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MODEL NO. 4040CL 300 CLIP INSTANT ACCESS SYSTEM

AMP Protocol (A)
LOUTH Protocol (L)
ODETICS Protocol (O)
NEXIO Protocol (NX)

(-A, -L, -O, -NX, -7, -8, -T, -P)

User Manual

Rev. 1.01

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REVISION HISTORY

051808	1.00	Original document.
042710	1.01	Updated Louth Port settings.

Manual Version 1.06 051908
Document ID 4040CL_(-A, -L, -O, -NX, -7, -8, -T, -P)_User_Manual.doc

NOTES:

NOTES:

GETTING STARTED . . .

1. SYSTEM DESCRIPTION

The 4040CL system includes DNF's most robust controller, the ST400, with the industry's premiere Shotbox, the ST400.

The ST400 controls up to 8 video channels individually or ganged. It features full transport functionality (Channels greater than six are optional).

The 4040CL-AMP supports AMP protocol and requires that the Video Server be controllable under AMP protocol.

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

The 4040CL-O supports ODETICS Broadcast protocol and requires that the Video Server be controllable under ODETICS Broadcast Protocol.

The 4040CL-NX supports Leitch NEXIO protocol and requires that the Video Server be controllable under Leitch NEXIO protocol.

DEFINITIONS

- ❑ Throughout this document, DDR, VDR & Video Server will be referred to collectively as "Video Server".
- ❑ The ST400 CONTROLLER will be referred to as ST400.
- ❑ 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 "Softkey". Their function changes as indicated on the last line of the display; i.e. **{GANG}**.

2. SYSTEM INSTALLATION

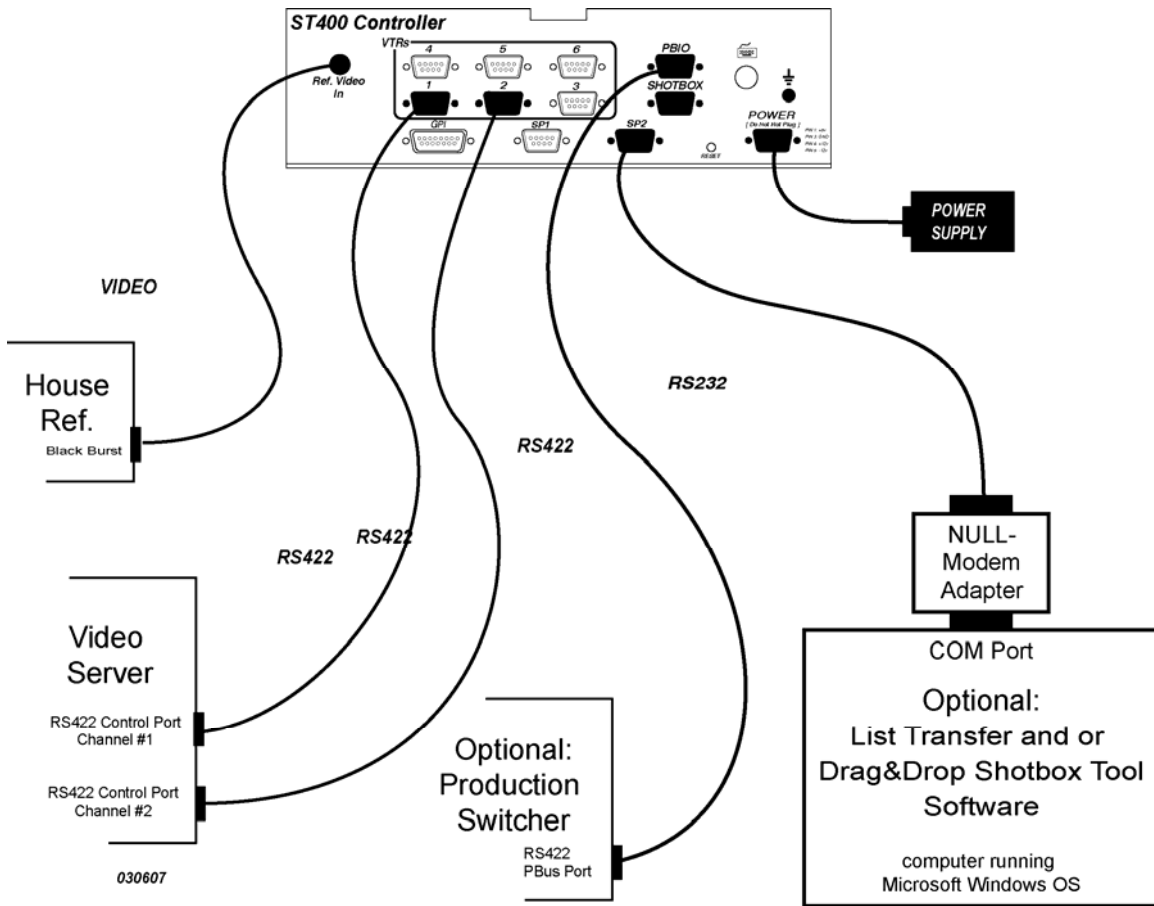
SEE CONNECTION DIAGRAM.

- 1) Plug one end of a 9-conductor, RS422 serial cable into the VTR1, 2, 3, 4, 5, or 6 (7 or 8 on -7 or -8 version) 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) Attach Video Ref. cable (from House Ref.) to Ref. Video In on the rear of the ST400 to utilize the capture function or the gang function.
- 3) 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.
- 4) Check SETUP MENU prior to using the ST400 to confirm proper Record mode and other User settable modes.

Installation is complete.

