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Model No. 4040CL-L (& 4040CL-L-T)

300 Clip Fast Access System

Louth Protocol

User Manual

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I. REVISION HISTORY

121103	1.0	Original document.
073004	1.1	Revised GPI IN/OUT CONNECTOR
093004	1.2	Added Loop, Capture and BVW sections. Updated Setup Menu. Updated Key Layout.
031406	1.21	Minor corrections.
052606	1.22	Updated dimensions for T-bar and Non T-bar housings. Added screen shots.

Getting Started

II. SYSTEM DESCRIPTION

The 4040CL system includes DNF's most robust controller, the ST400, with Cliplist software. The ST400 controls up to 6 video channels individually or ganged. It features full transport functionality.

The 4040CL provides fast access to fill clip and key clip combinations with the press of one key.

The 4040CL-L supports Louth (VDCP) protocol and requires that the Video Server be controllable under VDCP Protocol.

The 4040CL provides fast access to existing video clips stored in the Grass Valley Group PROFILE, the Leitch VR, and other Video Servers supporting VDCP Protocol.

The 4040CL-L also allows VTR control on select channels.

Definitions

Throughout this document, DDR, VDR & Video Server will be referred to collectively as "Video Server."

Words surrounded by brackets, for example, **[ENTER]**, are keys on the ST400.

[XXX] + [XXX] means hold the two keys down simultaneously.

The 6 keys directly below the display are referred to as "Softkeys." Their function changes as indicated on the last line of the display.

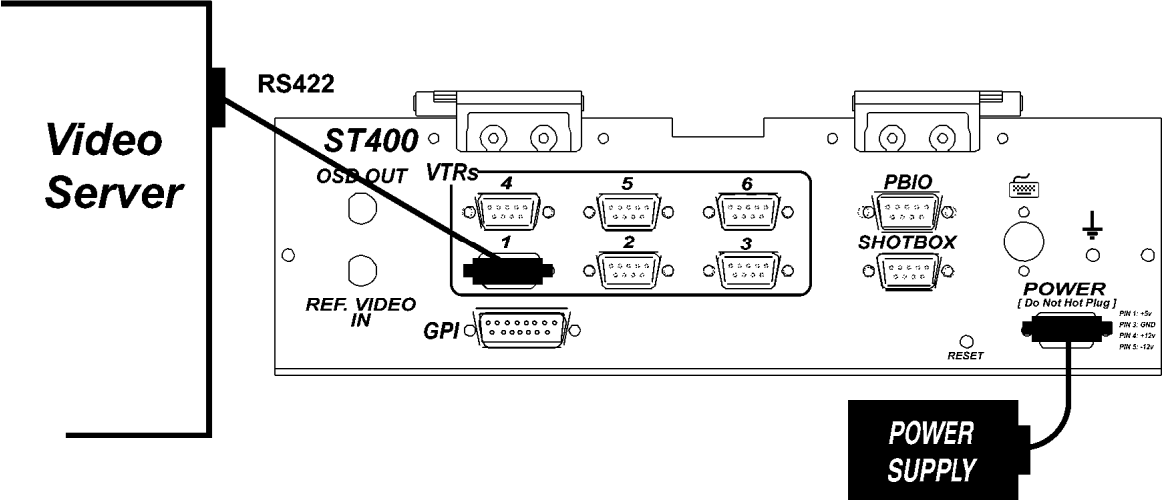
III. SYSTEM INSTALLATION

A. ST400, VTR/DDR Controller

1. Plug one end of a 9-conductor, RS422 serial cable into the VTR1 (VTR2, VTR3, VTR4, VTR5 or VTR6 connector on the rear of the ST400. Plug the other end of the cable into the 9-pin REMOTE connector on the Video Server.
2. Connect the supplied POWER SUPPLY, APX#4108, into the POWER connector on the rear of the ST400. Plug the Power Supply into an outlet, 90 VAC - 240 VAC.
3. Plug in a Black Burst Reference Video Source into REF. VIDEO IN connector on the back of the ST400 using a BNC cable.
4. Check SETUP MENU prior to using the ST400 to confirm proper Record mode and other User settable modes.

Installation is complete.

