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Model 2400VS-S-PBIO (&2400VS-S-PBIO-T)

192 Video Segment Instant Access System

**for Sony Protocol
with Peripheral Bus Interface Option**

USER MANUAL

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1. REVISION HISTORY

100703 Rev. 2.3	Company header information revised.
012904 Rev. 2.4	Reformatted. Updated Transmit Cue List and Receive Cue List Function description. Added DNF Controls Limited Warranty.

Getting Started . . .

2. SYSTEM DESCRIPTION

NOW, production switchers can load & play video segments on Sony Protocol DDRs, VTRS, etc.

- ❑ Use the EMEM or SNAPSHOT Learn & Recall functions of the production switcher to load and play a video segment from a Recall or timeline.
- ❑ Use the Run and Trigger functions of the production switcher to Play, Stop or Recue the video segment.

The 2400VS-S System consists of an ST300 with Video Segment software and an ST320 SHOTBOX.

The SEGMENT PLAYBACK option for the ST300 VTR Controller in combination with a DDR provides a Quick and Easy way to access and play up to 192 video segments.

Each ST300 Cue Point consists of an IN point and an OUT point. IN/OUT points can be manually entered **OR** marked with the current “tape” time from the DDR

The PERIPHERAL BUS INTERFACE Option for the ST300 VTR Controller is special software in the ST300. With this Option, the ST300 has 3 Peripheral Device Addresses, one for each VTR that it controls. This allows the production switcher to control any and all VTRs connected to the ST300.

Upon receipt of the Learn command from the production switcher, the ST300 saves the IN and OUT points for the currently defined video segments, the VTRs they are loaded on and the current GANG mode into the appropriate Cue Point.

When the Recall command is received, the ST300 loads the learned IN & OUT onto the learned VTRs, cues the VTR to the learned IN time, then restores the learned GANG mode.

The Trigger function on the production switcher puts the selected VTRs in to Play, Stop, Recue or other available modes.

Learn & Recall may also be done directly from the ST300 without the production switcher.

FEATURES

- ❑ Press 1 key to Mark Cue Point. Press 2 Keys to Recall 192 Cue Points.
- ❑ Fast and Easy to search to a Cue Point, manually entered Timecode number or Record out Point.
- ❑ Set Preroll duration from one frame to one hour.
- ❑ Freeze on Last Good video (Record OUT Point.)

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 ST320 SHOTBOX is referred to as “SHOTBOX.”
- ❑ SHOTKEY refers to the 1-50 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, 9-pin female, 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 5 VDC, 1Amp 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 9-pin connector (VTR 1, VTR 2 or VTR 3) on the rear of the ST300. Plug the other end of the cable into the 9 pin REMOTE connector on the Video Server.
- 2) Connect the +5, +12, -12 VDC POWER SUPPLY 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.
- 4) Select REMOTE mode on the VTR's front panel.