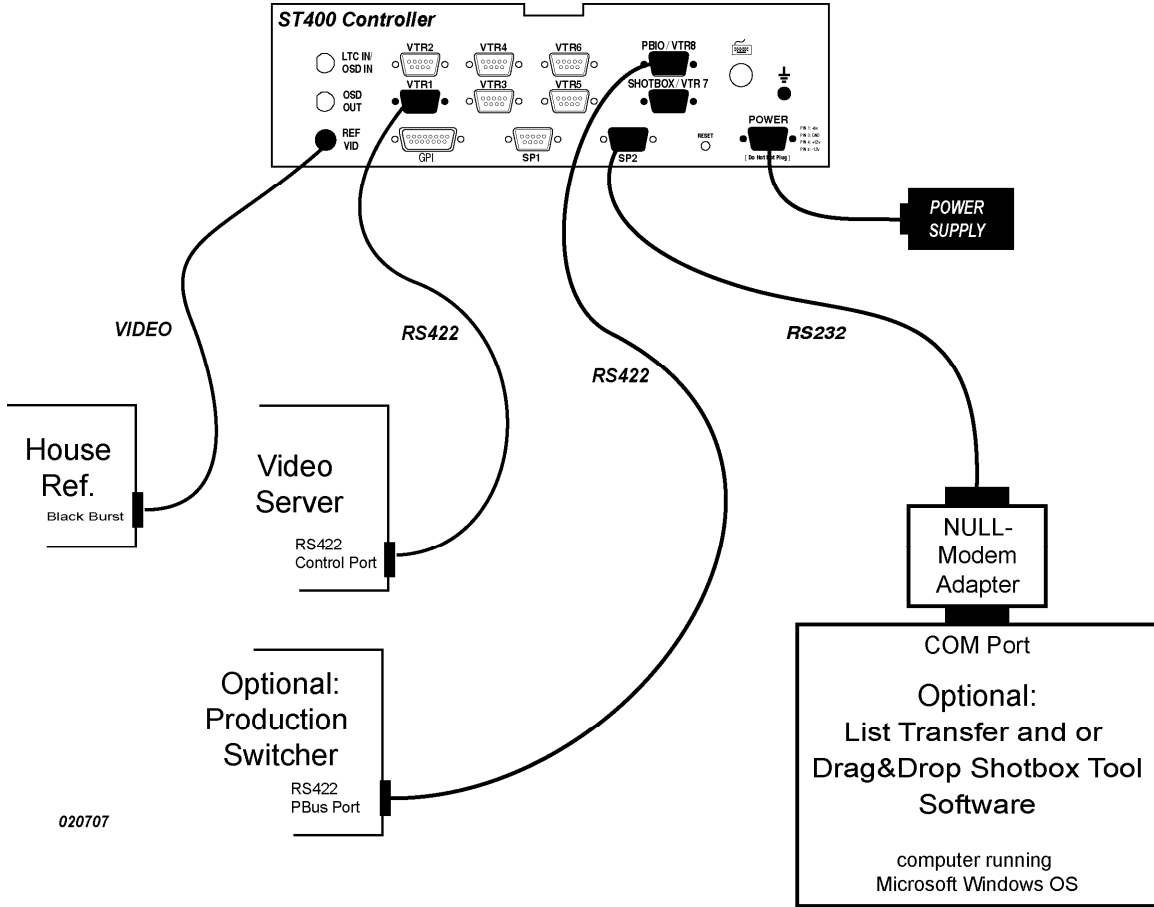
3. CONNECTION DIAGRAM

A. 4040CL CONNECTION DIAGRAM WITH CHASSIS V 5.40 AND BELOW.



NOTE: Do not use pins 7 or 8 on the SP2 connector. They are used internally.

B. 4040CL CONNECTION DIAGRAM WITH CHASSIS V 6.40.



NOTE: Do not use pins 7 or 8 on the SP2 connector. They are used internally.

4. VIDEO SERVER SETUP

- A.** Select the communications protocol on the VIDEO SERVER to be controlled that corresponds to the version of the controller

A=AMP

L=LOUTH (VDCP)

O=ODETICS

NX=LEITCH NEXIO

- B.** Assign a serial port on the VIDEO SERVER through which the ST400 will control it.

NOTES: The VIDEO SERVER may not support LTC or VITC time modes.

The ST400 will default to Tape Time if a non-supported time mode is selected.

The GVG XP(Profile) does not support timecode search

NOTES:

OPERATIONS . . .

5. LOAD A CLIP

- A. Select a VTR by pressing VTR **[1]**, **[2]**, **[3]**, **[4]**, **[5]**, or **[6]** key. (**{7}** or **{8}** on -7 or -8 version).
- 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.

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

Pressing the **[NEXT]** or **[LAST]** key will move the cliplist 1 page.

Pressing the **[CLIP LIST]** + **[NEXT]** or **[LAST]** keys will move the cliplist 5 pages.

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 pages of CLIP IDs.

Press **[LOAD]** to load the highlighted CLIP ID. After loading the selected clip, the CLIP LIST function will terminate. The CLIP LIST indicator will turn off.

OR

Press **[ENTER]** on the ST400 to manually enter a Clip ID using the ST400 numeric keypad, or PC keyboard.

Enter the desired clip ID up to:

32 characters for AMP, LOUTH (VDCP), and NX protocol.

8 characters for ODETICS protocol.

Press **[ENTER]** to load the entered CLIP ID for playout. If using a PC Keyboard press ENTER on the PC keyboard.

- C. Repeat steps A. - B. to load clips on the desired VTRs.

6. PLAY CLIP SEGMENT

Load a clip on the selected channel. See section: 5; LOAD A CLIP or See section: 0; RECALL A CLIP

Optional:

Set an IN Point and OUT Point.

Jog/Shuttle to the desired IN point. Press **[IN]**.

Jog/Shuttle to the desired OUT point. Press **[OUT]**.

