XT [2]

Technical Reference – Software - Issue 4 - April 2008
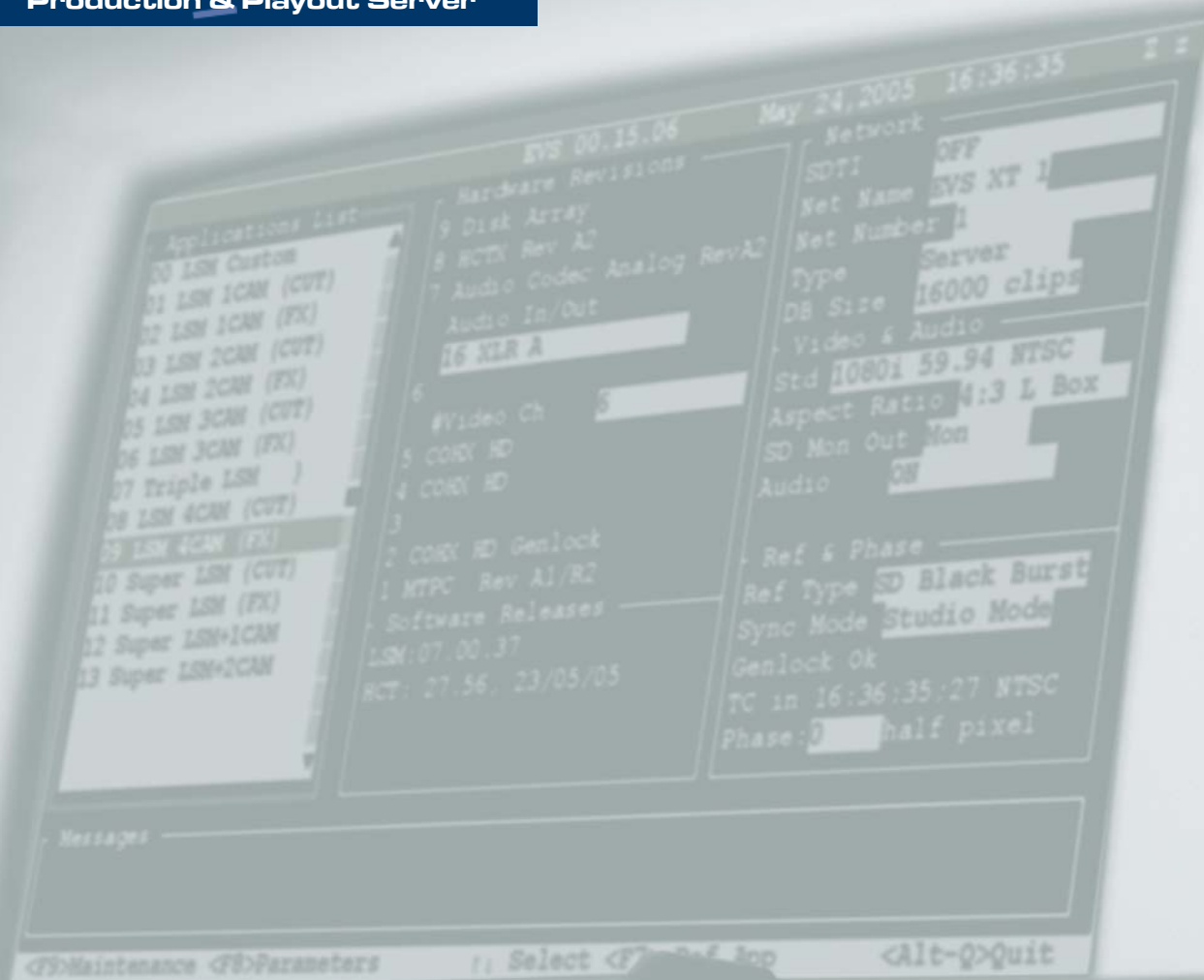
EVS

www.evs.tv

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IMPROVEMENT REQUESTS

Your comments will help us improve the quality of the user documentation. Do not hesitate to send improvement requests, or report any error or inaccuracy on this user manual by e-mail to doc@evs.tv.

Table of Contents

What's New?

A general review of the Software Technical Reference manual has taken place in parallel with the releases for Multicam versions 8.04 and 9.00.

For this reason, several sections have been reviewed even if no specific changes related to these sections have been brought on version 9.00. These will not be mentioned in the table below. Moreover, all references to XT servers have been removed since the Multicam version 9.00 is only compatible with XT[2] servers.

Only the changes linked to new features on version 9.00 are listed in the table below:

New on version 8.04	
1.3.5	License Option – new option for Avid DNxHD ®
1.3.14.3	Updated taking into account new online rebuild
New on version 9.00	
1.3.3.1	Codes availability and options – updated data
1.3.15	Clip compatibility between Multicam versions
2.6	Disk Data Recovery
3.1.1	Setup Configuration, Page 1 – modified window
3.1.1.5	Setup Configuration, Page 1 – general timecode settings modified with LC timecode, User timecode and Primary timecode.
3.1.5	Setup Configuration, Page 4 – new page: GPI settings
3.1.6	Setup Configuration, Page 5 – new page: RS422 protocol settings
3.1.7 & 3.1.8	Setup Configuration, Page 6 – new page: HCTX Gigabit Connection
3.2.2	How to disconnect a machine from the server
1.3.14.2 & 3.3.1 to 3.3.4	Server Monitoring, Page 1– updated Disk Status area, updated Timecode Status area
3.3.5 & 3.3.6	Server Monitoring, Page 2 – new area for timecode monitoring (on HD and SD recorders)
3.3.7	Server Monitoring, Page 3 – new area for log management
4.2.1	New clip ID: VAR ID
4.2.2	Clip identifiers used by the protocols
4.3	Fill and Key management from VDCP and Odetics protocols

1. EVS software

Version 00.18.31

1.1 INTRODUCTION

The EVS software is used for configuration and maintenance operations. It is also used to select which application to run, since EVS disk recorders have the ability to run various dedicated applications (Video Server, Slow Motion, ...).

When turning on the EVS mainframe, the first step is the PC boot sequence, followed by the boot of the video I/O boards, and finally the EVS software is started.

If a default application has been previously selected, this application will start automatically after a few seconds if no key is hit.

If a default application has not been defined or if the space bar is hit, the system will remain in the EVS main menu (see snapshot next page) and wait for the operator's next command.

1.2 EVS MAIN MENU

Application window

Title bar

Configuration windows

Message window
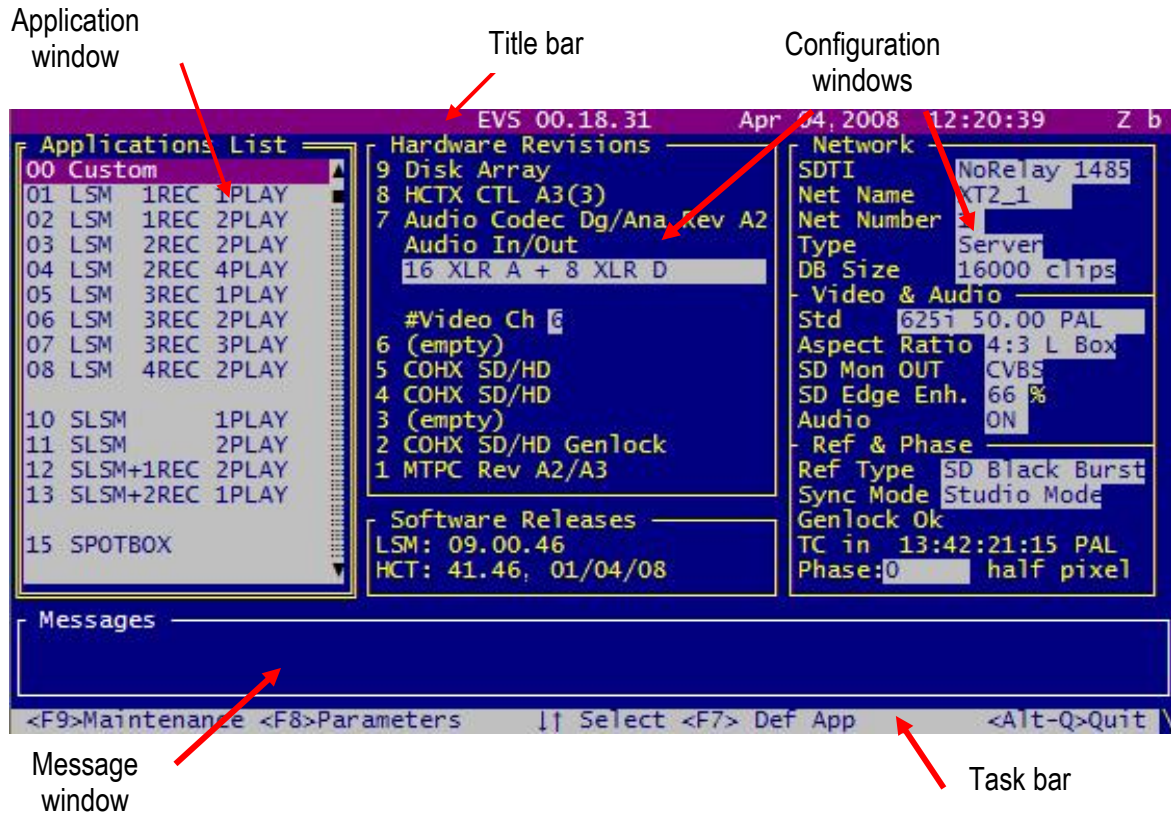
Task bar

1.2.1 EVS SCREEN LAYOUT

Title bar: the first line of the VGA screen is the title bar. It contains the EVS software revision and current date and time.

Task bar: the last line of the VGA screen is the task bar. It contains a summary of the keyboard controls available.

Application window: this window contains the list of all applications installed on the system.

Configuration windows: the windows show the hardware configuration of the system.

Message window: messages are displayed in this space to provide more information on the current selection.

1.2.2   TIPS TO MOVE INSIDE THE EVS SOFTWARE
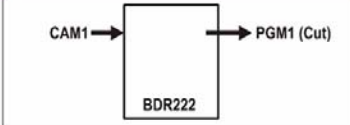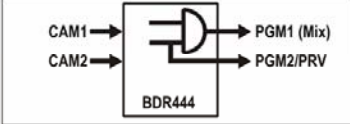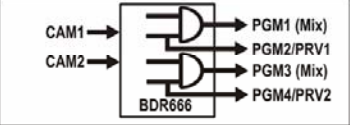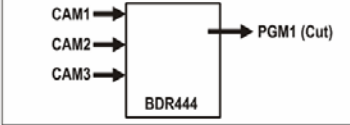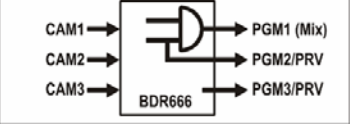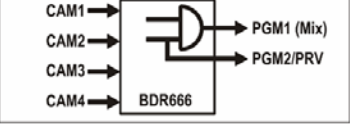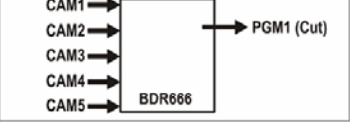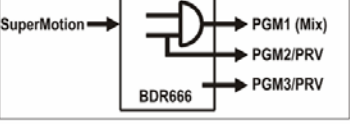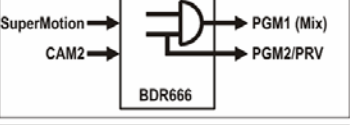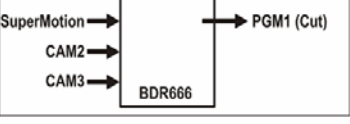
- The active window is always shown with a double frame.

- Use ↑, ↓ and **<TAB>** keys to change the selection inside the active window.

- Use **<SPACE BAR>** to toggle between pre- defined values.

- Use **ENTER** to select an item or to confirm an entry.

- Use **ESC** to go back to the previous menu or to cancel an entry.

1.2.3   STARTING AN APPLICATION
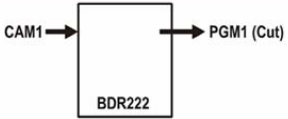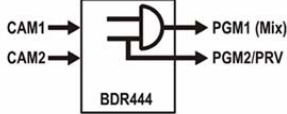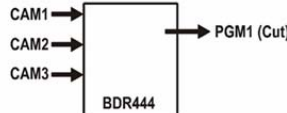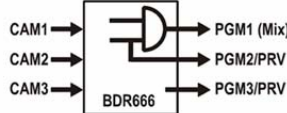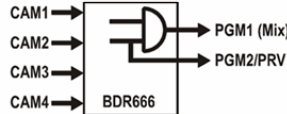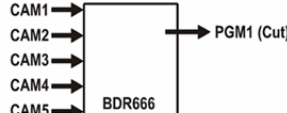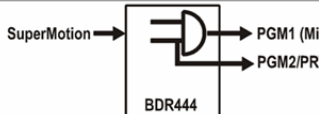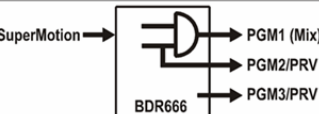
Select the appropriate application from the Applications list, then press **ENTER** to confirm the selection.

1.2.4 CONFIGURATIONS AVAILABLE ON XT[2] SYSTEMS

EVS XT[2] - Configurations with HD and SD Super Motion 3 Phases

EVS XT[2] - Configurations with HD Super Motion 2 Phases

Note on clips compatibility:

Clips are compatible across all Multicam configurations including Super LSM.

Record trains are also compatible as long as the number of record channels (cameras) is not decreased in LSM mode.

Ex.:   SuperLSM $\rightarrow$ 2CAM (Fx):   Record trains are lost.

4CAM (Fx) $\rightarrow$ 3CAM (Cut):   Record trains are compatible.

Record trains are always kept in Spotbox mode (all modes except LSM), even when the number of record trains is reduced.

1.2.5 COMMANDS AVAILABLE FROM THE MAIN MENU

- The ↑ and ↓ keys of the keyboard can be used to select an application. The purple line shows the current selection. The black line shows the default application.

- The **ENTER** key is used to start the selected application.

- Press **F7** to make the application currently selected the new default application. The default application is automatically started every time the EVS program is entered. When the application currently selected is already the default application, pressing **F7** will disable the default application and the system will remain in the EVS Main menu every time the EVS software is entered.

- Press **F8** to open immediately the Channel Parameters window related to the selected application. Press **ALT + Q** to come back to main menu.

- Press **F9** to enter the Maintenance menu.

- To exit the EVS software and go back to the DOS prompt, press simultaneously **ALT** + **Q** and confirm with **ENTER**. To restart the EVS software from the DOS, simply type **RUN**.

