slo-mo speed. Turn the Wheel to select desired speed. Press [ESC] or any transport key to exit.
STOP	[STOP]	Press once to STILL frame VTR. Press again to put VTR into STOP mode.
TIME MODE SELECT	[TIME MODE]	Press to toggle between Timecode (TC), VITC (VT) or Tape Timer (TM) display modes.

## 19. SPECIFICATIONS

### a. ST300

Power:	90 VAC to 265 VAC adapter supplied with IEC connector
Size:	(L" x W" x H") 12" x 6" x 1.5" (front) 3.0" (rear) (T-Bar unit is 12.6" wide)
Weight:	4 lbs.
Rear Panel Connectors:	VTR1, VTR2, VTR3, VTR4 (All DB9F) GPI (DBF15F) Power (DB9M) Aux (DB9F) Reference Video (BNC)
Display:	Easy to read 2-line, back-lit LCD display (User adjustable contrast)
Jog/Shuttle Wheel:	With mechanical detents.
Optional "T"-bar:	Slo-mo 0-200% of Play Speed

### VTR RS422 SERIAL CONNECTOR

#### 9-Pin D-Type, Female

Pin #	1	Frame Ground	6	Receive Common
	2	Receive A ←	7	Receive B ←
	3	Transmit B →	8	Transmit A →
	4	Transmit Common	9	Frame Ground
	5	Spare		

### POWER CONNECTOR

#### 9-Pin D-Type, Male

Pin #	1	+5v DC	6	+5 VDC
	2	+5v DC	7	Ground
	3	Ground	8	Ground
	4	+12 VDC	9	Ground
	5	-12 VDC		

### AUX PORT RS422 SERIAL CONNECTOR

#### 9-Pin D-Type, Female

Pin #	1	Frame Ground	6	Receive Common
	2	Receive A ←	7	Receive B ←
	3	Transmit B →	8	Transmit A →
	4	Receive Common	9	Frame Ground
	5	Spare		

## GPI IN/OUT CONNECTOR 15-Pin D-Type, Female (DB15F)

Pin #	Description	Function	Pin #	Description	Function
1	GPI 1 Out		9	GPI 1 In	Play
2	GPI 2 Out		10	GPI 2 In	Stop
3	GPI 3 Out		11	GPI 3 In	Recue
4	GPI 4 Out		12	GPI 4 In	Next Cue
5	GPI 5 Out		13	GPI 5 In	Last Cue
6	GPI 6 Out		14	GPI 6 In	Recall
7	GPI 7 Out		15	GPI 7 In	
8	Ground				

### b. ST420 (SHOTBOX)

Power: +5v DC @ 4A, +12v DC @ 1.0A, -12v DC @ 0.6A  
90 VAC to 265 VAC adapter supplied with IEC connector

Size: [L" x W" x H"] 11.5" x 6.5" x 1.75" (front)  
3.5" (rear)

Weight: 4 lbs.

Rear Panel Connectors: Power ..... DB9M  
OUTPUT ... DB9F

## RS422 SERIAL CONNECTOR 9-Pin D-Type, Female

Pin #	1	Frame Ground	6	Transmit Common
	2	Transmit A →	7	Transmit B →
	3	Receive B ←	8	Receive A ←
	4	Receive Common	9	Frame Ground
	5	Spare		

## POWER CONNECTOR 9-Pin D-Type, Male

Pin #	1	+5v DC	6	+5 VDC
	2	+5v DC	7	Ground
	3	Ground	8	Ground
	4	+12 VDC	9	Ground
	5	-12 VDC		