B. Connection Diagram



IV. VIDEO SERVER SETUP

- A. Select Louth Broadcast communications protocol on the VIDEO SERVER to be controlled.
- B. Assign a serial port on the VIDEO SERVER through which the ST400 will control it.

NOTES: In Louth mode, the VIDEO SERVER only allows Full Record. INSERT and ASSEMBLE record modes are disabled.

Setup is complete

V. LOAD A CLIP

- A. Select a VTR by pressing VTR **[1]**, **[2]**, **[3]**, **[4]**, **[5]** or **[6]**.
- 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.

OR

Press **[ENTER]** to start manually entering a CLIP ID using the ST400 numeric keypad, or PC keyboard.

- D. Press **[LOAD]** to load the entered CLIP ID for playout.
- E. Repeat steps a. thru d. to load clips on desired VTRs.
- F. Set the Gang Mode, if required. See "GANG SETUP" in FUNCTION TABLE section.

VI. LEARN A CLIP OR CLIP COMBINATION

- A. Press VTR **[1]**, **[2]**, **[3]**, **[4]** **[5]** or **[6]**.
- B. Load a clip on the selected channel. See section LOAD A CLIP.
- C. Use the transport functions to view the clip.

Press **[IN]** to mark an IN point. The IN LED will blink. On recall, the clip will cue to the IN time, not the beginning of the clip and the LED will stay on steady.

Optional- Press **[OUT]** to mark an OUT point. The OUT LED will blink. On recall, the clip will play to the OUT point then stop.

To delete an IN or OUT point, press and hold **[DEL]**, then press **[IN]** or **[OUT]**. The IN/OUT LED will turn off.

If no IN point is marked, the current location of the clip will be learned as the IN point.

- D. For GANGs, repeat steps a., b., or c. for each channel. Then press the **{ GANG }** softkey.

Press VTR **[1]**, **[2]**, **[3]**, **[4]**, **[5]** or **[6]** to add the VTR to the GANG. The VTR LED will turn on.

Press the VTR key again to remove it from the gang. The VTR LED will turn off.

Press **[ESC]** to exit GANG mode. The LED of all GANGed VTRs will turn on.

- E. Select the desired Cue Point by pressing **[NEXT CUE]**, **[LAST CUE]** or by manually entering the Cue Point using the numeric keypad, followed by **[ENTER]**.

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

- F. Press **[SHIFT]** + **[LEARN]** to initiate the Learn.

The display will show: "Select VTRs to learn: -----"

- G. Select the VTRs to be learned by pressing VTR keys **[1]**, **[2]**, **[3]**, **[4]**, **[5]** and/or **[6]**.

- H. Press **[LEARN]** to complete the Learn process.

NOTE: Learn will overwrite the previous contents of the Cue Point.

Press **[ESC]** at anytime to escape without LEARNING.

VII. RECALL A CLIP OR CLIP COMBINATION

- A. 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 of the display.

- B. Press **[LOAD]** on the ST400.

The ST400 will automatically load the learned clips on the learned VTRs. Cue the clips to the learned IN time.

VIII. RECUE CLIP

- A. Press **[RECUE]**. If an IN Point is marked (the IN indicator is on), the clip will RECUE to the IN Point.
- B. Press **[CUE OUT]** to cue to the marked OUT point.

IX. GOTO TIME

- A. Press **[SHIFT] + [RECUE]**.
- B. Enter the TIMECODE to search to.
- C. Press **[ENTER]** or **[RECUE]** to search to entered Timecode.

X. CLEAR CUE POINTS

- A. Select the cue point to be cleared using **[NEXT CUE]**, **[LAST CUE]**, or manually entering the cue point number.
- B. Press **[SHIFT] + [LEARN]**.
The **[CLEAR]** softkey will be displayed on the bottom of the display.
- C. Press the **[CLEAR]** softkey to clear the cue point. The cue point will be cleared and the display will return to the normal screen.
OR

Press **[ESC]** to escape without clearing.

XI. PLAY CLIP SEGMENT

- A. Set an IN Point and OUT Point.
Jog/Shuttle to the desired IN point. Press **[IN]**. The IN LED will blink.
Jog/Shuttle to the desired OUT point. Press **[OUT]**. The OUT LED will blink.