1.3 MAINTENANCE MENU

The Maintenance menu contains various options to configure and check the system. These options are described in details in the next sections.
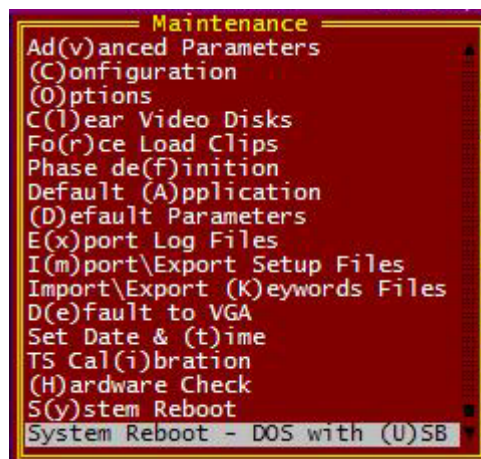
To select an option, use the ↑ and ↓ keys of the keyboard to highlight the corresponding line and press **ENTER** or press the key corresponding to the character between brackets.

To go back to the Application window, press **ESC** on the keyboard.

1.3.1 VIDEO & AUDIO CHANNEL PARAMETERS (AVCFG)

⚠️ **Important**

Most parameters are factory preset, and should not be modified without advice of qualified EVS staff. Improper values for some parameters will prevent the proper operation of the system.

Please refer to the parameters' charts for correct values (See section 1.3.10 'Default parameters', on page 34).

Every application has its own set of parameters. When the user selects parameters, the application list appears to select an application first, then V/A Channels Parameters window appears.

Parameters are used to define video & audio channels, type and configuration of recorders, audio format and audio-video synchronization parameter.

```
═LSM  3REC 3PLAY═══════════Channels Config═v.03.02.29═══════════Lock Video Conf:No═
 Base Config:Multicam LSM               Loop Rec:Yes   Clip Capacity:Global
 Video Players : 3  Video Recorders:3   Type for REC1:50/60 Hz Stand.Rate
 Audio Format  : Embedded  (E) Lipsync (ms): 0.00    Audio Full Scale: 22   dBu
 Audio Type    : 8 Tracks      Use audio of REC 1 for all REC: No
 Ancillary Mode: 24 bits
        ── 1 ──   ── 2 ──   ── 3 ──   ── 4 ──   ── 5 ──   ── 6 ──
       OUT1 - PGM1 OUT2 - PGM2 OUT3 - PGM3 IN1 - CAM A IN2 - CAM B IN3 - CAM C
 Type  Play      Play      Play      Record    Record    Record
 Ctrl  LSM       LSM       LSM       LSM       LSM       LSM
 Rec.                                33% Loop  33% Loop  33% Loop
 A1    E-01  0 dB E-09  0 dB E-17  0 dB E-01  0 dB E-09  0 dB E-17  0 dB
 A2    E-02  0 dB E-10  0 dB E-18  0 dB E-02  0 dB E-10  0 dB E-18  0 dB
 A3    E-03  0 dB E-11  0 dB E-19  0 dB E-03  0 dB E-11  0 dB E-19  0 dB
 A4    E-04  0 dB E-12  0 dB E-20  0 dB E-04  0 dB E-12  0 dB E-20  0 dB
 A5    E-05  0 dB E-13  0 dB E-21  0 dB E-05  0 dB E-13  0 dB E-21  0 dB
 A6    E-06  0 dB E-14  0 dB E-22  0 dB E-06  0 dB E-14  0 dB E-22  0 dB
 A7    E-07  0 dB E-15  0 dB E-23  0 dB E-07  0 dB E-15  0 dB E-23  0 dB
 A8    E-08  0 dB E-16  0 dB E-24  0 dB E-08  0 dB E-16  0 dB E-24  0 dB

 A.Mon 1 E-01 Out   0 dB 2 E-02 Out   0 dB 3 E-03 Out   0 dB 4 E-04 Out   0 dB

 Press [Space Bar] to select base configuration (LSM, maXS, VTR, some slave)
 Alt+Q:Exit TAB:Next Parameter F3:Adv.Config F4:Save as F5:Load F6:Name Config/
```

1.3.1.1 AUDIO & VIDEO PARAMETERS OVERVIEW

🔊 **Note:**

When Modifying the value of a parameter in the Audio & Video Channel Parameters, always press ENTER after changing the value of a parameter to validate the new choice. Check the channels table in the centre of the screen to make sure that the changes are reflected there.

LOCK VIDEO CONFIGURATION

Possible values: Yes / No

This item enables/disables the access to the modifications of the next three items: Video Players, Video Recorders and Type for REC1.

The video configuration is locked if Option Code 4 (Authorize video configuration changes) is not active in the Options List.

BASE CONFIGURATION

Possible values:

Replay-Only LSM

Multicam LSM

XT Server Sony

XT Server DD35

XT Server Odetics

XT Server Odetics F&K

XT Server VDCP

XT Server VDCP F&K

XT Server AVSP

XT Server IPDP

XT SpotBox Sony

XT SpotBox DD35

XT SpotBox Odetics

XT SpotBox Odetics F&K

XT SpotBox VDCP

XT SpotBox VDCP F&K

XT SpotBox AVSP

XT SpotBox IPDP

Video Delay

2-ch VTR

The different configurations appear according to the license codes that have been enabled.

LOOP REC

This parameter is always forced to YES. It enables/disables the endless loop recording in AVSP Server/Spotbox configurations. This function is applied to all recorder channels.

CLIP CAPACITY

Possible values: Global / Per Channel

This parameter allows selecting the recording mode.

In Global mode, the clip capacity is shared between the different record trains. Example: When 3 record trains are used, creating a clip of 30 min on REC1 will take 10 min of recording capacity equally from each record train.

In Per Channel mode, the clip capacity is only relevant to the individual record train. Example: 3 record trains are used, creating a clip of 30 min on REC1 will take 30 min of recording capacity from the 1st record train, but will not affect the recording capacity of the other two record trains.

The default value depends on the basic configuration:

LSM	2-ch VTR	Slave/Server configurations	Video Delay
Global (locked)	Per Channel	Per Channel	Global (locked)

VIDEO PLAYERS

Range: [1...6]

This parameter allows selecting the number of player channels of the application and the associated audio channels.

VIDEO RECORDERS

Possible values in range: [1...6]

This parameter allows selecting the number of RECORD channels of the application. The partition of the disk storage between these channels, and the associated audio channels are automatically updated.

TYPE FOR REC1

This parameter defines the type of recorder for the 1st record channel.

Four types of record are available:

- Standard rate 50/60 Hz

- SD SLSM Alternate Parity – EVS mode (150/180 Hz)

- SD SLSM Identical Parity (150/180 Hz)

- HD SLSM 2x Alternate Parity – EVS mode (100/120 Hz)

- HD SLSM 3x Alternate Parity – EVS mode

> **Note**
> The fault tolerance on the different phases of the super motion camera is +/- 90% of one field. So there should be no delay between the different phases when all equipments are genlocked.

AUDIO FORMAT

Possible values: [Analog (A), AES/EBU (D), Embedded (E), Dolby E AES (DY), Dolby E Embedded (EY)]

This parameter allows selecting the Audio format.

When the Audio Format is set to AES/EBU (D or DY) or Embedded (E or EY), the analogue audio outputs (if installed on the server) are automatically activated and can be used for additional monitoring.

When the Audio Format is set to Embedded (E or EY), the digital audio (AES/EBU) outputs (if installed on the server) are also active.

For more information on Dolby Audio Management, refer to section 1.3.1.2 'Dolby Audio Management', on page 14.

AUDIO TYPE

Possible values: [1 Track, 2 Tracks, 4 Tracks, 8 Tracks]

This parameter allows selecting the type of audio (number of mono audio tracks associated to each video channel).

LIPSYNC

Range for PAL: From -41,458 ms to 14,708 ms ➔ 848 à 3544 (samples)

0 ms ➔ 2838

Range for NTSC: from -34,625 to 12,125 ms ➔ 688 à 2932 (samples)

0 ms ➔ 2350

The Lipsync parameter is the delay (in ms) between video and audio signals. A positive value means video is ahead of audio. A negative value means audio ahead of video.

This parameter is also available from the **Setup** menu of the Remote when the Multicam application is started. Changing the Lipsync value in the **Setup** menu will update it in the EVS menu and vice versa.

CTRL-↑/↓ changes the value per 1 msec step. The operator can also enter directly a value with the keyboard.

> **Note:**
> This adjustment is done during the RECORD process. A new Lipsync value will apply for the next recorded pictures only.

USE AUDIO OF REC 1 FOR ALL REC

Possible values: [Yes or No]

All audio channels associated to REC1 (CAM A) will be automatically used for all other RECORD channels if 'Yes' is selected.

ANCILLARY MODE

Possible values: [24 bits or 20 bits]

This parameter defines the encoding method used for Digital Audio.

CHANNELS

Channels input/output and name are automatically defined according to the parameters entered in the fields: Base configuration, Video Players, Video Recorders and Type of Rec.

The player channels are allocated first (starting with OUT1), then the record channels are allocated (starting with IN1)

> **Note:**
> To modify the parameters included in the "Channels' area", press **F3** to enter the Advanced Configuration mode

TYPE

Possible values: [Rec, Play, SLSM Rec, SLSM Rec. 1, SLSM Rec. 2, SLSM Rec. 3]

This parameter is automatically set according to the settings of the previous ones. It defines the type of channel and depends on the values of Video Players, Video Recorders and Type of REC1.

CTRL

Possible values: [Sony, DD35, VDCP, Odetics, Edit Rec, AVSP, IPDP]

This parameter defines which system or protocol controls the current channel. This parameter is automatically set and not editable when the Base Configuration is set to LSM or Video Delay.

PORT

Range: [1 ... 6]

This parameter defines the RS422 port number that controls each channel. These fields are not available with LSM and Video Delay configurations.

> **Note:**
> A single Sony BVW serial connection can control multiple PGM channels which are ganged on an XT server. It is therefore possible to assign the same RS422 port number (#n), which corresponds to a Sony BVW protocol, to several PGM channels on the same XT server.
>
> A single Odetics or VDCP serial connection can control two PGM paired channels, in a Fill and Key configuration, on an XT server. It is therefore possible to assign the same RS422 port number (#n), which corresponds to a VDCP or Odetics protocol, to the Fill and Key player channels of one XT server. The first channel will be assigned as the Fill channel and the second will automatically be the Key channel.

REC

For a player channel, this parameter defines which record train is the default source.

For a recorder channel, two parameters are available:

- Recording Capacity: (% Disk) Percentage of disk space allocated to each channel. Total of all values must not exceed 100%.

- Loop/No Loop: depends on the value of Loop Rec, previously described. Always forced to "Loop" with the current version.

A1 - A2 - A3 – A4 IN

1st /2nd /3rd /4th mono audio input of the current channel.

A1 - A2 - A3 – A4 OUT

1st /2nd /3rd /4th mono audio output of the current channel.

Audio format

Possible values: [Analog (A), Digital AES/EBU (D), Dolby E AES (DY), Embedded (E), Dolby E Embedded (EY)]

The available values depend on the type of audio connectors defined in EVS hardware configuration:

None	16 XLR Analog	16 XLR Digital	16 XLR Analog + 8 XLR Digital 16 XLR Analog + 16 BNC Digital 16 XLR Analog + 4 DB15 Digital 4 DB15 Analog + 16 BNC Digital 4 DB15 Analog + 4 DB15 Digital
E - EY	E - EY - A	E - EY – D - DY	E - EY - A – D - DY

AUDIO CHANNEL

Range: [1 ... 24]

This parameter allows selecting the audio channel among the selected audio format. The values depend on the audio format and available connectors:

	Analog (A)	Digital (D - DY)	Embedded (E - EY)
Embedded only	n/a	n/a	1 – 48
16 XLR Analog	1 – 8	n/a	1 – 48
16 XLR Digital	n/a	1 – 16	1 – 48
16 XLR Analog + 8 XLR Digital	1 – 8	1 – 8	1 – 48
16 XLR Analog + 16 BNC Digital or 16 XLR Analog + 4 DB15 Digital	1 – 8	1 – 16	1 – 48

In an Embedded configuration, the audio output is also sent in AES and Analogue formats. In an AES configuration, the audio output is also sent in Analogue format. The following table specifies the outputs the audio is sent to in the various audio formats at the same time. The following tables applies to a 6U configuration

None / 16 XLR D / 16 BNC D / 4 DB15 D + 16 XLR A

4 tracks	PGM1				PGM2			
Embedded	E1	E2	E3	E4	E9	E10	E11	E12
AES	D1	D2	D9	D10	D3	D4	D11	D12
Analog	A1	A2	A5	A6	A3	A4	A7	A8

	PGM3				PGM4			
Embedded	E17	E18	E19	E20	E25	E26	E27	E28
AES	D5	D6	D13	D14	D7	D8	D15	D16
Analog								

	PGM5				PGM6			
Embedded	E33	E34	E35	E36	E41	E42	E43	E44
AES								
Analog								

None / 16 XLR D / 16 BNC D / 4 DB15 D + 16 XLR A

8 tracks	PGM1								PGM2							
Embedded	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14	E15	E16
AES	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16
Analog	A1	A2	A3	A4	A5	A6	A7	A8								

	PGM3								PGM4							
Embedded	E17	E18	E19	E20	E21	E22	E23	E24	E25	E26	E27	E28	E29	E30	E31	E32
AES																
Analog																

	PGM5								PGM6							
Embedded	E33	E34	E35	E36	E37	E38	E39	E40	E41	E42	E43	E44	E45	E46	E47	E48
AES																
Analog																

AUDIO GAIN

Range: [from -90dB to +23.5dB]

This parameter allows the operator to adjust the audio gain for each audio track. The adjustments are done by pressing **CTRL-↓/↑** (±0.75dB steps) or **SHIFT-↓/↑** (±6dB steps).

AUDIO MONITORING

This parameter defines the audio monitoring outputs, selects the type of audio and allows adjusting the audio gain for each channel.

1.3.1.2   DOLBY AUDIO MANAGEMENT

SOME DEFINITIONS

Dolby Digital or Dolby 5.1 or AC-3, is an audio coding system containing up to **6 discrete channels of sound**, with 5 channels for normal-range speakers (20 Hz - 20,000 Hz) (Right front, Center, Left Front, Right Rear and Left Rear) and one channel (20 Hz - 120 Hz) for the LFE, or subwoofer.

Dolby E is a professional **coding system** optimized for the distribution of surround and multichannel audio **through two-channel** postproduction and broadcasting infrastructures, or for recording surround audio on two audio tracks of conventional digital video tapes, video servers, communication links, switchers, and routers.