## 20. TROUBLESHOOTING

### ST420 TROUBLESHOOTING

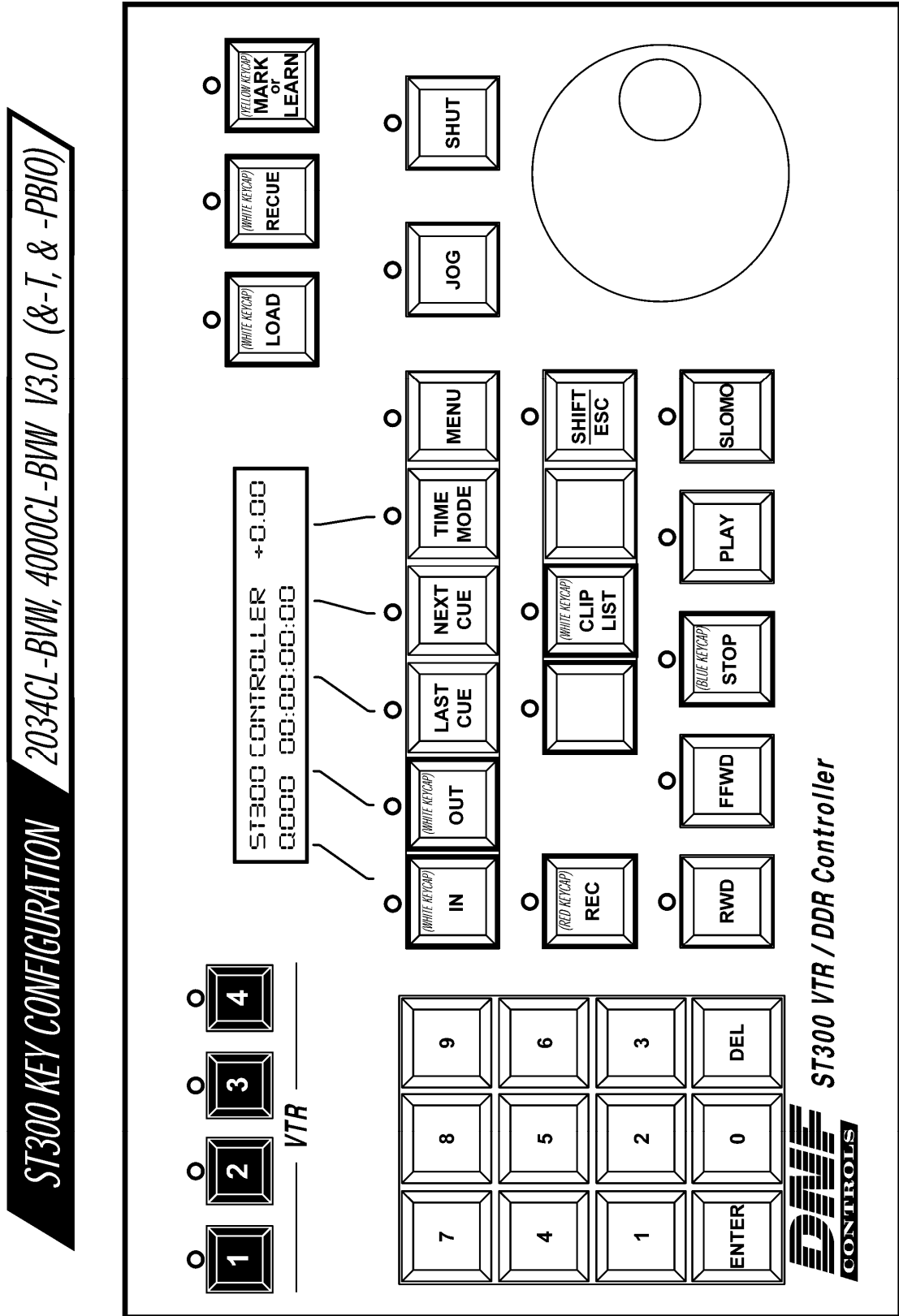
- a. All keys are RED - no communication with ST300.
- b. All keys are dark - no communication between the ST300 and the Video Server.
- c. The version of the ST420 must comply in the software version with the ST300 it is connected to.

To determine the software version of the ST420 do the following:

- 1) Press **[SHIFT]** + **[STOP]** + **[PLAY]**.  
The key that displays the current version is RED.
- 2) The ST420 displays:  
“SELECT ST300 V2.1 or V2.0 or V 3.0.”

Press the key for the software version of ST300 being used.  
Please refer to the ST300 to determine the Version if needed.

## 21. KEY LAYOUT



## **22. DNF CONTROLS LIMITED WARRANTY**

DNF Controls warrants its product to be free from defects in material and workmanship for a period of one (1) year from the date of sale to the original purchaser from DNF Controls.

In order to enforce the rights under this warranty, the customer must first contact DNF's Customer Support Department to afford the opportunity of identifying and fixing the problem without sending the unit in for repair. If DNF's Customer Support Department cannot fix the problem, the customer will be issued a Returned Merchandise Authorization number (RMA). The customer will then ship the defective product prepaid to DNF Controls with the RMA number clearly indicated on the customer's shipping document. The merchandise is to be shipped to:

DNF Controls  
12843 Foothill Blvd., Suite C  
Sylmar, CA 91342  
USA

Failure to obtain a proper RMA number prior to returning the product may result in the return not being accepted, or in a charge for the required repair.

DNF Controls, at its option, will repair or replace the defective unit. DNF Controls will return the unit prepaid to the customer. The method of shipment is at the discretion of DNF Controls, principally UPS Ground for shipments within the United States of America. Shipments to international customers will be sent via air. Should a customer require the product to be returned in a more expeditious manner, the return shipment will be billed to their freight account.

This warranty will be considered null and void if accident, misuse, abuse, improper line voltage, fire, water, lightning or other acts of God damaged the product. All repair parts are to be supplied by DNF Controls, either directly or through its authorized dealer network. Similarly, any repair work not performed by either DNF Controls or its authorized dealer may void the warranty.

After the warranty period has expired, DNF Controls offers repair services at prices listed in the DNF Controls Price List. DNF Controls reserves the right to refuse repair of any unit outside the warranty period that is deemed non-repairable.

DNF Controls shall not be liable for direct, indirect, incidental, consequential or other types of damage resulting from the use of the product.

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