OR

Press **[SHIFT] + [IN]**. Manually enter the IN time on the numeric keypad. Press **[ENTER]**.

Press **[SHIFT] + [OUT]**. Manually enter the OUT time on the numeric keypad. Press **[ENTER]**.

- B. Learn the segment into a cuepoint.
- C. Recall a cuepoint.
The IN and OUT LEDs turn on steady.
- D. Press **[PLAY]**. The clip will play the OUT point, then stop.

NOTE: If IN & OUT LEDs blink, the clip will not stop at the OUT point. It will only stop at the OUT point of LEDs are on steady.

XII. LOOP CLIP (SEGMENT)

- A. Set an IN Point and OUT Point (optional).
Jog/Shuttle to the desired IN point. Press **[IN]**. The IN LED will blink.
Jog/Shuttle to the desired OUT point. Press **[OUT]**. The OUT LED will blink.

OR

Press **[SHIFT] + [IN]**. Manually enter the IN time on the numeric keypad. Press **[ENTER]**.

Press **[SHIFT] + [OUT]**. Manually enter the OUT time on the numeric keypad. Press **[ENTER]**.

- B. Learn the segment into a cuepoint.
- C. Recall a cuepoint.
The IN and OUT LEDs turn on steady.
- D. Press **[LOOP ENABLE]**. The clip will loop between IN and OUT (if set). If no IN and OUT are set, the complete clip is looped.

XIII. BVW PROTOCOL

- A. Press **[MENU]**.
- B. Turn the wheel until "Protocol" is highlighted.
- C. Select **[BVW]** protocol if you wish to control tape machines with the selected channel.
- D. All the functions described in the manual are available in BVW protocol except:
 - Cliplist
 - Clip Create
 - Loop
 - Play Segment
 - Subclip

When a Learn is performed in BVW protocol, only the IN, OUT and gang information is stored.

NOTE: BVW and Louth channels cannot be ganged together.

Advanced Features

XIV. CREATE A CLIP

- A. In the Setup Menu, configure Louth port as Input Port.
- B. Press **[CLIP LIST]**.
- C. Press **[CREATE]**. The display will show the default CLIP ID.
- D. Press **[LOAD]** to accept the default CLIP ID.

OR

Manually enter an ID with a maximum of 32 characters from the ST400 numeric keypad.

OR

Manually enter an ID with a maximum of 32 characters from a PC keyboard.

- E. Press **[LOAD]**. The clip will be created and loaded.

If the entered 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.

XV. REALIGN GANGED CHANNELS

When the channels are Jogged/Shuttled/Slomoed in gang, they may drift apart. To bring the channels back to their initial offsets, press **[SHIFT] + [STOP]**.

XVI. CREATE A SUBCLIP (FOR LOUTH ONLY)

- A. Load a clip as described in Section V, LOAD A CLIP.
- B. Mark (enter) an IN and OUT point.
- C. Press **[SHIFT] + [CLIP LIST]**.
- D. Enter a new clip name using a PC keyboard or a numeric keypad.
- E. Press **[ENTER]**.
- F. The new clip is created. The new clip has entered name. It's SOM is the IN point and EOM is the OUT point.

XVII. CAPTURE

- A. Select BVW protocol to control the source channel (see SETUP MENU).
- B. Select LOUTH protocol to control the destination channel (see SETUP MENU).
- C. Mark (Enter) an IN and OUT point on the source channel.
- D. Enter a destination channel (see SETUP MENU).
- E. Enter Preroll Time (see SETUP MENU).
- F. Enter Record Delay (see SETUP MENU).
- G. Select a source channel (press a corresponding **[VTR]** key).
- H. Press **[SHIFT] + [RECORD]**.
- I. Enter the new clip name using a PC keyboard or a numeric keypad.
- J. Press **[ENTER]**.
The VTR gets prerolled to the IN point. At the IN point the recorder starts recording. At the OUT point the recorder stops. The new clip with the specified name is created.

Reference

XVIII. SETUP MENU

Press **[MENU]**. The MENU indicator will turn on.
The display will show the following parameters with their current settings.

Turn the wheel to select a menu option.
Press the **{CHANGE}** softkey to modify the current setting.

Press the **{EXIT}** softkey to exit the Setup Menu.