DOLBY CONFIGURATIONS IN XT[2] SERVERS

Case 1: The 5.1 audio signal is carried on 6 discrete PCM audio channels

- Available on an XT2 in all configurations
- The audio can be analog, digital or embedded depending on the configuration
- In AES audio, if the audio is correctly genlocked to the video, the sample rate converter can be switched off.

Case 2: The 5.1 audio signal is coded in the two-channels Dolby E standard

- Dolby E over AES/EBU links
  - o Set the configuration of the pair of channels carrying the Dolby E signal to "DY" in the avcfg. This has two effects :
- It disables the sample rate converter on the input channels
- It forces all transitions to a hard cut.

If the sample rate converter is activated and the audio configuration is a mix between PCM audio over AES and Dolby E over AES, the sample rate converter will only be applied to the PCM over AES signal.

- Dolby E Embedded in the SDI/HD SDI stream
  - o Set the configuration of the pair of channels carrying the Dolby E signal to "EY" in the avcfg. This will force the transition to a hard cut.
  - o The sample rate converter parameter does not apply to embedded audio.

The Dolby E transitions will be correct as long as :

- the configuration is correct
- the AES stream containing Dolby E is correctly synchronised with the video

Dolby E transitions will <u>not</u> be correct (2 frames of mute at the transitions) if the avcfg is set to E instead of EY or D instead of DY.

Audio effects (scrub, slow motion) are not possible in Dolby E. If they are used anyway, the audio will be muted.

1.3.1.3 TO MODIFY A/V CHANNEL PARAMETERS

1. Press **F9** to open the Maintenance menu.

2. Select the 'Channel Parameters' item and press **ENTER**.

3. Select the Application to configure and press **ENTER**.

    The Audio Video Channel Parameters window appears.

4. Use the **<TAB>** key to move from one box to the next one. Some information about the current parameter is displayed in the INFO area.

5. Press **<TAB>** or the arrow keys (←,→,↑,↓) to move across the different parameters in the window.

6. When the desired field is selected, modify the parameter to its new value with **<SPACE BAR>** or by entering its numeric value and then press **ENTER** to validate.

7. Press **F3** to enter the Advanced Parameters.

8. Press **F4** to save the current configuration. A dialog Box appears to enter a name.

9. Press **F5** to load the list of configurations previously saved.

10. Press **ALT + Q** to exit the A/V Channel parameters window.

OR:

1. From the 'Application List', select the application to configure and press **F8**

2. Then continue from step 4.

1.3.2 OSD, VIDEO AND AUDIO SIGNALS ON COHX IN REC/PLAY

Embedded audio is present on the monitoring of the codecs in rec.

The following table summarises what is present on each of the BNC of a COHX input/output.

COHX backplane connector
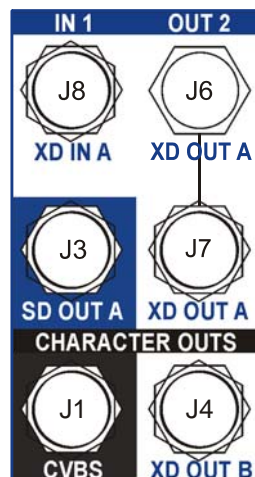
HD Codec in Rec

BNCs	Video	Embedded Audio (if present at input)	Delay	Phase
J8	HD Input	n/a	n/a	n/a
J6	HD signal of BNC 1	Audio of BNC 1	n/a	n/a
J7	HD signal of BNC 1	Audio of BNC 1	n/a	n/a
J3	SD downconverted signal of BNC 1	Audio of BNC 1	Yes	Adjustable
J1	SD SDI or CVBS signal of BNC 1 with OSD (08.03)	Audio of BNC 1 only in SDI	Yes	Adjustable
J4	HD signal of BNC 1 with OSD	Audio of BNC 1	n/a	n/a

SD Codec in Rec

BNCs	Video	Embedded Audio (if present at input)	Delay	Phase
J8	SD Input	n/a	n/a	n/a
J6	SD signal of BNC 1	Audio of BNC 1	n/a	n/a
J7	SD signal of BNC 1	Audio of BNC 1	n/a	n/a
J3	Hardware loop of BNC 1	Audio of BNC 1	n/a	n/a
J1	SD SDI or CVBS signal of BNC 1 with OSD	Audio of BNC 1 only in SDI	n/a	n/a
J4	SD signal of BNC 1 with OSD	Audio of BNC 1	n/a	n/a

HD Codec in Play

BNCs	Video	Embedded Audio (depending on the avcfg configuration)
J8	n/a	n/a
J6	HD output	Yes
J7	HD output	Yes
J3	SD downconverted output	Yes
J1	SD SDI or CVBS signal output with OSD	Only in SDI
J4	HD output with OSD	Yes

SD Codec in Play

BNCs	Video	Embedded Audio (depending on the avcfg configuration)
J8	n/a	n/a
J6	SD output	Yes
J7	SD output	Yes
J3	Hardware loop of BNC 1	n/a
J1	SD SDI or CVBS output with OSD	Only in SDI
J4	SD signal output with OSD	Yes

1.3.3 ADVANCED PARAMETERS

> ⚠ **Important**
>
> Most parameters are factory preset, and should not be modified without advice of qualified EVS staff.
>
> Improper values for some parameters will prevent the proper operation of the system. Please refer to the parameters' charts for correct values. (See section 1.3.10 'Default parameters', on page 34)

```
                          EVS 00.18.31    Apr 04,2008 12:22:59    Z
 Parameters for 00 Custom application

 Standard Definition (525i/625i)
   Codec Type SD MJPEG Standard
   Video BitRate (Mbps) 30
   Recorded Video Lines (625i)    576 lines (L23-310;L336-623)
   Recorded Video Lines (525i)    496 lines (L16-263;L278-525)

 High Definition (1080i/720p)
   Codec Type HD MJPEG EVS
   Video BitRate (Mbps) 100
   Horizontal Resolution (1080i) 1280
   Horizontal Resolution (720p)   768

 Data Recording                        Vertical Interpolator      off
   Video Disk Block Size    8MB        Four Lines Interpolation   off
   Operational Disk Size (%) 100

 Messages
 Select SD Codec Type (default SD MJPEG Standard)

<Enter> validate the entry, ↑↓ Select                        <ESC>Quit
```

1.3.3.1 CODECS AVAILABILITY AND OPTIONS DEPENDING ON THE VIDEO STANDARD AND THE HARDWARE

SD 625i

	COHX		
Codec Type	SD MJPEG Standard	SD IMX (D10)	SD MPEG2 i-field
Bitrate	20-200 Mbps	30 ; 40 ; 50 Mbps	20-200 Mbps
	Default : 30 Mbps	Default : 30 Mbps	Default : 30 Mbps
Recorded video lines	576 lines (L23-310 ; L336-623) default	608 lines (L7-310 ; L320-623)	608 lines (L7-310 ; L320-623)
	592 lines (L15-310 ; L328-623)		
	608 lines (L7-310 ; L320-623)		

SD 525i

	COHX		
Codec Type	SD MJPEG Standard	SD IMX (D10)	SD MPEG2 i-field
Bitrate	20-200 Mbps	30 ; 40 ; 50 Mbps	20-200 Mbps
	Default : 30 Mbps	Default : 30 Mbps	Default : 30 Mbps
Recorded video lines	496 lines (L16-23 ; L278-525) default	512 lines (L7-262 ; L270-525)	512 lines (L7-262 ; L270-525)
	480 lines (L23-262 ; L286-525)		
	512 lines (L7-262 ; L270-525)		

**HD 1080i
50Hz**

Codec Type	COHX						
	HD MJPEG EVS	HD MJPEG Standard	HD MPEG2 i-field	AVID DNxHD 120 Mbps	AVID DNxHD 185 Mbps	Apple ProRes 422 120 Mbps	Apple ProRes 422 HQ 185 Mbps
Bitrate	20-360 Mbps	20-360 Mbps	20-360 Mbps	1-120 Mbps	121-185 Mbps	120 Mbps	185 Mbps
	Default : 100 Mbps	Default : 100 Mbps	Default : 100 Mbps	Default : 120 Mbps	Default : 185 Mbps	Default : 120 Mbps	Default : 185 Mbps
Horizontal Resolution	960	960	960 (default)	1920	1920	1920	1920
	1152	1152	1152				
	1280 (default)	1280 (default)	1280				
	1372	1372	1372				
	1440	1440	1440				
	1536	1536	1536				
	1600	1600	1600				
	1920	1920	1920				

**HD 1080i
59,94Hz**

Codec Type	COHX						
	HD MJPEG EVS	HD MJPEG Standard	HD MPEG2 i-field	AVID DNxHD 145 Mbps	AVID DNxHD 220 Mbps	Apple ProRes 422 145 Mbps	Apple ProRes 422 HQ 220 Mbps
Bitrate	20-360 Mbps	20-360 Mbps	20-360 Mbps	1-145 Mbps	146-220 Mbps	145 Mbps	220 Mbps
	Default : 100 Mbps	Default : 100 Mbps	Default : 100 Mbps	Default : 145 Mbps	Default : 220 Mbps	Default : 145 Mbps	Default : 220 Mbps
Horizontal Resolution	960	960	960 (default)	1920	1920	1920	1920
	1152	1152	1152				
	1280 (default)	1280 (default)	1280				
	1372	1372	1372				
	1440	1440	1440				
	1536	1536	1536				
	1600	1600	1600				
	1920	1920	1920				

**HD 720p
50Hz**

	COHX						
Codec Type	**HD MJPEG EVS**	**HD MJPEG Standard**	**HD MPEG2 i-field**	**AVID DNxHD** **120 Mbps**	**AVID DNxHD** **185 Mbps**	**Apple ProRes 422** **120 Mbps**	**Apple ProRes 422 HQ** **185 Mbps**
Bitrate	20-360 Mbps	20-360 Mbps	20-360 Mbps	1-120 Mbps	121-185 Mbps	120 Mbps	185 Mbps
	Default : 100 Mbps	Default : 100 Mbps	Default : 100 Mbps	Default : 120 Mbps	Default : 185 Mbps	Default : 120 Mbps	Default : 185 Mbps
Horizontal Resolution	640	640	640	1280	1280	1280	1280
	768 (default)	768 (default)	768 (default)				
	960	960	960				
	1024	1024	1024				
	1280	1280	1280				

**HD 720p
59,94Hz**

	COHX						
Codec Type	**HD MJPEG EVS**	**HD MJPEG Standard**	**HD MPEG2 i-field**	**AVID DNxHD** **145 Mbps**	**AVID DNxHD** **220 Mbps**	**Apple ProRes 422** **145 Mbps**	**Apple ProRes 422 HQ** **220 Mbps**
Bitrate	20-360 Mbps	20-360 Mbps	20-360 Mbps	1-145 Mbps	146-220 Mbps	145 Mbps	220 Mbps
	Default : 100 Mbps	Default : 100 Mbps	Default : 100 Mbps	Default : 145 Mbps	Default : 220 Mbps	Default : 145 Mbps	Default : 220 Mbps
Horizontal Resolution	640	640	640	1280	1280	1280	1280
	768 (default)	768 (default)	768 (default)				
	960	960	960				
	1024	1024	1024				
	1280	1280	1280				

Note:

The dynamic bitrate management system modifies compression tables for each recorded field to keep the bitrate of the encoded stream as close as possible to the target. A higher bitrate means better picture quality and less storage capacity but a higher bandwidth is required. Improper values can lead to exceed disks performance, causing frozen pictures during playback.

Important

Some video formats allowed on XT[2] hardware create clips that are not compatible with previous hardware. When an incompatible format is selected, a warning will be issued at the starting up of the application. In addition, the video format information displayed on the **Shift-F2** page of the Multicam indicates any incompatible information.

VIDEO DISK BLOCK SIZE

[512Kb]

This parameter indicates the size (in KB) of data blocks to be recorded to or read from the disks.

OPERATIONAL DISK SIZE

Range: [0...100]

This parameter indicates the percentage of the disks actually used to store the data. Restricting access to the centre part of the drives increases the performance of the system but decreases capacity.

VERTICAL INTERPOLATOR AND FOUR LINES INTERPOLATION

Possible values: Off / On

This parameter enables or disables the interpolation process. Select 'off' to disable the interpolation process, or 'on' to enable the interpolation process selected by the 'Four lines interpolation' parameter. The interpolation process is aimed at reducing the vertical jitter of the pictures that is present during slow-motion replays.

This vertical jitter is actually caused by a violation of the frame parity when playing back the pictures at less than 100 % speed.

The process consists in re-building new frames to produce a more transparent result. These frames have to be interpolated - i.e. calculated by making suitably weighted averages of adjacent lines. There are 2 interpolation modes: the 2-line interpolator and the 4-line interpolator. The disadvantage of this method is that it reduces the vertical resolution. This is particularly true with the 4-line interpolator.

The user can choose between 3 modes:

- **no interpolation:** maximize the vertical bandwidth of the picture but a vertical jitter appears in "SloMo". [set 'Interpolation validation' to off, whatever the value of 'Four lines interpolation']

- **2-line interpolator:** reduce the vertical jitter but the vertical bandwidth is reduced. [set 'Four lines interpolation' to off and 'Interpolation validation' to on]

- **4-line interpolator:** the picture is perfectly steady but the vertical bandwidth is even more reduced. [set 'Four lines interpolation' to on and 'Interpolation validation' to on]

Note:
All VTRs use interpolation in PLAY VAR mode.