c. PRODUCTION SWITCHER

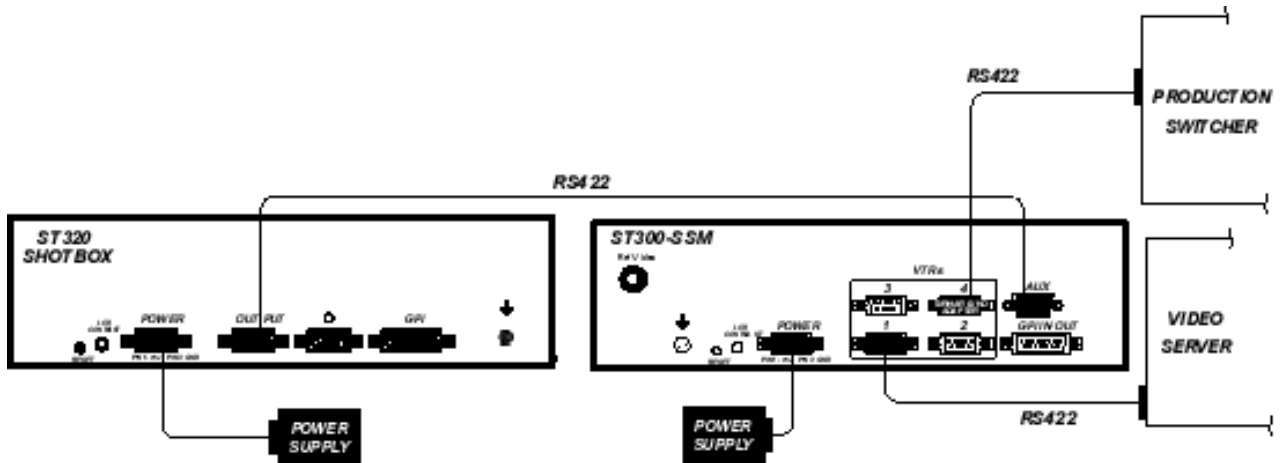
- 1) Connect a standard cable (RS422, 9-pin serial cable) to the supplied turnaround adapter. Plug the turnaround adapter into the “VTR4” connector on the rear of the ST300. Connect the other end of the cable to the Peripheral Bus Connector on the production switcher. (Communication Format- 38.4K, N, 8,1)
- 2) To select a Production Switcher type (default = Grass Valley Group).
 - a) Press [MENU] and turn the wheel until “SWITCHER” is displayed.
 - b) Press Softkey to toggle between Sony and Grass Valley Group types.
 - c) Press [ESC] at anytime to exit the MENU.
- 3) The ST300 has 3 Peripheral Device Addresses, one for each VTR that it controls.

To set the Device Address for each VTR:

- 4) Press [MENU] and turn the wheel until “Peripheral Address” is displayed.
- 5) Press VTR[1], VTR[2] or VTR[3], to select a VTR.
- 6) Assign a Peripheral Device Address for that VTR, from 0 to 23, by entering the desired address using the numeric keypad. To turn off the address, press [DEL]. Any address >23 turns off the address.
- 7) Select the next VTR and assign an address. Each VTR should have a unique address.

- 8) Press [MENU] and turn the wheel clockwise until "Parity Type:" is displayed.
Press Softkeys to toggle between NONE, EVEN or ODD parity.
Parity type should be the same as the Production Switcher's parity.
- 9) When done, press [ESC] to exit the MENU.
- 10) Configure the production switcher:
Enable the Peripheral Bus.
Enable the Peripheral Device Addresses assigned to the ST300.
Enable the appropriate Learn/Recall levels.
Enable the Timeline or Recall Trigger function.

CONNECTION DIAGRAM



d. LCD DISPLAY

During normal operation, the top row of the display shows the selected time mode and current time location of the VTR.

For example: TM 01:12:09:23

Time Modes - TM= Tape Timer TC= LTC VT= VITC

The currently selected SLO-MO speed is displayed on the far right side of the top row.

The bottom row of the display shows the current Cue Point number and its contents.

4. LEARN ON THE ST300

The current segment number and its contents are shown on the bottom line of the display.

Press [NEXT CUE] or [LAST CUE] to step through the list of segments, one at a time.

a. MARK THE IN (OUT) POINT

1. The IN (OUT) indicator is OFF
2. Press [IN] ([OUT]). The IN (OUT) indicator turns ON, the second row of the display shows the currently marked IN (OUT) time for ½ second. The current time is marked into the IN (OUT) point.

b. VIEW THE IN (OUT) POINT

- 1) When the IN (OUT) indicator is ON, the content of an IN (OUT) point can be viewed by pressing and holding [IN] ([OUT]).
2. Press [GOTO] or [RECUE] to search to the current IN (OUT) point.

c. ENTER AN IN (OUT) POINT

- 1) Press [SHIFT] + [IN] ([OUT]). The first row of the display shows the current IN (OUT) time. The second row of the display shows "ENTER IN (OUT)." If there is no IN (OUT) point currently selected on that VTR, the first row of the display shows "?:?:?:??"
- 2) Enter the desired IN (OUT) time using the numeric keypad.
- 3) Press [ENTER] to save entered time as an IN (OUT) time.