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]**.

A. Press **[PLAY]**.

The clip will play from its current time to the OUT point, and then stop.

B. Press **[RECUE]**. The clip will cue to the IN point.

7. SET IN AND OUT POINTS

A. Press VTR **[1]**, **[2]**, **[3]**, **[4]**, **[5]**, or **[6]** (**{7 }** or **{8 }** on -7 or -8 version), to select the channel to learn.

B. Load a clip on the selected channel. See Section: 5; LOAD A CLIP.

C. Use the transport functions to view the clip.

FOR AMP, ODEDTICS, BVW PROTOCOL:

1) Press **[IN]** to mark an IN point. The IN LED will turn on.

2) Press **[OUT]** to mark an OUT point. The OUT LED will turn on.

OR

Use the key pad to enter IN and OUT POINTS

3) Press **[SHIFT]** + **[IN]** enter an IN point value on the keypad.

4) Press **[ENTER]**. The IN LED will turn on.

5) Press **[SHIFT]** + **[OUT]** enter an OUT point value on the keypad.

6) Press **[ENTER]**. The OUT LED will turn on.

FOR LOUTH (VDCP) PROTOCOL:

1) 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.

2) Press **[OUT]** to mark an OUT point. The OUT LED will blink.

On recall, the clip will play to the OUT point then stop and the LED will stay on steady.

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

8. DELETE IN AND OUT POINTS

To delete an IN or OUT point, press and hold **[DEL]**, then press **[IN]** or **[OUT]**.

The IN/OUT LED will turn off.

9. LEARN A CLIP OR A CLIP COMBINATION

A. CLIP MODE

- 1) Press VTR **[1]**, **[2]**, **[3]**, **[4]**, **[5]**, or **[6]** (**{7}** or **{8}** on -7 or -8 version), to select the channel to learn.
- 2) Load a clip on the selected channel. See Section: 5; LOAD A CLIP.
- 3) Use the transport functions to view the clip.

FOR AMP, ODEDTICS, and BVW PROTOCOL:

- a) Press **[IN]** to mark an IN point. The IN LED will turn on.
- b) Press **[OUT]** to mark an OUT point. The OUT LED will turn on.

OR

Use the key pad to enter IN and OUT POINTS

- c) Press **[SHIFT]** + **[IN]** enter an IN point value on the keypad.
- d) Press **[ENTER]**. The IN LED will turn on.
- e) Press **[SHIFT]** + **[OUT]** enter an OUT point value on the keypad.
- f) Press **[ENTER]**. The OUT LED will turn on.

FOR LOUTH (VDCP) PROTOCOL:

- a) 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.
- b) Press **[OUT]** to mark an OUT point. The OUT LED will blink. On recall, the clip will play to the OUT point then stop and the LED will stay on steady.

OR

Use the key pad to enter IN and OUT POINTS

- a) Press **[SHIFT]** + **[IN]** enter an IN point value on the keypad.
- b) Press **[ENTER]**. The IN LED will blink.
- c) Press **[SHIFT]** + **[OUT]** enter an OUT point value on the keypad.
- d) Press **[ENTER]**. The OUT LED will blink.

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

- 4) For GANGs, repeat steps 1) thru 3) for each channel.

Then, press the **{GANG}** softkey.

Press VTR **[1]**, **[2]**, **[3]**, **[4]**, **[5]**, or **[6]**, (**{7 }** or **{8}** (on -7 OR -8 version), key to add it 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 LEDs of all GANGed VTRs will turn on.

- 5) 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 of the display.

- 6) Press **[SHIFT]** + **[MARK]** to initiate the LEARN.

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

- 7) Select the VTRs to learn by pressing VTR keys **[1]**, **[2]**, **[3]**, **[4]**, **[5]**, or **[6]** , (**{7 }** or **{8}** on -7 or -8 version)..

- 8) Press **[MARK]** to complete the learn process.

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

Press **[ESC]** anytime to escape without learning.

The ST400 will: LEARN (save) the VTR number (1, 2, 3,4,5,6, (7, or 8 on -7 or -8 versions)), current IN & OUT time, and gang information to the selected Cue Point.

B. BVW MODE

- 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) Locate the clip to the desired IN time. Press **[IN]** to mark the IN time.
- 3) Locate the clip to the desired OUT time. Press **[OUT]** to mark the OUT time.
- 4) Press **[SHIFT]** + **[MARK]** to start the LEARN.

The first line of the display will show:

“Select VTRs to learn-----”

- 5) Press VTR **[1]**, VTR **[2]**, VTR **[3]** VTR**[4]**, VTR**[5]**, and/or VTR**[6]** , (**{7}** or **{8}** on -7 or -8 version), 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 learn automatically.

- 6) Press **[MARK]** to complete the LEARN.

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

OR

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

The ST400 will: LEARN (save) the VTR number (1, 2, 3,4,5,6, (7, and 8 on -7 or -8 versions).) and current IN & OUT time and gang to the selected Cue Point.

10. 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 at the bottom of the display.

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

The selected clip or clip combination will be loaded on the learned channels, and cued to the learned IN point. The learned OUT point and GANG mode will be set.

11. RECUE CLIP

- A. 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.

- B. Press **{CUE OUT}** to cue to the marked OUT point. If no OUT point is marked, the clip will not cue anywhere.

12. 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] + [MARK]**.

The **{CLR-CUE}** softkey will be displayed on the bottom of the display.

C. Press the **{CLR-CUE}** 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.

13. LOOP CLIP ON THE ST400

A. Load a clip on the selected channel. See section: 5; LOAD A CLIP or See section: 0; RECALL A CLIP

Optional: Set an IN Point and/or OUT Point.