1.3.3.2 HOW TO MODIFY ADVANCED PARAMETERS

1. Press **F9** to open the Maintenance menu.

2. Select the 'Advanced Parameters' item and press **ENTER.**

3. Use the ↑ and ↓ keys to select the parameter to modify and press **ENTER.**

4. Enter the desired value, then press **ENTER.**

5. When all parameters are set, press **ESC.**

6. A confirmation message is displayed, press **ENTER.**

1.3.4 CONFIGURATION

This function is used to set the hardware configuration of the system (boards release numbers, port settings,...).
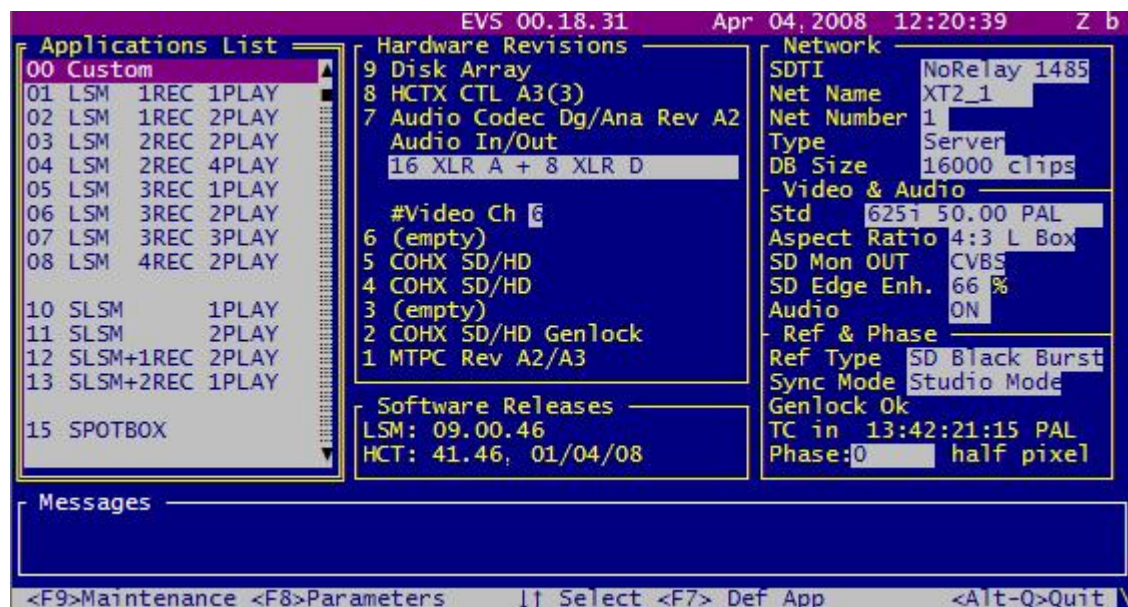
To enter the configuration window, press **F9** to open the Maintenance menu, select 'Configuration' and press **ENTER.** A double frame appears around the Configuration window, and the cursor blinks next to the 'HCT' label.

1.3.4.1 HOW TO MODIFY AN ITEM IN THE CONFIGURATION WINDOW

1. Use ↑, ↓ or **<TAB>** keys to select the desired item.

2. Press **<SPACE BAR>** several times until the correct value appears.

3. Select another item to modify or press **ESC** to go back to the Maintenance menu.

1.3.4.2   HARDWARE REVISIONS AREA

This area Indicates, board by board, the detected hardware inside the chassis. Please refer to the Technical Reference document for more information about the hardware.

Three pieces of information cannot be detected:

- **Audio In/Out:** defines the audio input and output connectors available from the rear panel.

  On a 6RU XT[2]

  o   16 XLR Analog,

  o   16 XLR Digital,

  o   16 XLR Analog + 8 XLR Digital,

  o   16 XLR Analog + 16 BNC Digital

  o   16 XLR Analog + 4 DB15 Digital

  o   8 XLR Analog + 16 XLR Digital

  o   None

  On a 4RU XT[2]

  o   4 DB15 Analog + 16 BNC Digital,

  o   4 DB15 Analog + 4 DB15 Digital

  o   None

- **Video Ch.:** the number of available video channels can be adjusted.

> **Note:**
> The order of the boards in this list is the same as inside the mainframe, from top to bottom. The revision of a board located in the front part of the mainframe is always written on a white label on the left front end of the board.

Rev: A1 SN: 2307   COHX

Board revision   Board serial   Board type
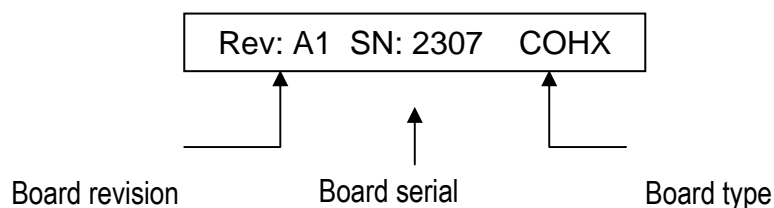
1.3.4.3   SOFTWARE RELEASES AREA

LSM

This parameter displays the version number of Multicam software installed.

HCT

This parameter displays the version number and release date of HCT microcode installed.

1.3.4.4   NETWORK AREA

SDTI

Possible values: [off / 540Mbps Relay / 540Mbps Non-Relay / 1485Mbps Non-Relay]

This parameter makes it possible to enable the SDTI option and select the bandwidth of the network.

On XT[2] servers, there are two pairs of SDTI connectors:

- XNet Relay connectors can be used at a maximum of 540 Mbps

- XNet[2] Non-Relay connectors can be used at either 540 or 1485 Mbps.

When connected on the SDTI network through Relay connectors, the SDTI loop is always maintained, even if the XT[2] is not powered on. If connected through Non-Relay connectors, the SDTI circuit is closed only when the Multicam software is started.

> ⚠ **Important**
> The SDTI bandwidth must be identical on all XT[2] servers connected to the XNet.
> If one system is configured with a different bandwidth, it will block the entire network.
> The Disk Block Size parameter must be the same on all XT[2] servers.

NET NAME

The Net name defines the machine name on the network. This name is user-defined but cannot exceed 8 characters. Entering a Network Name is not mandatory because a network number is also assigned to the system, but it is recommended to easily identify all servers connected to the XNet.

NET NUMBER

Range: [1 ... 29]

The Net Number parameter defines the machine number on the network. This number is user-defined and must be unique for each system on the network. When entering a new number if this number is already assigned to another machine, an error message will warn the user.

TYPE

Possible values: [Client, Master, Server]

The type defines the privileges of the XT[2] server on the SDTI network. One XT[2] server on the network should be set to Server type. If no server is defined, XNet will not be activated. If more than one server is defined, only the first one to connect will be the actual server.

Other XT[2] servers on the network can be set either to Master type if they need to access clips from other servers, or to Client type if their clips must be available on the network but they don't need to access clips from other servers.

	Allowed to access the content of all XT[2] servers on the network	Can be accessed by other XT[2] servers on the network
SERVER	Yes	Yes
MASTER	Yes	Yes
CLIENT	No	Yes

DB SIZE

Possible values: [6000 clips, 16000 clips]

This parameter defines the size of the network database, i.e. the maximum number of clips that can be created for the entire SDTI network.

1.3.4.5   VIDEO & AUDIO AREA

STD

This parameter allows selecting the video standard:

- 625i 50.00 PAL *(default for SD)*
- 525i 59.94 NTSC
- 525i 59.94 NTSC Japan
- 1080i 50.00 PAL (*default for HD*)

- 1080i 59.94 NTSC
- 1080i 59.94 NTSC Japan
- 720p 50.00 PAL
- 720p 59.94 NTSC
- 720p 59.94 NTSC Japan

ASPECT RATIO

In High Definition, this parameter allows the user to select the format of the image for the downconverted outputs of the XT[2] (not used in SD configurations).

- **4:3 L Box**   letterbox *(default)*, the entire width of the 16:9 original picture is shown, but there are black panels horizontally above and below the picture
- **4:3 Crop**   the sides of the 16:9 picture are cut off but the 4:3 frame is filled
- **16:9**   anamorphic, *widescreen mode.*

   The 16:9 picture area is squeezed horizontally to fit inside the 4:3 space.

In Standard Definition, the parameter defines the aspect ratio of the incoming video feeds to adjust the aspect ratio of the graphics when drawing circles in Target Tracking and Painting modes.

SD MON OUT

Possible values: [CVBS or SDI]

This parameter specifies the type of output monitoring.

SD EDGE ENHANCE

Range: [0 – 200%] (Default 66%)

This parameter specifies the value of the edge enhancer for the SD downconverted outputs of the XT[2] servers set in HD.

AUDIO

Possible values: [On or Off]

This parameter enables or disables the Audio.

1.3.4.6   REF & PHASE AREA

REF TYPE

Possible values: [SD Black Burst, HD Tri-Level Sync]

This parameter allows selecting the genlock reference input between:

- SD Black Burst *(default)*
- HD Tri-Level Sync (HD only)

SYNC MODE

Possible values: [Studio mode, Resync mode]

This parameter allows selecting the frame synchronizer mode between:

- **Studio mode:** should be used when the video input signals are synchronized. *(default)*
- **Resync mode:** should be used when the video input signals are not synchronized. In this case, they will be re-synchonized on the digital I/O board. This can cause a shift of up to 3 fields between the various video input signals.

GENLOCK

Possible values:[OK or BAD]

This information is automatically displayed.

This parameter checks if the Genlock input is valid.

TC IN

This parameter displays the status of the LTC input of the server, and the video format corresponding to the incoming timecode.

Ex: "TC in 12:24:45:09 PAL" or "TC in 12:24:45:09 NTSC". If no valid timecode is detected, the display will show "TC in --:--:--:-- Bad".

PHASE

This parameter shows the value currently set for the main video phase of the digital video outputs. Refer to the 'Phase Definition' section for details.

1.3.5 OPTIONS

```
══════════════════════════ Options ══════════════════════════Z═
    0                     Full options
    1                     Switch from Temporary to Permanent
    2          Demo       Authorize SD configurations
    3          Demo       Authorize HD configurations
    4          Demo       Authorize video configuration changes
    5          Demo       Avid DNxHD(R) Codec
    6          Perm       Apple ProRes 422 Codec
  101          Demo       Server/SpotBox base open config
  102          Demo       LSM all options
  103          Demo        LSM base open config
  104          Demo         LSM base 1 PLAY
  105          Demo         LSM base 2 PLAY
  106          Demo         LSM base 3 PLAY
  107          Demo         LSM base 4 PLAY
  108          Demo         LSM base 5 PLAY

  Validation Code:      -      -      -

  Limit time is: May 05,2008  23:59:59

<ENTER> Validate <ALT-I> More Info <ESC> Quit
<ALT-F> Update From Local File   <ALT-U> Update From USB Key
```

This window is used to manage software license codes for all applications. To run particular application software and/or specific software options, not only the software itself is required but also a license key, which is unique for every option on every system.

This license key can be temporary until a defined deadline for demonstration purposes, or permanent with no time limit.

Example of line for a PERMANENT option

104	PERM	Multicam LSM Base 1 PLAY

Example of line for a TEMPORARY option

108	DEMO	Multicam LSM Base 5 PLAY

Example of line for a TEMPORARY option with From Date/To Date

109 01/12/05 to 31/12/05	Multicam LSM Base 6 PLAY

1.3.5.1   EXPIRATION AND WARNING

When a temporary license key is about to expire, the system will warn the operator. The warning is displayed every time the EVS software starts, from 2 weeks before the expiration date. The following message appears:

```
═══════════════ Warning ═══════════════
Demo Options will be out of date on
        Dec 31, 2000 23:59:59
        Please contact EVS :
        Tel: 32 4 361 7000
        Fax: 32 4 361 7099
      E-mail: support@evs.tv


      Press <ENTER> to continue
```
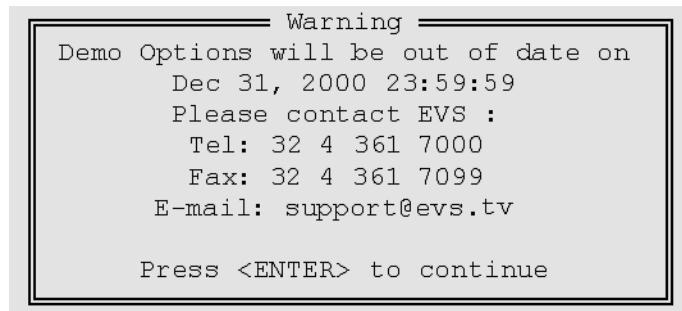
1.3.5.2   ACCESSING THE OPTIONS MENU

To enter the Options menu, open the Maintenance menu, then use the ↑ and ↓ keys to highlight the 'Options' line, and press **ENTER**. The Options window appears as shown below:

```
═══════════════════════════ Options ═══════════════════════════Z═
  0                      Full options
  1                      Switch from Temporary to Permanent
  2          Demo    Authorize SD configurations
  3          Demo    Authorize HD configurations
  4          Demo    Authorize video configuration changes
  5          Demo    Avid DNxHD(R) Codec
  6          Perm    Apple ProRes 422 Codec
101          Demo    Server/SpotBox base open config
102          Demo    LSM all options
103          Demo      LSM base open config
104          Demo        LSM base 1 PLAY
105          Demo        LSM base 2 PLAY
106          Demo        LSM base 3 PLAY
107          Demo        LSM base 4 PLAY
108          Demo        LSM base 5 PLAY

  Validation Code:   ▉  -    -    -

  Limit time is: May 05,2008  23:59:59

<ENTER> Validate <ALT-I> More Info <ESC> Quit
<ALT-F> Update From Local File   <ALT-U> Update From USB Key
```

The highlighted lines show the valid options. The red line is the current line. Use the ↑ and ↓ keys to move inside the options list.

When temporary options are present, the limit time for these is shown in the lower part of the Options window.

To go back to the Maintenance menu, press **ESC.**

1.3.5.3   HOW TO ENTER NEW LICENSE CODES

To enter new license codes, proceed in one of the following ways:

- If you have received a xxxxx.COD file (xxxxx = serial number of the server for which this file has been calculated) from EVS, copy this COD file on a floppy disk and press simultaneously **ALT+F** keys. The license codes will be automatically read from the floppy disk and updated into the system.

  or

- You can also copy manually the xxxxx.COD file to the `C:\` drive, then restart the EVS menu, enter the Options windows and press simultaneously **ALT+U** keys. The codes will be read from the `C:\` drive and updated into the system.

  or

1. Make sure the cursor blinks in the 'Option' box in the lower part of the Options windows.

2. In the **Validation Code** field, type the code corresponding to the selected option (license codes are sent by EVS Technical Support Dpt) and press **ENTER**.

3. Repeat this operation for the next license code.

4. You can check that the corresponding options are enabled by scrolling into the options list.

1.3.5.4   HOW TO REMOVE A LICENSE CODE

To remove a license code, proceed as follows:

1. Use the ↑ and ↓ keys to move inside the options list and select the option that must be removed.

2. When the option is selected (white characters), press simultaneously **CTRL-DEL** on the keyboard.

3. Confirm the delete of the option with **ENTER** or cancel with **ESC.**

1.3.5.5   HOW TO CHECK HARDWARE KEY (DONGLE) INFORMATION

When the Options window is open, press simultaneously **ALT + I**. A new window 'Option Info' appears. The following information is available:

System ID: ID code of the hardware key. This information is necessary for license code calculation. Factory setting only.

User: User's name. This information is a label and is for information only. Factory setting only.

Serial #: Serial number of the mainframe. The S/N is also written on the back plate of the mainframe. Factory setting only.

Frame Type: Defines the type of mainframe (6U or 4U). If this value is wrong, audio and video routing inside the system will not work properly. Factory setting only.

PSU Type: Defines the type of CPU installed on the chassis: standard or redundant (hswap).

Limit time: Expiry date & time for temporary license codes. This line does not appear when the permanent codes are installed.

Key time: current date & time of the hardware key displayed in a GMT+1 Timezone (Belgium Time). This is the date used to determine whether limit time for temporary license codes has been reached or not. Factory setting only.

Press **ENTER** to go back to the Options window.