OR

Press [GOTO] or [RECUE] to save entered time as an IN (OUT) time and search to it.

OR

Press [ESC] to exit without saving.

d. LEARN A SEGMENT INTO A CUE POINT

- 1) Select VTR [1], [2] or [3] to establish a Cue Point.
- 2) [MARK] or [ENTER] an IN and OUT point on currently selected VTR.
- 3) If Gang mode is desired, repeat steps 1-2 until all the VTRs have IN and OUT points.
- 4) 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.

- 5) Press [SHIFT] + [LEARN] to start the LEARN.
- 6) Select VTR. If the VTRs are ganged, select one VTR that is part of the Gang. The rest of the Gang will LEARN automatically.
- 7) Press [LEARN] to complete the LEARN.
OR

Press [ESC] to exit without LEARNing.

The ST300 will: LEARN (save) the VTR Number (1,2,3), the current gang configuration and the current IN time into the selected Cue Point.

5. LEARN ON THE SHOTBOX

NOTE: The ST300 and SHOTBOX share common memory in the ST300. So, if you LEARN on the SHOTBOX you don't need to LEARN on the ST300.

- a. Press [LEARN]. The LEARN indicator will turn on.

The display will show the prompt:

Select Bank & Switch STOP- Abort

- b. Select the desired BANK and ShotKey.
- c. Press [STOP] to exit at any time

The SHOTBOX will: LEARN (save) the current time and gang configuration of the active VTR(s).

6. LEARN ON THE PRODUCTION SWITCHER

- a. Select and enable the Peripheral Device Addresses for the ST300.
- b. Do a LEARN to the desired REGISTER.

The ST300 will: LEARN (save) the VTR#, gang configuration and current IN time into the REGISTER number in the ST300.

7. RECALL ON THE ST300

- a. Select the desired Cue Point by pressing [NEXT CUE] or [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.

- b. Press [GOTO] on the ST300.
The In and Out of the Cue Point becomes the current IN and OUT points.
The ST300 parks the learned VTRs at the IN point.

8. RECALL ON THE SHOTBOX

Select the desired Cue Point by pressing the bank and the switch key.

9. RECALL ON THE PRODUCTION SWITCHER

RECALL the desired REGISTER NUMBER.

The ST300 will automatically load the Learned Segment on the Learned VTR, cue the clips to the Learned time, and set the Learned GANG mode.

10. VIEW THE CONTENTS OF CUE POINTS ON THE SHOTBOX

The top line of the display shows the BANK and SWITCH location for the selected Cue Point. If a Cue Point was selected from the ST300, not the SHOTBOX, the BANK and SWITCH will be set to "0".

The bottom line of the display shows the IN point of the Segment that was selected by the SHOTBOX or ST300. The bottom line also shows the currently selected VTR on the ST300. This is the VTR that is currently being controlled.

- a. Press and hold [VIEW].

Select the desired BANK 1, 2, 3 or 4.
The indicator on the selected bank will turn on.

- b. Press the desired SWITCH.

The contents of the Cue Point IN and OUT Points assigned to this BANK and SWITCH will be shown on the display.

The indicator on the pressed SWITCH will turn on.

For example:

IN: 00:00:01:00
OUT: 00:00:02:00

If no time is assigned to the switch, "NO ASSIGNMENT" will be displayed.

- c. Release [VIEW] at anytime when done.

11. PLAY A SEGMENT

ON THE SHOTBOX

Press [**PLAY**].

NOTES:

- a. If VTRs are GANGED and the segment durations are different on the ganged VTRs, the playback duration will be equal to the Master VTRs segment duration.
- b. The OUT Point is not frame accurate on the VS-S System. Allow up to 10 frames latency after the VTR has reached the OUT Point.

12. TRIGGER FROM THE PRODUCTION SWITCHER

The operator fires a trigger using either the TIMELINE or RUN function on the production switcher.