PARAMETER	DESCRIPTION
LOUTH PORT	Enter the controlled channel's Louth port number (1 - 9) on the numeric keypad. Then press the {INPUT} or {OUTPUT} softkey. An INPUT is indicated by '-' before the port number. To CREATE (RECORD) clips, an INPUT channel must be selected. To playout CLIPS, an OUTPUT channel must be selected. Enter '0', to turn off the port.
PROTOCOL	Select {LOUTH} if you're controlling a video server. Select {BVW} to control a VTR.
STANDARD	{NTSC} or {PAL}
WIND MODE	{HOLD} (Fast wind is maintained only while key is depressed.) OR {LATCH} (Fast wind is initiated and maintained with momentary key press.) {SPEED} Press the softkey to change the speed setting (3.9, 6.0, 8.1, 10.0, 23.7).
EXTENDED IDs	{ON} – Allow up to 32-character CLIP IDs. {OFF} – Allow up to 8-character CLIP IDs.
RECORD MODE	Press a softkey to select the desired record mode: Lockout or Crash.

PARAMETER	DESCRIPTION
SLOMO	<p>Press the {TBAR} (or {WHEEL}) softkey to select the T-bar or wheel for slomo.</p> <p>For T-bar: The T-bar has a speed range of 0 → 2x with a detent at 1x play speed OR a range of 0 → 1x (detent at 1x play speed).</p> <p>Press {SPD-RNG} softkey to toggle between SLOMO speed ranges: 0 → 1x OR 0 → 2x.</p> <p>Press {BACK} softkey to return to SLOMO MENU.</p> <p>Press [ESC] to exit OR turn the Wheel to select another item.</p> <p>For Wheel: Press the {PRSET} softkey to toggle between UPDATE and STATIC modes.</p> <p>UPDATE: When exiting SLOMO mode, the last used speed is saved in the Preset Speed register.</p> <p>STATIC: The Preset Speed register is NOT updated when exiting SLOMO mode. It is only changed by [SHIFT] + [SLOMO] (PRESET SLOMO).</p> <p>Press {SPD-RNG} softkey to toggle between SLOMO speed ranges: 0 → 2x OR -1 → 2x.</p>
RECALL MODE	<p>Press {NORMAL} or {REDIR} (redirect).</p> <p>NORMAL- The cue point will load on the learned VTR.</p> <p>REDIR- When one and only one clip is learned into a Cue Point, the Clip will be REDIRECTED to load on the currently selected VTR.</p>
GANG MODE	<p>{PERM} Permanent Gang – The GANG can be created and undone only with the {GANG} softkey.</p> <p>{TEMP} Temporary Gang – The Gang is created by pressing {GANG} softkey, then selecting the VTRs to gang/ungang. Quickly undo the GANG by pressing any VTR key.</p>
PLAY PREROLL	<p>Enter Play Preroll – the time it takes the server to start playout. Used for LOOP function.</p>

PARAMETER	DESCRIPTION
RECORD PREROLL	Enter Record Preroll – the time it takes the server to start Record. Used for capture.
PREROLL	Enter the Preroll time for the source VTR in Capture.
DESTINATION CHANNEL	Select a Destination channel for capture. Must be a Louth channel.
SERVICE	<p><i>{DEFAULTS} {CLEANUP} {BACK}</i></p> <p>DEFAULTS Set ST400 to factory defaults. Follow the prompts on the display. Press [YES] to continue or press [NO] to exit without changing ST400.</p> <p>CLEANUP Clears all cue points in all banks. Follow the prompts on the display.</p> <p>BACK Return to prior menu item.</p>

