Model 2400VS-DL-VA (&2400VS-DL-VA-T)

192 Video Segment Instant Access System

DoReMi Labs Protocol
Video Assist Option

USER MANUAL

Table of Contents

Manual Version ....…… 2.3   012904
Document No ....2400VS-DL-VA_User_Manual.doc

1. REVISION HISTORY

100703 Rev. 2.2   Company header information revised.

012904 Rev. 2.3   Reformatted
Updated Transmit Cue List and Receive Cue List function description.
Added DNF Controls Limited Warranty.

2. DESCRIPTION

NOW, Load and Play video segments on the *DoReMi* DDR.

The 2400VS-DL-VA System consists of an ST300 with Video Segment software and the Video Assist software option and an ST320 SHOTBOX.

TBAR or detented Wheel for Fast and Easy slomo-ing: 0-200% or −100% to + 200% of Play speed.

The Video Segment option for the ST300 in combination with a Video Server 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 Video Server.
All Cue Points are retained when power is off.

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.

Getting Started . . .

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, VTR 3 or VTR 4) 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) Select REMOTE mode on the VTR's front panel.

4) Check the SETUP MENU prior to using ST300 to confirm proper Record mode, SLO-MO speed range and other User settable modes.

Installation is complete.

CONNECTION DIAGRAM
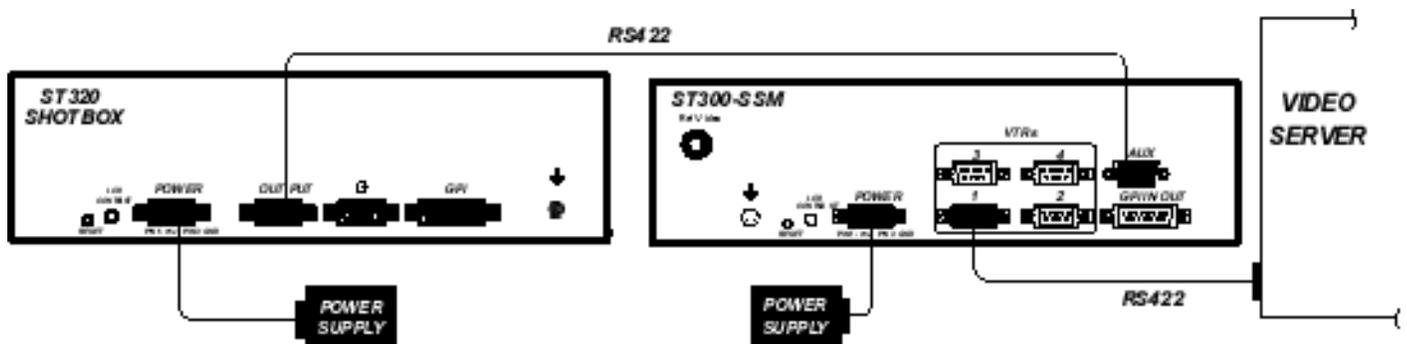
c.   LCD DISPLAY

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. *DOREMI* MENU

NOTE: Refer to the *DoReMi Labs* Manual for more information.

These Options for 2 Channel V1 only. Other models may have a different MENU.

Turn the wheel to move between menu options.

a.   Press Softkey [*CHG*] to change specific menu option.

        Available menu options:
        00   Control – remote/local
        01   Time mode- A Time (absolute time)
                        A Time as LTC
                     VITC Time
                      Time Code
        02   Sync from- Internal
                        Auto
                      Sync In
                      Input
        03   Chase- on/off
        04   Mount
        05   Input from – Composite/S-VHS
        06   Compress
        07   Initialize
        08   Format
        09   Drop Frame –Drop/No Drop
        10   Time Left

        If you press [*CHG*] in option 04,07,08, the second line of the display shows "Are you sure?" Press Softkey [*YES*] or [*NO*].

b.   Press [**ESC**] to exit the Menu Mode

5. *DOREMI* OPTION MENU

(**NOTE:** The 1 Channel V1 has only options 0-19)

a.   Turn the wheel to move between menu options.

b.   Press ++ or -- Softkeys to change specific menu option or MENU to enter the submenu if
        it exists for the specific menu option.