1.3.6 CLEAR VIDEO DISKS

This function is used to erase all media from the RAID disk array.

⚠ **Important:**
Caution: This will definitely delete all video and audio data, including protected clip and record trains.

To clear video disks, proceed as follows:

1. Press **F9** to open the Maintenance menu.

2. Use the ↑ and ↓ keys to select the **Clear Video Disks** option line and press **ENTER.**

3. You are asked to confirm **ENTER** or cancel **ESC** the command.

1.3.7 FORCE LOAD CLIPS

This function is used when swapping disks arrays between XT[2] servers. If clips are saved to disks, this command forces the system to re-load the clips.

1.3.8 PHASE DEFINITION

This option is used to adjust the digital phase of the mainframe.

1.3.8.1 STANDARD DEFINITION

If the REF TYPE (see Configuration windows) is set to 'SD BlackBurst', the phase definition window is as follows:

```
╔══════════════ Phase Definition ══════════════╗
║                                               ║
║      Phase Value (SD)  [0     ]  Half pixel (37ns)  ║
║                                               ║
║    -12000  ◄▐███████████████▉███████████████▌►  15000  ║
║                                               ║
╟───────────────────────────────────────────────╢
║ [ENTER]Validate [ESC]Cancel   ←/CTL+→ Change Phase  ║
╚═══════════════════════════════════════════════╝
```
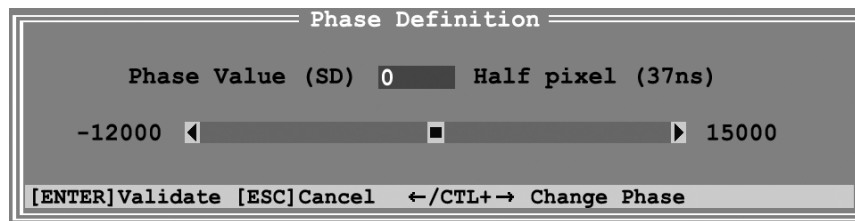
The phase value for SD can be adjusted between - 12000 ns and +15000 ns by 37 ns steps.

1.3.8.2 HIGH DEFINITION

If the REF TYPE is set to 'SD BlackBurst' and if the system is configured for HD, the phase definition window appears as follows:

```
╔══════════════ Phase Definition ══════════════╗
║                                               ║
║     Phase Value (SD)  [0    ]   Half pixel(37ns)  ║
║                                               ║
║   -12000  ◄▐█████████████▉█████████████▌►  15000  ║
║                                               ║
║  Secondary Phase Value (HD to SD)  [0    ]   Half pixel(13.5ns)  ║
║                                               ║
║   -1000  ◄▐█████████████▉█████████████▌►  1000  ║
║                                               ║
╟───────────────────────────────────────────────╢
║ [ENTER]Validate [ESC]Cancel  ←/CTL+→ Change Phase [TAB] Next ║
╚═══════════════════════════════════════════════╝
```
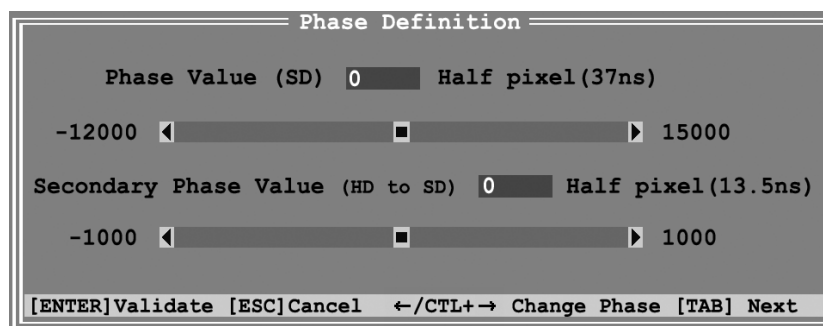
The main phase value for SD can be adjusted between - 12000 ns and +15000 ns by 37 ns steps and the secondary phase value (relative phase of the HD SDI outputs compared to the phase of the SD SDI outputs) can be adjusted between - 1000 ns and +1000 ns by 13.5 ns steps

If the REF TYPE is set to 'HD Tri-Level Sync', the phase definition window is as follows:

```
╔══════════════ Phase Definition ══════════════╗
║                                               ║
║     Phase Value (HD)  [0    ]   Half pixel(13.5ns)  ║
║                                               ║
║   -30000  ◄▐█████████████▪█████████████▌►  32000  ║
║                                               ║
║  Secondary Phase Value (SD to HD)  [0    ]   Half pixel(37ns)  ║
║                                               ║
║   -400  ◄▐█████████████▪█████████████▌►  400  ║
║                                               ║
╟───────────────────────────────────────────────╢
║ [ENTER]Validate [ESC]Cancel  ←/CTL+→ Change Phase [TAB] Next ║
╚═══════════════════════════════════════════════╝
```
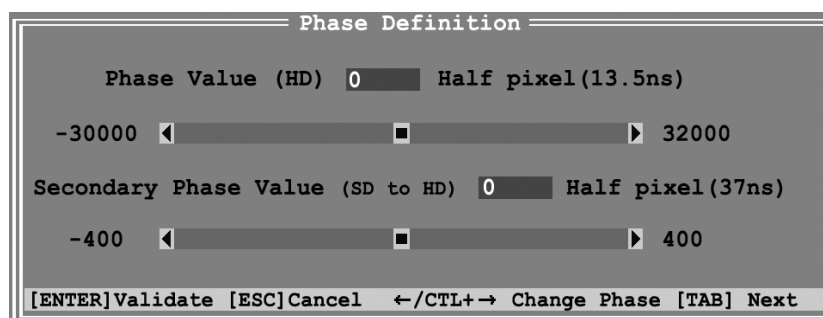
The main phase value for HD can be adjusted between - 30000 ns and +32000 ns by 13.5 ns steps and the secondary phase value (relative phase of the SD SDI outputs compared to the phase of the HD SDI outputs) can be adjusted between - 400 ns and +400 ns by 37ns steps

1.3.8.3   COMMANDS

- Use ← and → keys to adjust the main phase value by half pixel (i.e. SD: 37 ns or HD:13.5 ns) steps or type in the value in the **Phase Value** field.

- Use **CTRL +** ← and → keys to adjust the phase value by 1-line (i.e. 1440 in SD; 2880 half pixel in HD 720p; and 3840 half pixel in HD 1080i) steps.

- Use **<TAB>** key to toggle between **Main Phase** and **Secondary Phase** fields.

- Use ← and → ↑ and ↓ keys to adjust the secondary phase value by half pixel (i.e. SD: 37 ns or HD:13.5 ns) steps or type in the value in the **Phase Value** field.

- Press **ENTER** to save the new values and return to the Maintenance menu or press **ESC** to go back to the Maintenance menu without saving the changes.

⚠ **Important note 1:**
The SD phase is always adjusted according to the SDI outputs. Internal CVBS outputs have a delay of 48 x 37 nsec compared to the corresponding SDI outputs.

⚠ **Important note 2:**
The internal CVBS outputs can not be used to feed directly a vision mixer or any equipment performing video effects, since the phase of the chroma subcarrier is not adjustable internally.

1.3.9   DEFAULT APPLICATION

This option is used to define the default application that is automatically started by the system. Every time the EVS software is entered, the default application is started a few seconds later. You can avoid the automatic start by pressing the **<SPACE BAR>** or the ↑ and ↓ keys immediately when entering the EVS software. If no default application has been defined, the system will remain in the EVS software.

The default application is shown against a black background in the Application window.

1.3.9.1   HOW TO DEFINE A DEFAULT APPLICATION

- In the Application window, select the new default application using the ↑ and ↓ keys and press **F7**

  OR:

- Call the Maintenance menu with **F9** and select 'Default Application', select the defined application from the list, and press **ENTER**

  o If a default application was already defined, a message warns the operator that it will be disabled. The command can be confirmed with **ENTER** or cancelled with **ESC**.

  o If the command is confirmed, another message tells the operator that a new default application has just been defined.

1.3.9.2   HOW TO REMOVE THE DEFAULT APPLICATION

- In the Application window, select the application that is the current default application (blue characters with black background) using ↑ and ↓ keys, and press **F7**.

    OR:

- Call the Maintenance menu with **F9** and select 'Default Application'. Then select the current default application from the list and press **ENTER.**

    A message warns the operator that the current default application will be disabled. The command can be confirmed with **ENTER** or cancelled with **ESC.**

1.3.10   DEFAULT PARAMETERS

This command erases all current parameter settings and restores the default factory settings for all applications. When selecting this option, you are asked to confirm the command or cancel it.

1.3.10.1   DEFAULT PARAMETERS FOR ALL APPLICATIONS

Multicam LSM	Replay Only LSM	HD XT[2] 6U	HD XT[2] 4U
00 Custom	00 Custom	Y	Y
01 MultiLSM 1cam Cut	01 R.O. LSM 1cam Cut	Y	Y
02 MultiLSM 1cam Fx	02 R.O. LSM 1cam Fx	Y	Y
03 MultiLSM 2cam Cut	03 R.O. LSM 2cam Cut	Y	Y
04 MultiLSM 2cam Fx	04 R.O. LSM 2cam Fx	Y	Y
05 MultiLSM 2cam 4Out	05 R.O. LSM 2cam 4Out	Y	
06 MultiLSM 3cam Cut	06 R.O. LSM 3cam Cut	Y	Y
07 MultiLSM 3cam Fx	07 R.O. LSM 3cam Fx	Y	
08 MultiLSM Triple	08 R.O. LSM Triple	Y	
09 MultiLSM 4cam Cut	09 R.O. LSM 4cam Cut	Y	
10 MultiLSM 4cam Fx	10 R.O. LSM 4cam Fx	Y	
11 MultiLSM SLSM Cut	11 R.O. LSM SLSM Cut	Y	Y
12 MultiLSM SLSM Fx	12 R.O. LSM SLSM Fx	Y	Y
13 MultiLSM SLSM+1 C	13 R.O. LSM SLSM+1 C	Y	Y
14 MultiLSM SLSM+1 F	14 R.O. LSM SLSM+1 F	Y	
15 MultiLSM SLSM+2 C	15 R.O. LSM SLSM+2 C	Y	
16 MultiLSM SLSM+2 F	16 R.O. LSM SLSM+2 F	Y	

Line	0	1	2	3	4	5	6	7	8
Application	LSM Custom	LSM 1CAM Cut	LSM 1CAM FX	LSM 2CAM Cut	LSM 2CAM FX	LSM 2CAM 4Out	LSM 3CAM Cut	LSM 3CAM FX	Triple LSM
Video Players	1	1	2	1	2	2	1	2	3
Video Recorders	1	1	1	2	2	4	3	3	3
Type of REC 1	1	1	1	1	1	2	1	1	1
Audio Format	Analogue	Analogue	Analogue	Analogue	Analogue	Analogue	Analogue	Analogue	Analogue
Audio Type	Stereo	Stereo	Stereo	Stereo	Stereo	Stereo	Stereo	Stereo	Stereo
Recorders configuration (% Disk) *	100	100	100	50/50	50/50	50/50	33/33/33	33/33/33	33/33/33
Operational Disk Size	90	90	90	90	90	90	90	90	90
Video Bitrate (SD)	30	30	30	30	30	30	30	30	30
Video Bitrate (HD)	100	100	100	100	100	100	100	n/a	n/a
4-line interpolation	1	1	1	1	1	1	1	1	1
Interpolation Validation	0	0	0	0	0	0	0	0	0

Line	9	10	11	12	13	14	15	16
Application	LSM 4CAM Cut	LSM 4CAM FX	Super LSM Cut	Super LSM FX	Super LSM +1 Cut	Super LSM +1 FX	Super LSM +2 Cut	Super LSM +2 FX
Video Players	1	2	1	2	2	1	1	1
Video Recorders	4	4	1	1	2	3	3	3
Type of REC 1	1	1	2	2	2	2	2	2
Audio Format	Analogue	Analogue	Analogue	Analogue	Analogue	Analogue	Analogue	Analogue
Audio Type	Stereo	Stereo	Stereo	Stereo	Stereo	Stereo	Stereo	Stereo
Recorders configuration (% Disk) *	25/25/25/25	25/25/25/25	100	100	75/25	75/25	60/20/20	60/20/20
Operational Disk Size	90	90	90	90	90	90	90	90
Video Bitrate (SD)	30	30	30	30	30	30	30	30
Video Bitrate (HD)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4-line interpolation	1	1	1	1	1	1	1	1
Interpolation Validation	0	0	1	1	1	1	1	1

XT Spotbox**	XT server**	HD XT[2] 6U	HD XT[2] 4U
00 Custom	00 Custom	Y	Y
01 XT SpotBox BVW75	01 XT Server BVW75	Y	Y
02 XT SpotBox DD35	02 XT Server DD35	Y	Y
03 XT SpotBox Odetics	03 XT Server Odetics	Y	Y
04 XT SpotBox VDCP	04 XT Server VDCP	Y	Y
05 XT SpotBox AVSP	05 XT Server AVSP	Y	Y

* (% per channel). Ex: 50/50 means 2 record channels, 50% of available storage for each channel.

** All Spotbox/Server lines are similar to the LSM Custom line

1.3.11 DEFAULT TO VGA

Between the PC boot and the I/O boot, the video driver is loaded and the display is switched to one of the following mode:

- VGA mode

- B&W video mode, allowing the VGA screen to be displayed on a standard composite video monitor using the VGA↔BNC adapter provided with the unit.

> **Note:**
> At start-up, the keys' combination **ALT** and **<Backspace>** on the keyboard is still available for switching from one mode to the other.

1.3.12 TS CALIBRATION

When the Touch Screen option is installed, it can be calibrated using this command. If the Touch Screen is not installed, a warning message is displayed.

1.3.13 SET TIME

The Set Time command allows adjusting the system time & date.

Example of time format:

22:58:00   for 22 h 58 min 00 sec (24 hour display)

Example of date format (dd-mm-yyyy):

24-10-2007   for October 24, 2007

15-03-2008   for March 15, 2008

1.3.14 HARDWARE CHECK / RAID REBUILD

The purpose of this tool is to check the hardware and to verify the validity of the data recorded on the video disk array. After the selection of this command from the Maintenance menu, the system automatically starts the test process.

One after the other, the different stages are displayed in the BOOT.HCTX window. The test process is complete when the HCTX board is initialized.

> **Important:**
> Hardware check is also used to rebuild the video and audio information after replacing a faulty disk.

1.3.14.1 DISK ERRORS AND DISCONNECTION

When one disk of the video raid array has sustained errors, the Multicam automatically disconnect that disk and use the parity disk to rebuild the missing data and provide the video and audio data blocks to the application. The operator can thus continue working normally and the message "!Dsk" appears on all monitoring outputs.