FOR AMP, ODEDTICS, and BVW PROTOCOL:

- a) Jog or Shuttle to the desired start point. Press **[IN]** to mark an IN point. The IN LED will turn on.
- b) Jog or Shuttle to the desired end point. Press **[OUT]** to mark an OUT point. The OUT LED will turn on.
- c) Press **[RECUE]** to assure that clip is parked within IN & OUT points.

OR

Use the key pad to enter IN and OUT POINTS

- d) Press **[SHIFT] + [IN]** enter an IN point value on the keypad.
- e) Press **[ENTER]**. The IN LED will turn on.
- f) Press **[SHIFT] + [OUT]** enter an OUT point value on the keypad.
- g) Press **[ENTER]**. The OUT LED will turn on.

FOR LOUTH (VDCP) PROTOCOL:

- a) Jog/Shuttle to the desired IN point. Press **[IN]**. The IN LED will blink.
- b) Jog/Shuttle to the desired OUT point. Press **[OUT]**. The OUT LED will blink.

OR

- a) Press **[SHIFT]** + **[IN]**. Manually enter the IN time on the numeric keypad. Press **[ENTER]**.
- b) Press **[SHIFT]** + **[OUT]**. Manually enter the OUT time on the numeric keypad. Press **[ENTER]**.
- c) Learn the segment into a cuepoint.
- d) Recall the cuepoint. The IN and OUT LEDs turn on steady.

B. Press [LOOP ENABLE].

The clip will immediately start looping.

NOTES: If the CLIP ID ends with an asterisk sign (*). For AMP protocol use an octothorpe sign (#) , it will automatically loop when either **[LOOP ENABLE]** or **[PLAY]** is pressed.

Loop Clip will only work from the 4040CL. Loop Clip will not affect clips loaded from the user Interface.

14. TIMECODE SEARCH

NOTE for ODETICS ONLY: In order to properly search by Timecode, please select Timecode = NOT SUPPORTED menu option for every channel connected to the GV Profile and Timecode = SUPPORTED for all other channels.

To select "Timecode" option:

- 1) Press [MENU] key.
- 2) Turn the wheel until TIMECODE option is highlighted.
- 3) Press **{CHANGE}** softkey.
- 4) Press a softkey to select SUPPORTED or NOT SUPPORTED setting.
- 5) Press [ESC] twice to exit menu mode.

- A.** Press [SHIFT] + [RECUE].
- B.** Enter the desired timecode number.
- C.** Press [ENTER] to search to timecode number.

Press [ESC] to exit search mode.

15. VIEW COUNTDOWN TIME (AMP & LOUTH PROTOCOL ONLY)

- A.** Press **{RT}** softkey to enable the countdown mode on the current channel.
- B.** The countdown time is displayed on the first line of the display. The countdown time is the remaining time till the OUT point or if the OUT point is not marked, till the end of the clip.
- C.** If the OUT point is marked and the playout continues passed the OUT point, the negative countdown is displayed.
- D.** Press **{RT}** softkey to disable the countdown mode on the current channel.

NOTE: When RT mode is selected, the IN and OUT point are still marked in either TM or LTC mode, depending on which mode is selected by [TIME MODE] key.

16. BVW MODE

If you wish to control a tape machine or a DDR with the 4040CL, select control MODE=BVW (see Setup Menu section). In this mode, the media is accessed by timecode, not by clip names. The cuepoints in BVW mode consist only of IN point, OUT point and Gang information.

The following functions are not available in BVW mode:

- View Clip ID
- Recue Clip
- Loop Clip
- Capture
- Create Clip
- Create Subclip

All other functions work as described in the manual.

ADVANCED FEATURES . . .

17. CREATING A CLIP

NOTE: Check that server is set for record operation.

- A.** Press **[CLIP LIST]**.
- B.** Press **{CREATE}**.
- C.** Manually enter an ID with a maximum of 32 characters from the ST400 numeric keypad, **OR** a PC keyboard.
Enter the desired clip ID up to:
32 characters for AMP, LOUTH (VDCP), and NX protocol.
8 characters for ODETICS protocol.
- D.** Optional: Press **{<-}** or **{->}** to enter the start time/duration for the new clip.
- E.** Press **{CREATE}**.
The clip will be created with the entered CLIP ID.
If the selected CLIP ID already exists, a warning message will be displayed. Press any key to continue.
- F.** Press **[REC]** to start the record process. The channel will stay in record for the duration set in the "CREATE" dialogue or if no duration was set then until the **[STOP]** button is pressed...

18. CAPTURE

This function allows clips to be recorded on to the Video Server from a video source (SOURCE) such as a VTR. The SOURCE is connected to the VTR6 connector on the rear of the 4040CL.

Prior to performing a capture, press **[MENU]**.

Set the PREROLL value for the SOURCE VTR. Typical value is 5 seconds.

Set the RECORD DELAY value. This is the record latency of the destination Video Server. Typical value is 3 (frames).

Select the destination Video Server Channel. The destination channel may be any VTR except VTR6.

A. Press VTR **[6]** to initiate the Capture function.

B. Set an IN point on the SOURCE VTR.

Jog/Shuttle to the desired IN point. Press **[IN]**.

OR

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

C. Set an OUT point on the SOURCE VTR.

Jog/Shuttle to the desired OUT point. Press **[OUT]**.

OR

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

D. Press **[SHIFT] + [RECORD]**.

The display will prompt for a CLIP ID.

Manually enter the desired clip ID up to:

32 characters for AMP, LOUTH (VDCP), and NX protocol.

8 characters for ODETICS protocol.

Press **{CREATE}** to accept the entered CLIP ID.

The SOURCE VTR will preroll to it's IN point, then play. The video server will start recording at the SOURCE'S IN point and stop recording at the SOURCE'S OUT point.