        Available menu options:
        00   Auto Play **(Not supported by DNF)**
        01   Disk Copy
                 Press MENU to toggle between options:
                            Source is: **(Not Supported by DNF)**
                            Full Disk   **(Not Supported by DNF)**
                            Segment #:   **(Not Supported by DNF)**
                            Target #1:   **(Not Supported by DNF)**
                            # Targets: **(Not Supported by DNF)**
        02   Edit Preset
                 Press MENU to toggle between options:
                            A1: (press ++/-- to toggle On/Off)
                            Insert: (press ++/-- to toggle On/Off)
                            Assemble: (press ++/-- to toggle On/Off)
                            Video: (press ++/-- to toggle On/Off)
                            TC: (press ++/-- to toggle On/Off)
                            A2: (press ++/-- to toggle On/Off)
        03   Set Video
                 Press MENU to toggle between options:
                            Delay: (press ++/-- to set 00-310 sec)
                            ChromHue: (press ++/-- to set –128-+127)
                            ChromSat: (press ++/-- to set –128-+127)
                            Lumacont: (press ++/-- to set –128-+127)
                            LumaBrit: (press ++/-- to set –128-+127)
                            PAL switch 0
                            Black (press ++/-- to toggle between 0.0/7.5 IRE)
                            HTRIG (press ++/-- to select desired value)
                            HTRIG (press ++/-- to toggle On/Off)
                            CH PH (press ++/-- to select desired value)
                            Pattern (press ++/-- to toggle On/Off)
            04   Save

                     Press Softkey [*CHG*] to save. The display will prompt
                     "Are you sure?" Press Softkey [*YES*] to save, [*NO*] – to not save
            05   Disc Access
                     Press ++/-- to toggle between Play & Record/Play Only
            06   Frame Mode
                     Press ++/-- to toggle between On/Off/Play Only
            07   Step Rec
                     Press ++/-- to toggle between Disabled/Enabled
            08   Clip menu
                     Press ++/-- to scroll the list of available clips
            09   TC burn-in
                     Press MENU to toggle between
                     Color (press ++/-- to selelct Off
                                                White/Black
                                                White/Bkgd
                                                Black/White
                                                Black/Bkgd
                     Position (press ++/-- to select Bottom_Right
                                                Bottom_Center

<div align="center">
Bottom_left
Top_Left
Top_Center
Top_Right
</div>

10   Audio In

         Press ++/-- to toggle between Analog/Digital

11   SCSI Speed

         Press MENU to toggle between
         Clock(press ++/-- to select 10/20 MHz)
         Width (press ++/-- to select 8/16 bit)

12   V1 Type

         Press ++/-- to toggle between Player Only / Rec/Player

13   Video Type

         Press ++/-- to toggle between NTSC/PAL

14   Nb pixels

         Press ++/-- to toggle between Full/Limited

15   Decimation

         Press ++/-- to toggle between On/Off

16   Nb Fields

         Press ++/-- to toggle between One/Two

17   SCSI ID

         Press ++/-- to select 00-07

18   Clks/frame
19   Emulate

         Press ++/-- to toggle between V1/BVW-75

20   # Audio Ch

         Press ++/-- to toggle between 0/2

21   Jog On   **(Not Supported by DNF)**

22   Loop mode

         Press ++/-- to toggle between On/Off

23   Edit Time

         Press MENU to select
         Edit IN (press ++/-- to select 04-10)
         Edit Out (press ++/-- to select 04-10)

24   Stripe TC

         Press Softkey [*CHG*] to save. The display will prompt
         "Are you sure?" Press Softkey [*YES*] to stripe, [*NO*] – to not stripe

25   Odd Fields

         Press ++/-- to select Under 00%- under 100%

26   Stop Chase

         Press ++/-- to select Nb frames 00-10

27   Fast mode

         Press ++/-- to toggle between Normal/Enhanced

28   Jog speed

         Press ++/-- to toggle between No Limit/Limit to 100%

29   Stop Mode

         Press ++/-- to toggle between Still Mode/ EE Mode

30   Version Number

         Press MENU to see information about version number, serial number,
         RAM size etc.

c.   Press [**ESC**] to exit the Menu Mode

6.   THE ST300

NOTE: All the Cue Points are stored on the V1.