The ST300 puts the VTR into the following modes based upon the trigger value:

GRASS VALLEY VALUES

<u>Trigger Value</u>	<u>Mode</u>
0	Play
1	Recue to beginning of clip
2	Slomo using ST300 Wheel Preset or T-Bar Speed
3	Reverse Play
4	Still Frame
5	None
6	Record
7	Play Segment
8	None
9 or greater	Play

SONY VALUES

<u>Trigger Value</u>	<u>Mode</u>
0	Recue
1	Play
2	Slomo using ST300 Wheel Preset or T-Bar Speed
3	Reverse Play
4	Still Frame
5	None
6	Record
7	Play Segment
8	None
9 or greater	Play

Advanced Features . . .

13. VIEW CONTENTS OF CUE POINTS

ON THE ST300

- a. Press and hold [**SHIFT**] + [**NEXT CUE**].
OR

Press and hold [**SHIFT**] + [**LAST CUE**].

The display shows the current cue number and its contents for the current VTR.

- b. Release the keys to exit the view mode.

14. PLAY A SEGMENT

ON THE ST300

- a. Select a video segment by pressing [**LAST CUE**] or [**NEXT CUE**].
OR

Enter the desired cue number on the numeric keypad.

- b. Press [**GOTO**].

- c. Press and hold [**SHIFT**], then press and release [**PLAY**].

15. TRANSFERRING CUELIST

The TRANSMIT CUELIST 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.

a. TRANSMIT CUE LIST FUNCTION

1) To Transmit Cue Points to the 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] and scroll the Wheel to “Transmit CUE List?
YES=Enter,Exit=ESC”.
- c) Press [ENTER] to start transmitting.
The Display shows “Waiting to transmit” on the first line.
- d) When the Receiver is ready, transfer starts automatically.
The Display now shows “Transmitting cue list.”
- e) After the transfer is over, the display shows “Transfer is over” for one second and then shows “Waiting to transmit” again.
- f) Connect another ST300 to transmit the list again.

OR

Press [ESC] twice to exit the MENU mode.

2) To Transmit Cue Points to the 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 b-f of the TRANSMIT CUE POINTS to the ST300 section.

b. RECEIVE CUE LIST FUNCTION

The RECEIVE CUELIST function allows you to receive your 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 the 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] and scroll the Wheel to “Receive CUE List?
YES=Enter, Exit=ESC.”
- c) Press [ENTER] from start receiving.
The Display shows “Waiting to receive” on the first line.
- d) When the Transmitter is ready, transfer starts automatically.
The Display now shows “Receiving cuelist.”
- e) After the transfer is over the display shows “Done-Success! Press any key...”
- f) Press any key. The display shows “Receive cuelist?” message.
- g) 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 b-g of the RECEIVE CUE POINTS from the ST300 section.

Additional Functions . . .

16. SHOTBOX BANK AND SWITCH INDICATORS

The BANK key indicators show the currently selected bank.

The SWITCH key indicator shows the last selected or viewed Cue Point.

Only one BANK and SWITCH indicator are on at a time. Sometimes one BANK indicator will be on and all the SWITCH indicators will be off.

The BANK and SWITCH indicators that are currently on, show the location of the selected Cue Point **OR** the location of the last viewed Cue Point.

17. SHOTBOX CONTROL SWITCHES

Pressing [**PLAY**] puts the VTR into PLAY Segment mode.

Pressing [**STOP**] puts the VTR into STOP mode.

Pressing [**RECUE**] stops the VTR and cues back to the IN Point.

The CONTROL Switch indicators show the real-time status of the VTR.

18. SHOTBOX SWITCH MAPPING TO CUE POINT LOCATIONS

The SWITCHES on the SHOTBOX access the ST300's Cue Point locations as follows:

BANK 1, SWITCHES 1 → 48 access Cue Point locations 101 → 148.

BANK 2, SWITCHES 1 → 48 access Cue Point locations 201 → 248.

BANK 3, SWITCHES 1 → 48 access Cue Point locations 301 → 348.

BANK 4, SWITCHES 1 → 48 access Cue Point locations 401 → 448.