The created clip will be loaded on the destination channel.

19. CREATE A SUBCLIP (AMP , LOUTH (VDCP), NX PROTOCOLS ONLY)

- A. Load a clip as described in Section 5, **LOAD A CLIP**.
- B. Mark (enter) an IN and/or OUT point. Note: At least one point has to be marked in order to create a subclip.
- C. Press **[SHIFT] + [CLIPLIST]**.

The display will prompt for a CLIP ID.

Manually enter the desired clip ID up to:

32 characters for AMP, LOUTH (VDCP), and NX protocol.

8 characters for ODETICS protocol.

- D. Press **{CREATE}**.
- E. The new clip is created in the working directory. The new clip has entered name. Its SOM is the IN point (if the IN point was marked; otherwise, it's the SOM of the original clip), and EOM is the OUT point (if the OUT point was marked; otherwise, it's the EOM of the original clip).

20. CREATE CUE POINT LABELS

Use LABELS mode to assign meaningful names to cue points. Rather than viewing cryptic CLIP IDs, LABELS provides a faster and easier method to select cue points.

- A. Select cue point to label.
- B. Press the **[LABEL]** key.
- C. Manually enter a label, up to 12 characters in length, using the numeric keypad, or PC keyboard.
- D. Press **[ENTER]** to assign the entered label to the selected cue point.

OR

[ENTER] on the PC keyboard.

OR

[ESC] to exit without save.

NOTE: Labels are saved in non-volatile memory in the ST400. They are not saved in the video server.

21. SELECT A WORKING DIRECTORY (AMP PROTOCOL ONLY)

- A. Press **[MENU]** key.
- B. The Working Directory Option shows the currently selected working directory.
- C. Turn the wheel until this option is highlighted.
- D. Press **{CHANGE}** softkey.
- E. A Window with the list of directories residing on the server is displayed.
- F. Turn the wheel to highlight the desired directory.
- G. Press **[LOAD]** to make the highlighted directory your current working directory.

OR

Press **[ENTER]** to manually enter the directory name using a PC keyboard.

- H. Press **[ESC]** to exit menu mode.

NOTE: When **[CLIPLIST]** is pressed, the clips that reside in the current working directory will be displayed.

NOTE: When a clip is recalled from a cuepoint, the current working directory remains the same.

22. OPTIONS . . .

A. -7 VERSION... 7 CHANNEL VTR CONTROLLER

The -7 version allows one additional channel to be controlled by the unit, for a total of seven.

Press the **{7}** softkey to select the appropriate VTR. All other functions perform as with the standard unit.

B. -8 VERSION... 8 CHANNEL VTR CONTROLLER

The -8 version allows two additional channels to be controlled by the unit, for a total of eight.

Press the **{7}** or **{8}** softkey to select the appropriate VTR. All other functions perform as with the standard unit.

C. -T VERSION... T-BAR CONTROLLER

The -T version Adds the T-BAR for more precise SLO MOTION control. The T-BAR has a mechanical detent at play speed. This option also adds a **[REV]** key which allows instant reverse play.

D. -P VERSION... PBUS INPUT OUTPUT OPTION (PBIO)

1) PBIO ENABLE/DISABLE

Press the **{PBIO}** softkey to enable or disable PBIO. When disabled the ST400 will ignore all Pbus commands. When enabled, the ST400 will respond to all Pbus commands.

When enabled and Pbus commands are received, the softkey's LED will flash, indicating command received.

2) PRODUCTION SWITCHER PBIO TRIGGER VALUES

The Production Switcher outputs a Peripheral Bus trigger at specific Timeline key frames, as programmed by the operator. The 4040CL performs a specific function for each trigger value:

Grass Valley Group Production Switcher

<u>Trigger Value</u>	<u>Mode</u>
0	Play (if OUT point is specified, stop at OUT, if clip ends with "*", Loop Play)
1	Recue to beginning of clip
2	Slo-mo using ST400 Preset Speed
3	Reverse Play
4	Still Frame
5	Loop (not available in BVW protocol)
6	Record
7	Fast Forward
8	Fast Rewind
9 or greater	Play

Sony Production Switcher

<u>Trigger Value</u>	<u>Mode</u>
0	Recue to beginning of clip Play
1	Play (if OUT point is specified, stop at OUT, if clip ends with "*", Loop Play)
2	Slo-mo using ST400 Preset Speed
3	Reverse Play
4	Still Frame
5	Loop (not available in BVW protocol)
6	Record
7	Fast Forward
8	Fast Rewind
9 or greater	Play

To control more than one VTR, enable the Peripheral Device Address for each VTR. The Trigger value will be sent to the enabled devices.

OR

GANG the required VTRs on the ST400. See FUNCTION TABLE for GANG instructions. Enable the Peripheral Device Address for one of the GANGed VTRs. The Trigger will be sent to the enabled VTR. The other VTRs in the GANG will perform the same action.

REFERENCE . . .

23. SETUP MENU

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

The display will show the MAIN MENU.

Turn the wheel to select a menu option.

Press the **{SELECT}** softkey to access the selected menu.