When exiting the Multicam application, a warning will appear to remind the operator that one disk was disconnected, and invite him to perform a hardware check to repair the video raid:

```
To protect disk array integrity, a disk has
 been disconnected. At the next opportunity
please perform a hardware check to evaluate
 the faulty disk, and perform a rebuild to
             correct the problem.

                Enter: OK
```

If the Multicam is restarted without the RAID being rebuilt, the following message is blinking during the Bootwins: "SCSI Controller #C disconnected in operation!". Then when entering the Multicam, another message appears:

```
To protect disk array integrity, a disk has
 been disconnected. At the next opportunity
please perform a hardware check to evaluate
 the faulty disk, and perform a rebuild to
             correct the problem..

   ESC: Exit            Enter: Continue
```

The operator can press enter and operate normally on 4 disks or exit the software and return to EVS menu to run a Hardware Check.

1.3.14.2   DISKS MONITORING

The Server Monitoring screen allows disk monitoring. Press **Shift-F5** to access this screen:

```
                        SERVER MONITORING                          /Zi
SH+ESC:UGA EXPLORER                 Sh+F4:Network Monitoring F9:CLIP F10:PLST

 Disk Status
 Raid Map     Raid 0              Raid 1              Raid 2
 0/A     3/D Dsk!     Ok          Ok        Ok        Ok        Ok
 1/B 2/C 4/E Ok    Ok    Ok        /     Ok  Ok        Ok    /   Ok
             Rebuild 26.92%
 Genlock status                    Analog LTC status
 OK   since 19/11/07 - 16:01:39    10:47:59:11  <LOST> Drifts : 000

 TimeCode Status         Rec1 Rec2 Rec3
 LTC   LTC jumps         005  005  005
       LTC threshold     050  050  050
       Peak alerts       004  004  004
       Peak Limit (sec)  010  010  010
       Frequency alerts  000  000  000
       Frequency:Number  010  010  010
       Frequency:Time    050  050  050
 USER  USER jumps        004  004  004
       USER threshold    050  050  050


TAB:SELECT <-/->:CHANGE           PgDn:Pg2            ALT+Q:EXIT MULTICAM-
```

In the Disk Status section, the screen indicates the position of the disks on the disk array and the status of each disk:

/	Not present
Dsk!	Disconnected disk
OK	Disk present

When a disk is disconnected, the message "Rebuild xx.xx%" will appear next to the disk array to which the disconnected disk belongs. This value shows the advance of the rebuild process. When a disk is disconnected but new pictures are still being recorded on the disk array, this number will decrease until the disk is replaced and the rebuild process starts. The rebuild is complete when this number reaches 100%.

1.3.14.3   REBUILD PROCESS

The XT[2] server is capable of performing a rebuild process of the SCSI RAID. This process can happen either while the Multicam application is not running (offline process – rebuild is faster) or while the Multicam application is running (online process – rebuild is slower).

DISCONNECTION PROCESS

As explained in the previous section, the software will disconnect a disk that does not behave as expected.

Two options are available for the operator:

- Replace the disconnected disk and restart the server

  o Start the Multicam application. The rebuild process will start automatically.

  o Start a hardware check from the EVS menu and launch the rebuild. The process starts offline. The operator can wait for the rebuild to be completed or cancel it and start the Multicam application, in which case the rebuild carries on in online mode.

- The operator can also force the disk to be reconnected by starting the rebuild process in the hardware check. The process starts offline. The operator can wait for the rebuild to be completed or cancel it and start the Multicam application, in which case the rebuild carries on in online mode.

Maximum duration for on-line rebuild:

- 5x73GB : 16.5h

- 5x146GB : 33h

- 5x300GB : 66h

- 10x300GB : 133h

- 15x300GB : 200h

Off-line rebuild time takes about 1.5h for 5x73GB disks, 3h for 5x146GB disks, 6h for 5x300GB disks.

Note:
If errors are detected during the rebuild process, a message appears after the rebuild is complete to warn the operator, and the raid is not considered as properly rebuilt. In this state, the system will keep working on 4 disks. If you want to run on 5 disks again, you can try replacing the disk again and perform another rebuild, or clear all clips.

If you don't need to retrieve the clips or the record trains, you don't need to rebuild the RAID. In this case, select the "Clear All Clips" answer when the message with this option appears in the Hardware Check.

If you don't rebuild the RAID array or if you don't clear clips, the XT will keep running on 4 disks only, and the operator will see a warning message appearing every time he starts or closes the Multicam application. Normal operation can be achieved on 4 disks, but then, if another disk fails, the system will hang and all video and audio data will be definitely lost.

Note:
By default, the online rebuild process takes up 10% of the disk bandwidth. If you want to change this, contact EVS support.

1.3.14.4 RETRIEVING SCSI LOGS

If you suspect that the drive disconnection in operation was not due to a severe disk failure, but perhaps to the server being too prompt to disconnect a drive, you must run a hardware check immediately after ending the session during which the disk was disconnected.

Don't rebuild the RAID, but press simultaneously the **ALT-L** keys to generate the log file `C:\LSMCE\DATA\LOG\SCSI.LOG`, and send this file to EVS for detailed analysis. Note that this procedure is only valid if the drive is disconnected during operation, not for a drive being disconnected when booting the system.

1.3.15 CLIP COMPATIBILITY BETWEEN MULTICAM VERSIONS

Important:
The clips created in version 8.4 or lower are not compatible with Multicam v.9. For this reason, you should proceed as follows before you using the Multicam version 9.

1. Back up all the clips stored on the XT Server with XFile.

2. Just after migrating from version 8.04 to the version 9.0., perform a Clear Video Disks operation.

   This is available from the Maintenance menu (F9), with the Clear Video Disks option. For more information on the Clear Clip operation, refer to section 1.3.6 'Clear Video disks', on page 31.

Later on, you can then convert and restore any clip that has been backed up with XFile.

2. Bootwins & Error Messages

2.1 INTRODUCTION

This section of the manual describes:

- the sequences of the system initialization and the errors that might occur during this process.

    These different error messages will allow the EVS engineers to identify quickly the reason of a hardware problem and to provide the operator with a relevant solution.

- the tool, called EVS Disk Doctor, which makes it possible to recover the disk data in case Multicam would not succeed in reading it when the application is started.

2.2 INITIALIZING THE DISKS

STEP 1: INITIALIZATION START

The system is trying to initialize the SCSI hard disks.

The message "Waiting for disk information … " appears. The procedure is started on the system to initialize hard disks.

STEP 2: DISK STATUS

A status table is displayed:

	DISK A	DISK B	DISK C	DISK D	DISK E
Board #0	READY	READY	READY	READY	READY
Board #x	READY	READY	READY	READY	READY
Primary defects	XXX	XXX	XXX	XXX	XXX
Grown defects	YYY	YYY	YYY	YYY	YYY

It gives the status of each disk of each board. The different statuses are:

NOT PRESENT	Disk is not found.
PRESENT	Disk is present but Test unit ready function failed.
MAJOR ERROR	A major error has been detected: Disk cannot be used.
READY	Disk initialization succeeded.

NOT_READY	Time out after attempting to start the disk.
VERIFY_ERROR	An error occurred while verifying sectors on the disks. The system can probably work for a while but should be disconnected in operation.
LBA ERROR	LBA size is not 512. System cannot work.
SYS ERROR	All other possible errors.

Note:
The information regarding primary and grown defects is only available in maintenance mode (start a hardware check in EVS maintenance menu). XXX is the number of primary defects found on each disks. YYY is the number of defects found on each disks.

STEP 3: BOARD CAPACITY DISPLAY

After this table, the system displays the total capacity of all boards.

The message `"Capacity of board #x: m.n GBytes or XXX blocs of YYY KBytes"` is displayed.

where:

x	is the board number
m.n	is the size of the board in base 1024*1024*1024 (Giga bytes)
XXX	is the number of blocs available on the disks
YYY	is the size of each bloc.

POSSIBLE ERROR MESSAGES

- If a major error has been detected on a disk, it has been disconnected. In this case, the system displays the message:

  `"!!! SCSI CONTROLLER #X DISCONNECTED!!!"`

  where X is the number of the controller. It is advised to replace this disk and to rebuild its data if necessary.

  In that case, start the CHECK program in EVS menu to rebuild.

- If more than 2 disks are faulty at start up, the system displays the message:

  `"MORE THAN 2 CONTROLLERS IN ERROR. SYSTEM CANNOT WORK PROPERLY"`.

  In that case, the faulty disks must be replaced. Data rebuild is not possible.

- If a major error occurred on the board or the board is not correctly plugged or simply missing, the system displays the message:

  `"!!! ERROR: TIMED OUT -> SCSI BOARD #0 PROBABLY NOT PRESENT"`.

  In that case, check the board installation. If the error persists, install a new board or contact EVS support.

2.3   READING THE CONFIGURATION FILE

After the disk initialization sequence, the system reads the configuration file stored on the disk. This file contains the parameters which guarantee the coherence of main parameters of the system from session to session. Those parameters are: <u>diskBlockSize</u> and <u>operationalDiskSize</u>.

The message `"Reading configuration file … please wait"` is displayed during process.

IF THE CONFIGURATION FILE IS FOUND ON DISKS

The parameters are displayed:

Configuration	of user	on disks
block size	xxx kBytes	yyy kBytes
nbr of blocks	aaa	bbb

This table shows the parameters stored on the system ('on disks' column) and the ones from the EVS advanced parameters ('of user' column).

The values from both columns must be identical to use properly the system. If not, the system displays a warning message:

`"A parameter incoherence has been detected"` `"Would you like to format the system".`

Answer 'Yes' to format the A/V data saved on disks.

Answer 'No' to go back to EVS main menu.

⚠ **Important:**
If you answer 'Yes' and decide to format the system, all clips will be cleared. This operation is instantaneous.

IF THE CONFIGURATION FILE IS NOT FOUND

A warning message appears:

`"Your system is not formatted"` `"Would you like to format the system ?".`

Answer 'Yes' to format the A/V data saved on disks.

Answer 'No' to go back to EVS main menu.

IF ERRORS OCCUR WHILE READING THE CONFIGURATION FILE

The following message appears:

`"Error reading configuration file – status = [Err]".`

The type of error [Err] can be:

1.	**Block error**	A disk error occurred while loading the configuration file to disks. In this case, the disks have to be replaced by new ones.
2.	**Cache overflow error**	No more memory blocks are available from the memory cache.
3.	**Checksum error**	This error might occur when a disk has been replaced but the data of this disk is not restored. For solving the problem, start the Rebuild data process.
4.	**Signature error**	The signature of the configuration file is modified or the file format is modified and then the file is not compatible with the microcode. In this case, select the Format command to correct the error.

If the loading duration of the configuration file is too long, a time-out error message appears:

`"READ CONFIGURATION ERROR: TIMED OUT – state = [ST]".`

In this case, reset the system and start again the application.

2.4 FORMATTING THE CONFIGURATION FILE

If the operator answers 'Yes' to the message `"Would you like to format the system"`, the system generates a new configuration file on disks. The following message appears:

```
Format:     creating a new configuration file.
            blk size =              xxx kBytes
            number of blocs =       aaa
Formatting … please wait.
```

If an error occurs, the message is displayed: `"FORMAT ERROR: TIMED OUT – state = [ST]"`. In this case, reset the system and start again the application.

When format is completed successfully, the message `"Format completed"` is displayed and the system read the configuration file to be sure everything is in order.

⚠ **Important:**
If you answer 'Yes' and decide to format the system, all clips will be cleared. This operation is instantaneous.

2.5   INITIALIZING THE MICROCODE

The final step is the initialization of the microcode.

If the first line of the application is flashing with the message `"Disk #x has been disconnected in operation"`, the system will display the message: `"Disk to be disconnected: x"`. The system will work on 4 disks. Raid function is turned off.

The message `"Init board: nb blocks of size kBytes. Audio:aud  DiskUse:use%"` is displayed.

where

nb	is the number of blocks used on the system
size	is the size in kBytes of a block on a disk
aud	is ON/OFF
use	is the operationalDiskSize in %

If the system must load tables (no clear clips done in EVS main menu), the message `"Loading tables …"` will appear.

When the initialization is complete, the system displays the message `"HCTX board initialized"` and the system is ready. If an error occurs, the message `"ERROR (0xErr): HCTX board not correctly initialized"` is displayed. The error (Err) are detailed in the following section.

POSSIBLE ERRORS

If an error is detected while loading tables, the following message is displayed: `" LOAD <TAB>LE ERROR – state = [St]"` where 'St' can be:

1.	**Block error**	A disk error occurred while loading the table on hard disks. Maybe a disk failure. Replace disks.
2.	**Cache overflow error**	No more blocks available in cache. Algorithm problem. Contact EVS.
3.	**Checksum error**	This can occur if a disk has been replaced and data not rebuilt on it. Rebuild data on the disk to clear the message. If no disk has been replaced, try to re-start the server to clear the error message. If it does not resolve it after a few re-start, a clear clip will be necessary.
4.	**Signature error**	The signature on the table file is not found in the header file. Try to re-start the server to clear the error message. If it does not resolve it after a few re-start, a clear clip will be necessary.

If the message `"INIT ERROR: TIMED OUT – state = [St]"` is displayed, it means the initialization is not complete. 'St' refers to a position in the code.

Note:

Never forget that to start Multicam, the bootwins must successfully initialize the microcode. In that case, the message `"HCTX board initialized"` is displayed. In all other error case, the boot sequence or initialization phase is cancelled and multicam cannot be started.

2.6   DISK DATA RECOVERY

When Multicam is started, it sometimes happens that the application does not succeed in reading the data stored on the disks. However, the data is still available on the disks.

The EVS Disk Doctor has been developed to address this issue. This tool allows reconstructing the data (trains and clips) stored on the disks.

The tool scans each data block, identifies the recorder on which the data has been created and reconstructs the whole audio and video material.

The clips will also be recovered. However several overlapping clips will be recovered as one single long clip. This means that, in the schema below, the clips CD, EF and GH will be recovered as one single long clip for which the IN point will be C and the OUT point will be H.
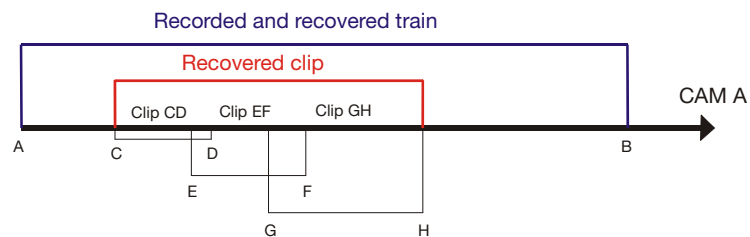
If you want to use this tool, please contact the EVS support.