19. CUE POINT TO REGISTER MAPPING

- Do **Not** Use Register 0 on the production switcher
- Registers 1-50 of the production switcher correspond to Cue Points 101-150 on the ST300 (bank 1, switches 1-50 on the SHOTBOX).
- Registers 51-99 of the production switcher correspond to Cue Points 201-249 on the ST300 (bank 2, switch 1-49 on the SHOTBOX).

Reference . . .

20. 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.

MENU MODES	(Turning Wheel Clockwise)				
RECORD	<p>Press [MENU] to select the desired record mode: Lockout, Assemble, Crash(Full) or Insert.</p> <p><u>Only</u> in INSERT mode: Press the associated Softkey, located below the display, to toggle Video(V), Audio1(A1), Audio2(A2), Audio3(A3) on/off.</p>				
WIND MODE	<p>Press Softkey to select: HOLD (fast wind is maintained only while key is depressed) OR LATCH (fast wind is initiated and maintained with momentary key press).</p> <p>Select fast wind speed (3.9 to 23.7) by pressing Softkey below SPD.</p>				
SLOMO	<p>ST300 display shows:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>SLOMO with:</td> <td>WHEEL</td> </tr> <tr> <td>TBAR</td> <td>Speed Prset</td> </tr> </table> <p>Press Softkey [TBAR] (or [WHEEL]) to toggle between them. NOTE - The T-BAR has a fixed speed range of 0 → +200 with a detent at +100% play speed.</p> <p>For Wheel only: Press Softkey [SPEED] to select SLOMO speed ranges: Press Softkey to select: 0 → +200 OR -100 → +200.</p> <p>Press Softkey [BACK] to return to SLOMO MENU. Press [ESC] to exit MENU OR turn the Wheel to select another item.</p> <p>(Continued on next page)</p>	SLOMO with:	WHEEL	TBAR	Speed Prset
SLOMO with:	WHEEL				
TBAR	Speed Prset				

	<p>For Wheel only:</p> <p>Press Softkey [PRSET] to select the SLOMO Preset Speed Mode</p> <p>Press Softkey [UPDATE] when exiting SLOMO mode. The last used speed is saved in the Preset Speed register.</p> <p>Press Softkey [STATIC]. The Preset Speed register is NOT updated when exiting SLOMO mode. It is only changed by pressing [SHIFT] + [SLOMO] (PRESET SLOMO).</p>
ST300 SETUP	<div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <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 [YES] when asked “Are You Sure?”</p> <p>Press Softkey beneath SetDefault to set ST300 to default settings. Press Softkey [YES] when asked “Are You Sure?”</p>
DISPLAY SOFTWARE VERSION	The version number for the currently installed software is displayed.
DROP FRAME	Press Softkey to select DROP FRAME ON or OFF. Used in conjunction with Timecode Generator preset.
RECORD	Press Softkey to select single button or 2-button record. RECORD = [REC] Only OR [REC] + [PLAY].
FREEZE	Press Softkey to enable or disable FREEZE at Record Outpoint. Changing mode automatically clears FREEZE point.
PBIO ADDRESS	1 through 23.
SWITCHER TYPE	Grass Valley Group or Sony.
PARITY TYPE	ODD, EVEN or NONE (Select to match Switcher).
TRANSMIT CUELIST	Transmits Cuelist to another ST300 or to a PC.
RECEIVE CUELIST	Receives Cuelist from another ST300 or a PC.