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

<u>MAIN MENU</u>	
<u>PARAMETER</u>	<u>DESCRIPTION</u>
{SERVICE} SOFTKEY	<p>{DEFAULTS}</p> <p>{FACTORY}</p> <p>Set ST400 to factory defaults. Follow the prompts on the display.</p> <p>Press [ENTER] to set factory defaults or press [ESC] to exit without changing ST400.</p> <p>{SET-USR}</p> <p>Set ST400 to saved user defaults. Follow the prompts on the display.</p> <p>Press [ENTER] to set saved user defaults or press [ESC] to exit without changing ST400.</p> <p>{SAVE-USR}</p> <p>To save the user defaults. This will save the current setting.</p> <p>{CLEANUP}</p> <p>Clears all cue points. Follow the prompts on the display.</p> <p>{BACK}</p> <p>Return to prior menu item.</p>
{SELECT} SOFTKEY	Press {SELECT} softkey to access the selected setup menu or press [ESC] to exit without changing ST400.
{LiteOFF} SOFTKEY	<p>Press {LiteOFF} softkey to turn the screen back light off. This is used when the screensaver option is turned off and the unit will not be used for an extended period of time.</p> <p>Any subsequent button press will restore the back light.</p> <p>Press [ESC] to exit.</p>
{EXIT} SOFTKEY	Press {EXIT} softkey or press [ESC] to exit.
CHANNEL SETUP	Turn wheel to select. Press {SELECT} to access the CHANNEL SETUP menu or press {EXIT} or [ESC] to exit.
UNIT SETUP	Turn wheel to select. Press {SELECT} to access the UNIT SETUP menu or press {EXIT} or [ESC] to exit.

CHANNEL SETUP TABLE

Turn the wheel to select a menu option.

Press the **{CHANGE}** softkey to access the selected option.

Press the **{BACK}** softkey to accept the changes and return to the selection menu.

Press the **[ESC]** softkey to exit the Setup Menu.

<u>PARAMETER</u>	<u>DESCRIPTION</u>
LOUTH PORT LOUTH PROTOCOL ONLY	Enter the LOUTH PORT number. Select INPUT for record and OUTPUT for playback.
PROTOCOL	Set each channel as required. Select {BVW} , {AMP} , {LOUTH} , {ODETICS} , or {NX} . {BVW} Select BVW to control video server like a VTR. In this mode, the clip must have already been loaded. {AMP} Select AMP if controlling GVG M-series, K2, TURBO, or PROFILE with AMP Protocol. {ODETICS} Select ODETICS if controlling a server with ODETICS Protocol. {NX} Select NX if controlling a Leitch Nexio.
STANDARD	Press {NTSC} , {DF} , or [PAL] to select the video standard for time calculations.
RECORD MODE	Set each channel as required. Press softkey to select to select the desired record mode: {Lockout} , Record not allowed {Crash} Full record (audio and video). {APPLY TO ALL} Apply selection to all VTRs.
DISK PREROLL LOUTH PROTOCOL ONLY	Select {V1} , {V2} , or {Off} . See DISK PREROLL SETUP CHART below.
PLAY PREROLL LOUTH and AMP PROTOCOL ONLY	Enter, in frames, the amount of play delay.
RECORD DELAY	Enter delay value. (Used by CAPTURE function.)
PREROLL	Enter Preroll value. (Used by CAPTURE function.)

<p>TIME SEARCH ODETICS PROTOCOL ONLY</p>	<p>Set each channel as required. Select {NOT SUPPORTED} to have TC search on the GVG profile servers, or {SUPPORTED} for all other servers.</p>
<p>WORK FOLDER AMP PROTOCOL ONLY</p>	<p>Displays the currently selected Working folder. Refer to Section 21. for instructions on how to change the working directory. (Always set to Default in Odetics) Not applicable in BVW mode.</p>
<p>EXTENDED IDS LOUTH, NEXIO AND AMP PROTOCOL ONLY</p>	<p>Select {ON} to allow clip ID's greater than 8 characters in Clip List. Select {OFF} to restrict Clip List to clip ID's less than or equal to 8 characters.</p>

DISK PREROLL SETUP CHART for LOUTH protocol		
Server	Menu Settings	
	Disk Preroll	Play Preroll
360 systems	V1	10 frames
Avid Airspeed	OFF	8 frames
Doremi	V2	16 frames
EVS XT	V1	2 frames
GV PDR, XP	V2	40 frames
GV K2	V2	10 frames
GV M-series, Turbo	V2	20 frames
Leitch NX400	OFF	11 frames
Leitch NX3600, NX4200	OFF	6 frames
Omneon	V1	20 frames

NOTES:

UNIT SETUP TABLE

Turn the wheel to select a menu option.
 Press the **{CHANGE}** softkey to access the selected option.
 Press the **{BACK}** softkey to accept the changes and return to the selection menu.
 Press the **[ESC]** softkey to exit the Setup Menu.

<u>PARAMETER</u>	<u>DESCRIPTION</u>
WIND MODE	Press Softkey to select: {HOLD} (Fast wind is maintained only while key is depressed.) OR {LATCH} (Fast wind is maintained after key is released.) Set the fast wind speed (3.9 to 23.7) by pressing the {SPEED} softkey. Set each channel as required.
SLOMO	Press the {TBAR} (or {WHEEL}) softkey to select the T-bar or wheel for slomo. 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). Press {SPD-RNG} softkey to toggle between SLOMO speed ranges: 0 → 1x OR 0 → 2x. Press {BACK} softkey to return to SLOMO MENU. Press [ESC] to exit OR turn the Wheel to select another item. For Wheel: Press the {PRSET} softkey to toggle between UPDATE and STATIC modes. UPDATE; When exiting SLOMO mode, the last used speed is saved in the Preset Speed register. STATIC: The Preset Speed register is NOT updated when exiting SLOMO mode. It is only changed by [SHIFT] + [SLOMO] (PRESET SLOMO). Press {SPD-RNG} softkey to toggle between SLOMO speed ranges: 0 → 1x OR 0 → 2x.
RECORD KEY	Select {REC} or {REC + PLAY} {REC} Use the [REC] key only to start record. {REC + PLAY} Use the [REC] + [PLAY] keys to start record

UNIT SETUP TABLE

Turn the wheel to select a menu option.
 Press the **{CHANGE}** softkey to access the selected option.
 Press the **{BACK}** softkey to accept the changes and return to the selection menu.
 Press the **[ESC]** softkey to exit the Setup Menu.