3. Multicam Software

The Multicam software is made up of several modules. The modules used for managing the video material stored on the XT[2] server are discussed in the Multicam user manual. Besides this, three other modules are relevant for technicians with administration tasks and will therefore be described in details in this section:

- The Setup Configuration module, on page 48.

- The SDTI Network Monitoring module, on page 67.

- The Server Monitoring module, on page 70

3.1   SETUP CONFIGURATION

The Setup Configuration module aims at configuring the Multicam software and defining server settings in relation to timecodes, protocol communication, etc.

This module contains several pages, i.e. windows, which are described in details in this section:

Page 1 See section 3.1.1.	It includes several general settings on: • the timecodes • the OSD • the VGA • the network • the clip management • the record trains • the channel names • the RS422 protocols
Page 2 See section 3.1.2	It includes detailed settings on the insertion of VITC or ANC timecodes, channel by channel.
Page 3 See section 3.1.3 and 3.1.4	It includes settings on: • the priorities on the SDTI network • the SMPTE 334M packet management
Page 4 See section 3.1.5	It includes the settings on the GPI IN.
Page 5 See section 3.1.6	It includes settings on the VAR ID used with the VDCP protocol.
Page 6 See section 3.1.7 and 3.1.8	It includes detailed settings on: • the HCTX gigabit connection • the MTPC board connection

How to Access the Setup Configuration

The Setup Configuration module is available by pressing simultaneously **SHIFT-F2** on the keyboard with CAPS LOCK disabled.

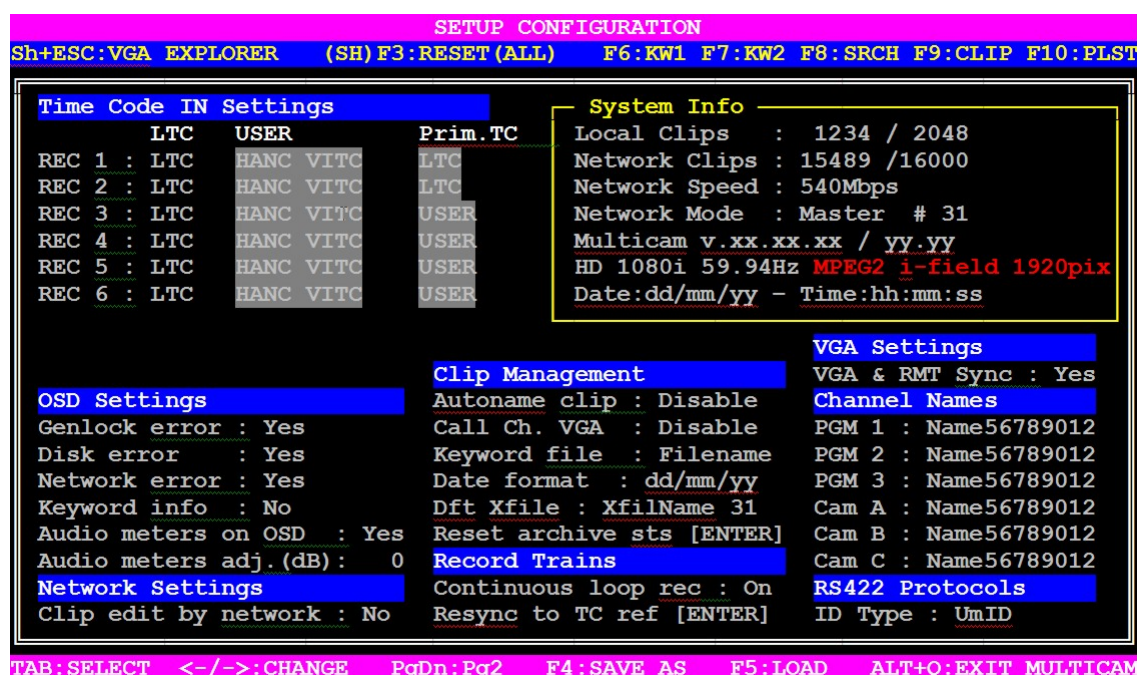The Setup Configuration is not accessible if CAPS LOCK is ON.

How to Move Inside the Setup Configuration

- Use **<TAB>** / **SHIFT-<TAB>** to move from one parameter to the next/previous, and the ←/→ arrow keys to change the value of a parameter.

- Use **PAGE UP** / **PAGE DOWN** to access the other configuration screens.

3.1.1 General Settings (Page 1)

The first page of the Setup configuration module contains some parameters from the Setup menu of the Remote Panel that are useful to adjust when working in a mode where no Remote Panel is used.

Some parameters included in the Setup configuration module are common with those in the Remote Setup menu. Therefore, a modification in the Setup configuration module is reflected immediately in the Remote Setup Menu, and vice-versa.

```
                         SETUP CONFIGURATION
Sh+ESC:VGA EXPLORER    (SH)F3:RESET(ALL)    F6:KW1 F7:KW2 F8:SRCH F9:CLIP F10:PLST

 Time Code IN Settings              ┌─ System Info ─────────────────┐
          LTC    USER      Prim.TC  │ Local Clips   :  1234 / 2048   │
 REC 1 : LTC    HANC VITC  LTC      │ Network Clips : 15489 /16000   │
 REC 2 : LTC    HANC VITC  LTC      │ Network Speed : 540Mbps        │
 REC 3 : LTC    HANC VITC  USER     │ Network Mode  : Master  # 31   │
 REC 4 : LTC    HANC VITC  USER     │ Multicam v.xx.xx.xx / yy.yy    │
 REC 5 : LTC    HANC VITC  USER     │ HD 1080i 59.94Hz MPEG2 i-field 1920pix │
 REC 6 : LTC    HANC VITC  USER     │ Date:dd/mm/yy - Time:hh:mm:ss  │
                                    └───────────────────────────────┘
                                                    VGA Settings
                           Clip Management          VGA & RMT Sync : Yes
 OSD Settings              Autoname clip : Disable   Channel Names
 Genlock error : Yes       Call Ch. VGA  : Disable   PGM 1 : Name56789012
 Disk error    : Yes       Keyword file  : Filename  PGM 2 : Name56789012
 Network error : Yes       Date format   : dd/mm/yy  PGM 3 : Name56789012
 Keyword info  : No        Dft Xfile : XfilName 31   Cam A : Name56789012
 Audio meters on OSD  : Yes Reset archive sts [ENTER] Cam B : Name56789012
 Audio meters adj.(dB):  0  Record Trains            Cam C : Name56789012
 Network Settings          Continuous loop rec : On  RS422 Protocols
 Clip edit by network : No  Resync to TC ref [ENTER] ID Type : UmID

TAB:SELECT  <-/->:CHANGE   PgDn:Pg2    F4:SAVE AS    F5:LOAD    ALT+Q:EXIT MULTICAM
```

Only some parameters of the Remote Setup menu are included in the Setup configuration module. These settings have been described in the Setup menu chapter of the Multicam user manual.

The settings relative to functions that are specific to the EVS Remote have not been included in the Setup screen since they are not useful when this panel is not used (Video Delay and Slave modes).

Some parameters are specific to the Setup configuration module, and are not present in the Setup menu of the EVS Remote panel. These are described in the following sections.

3.1.1.1 SYSTEM INFORMATION

The Setup screen also provides information about:

- actual and maximum number of local clips on the server: 4096 clips.

- actual and maximum number of clips of the database for the entire network: 6000 or 16000 clips, depending on the setting in the EVS Configuration menu.

- network speed, network mode and network number as defined in the EVS Configuration Menu

- version of the Multicam software

- codec and video configuration, and bitrate used.

3.1.1.2 CLIP MANAGEMENT SETTINGS

DATE FORMAT

(dd/mm/yy)

This is the date format used for the dates in searches or in clip information display. This parameter is read-only and provided for information purposes.

DELETING A KEYWORD FILE FROM THE SETUP SCREEN

Move the cursor to the Keywords File parameter using the **<TAB>** / **SHIFT-<TAB>** keys, then press **CTRL-DEL**, and confirm whether you want to delete the current keywords file from disk, or not.

3.1.1.3 CHANNEL NAMES

Play and Rec channels can be named (12 characters max.). The name of record channels will be displayed on the OSD of the video output monitor when a record train is loaded, displayed on the E/E monitoring outputs and can also be used to name clips automatically when the **Autoname Clip** parameter is set to "CAM name".

The name of the player channel will be displayed on the OSD, but truncated to 4 characters.

> **Note:**
> The channel names become very important for IPDirector usage. These names cannot currently be defined from an IPDirector system, and must be defined on this screen.

3.1.1.4   RS422 PROTOCOLS

ID TYPE

Possible values: ID LSM (default) / UmID

This parameter specifies the clip ID used by the protocols to access and to identify the clips. The default value is UmID.

At any time, the VDCP protocol can decide to use either the default value or the VAR ID. This VAR ID has to be set up in the section 3.1.6 'RS422 Protocol Settings', on page 61.

3.1.1.5   GENERAL TIMECODE SETTINGS

From Multicam version 9 onwards, the management of timecodes has been improved. The users can now choose which type of timecode they want to use as the reference to work on a given recorder of an XT[2] server. This is made possible by the management of two timecode jump tables.

TIMECODE JUMP TABLES

The timecode jump tables contain records with timecodes of video material recorded on the server. A new record is created in the table each time a jump in timecodes is detected on the recorded material.

The records of timecode jumps allow the identification of all the recorded material. The timecode jump tables are used on all searches for and manipulations of video material recorded on an XNet server.

The two timecode jump tables are filled with the following data:

- The first table is always filled in with the LTC timecode. This is the timecode defined on or plugged into the XT[2] server.

- The second table is filled in with the timecodes selected by the user. This can be one of the following timecode type:

  o   LTC and VITC timecodes in SD

  o   LTC, HANC LTC or HANC VITC in HD

> **Note**
> The timecode jump tables are circular: when the table is full, the latest entry will overwrite the oldest one.

For more information on the settings related to the timecode jump tables, refer to following sections.

For more information on the settings related to the definition and monitoring of timecode jumps, refer to section 3.3.4 'Timecode Statuses', on page 71.

TIMECODES TYPES AVAILABLE ON A RECORDER

The settings related to the timecode jump tables are specified on the **first page of the Setup screen** (accessed via SHIFT-F2).

The operators can use two types of timecodes to work with the video material stored by a given recorder on an XT[2] server:

- The LTC timecodes are automatically stored in the first timecode jump table, i.e. the 'LTC table'. This is specified in the LTC field, which is not editable.

- The second type of timecodes has to be specified by the user in the USER field. It will be stored in the second timecode jump table, the 'USER TC table'.

The users can specify one of the following timecode types in the USER setting:

- LTC and VITC timecodes in SD

- LTC, HANC LTC and HANC VITC in HD

The user will have the possibility to work with one of the timecode types defined for the recorder. Usually, an LTC timecode is used to perform operations on live events. A VITC timecode is used for video material ingested from tapes as it is the timecode embedded in the video signal.

TIMECODE TYPE USED ON A RECORDER

On the first page of the VGA Setup screen, the **Prim. TC** field (Primary TC) specifies which timecode type will be displayed at the bottom the VGA and will be used to work with the video material stored on the given recorder.

Possible Values

The values can be the following:

LTC	LTC timecode, which is automatically stored in the LTC table. It is specified in the LTC field.
USER	User-defined timecode, which is stored in the USER TC table and specified in the USER field.

Timecode Colour on the OSD

Depending on the value selected for this setting, the timecode displayed at the bottom of the user's OSD will have a different colour:

- If the LTC timecode is selected, the timecode colour will be white.

- If the USER timecode is selected, the timecode colour will be yellow.

HOW TO SETUP THE PRIMARY TC AND USER FIELDS

To set up the primary TC or VITC field, proceed as follows:

1. Press **SHIFT-F2** to open the Setup screen.

2. Use the **<TAB>** key to position the cursor on the field to edit.

3. Use the right and left arrows to go through the possible values for that field.
   The value defined when you leave the field will be saved.

3.1.2 VITC/ANC TIMECODE MANAGEMENT (PAGE 2)

The second page available in the Setup Configuration menu (**SHIFT-F2**) on XT[2] servers allows the channel-by-channel management of VITC or ANC TC management.

It also allows the users to clean or not the VBI information: the VITC being recorded in the active video lines, it can be disrupted in play var because of interpolation or parity violation on some fields. Moreover, if the server inserts VITC on the output while there is already VITC on another line, it can create problems.

The server allows the user to totally clean the VBI information from the vertical blanking at playback or to clean it only when it would not have been preserved.

3.1.2.1 VITC/ANC MANAGEMENT IN SD IN AND OUT

In SD, the page is as follows:

```
                          SETUP CONFIGURATION
Sh+ESC:VGA EXPLORER     (SH)F3:RESET(ALL)    F6:KW1 F7:KW2 F8:SRCH F9:CLIP F10:PLST

  Time Code Insertion Settings
              PLAY1      PLAY2      PLAY3      REC1       REC2       REC3

  IN LOOP
  D-VITC
    Lines                                     14-16      14-16      14-16

  SD OUT
  D-VITC    Yes        No
    Lines   14-16
    UserBits Yes
    CleanVBI No




TAB:SELECT  <-/->:CHANGE    PgUp:Pg1    F4:SAVE AS    F5:LOAD    ALT+Q:EXIT MULTICAM
```

The following parameters can be defined:

IN LOOP

D-VITC	The TC and user bits are always written on the SD outputs of the record codec and are the same as on the source video.
Lines	Lines on which the VITC must be written on the output connectors of the record codec.
	By default, these are lines 14-16 in NTSC and 19-21 in PAL.

SD OUT

D-VITC	Field to specify if embedded timecode has to be inserted in the output.	
	The possible values are:	
	No	No new timecode inserted in the output.
	In (default)	Same timecode as in the intput inserted in the output.
	LTC	Timecode from the LTC table inserted in the output.
	USER	User-defined timecode inserted in the output.
Lines	Lines on which the specified timecode must be written on the output.	
UserBits	Yes/No flag to specify if the user bits have to be included in the output. The default value is 'Yes'.	
Clean VBI	Field in which the use specifies whether the VBI needs to be cleaned on the output.	

The possible values are:

No	The VBI is not cleaned in the output.
Always	The VBI is always cleaned in the output.
If not OK	The VBI is cleaned in the output if it is not correct (play var mode, vertical split screen, etc.)

3.1.2.2   VITC/ANC MANAGEMENT IN HD IN AND HD/SD OUT

In HD, the page is as follows:

The following parameters can be defined:

IN LOOP

D-VITC	The TC and user bits are always written on the monitoring SD outputs of the record codec and are the same as on the source video.
Lines	Lines on which the VITC must be written on the monitoring output connectors of the record codec. By default, these are lines 14-16 in NTSC and 19-21 in PAL.