XIX. FUNCTION TABLE

Function	Key Press	Description
CUE TO OUT POINT	[CUE OUT]	If OUT point is marked, cue to the OUT point.
FFWD	[FFWD]	Press and hold to FFWD. Release key to stop. Set WIND SPEED in MENU.
GO TO ENTERED TIME	[SHIFT] + [RECUE]	To search, manually enter the desired time on the ST400's numeric keypad. Press [ENTER] or [RECUE] .
GANG SETUP	[GANG]	<p>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.</p> <p>Upon exiting, all members of the gang will have their VTR LEDs turned on. The flashing LED shows which VTR is currently selected.</p>
JOG	[JOG]	Select JOG mode and enable Wheel.
LAST CUE	[LAST]	Step to the previous Cue Point Location.
NEXT CUE	[NEXT]	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]	<p>Press [SLOMO] to slo-mo the VTR. Turn the Wheel (or move the T-bar, if available) to change the play speed.</p> <p>Press [SLOMO] to STILL frame OR press any transport key to exit SLOMO.</p>
STOP	[STOP]	Press to stop the channel.
TIME MODE SELECT	[TIME MODE]	Press to toggle between Timecode (TC), VITC (VT) or Tape Timer (TM) display modes on a VTR and between Remaining Time (RT) and Elapsed Time (ET) on a Video Server.

Function	Key Press	Description
PLAY	[PLAY]	If an OUT point is marked, play to the OUT point and stop. If no OUT point is marked, play normally.
RECUE	[RECUE]	If the IN point is marked, cue to the IN point
REALIGN GANGED CHANNELS	[SHIFT] + [STOP]	Search ganged channels to the appropriate time to resynchronize them.

XX. SPECIFICATIONS

Power:	90 VAC to 265 VAC adapter supplied with IEC connector APX Model #AP4108 +5v @ 4A, +12v @ 1.0A, -12V @ 0.6A	
Size:		
Non-Tbar	(H x W x D) 1 3/4 (front) x 3 3/8 (rear) x 11 3/8 x 6 1/2 (8 5/8 high to top of display)	
T-bar	(H x W x D) 1 3/4 (front) x 3 3/8 (rear) x 13 3/4 x 6 1/2 (8 5/8" high to top of display)	
Weight:	10 lbs.	
Rear Panel Connectors:	VTR1, 2, 3, 4, 5, 6, 7, 8 GPI Power Keyboard Ref. Video In Ground	(All DB9F) (DBF25F) (DB9M) (6-pin mini DIN) (BNC) Threaded stud
Display:	Easy to read, back-lit LCD display	
Jog/Shuttle Wheel:	With mechanical detents	

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, Female (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
26-Pin D-Type, Female (DB26F)**

Pin #	Function	Pin #	Function
1	No Connection	14	GPI #5 Last Cue
2	No Connection	15	GPI #6 Recall
3	No Connection	16	No Connection
4	No Connection	17	No Connection
5	No Connection	18	Ground
6	No Connection	19	+5V
7	No Connection	20	+5V
8	No Connection	21	No Connection
9	Ground	22	No Connection
10	GPI #1 Play	23	No Connection
11	GPI #2 Stop	24	No Connection
12	GPI #3 Recue	25	No Connection
13	GPI #4 Next Cue	26	Ground

XXI. SCREEN SHOTS

4040CL & 2044CL Main Screen

(Not to scale)

TM 00:00:00:00	VTR1
PLAY MODE: NORMAL (REC MODE: LOCKOUT)	
LOADED:	
CLIP:	
IN: --:--:--:--	DUR: --:--:--:--
OUT: --:--:--:--	SPEED: +0.00
Q000	
Clip: CLIPNAME	
IN: 00:00:00:00	DUR: 00:00:00:00
OUT: 00:00:00:00	
VTRS: 1 3 5	
CUE-OUT GANG	