<u>PARAMETER</u>	<u>DESCRIPTION</u>
RECALL MODE	<p>Press {NORMAL} or {REDIRECT}. {REDIRECT}</p> <p>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> <p>{NORMAL}</p> <p>The cue point will load on the learned 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- Quickly create a GANG by pressing and holding a VTR key, then pressing other VTR keys. Quickly undo the GANG by pressing any VTR key.</p>
DESTINATION CHANNEL SELECT	<p>Select [VTR1], [VTR2], [VTR3], [VTR4], or [VTR5] ({7} or {8} on -7 or -8 version) to be the destination (recorder) channel for Capture Function. [VTR6] cannot be selected.</p>
REF. VIDEO	<p>Select the appropriate softkey to enable or disable the reference video {ON}, {OFF}.</p>
LEARN CLEAR	<p>Press {ON}, {OFF}. {ON} will clear the IN and OUT points for the loaded clip after the clip has been "learned" into a cue point.</p>
SCREENSAVER	<p>Press {ON}, {OFF} to select to select the desired mode: {ON} = Screen backlight will turn off after about 20 minutes. {OFF} = Screen will remain on constantly unless LiteOFF has been selected</p>

LIST OPTION ONLY	
{LIST} In setup menu	{TX} To transmit cue list to PC. {RX} To receive a cue list from PC.

PBIO OPTION ONLY	
PB ADDRESS	Select [VTR1] , [VTR2] , [VTR3] , [VTR4] , [VTR5] , or [VTR6] . Assign Pbus Device Address to selected VTR by entering an address between 0 and 23. Or, press DEL to clear the Pbus Device Address.
PB SWITCHER	Select {GRASS VALLEY} or {SONY} Production Switcher. For Philips, use Grass Valley.
PBIO PARITY	Press {NONE} , {ODD} or {EVEN} parity to match the Pbus setting on your Production Switcher.

NOTES:

24. FUNCTION TABLE

Function	Key Press	Description
CLIP LIST	[CLIPLIST]	Press the [CLIPLIST] key to display a list of clips on the video server.
	[CLIPLIST] then [LAST] or [NEXT]	Press the [LAST] or [NEXT] key after [CLIPLIST] will move the cliplist one page.
	[CLIPLIST] + [LAST] or [CLIPLIST] + [NEXT]	Press the [CLIPLIST] + [LAST] or [NEXT] key will move the cliplist five pages.
CUE TO OUT POINT	{CUE OUT}	Press the {CUE OUT}_softkey if OUT point is set, cue to the OUT point. If out point is not set do nothing.
FFWD	[FFWD]	Press and HOLD to shuttle. Release key to stop. Set WIND Speed in MENU.
GOTO ENTERED TIME	[SHIFT] + [RECUE]	Search the VTR to the manually entered time. Use the ST400 numeric keypad. Then press [ENTER] or [RECUE] to execute the command.
GANG SETUP	{GANG}	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. Upon exiting, all members of the gang will have their VTR LEDs turned on. The flashing LED shows which VTR is currently selected.
SET IN POINT	[IN]	Press to set the IN POINT
DELETE IN POINT	[DEL] + [IN]	Press the [DEL] + [IN] keys to clear the IN POINT
SET OUT POINT	[OUT]	Press to set the OUT POINT
DELETE OUT POINT	[DEL] + [OUT]	Press the [DEL] + [OUT] keys to clear the out POINT
JOG	[JOG]	Select [JOG] mode and enable Wheel.
LAST CUE	[LAST]	Step to the previous Cue Point Location.
LOOP	[LOOP ENABLE]	Plays the currently loaded clip in a continuous loop.
NEXT CUE	[LAST]	Step to the next Cue Point Location.
RECORD	[REC]	Places VTR into the Record mode selected by RECORD MODE in the SETUP MENU. Press [SHIFT] + [RECORD].

Function	Key Press	Description
REWIND	[RWD]	Press and HOLD to shuttle. 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 OR press any transport key to exit SLOMO.
SLO-MO SPEED PRESET	[SHIFT] + [SLOMO]	For WHEEL ONLY : 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.
RE-SYNC GANG	[SHIFT] + [STOP]	Press the [SHIFT] + [STOP] keys to bring all the GANGED VTRs to the precise offset positions of the selected VTR (during JOGGING or SHUTTLING maneuvers the time relationship between the VTRs may drift).
TIME MODE SELECT	[TIME MODE]	Press to toggle between Timecode (TC), VITC (VT) or Tape Timer (TM) display modes.
PLAY	[PLAY]	If an OUT point is marked, play to the OUT point and stop. If not OUT point is marked, play normally. If the CLIP ID ends with a '#', do loop play.
PLAY- SIMPLE	[SHIFT] + [PLAY]	Play to end of clip, not Out Point.
RECUE	[RECUE]	If the IN point is marked, cue to the IN point. If IN point is not marked, cue to the beginning of the clip. (Under BVW protocol, no action occurs if the IN point is not marked.)
PBIO OPTION ONLY		
PBIO ENABLE/ DISABLE	{PBIO}	PBIO LED is ON if PBIO is enabled. Toggle the key to temporarily disable all PBIO signals. The key blinks when a valid PBIO command is received from the Production Switcher.

25. 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 (All DB9F) GPI (DBF25F) Power (DB9M) SHOTBOX (DB9F) PBIO (DB9F) Keyboard (6-pin mini DIN) Ref. Video In (BNC) Ground Threaded stud.
Display:	Easy to read, back-lit LCD display
Jog/Shuttle Wheel:	With mechanical detents
T-BAR (OPTION)	With mechanical detent at 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, 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		

SP2 CONNECTOR, RS232 PINOUT

NOTE: Do not use pins 7 or 8. These pins are used for internal functions.