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 & search to it.
       OR

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

d.   DELETE IN/OUT POINT

To Delete an IN (OUT) Point, press [**DEL**] + [**IN**] ([**OUT**]).

e.   LEARN A SEGMENT INTO A CUE POINT

1)   Select VTR [**1**], [**2**], [**3**] or [**4**] 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**] + [**MARK**] 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 [**MARK**] to complete the LEARN.
OR

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

The ST300 will: LEARN (save) the VTR Number (1,2,3,4), the current gang configuration and the current IN time into the selected Cue Point.

NOTE: If you already have segments defined on the V1, the LEARN command from the ST300 will overwrite them.

f.   VIEW THE CONTENTS OF A CUE POINT

1)   Press [**SHIFT**] + [**NEXT CUE**].
OR

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

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

2)   Release the keys to exit the view mode.

g.   PLAY A SEGMENT ON THE ST300

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

Enter the desired cue number on the numeric keypad.

2)   Press [**GOTO**].

3)   Press and hold [**SHIFT**], then press and release [**PLAY**].

h.   LOOP PLAY A SEGMENT

Press [**LOOP PLAY**] to continuously loop playback the segment.

7. RECALL

a. RECALL ON THE ST300

1) 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.

2) 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.

b. RECALL ON THE SHOTBOX

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

8. THE SHOTBOX

a. LEARN ON THE SHOTBOX

NOTE: All the Cue Points are stored in the V1.

1) Press [**LEARN**]. The LEARN indicator will turn on.

    The display will show the prompt:

    > Select Bank & Switch
    > STOP- Abort

2) Select the desired BANK and ShotKey.

3) Press [**STOP**] to exit at any time.

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

b.   VIEW CONTENTS OF CUE POINTS

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 and 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.

1)   Press and hold [**VIEW**].

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

3)   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:
```
1  IN:    00:00:01:00
   OUT:   00:00:02:00
```

On VTR 1 IN is 00:00:01:00
On VTR 1 OUT is 00:00:02:00

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

4)   Press the same switch 4 times to see all 4 VTRs' Cue Point assignments.

5)   Release [**VIEW**] at anytime when done.

c.   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.

d.   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.

Pressing [**LOOP**] puts the VTR into Loop Segment Mode.

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

e. 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.

9. 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 cuelist."

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.

Reference . . .

10.   SETUP MENU

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

The display will show "ST300 Setup Menu".

The second line on the display shows "YES ←→".

Press [←] or [→] to select DOREMI Menu or DOREMI Options Menu.

Press Softkey [*YES*] to select the SETUP MENU.

For the ST300 MENU:

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	Press [**MENU**] to select the desired record mode: Lockout, Assemble, Crash (Full) or Insert. Only in INSERT mode: Press the associated Softkey, located below the display, to toggle Video(V), Audio1(A1), Audio2(A2), Audio3(A3), Audio4(A4) on/off.
WIND MODE	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). Select fast wind speed (3.9 to 23.7) by pressing Softkey below SPD.
SLOMO	ST300 display shows: SLOMO with: WHEEL TBAR Speed Prset 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. **For Wheel only:** Press Softkey [*SPEED*] to select SLOMO speed ranges: Press Softkey to select: 0 → +200 **OR** -100 → +200. Press Softkey [*BACK*] to return to SLOMO MENU. Press [**ESC**] to exit MENU **OR** turn the Wheel to select another item. (Continued on next page)

	For Wheel <u>only:</u> Press Softkey [***PRSET***] to select the SLOMO Preset Speed Mode. Press Softkey [***UPDATE***]. When exiting SLOMO mode, the last used speed is saved in the Preset Speed register. Press Softkey [***STATIC***]. The Preset Speed register is NOT updated when exiting SLOMO mode. It is only changed by [**SHIFT**] + [**SLOMO**] (PRESET SLOMO).
ST300 SETUP	Press Softkey beneath ClearCues to clear all Cue Points to 00:00:00:00. Press Softkey [***YES***] when asked "Are You Sure?" Press Softkey beneath SetDefault to set ST300 to default settings. Press Softkey [***YES***] when asked "Are You Sure?"
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**].
FRAMES PER	Select number of frames per second for Video Assist. Normal play = 24 or 30 fps. Default is 24.
TRANSMIT CUE POINT LIST	Allows the user to transfer the cuelist to another ST300 or to a PC.
RECEIVE CUE POINT LIST	Allows the user to receive the cuelist from another ST300 or a PC.