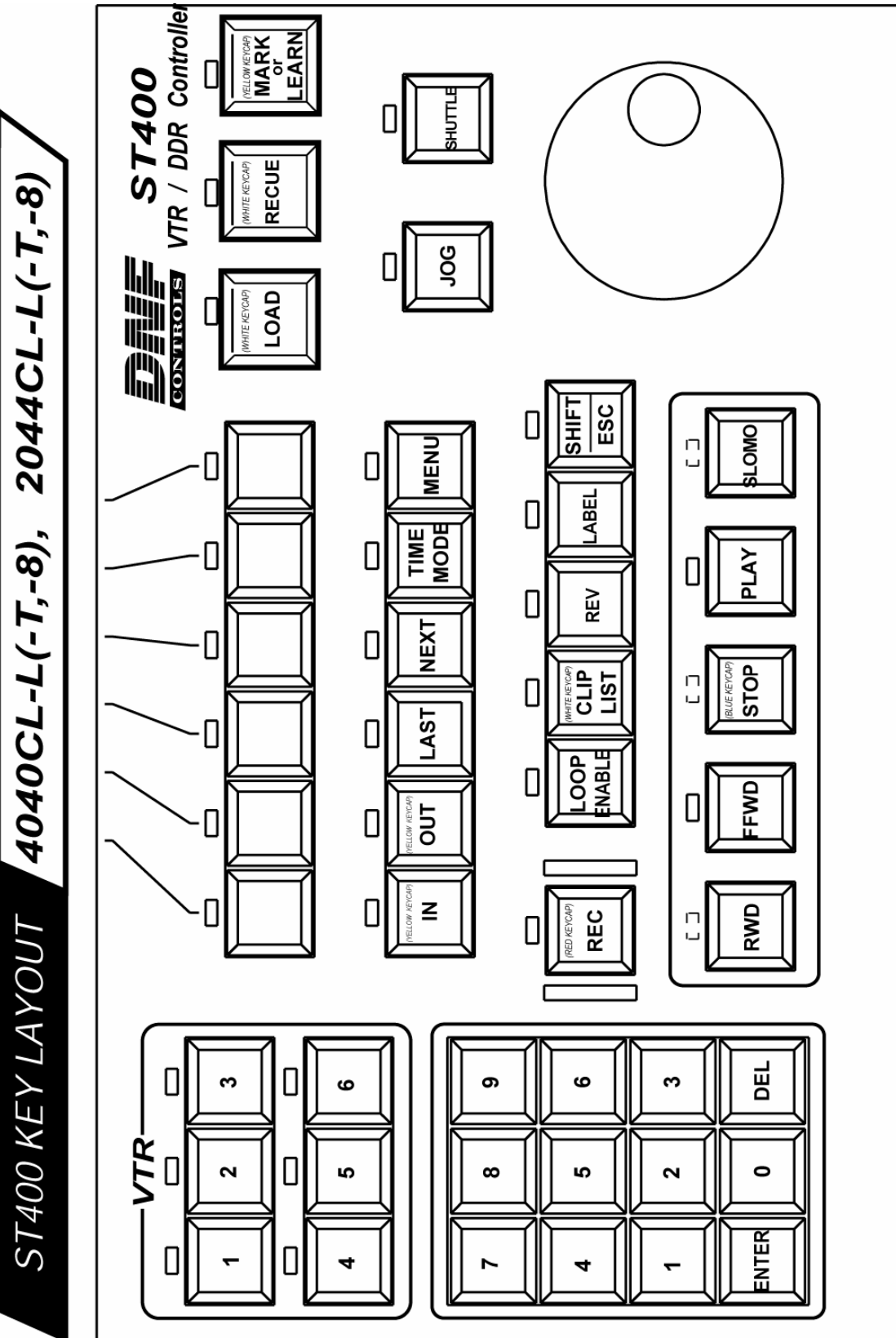
4040CL & 2044CL GANG Screen
(Not to scale)

TM 00:00:00:00	VTR1
PLAY MODE: NORMAL (REC MODE: LOCKOUT)	
LOADED:	
CLIP:	
IN: --:--:--:--	DUR: --:--:--:--
OUT: --:--:--:--	SPEED: +0.00
Select VTRs to gang: 1 - 3 - 5 -	
Q000	
Clip: CLIPNAME	
IN: 00:00:00:00	DUR: 00:00:00:00
OUT: 00:00:00:00	
VTRS: 1 3 5	
CUE-OUT GANG	

4040CL & 2044CL Clip List Screen
(Not to scale)

TM 00:00:00:00	VTR1
PLAY MODE: NORMAL (REC MODE: LOCKOUT)	
LOADED:	
CLIP:	
IN: --:--:--:-- DUR: --:--:--:--	
<div><div>▶▶▶</div><div>CLIP0001 CLIP0002 CLIP0003 CLIP0004 CLIP0005 CLIP0006 CLIP0007 CLIP0008 CLIP0009 CLIP0010</div></div>	
Turn Wheel to view clips, LOAD to Load. Press [CREATE] to Create a new clip. Press ENTER to manually enter clip ID.	
CREATE	ESC

XXII. KEY LAYOUT



XXIII. 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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