21. FUNCTION TABLE

Function	Key Press	Description
EE On/Off	[EE]	Toggle EE mode on/off. Status indicator is on when EE is on.
ENTER TIME	[ENTER TIME]	To manually entered timecode numbers into the currently displayed Cue Point. Enter the desired timecode number using the numeric keypad. Press [ENTER] to save your entry OR [ESC] to exit without saving. To enter a GOTO location without altering the contents of the Cue Point. Enter the desired timecode number using the numeric keypad. Press [GOTO] to search to the entered time. Press [ESC] to exit without searching.
FREEZE ON LAST GOOD VIDEO	Active in SLO-MO only.	In SLO-MO mode, STILL frame the VTR when the current time code is within 6 frames of the last Record Out point (memorized automatically upon exiting Record mode). Enable, disable or clear FREEZE point from SETUP MENU.
GOTO CUE or ENTERED TIME	[GOTO]	Search the VTR to the contents of the currently displayed Cue Point. If ENTER TIME is active (LED is on), search the VTR to the entered time. To enter a GOTO location without altering the contents of the Cue Point - Press [ENTER TIME]. Enter the desired timecode number using the numeric keypad. Press [GOTO] to search to the entered time. Press [ESC] to exit without searching.
GANG	[SHIFT] + [VTR#1] [SHIFT] + [VTR#2] [SHIFT] + [VTR#3]	Select VTRs to gang together. The ganged VTRs LEDs will turn on. Press [ESC] to exit.
GOTO FREEZE POINT	[SHIFT] + [GOTO]	Search VTR to FREEZE point (last Record OUT point).
FFWD	[FFWD]	Press and HOLD to shuttle. Release key to stop. Set WIND Speed in MENU.
JOG	[JOG]	Select JOG mode and enable the Wheel.
LAST CUE	[LAST CUE]	Step to the previous Cue Point Location.
MARK CUE POINT	[MARK]	Save the current time in the currently displayed Cue Point. Per SETUP MENU, the Cue Point Location will advance to the next Cue Point location or remain the same.
NEXT CUE	[NEXT CUE]	Step to the next Cue Point Location.
PREROLL	[PREROLL]	Preroll the VTR to the contents of the currently displayed Cue Point.
PREROLL VALUE		Enter desired Preroll Value. Press [ENTER] to save entry OR press [ESC] to exit without saving entry.

Function	Key Press	Description
RECORD	[REC]	Places VTR in the Record mode selected by RECORD MODE in the SETUP MENU. One button record.
REWIND	[RWD]	Press and HOLD to shuttle. Release key to stop. Set WIND Speed in MENU.
SHUTTLE	[SHUTTLE]	Select SHUTTLE mode and enable the Wheel.
SLOMO	[SLOMO]	Press SLOMO to slo-mo the VTR. Turn the wheel or move the T-Bar to change the play speed. Press SLOMO to STILL frame OR press any transport key to exit.
SLO-MO SPEED PRESET	[SHIFT] + [SLOMO]	For WHEEL ONLY- Press [SHIFT] + [SLOMO] to preset the slo-mo speed. Turn 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.
TIME PRESET (Generator Preset)	SHIFT + [TIME MODE]	Press to enter Time Preset. Press [ENTER] to load Time Generator OR press [ESC] to exit without saving.

22. SPECIFICATIONS

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)		
Weight:	4 lbs.		
Rear Panel Connectors:	VTR1, VTR2, VTR3, VTR4	(All DB9F)	
	GPI	(DB15F)	
	Power	(DB9M)	
	Aux	(DB9F)	
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		

RS422 SERIAL CONNECTOR 9-Pin D-Type, Female (DB9F)

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 (DB9M)

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

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

Pin #	1	GPI 1 Out	9	GPI 1 In
	2	GPI 2 Out	10	GPI 2 In
	3	GPI 3 Out	11	GPI 3 In
	4	GPI 4 Out	12	GPI 4 In
	5	GPI 5 Out	13	GPI 5 In
	6	GPI 6 Out	14	GPI 6 In
	7	GPI 7 Out	15	GPI 7 In
	8	Ground		

ST320 (SHOTBOX)

Power: 90 VAC to 265 VAC adapter supplied with IEC connector

Size: (L" x W" x H") 10.5" x 7.25" x 1.75" (front) 3.0" (rear)

Weight: 4 lbs.

Rear Panel Connectors: Power (DB9M)
OUTPUT (DB9F)

Display: Easy to read 2-line, back-lit LCD display (User adjustable contrast)

RS422 SERIAL CONNECTOR

9-Pin D-Type, Female (DB9F)

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 (DB9M)

Pin #	1	+5v DC	6	No Connection
	2	+5v DC	7	Ground
	3	Ground	8	Ground
	4	No Connection	9	Ground
	5	No Connection		

23. 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 D
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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