11. 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.
GOTO IN	[**RECUE**]	Search the VTR to the current IN Point.
GOTO ENTERED TIME	[**GOTO**]	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**] [**SHIFT**] + [**VTR#4**]	Select VTRs to gang together. The ganged VTR's LEDs will turn on. Press [**ESC**] to exit.
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.
NEXT CUE	[**NEXT CUE**]	Step to the next Cue Point Location.
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.
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.

Function	Key Press	Description
LOOP PLAY	[**LOOP PLAY**]	Video segment plays from first frame of video to last frame, then plays again from first frame. Function is continuous.
PLAY SEGMENT	[**SHIFT**] + [**PLAY**]	Plays Video Segment from In Point to OUT Point.
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.
Video Assist Speed Select	**SPEED SELECT**	Turn the wheel to select desired speed (0001-2500 frames per second).
Video Assist FFWD	[**SHIFT**] + [**FFWD**]	Plays the video forward at the pre-selected speed. Turn the wheel to change the speed. Press any transport key to exit.
Video Assist Rewind	[**SHIFT**] + [**REWIND**]	Plays the video backward at the pre-selected speed. Turn the wheel to change the speed. Press any transport key to exit.

12. 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	(DBF15F)
	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, backlit 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		

13. KEY LAYOUTS

ST300 KEY CONFIGURATION — 2400VS-DL

ST300 VTR / DDR Controller
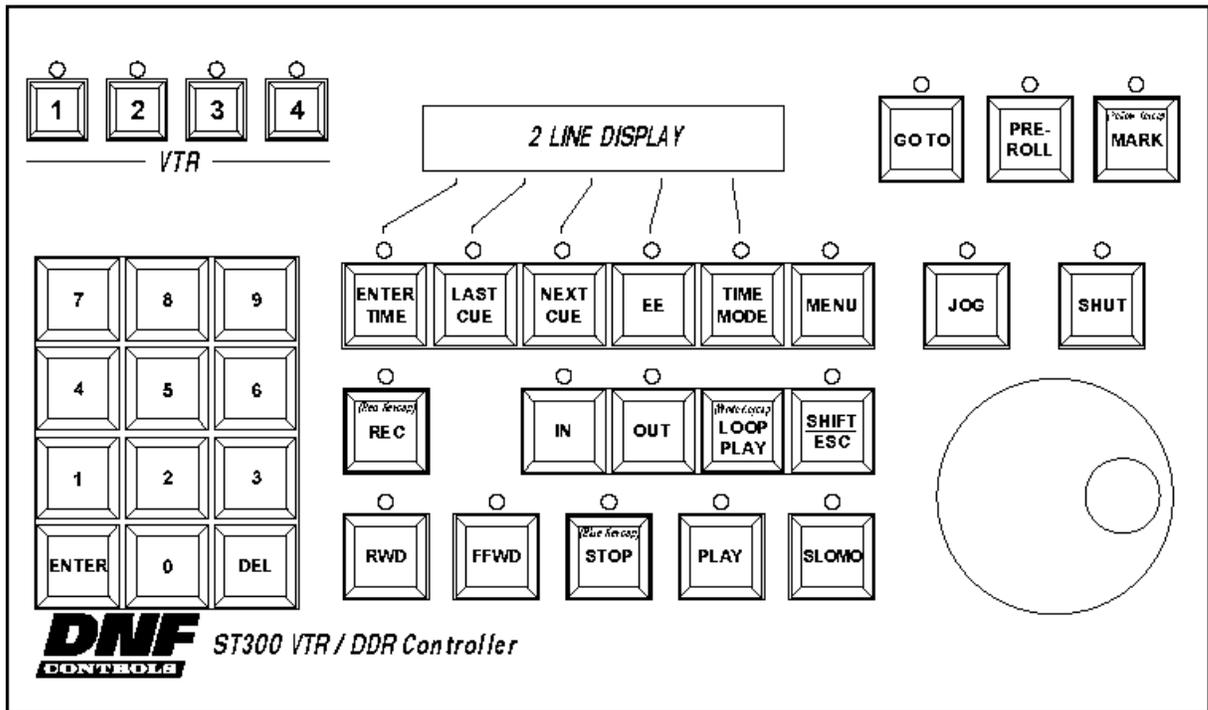
ST320 SHOTBOX KEY CONFIGURATION — STANDARD with LEARN