9-Pin D-Type, Female

Pin #	1	Do not use	6	Do not use
	2	Receive ←	7	Do not use
	3	Transmit →	8	Do not use
	4	Do not use	9	Do not use
	5	Ground		

GPI IN/OUT CONNECTOR

26-Pin D-Type, Female (DB26F)

Pin #	Function	Pin #	Function
1	OUT GPO 0 – Not used	14	IN LAST CUE
2	OUT GPO 1 – Not used	15	IN RECALL CUE
3	OUT GPO 2 – Not used	16	Not used
4	OUT GPO 3 – Not used	17	Not used
5	OUT GPO 4 – Not used	18	Ground
6	OUT GPO 5 – Not used	19	+5V
7	OUT GPO 6 – Not used	20	+5V
8	OUT GPO 7 – Not used	21	No Connection
9	Ground	22	No Connection
10	IN PLAY	23	No Connection
11	IN STOP	24	No Connection
12	IN RECUE	25	No Connection
13	IN NEXT CUE	26	Ground

26. TROUBLESHOOTING

A. ST400 TROUBLESHOOTING

Press **[SHIFT]** + **[ENTER]** keys to enter the self test mode. Pressing any key will display it's key code number and light it's LED if there is one. This will also test keyboard input if the PC type keyboard is attached. The communication ports can be tested using a special loop-back connector (D9M connector with pins 2 and 8 connected together and 3 and 7 connected together).

B. PBIO TROUBLESHOOTING (OPTION ONLY)

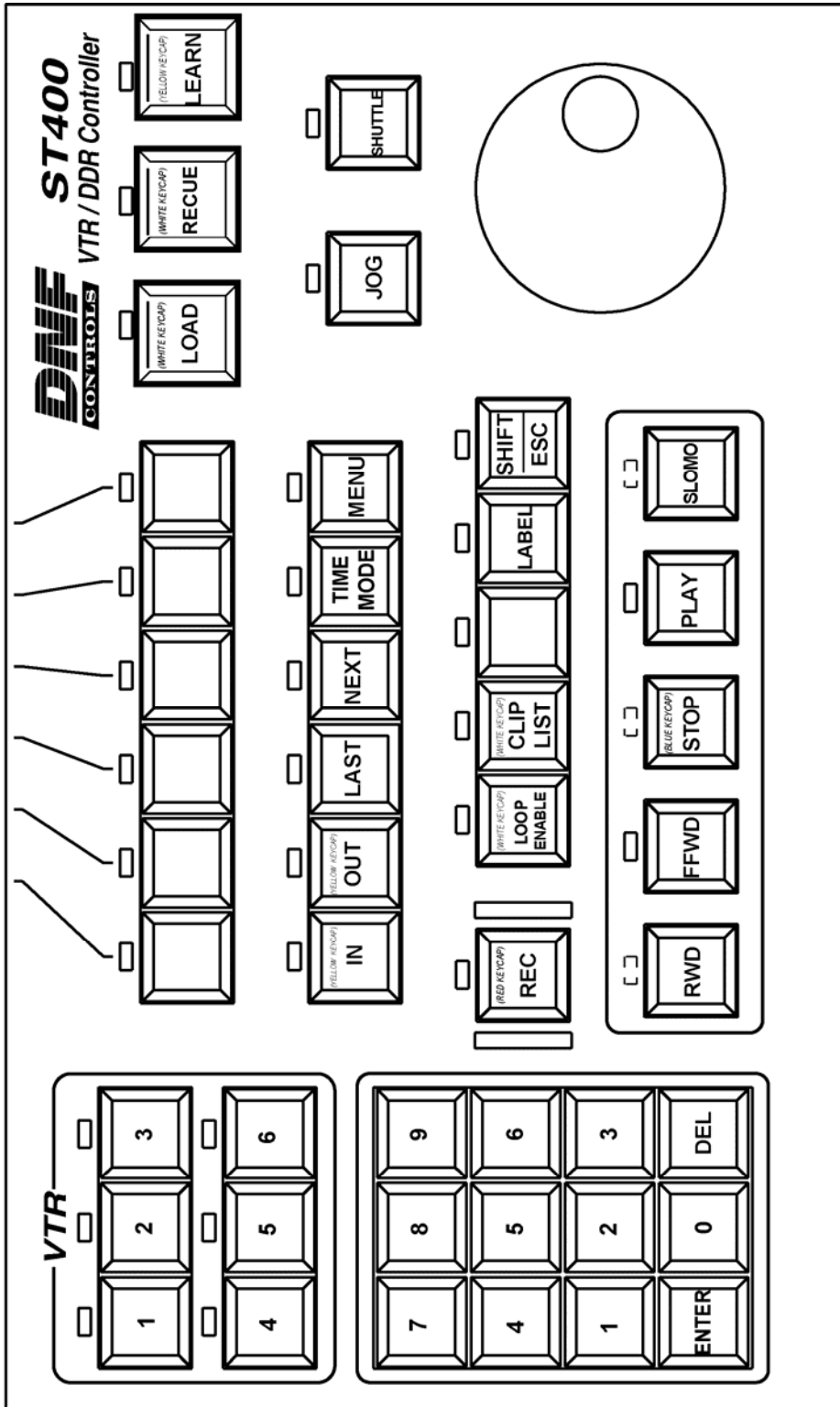
Press **[SHIFT]** + **[0 (zero)]** to display Pbus Data on LCD screen. For diagnostic purposes only.

Press **[SHIFT]** + **[0 (zero)]** again to exit test mode.

NOTES:

27. KEY LAYOUT

ST400 KEY LAYOUT 2044CL- and 4040CL-



NOTES:

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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