ST320 SHOTBOX
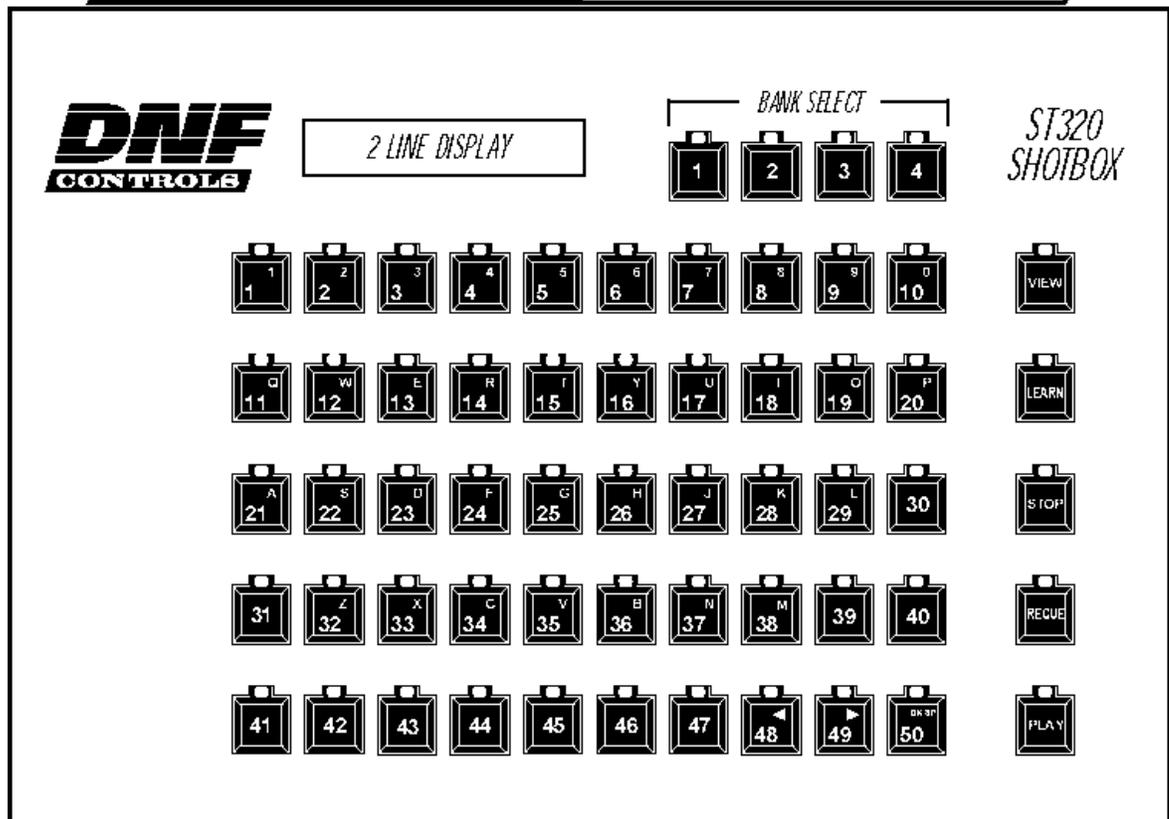
14.   DNF CONTROLS LIMITED WARRANTY

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.

<div align="center"># # #</div>