HD OUT

HANC LTC	Field to specify if embedded timecode has to be inserted in the output. The value specified has to be the same as for the HANC VITC field. The possible values are:

No	No new timecode inserted in the output.
In (default)	Same timecode as in the input inserted in the output.
LTC	Timecode from the LTC table inserted in the output.
USER	User-defined timecode inserted in the output.

UserBits	Yes/No flag to specify if the user bits have to be inserted in the output. The default value is 'Yes'.
HANC VITC	Field to specify if embedded timecode has to be inserted in the output. The value specified has to be the same as for the HANC LTC field. The possible values are:

	No	No new timecode inserted in the output.
	In (default)	Same timecode as in the input inserted in the output.
	LTC	Timecode from the LTC table inserted in the output.
	USER	User-defined timecode inserted in the output.

SD OUT

D-VITC	Field to specify if embedded timecode has to be inserted in the output. The possible values are:

	No	No new timecode inserted in the output.
	In (default)	Same timecode as in the input inserted in the output.
	LTC	Timecode from the LTC table inserted in the output.
	USER	User-defined timecode inserted in the output.

Lines	Lines on which the specified timecode must be written on the loop of the input. By default, these are lines 14-16 in NTSC and 19-21 in PAL.
UserBits	Yes/No flag to specify if the user bits have to be inserted in the output. The default value is 'Yes'.
Clean VBI	Field in which the use specifies whether the VBI needs to be cleaned on the output. The possible values are:

	No	The VBI is not cleaned in the output.
	Always	The VBI is always cleaned in the output.
	If not OK	The VBI is cleaned in the output if it is not correct (play var mode, vertical split screen, etc.)

3.1.3 SDTI NETWORK PRIORITIES (PAGE 3)

On the third page of the Setup Configuration module (**SHIFT-F2**), it is possible to define a higher priority for a player channel of the local server whenever they play network clips/trains. This higher priority will only apply in play, not in shuttle mode.

In the Setup menu, go to the third page (with the **PgUp**, **PgDown** keys) and select which player channel should get a higher priority on the SDTI network.

> **Note**
>
> Using this command will not prevent a freeze on the SDTI network if the network is completely stalled. It is always worth checking the network status and defining clear network usage rules if you wish to play footage across the network.

3.1.4   SMPTE 334M PACKETS MANAGEMENT (PAGE 3)

From Multicam 8.03 onwards, ancillary data packet in the vertical ancillary data space in HD and SD signals are supported, as defined in the SMPTE standards 334M, 291M (type 2 ANC packet).

```
                          SETUP CONFIGURATION
Sh+ESC:VGA EXPLORER    (SH)F3:RESET(ALL)    F6:KW1 F7:KW2 F8:SRCH F9:CLIP F10:PLST

SDTI Network Priorities
              PLAY1        PLAY2        PLAY3
High priority Yes          Yes          No

SMPTE 334M Packet Management
              PLAY1        PLAY2        PLAY3    REC1     REC2     REC3
Decoding                                        Yes      No       No
Encoding      Yes          No           No

Custom 1                                        Yes      No       No
Custom 2                                        Yes      No       No

SD OUT
Encoding      Yes          No           No



TAB:SELECT   <-/->:CHANGE    PgUp:Pg1    F4:SAVE AS    F5:LOAD    ALT+Q:EXIT MULTICAM
```

3.1.4.1   ACTIVATE / DEACTIVATE VANC DATA PACKET SUPPORT

In the Setup Configuration module (**SHIFT-F2**), press the **PgDn** key until you access the SMPTE 334M Packet Management section.

You can turn on/off the SMPTE 334M packet decoding for each record channel.

You can turn on/off the SMPTE 334M packet encoding for each player channel.

3.1.4.2   PACKETS SUPPORTED

Up to now, SMPTE 334M data packets carried on the chrominance (C) data stream within the SMPTE 292M signal are not decoded (HD).

From Multicam 8.03, all DIDs mentioned in the SMPTE 334M standards are supported:

- 61 ➜ 62
- 40 ➜ 5F
- C0 ➜ DF

Those DIDs are saved and restored on the output channels on their original lines. The other DIDs are not saved.

The maximum number of bytes saved per field (frame for 720p) is 2014. One saved SMPTE 334M packet is composed of user data word (UDW) plus 7 configuration bytes. It has to be taken into account to compute the number of bytes saved.

Please refer to the SMPTE RP 291-2006 standard for the assignment of DIDs to specific applications.

3.1.4.3   ENCODING OF THE SMPTE 334M PACKETS ON THE DOWNCONVERTED OUTPUTS

Multicam 8.03, and higher versions, can manage the encoding of the SMPTE334M present on the HD output on the SD downconverted output as well.

This parameter can be activated on the shift-F2 screen.

For the downconverted output, one SMPTE 334M packet is encoded per line starting from the second line after the line specified for the switching line. In other words, the maximum number of packet per field is as follows:

- 8 packets per field in 525i (lines 12-19 and 275-282)

- 15 packets per field in 625i (lines 8-22 and 321-335)

The limitations are:

The data are re-encoded in the same order as they were in HD, but not necessarily on the same lines.

If VITC in inserted in the downconverted output, no SMPTE 334M data will be inserted on the lines carrying the VITC.

3.1.4.4   KEEPING CUSTOM UNCOMPRESSED DATA

Upon request, it is possible to customise the decoding of the SMPTE 334M data. If you wish to keep uncompressed 8-bit data in the VANC data space, you can select two lines - L_a and L_b - on which N_a and N_b bytes can be saved per field (frame for 720p).

The saved data are left aligned after SAV (Start of Active Video) and the maximum number of data saved (N_a + N_b + regular SMPTE 334M packet) must not exceed 2014.

If you require this customisation, please contact your EVS representative to specify the number of bytes you want to keep and on which lines. EVS will provide you with a specific customisation file.

This specific configuration file will be activated using the Custom VANC grab 1 and 2 parameters in the SHIFT-F2 screen.

3.1.4.5   COMPATIBILITY INFORMATION

SDI Video streams (SD or HD) recorded with SMPTE 334M must be played by an XT[2] running a version equal or higher to Multicam 8.03 to keep the 334M information.

If you use other EVS equipment (XFile, CleanEdit, MediaXchange), please make sure that you use the versions of software compatible with Multicam 8.03.

3.1.5   GPI IN SETTINGS (PAGE 4)

On the fourth page of the Setup Configuration module (**SHIFT-F2**), it is possible to define GPI IN settings:

For more information on the GPI IN settings, refer to section on the GPI IN settings in the Setup menu chapter of the Multicam user manual.

Limitations for Protocols

- For all protocols (excepted AVSP), use the channel assignment (PGM1-6), not the device protocol type (Sony BVW75, Odetics).

- AVSP does not require any GPI IN setting in the Setup menu because they are defined through specific serial AVSP commands.

Functions Implemented per Protocol

- AVSP: Play, Stop, Still, Recue, GotoClipIN, GotoClipOUT, Next, Skip

- Sony: Play, Pause, Recue, Previous, Next, Skip

- DD35:   Play, Pause, Recue, Previous, Next, Skip

- Odetics: Play, Pause, Recue, Next

- VDCP: Play, Pause, Recue, Previous, Next, Skip

3.1.6 RS422 PROTOCOL SETTINGS (PAGE 5)

In the Setup Configuration module (**SHIFT-F2**), press the Page Down key until you access the page 5. It displays the VAR ID settings for the VDCP protocol.

These settings make it possible for the VDCP protocol to use the VAR ID to access the clip IDs on an XT[2] server or XNet network.
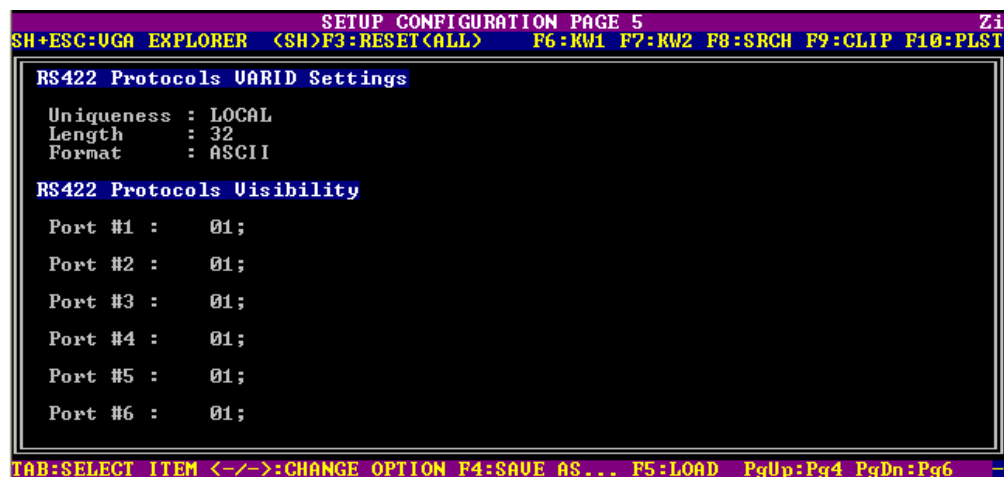
⚠️ **Important:**
The settings in this page are only applicable to the VDCP protocol.

Display-only Window

This page is only for display. The settings displayed are extracted from the 'varid.ini' file and can only be edited in this file. In case of error or undefined values, the default setting values are used.

```
                        SETUP CONFIGURATION PAGE 5                    Zi
SH+ESC:UGA EXPLORER  <SH>F3:RESET<ALL>     F6:KW1 F7:KW2 F8:SRCH F9:CLIP F10:PLST

 RS422 Protocols UARID Settings

  Uniqueness : LOCAL
  Length     : 32
  Format     : ASCII

 RS422 Protocols Visibility

  Port #1 :    01;

  Port #2 :    01;

  Port #3 :    01;

  Port #4 :    01;

  Port #5 :    01;

  Port #6 :    01;


TAB:SELECT ITEM <-/->:CHANGE OPTION F4:SAVE AS... F5:LOAD  PgUp:Pg4 PgDn:Pg6    —
```

Settings

For more information on the settings, refer to the section 3.1.6.1 'VAR ID Configuration File', on page 62.

Note
If a setting is changed through one serial link via the new serial command, the result will be displayed accordingly in the setup screen.

Conflict with XNet defined values

If any of the VAR ID settings does not correspond to the network defined values set on the XNet, the XT will be disconnected from the network and work in local mode. In this case, the following happens:

- The setup screen clearly displays the message "!Not XNet common value!" in yellow next to the incorrect parameter.

- A message is displayed on the SDTI Network Monitoring screen indicating the incorrect parameter.

3.1.6.1   VAR ID CONFIGURATION FILE

The VAR ID variables have to be set up in a configuration file. The settings are defined in XML format. The confirmation file, which is named 'varid.ini, is located in the C:\LSMCE\DATA.

The file has the following syntax:

```
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
; VARID settings
;----------------------------
;Parameter values and [default]
;
; Uniqueness= [Local] or Global
; Length= [32] or 8
; Format= [ASCII] or Binary
; Visibility= [], 1..29,*
;            default= empty is converted to local XT Net number
;            * for all XNet
;
;----------------------------
Uniqueness=Local
Length=32
Format=ASCII
1=
2=
3=
4=
5=
6=
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
```

The settings are described in the table below:

Setting	Description
VARID	The VAR ID parameters will be set up differently depending on the protocol used.
Uniqueness	This setting specifies whether the VAR ID will be unique at the XNet network level (Global) of at the XT level (Local). The default value is 'Local'.
Length	This setting specifies whether the VAR ID has a fixed length of 8 bytes or a variable length of 32 bytes. The default value is 'variable 32 bytes
Format	This setting specifies whether the VAR ID format has the ASCII or binary format. The default value is 'ASCII' as specified for VDCP standard.
Protocol Visibility	The protocol visibility allows specifying the list of servers which will be visible on the various communication ports the protocol will communicate with. For a list of servers, use the XNet number of the server and semi-colon separator (;). If no value is specified, the default is the local XT server. **Example:** 8;2;3;9 The list order is taken into account in the protocol visibility. This means that the system first searches for the requested clips on the first server of the list, then on the second, and so on.

Setting	Description
	In the above-mentioned example, If a clip with the same identifier is found on server 8 and server 2, the system would choose the clip on server 8 should this clip ID be loaded and/or modified.
Delete Strategy	No Delete Strategy is applied to this version. By default, the deletion applies to the first visible clip only.

3.1.7 HCTX GIGABIT CONNECTION SETTINGS (PAGE 6)

In the Setup Configuration module (**SHIFT-F2**), press the Page Down key until you access the page 6. It displays the connection parameters for the HCTX board and the MTPC board.

From Multicam 9, the XT2 servers support a Gigabit Ethernet connection. It will allow the backup of the audio and video data without going through the SDTI network.

The Gigabit connection is provided via the HCTX board. Its backpane is equipped with two Gigabit Ethernet ports. The settings for both ports need to be defined for the XT[2] server to be able to operate the Ethernet connection.

3.1.7.1   SETTINGS DESCRIPTION

The HCTX Gigabit connection settings are described in the table below:

Port #1 /
Port #2

IP Address	Specifies the IP address to connect to port 1 / port 2 of the Gigabit Ethernet connection on the XT[2] server.
Subnet Mask	Specifies the range of logical addresses within the address space assigned to the Gigabit Ethernet network. In the screenshot, the logical addresses available within the network are from 128.1.254.1 to 128.1.254.254.
Default Gateway	Specifies the IP address of the router on the Gigabit Ethernet network that serves as an access point to external networks.

FTP Login

User name	Specifies the user name for an FTP access to the XT[2] server via the Gigabit Ethernet connection.
Password	Specifies the password for an FTP access to the XT[2] server via the Gigabit Ethernet connection. The password is not hidden.

> **Note**
>
> The modifications of parameter values in this screen are not applied when you leave the field. You need to select the **APPLY** option at the bottom right of the screen and press **ENTER** to apply the modifications.

3.1.8 LAN IP CONNECTION SETTINGS (PAGE 6)

Interaction will be possible between the LAN and the MTPC board for the purpose of system maintenance.

The settings for the connection with the MTPC board are defined in the Setup Configuration module, on page 6. They will allow the communication between the MTPC board and another workstation on the XNet network through telnet or FTP access.

```
                    SETUP CONFIGURATION PAGE 6                      !Zi
SH+ESC:UGA EXPLORER  <SH>F3:RESET<ALL>      F6:KW1 F7:KW2 F8:SRCH F9:CLIP F10:PLST

HCTX Gigabit connection settings

Port #1                                    Port #2
  IP Address        128.  1.  1.  1          IP Address        128.  1.  2.  1
  Subnet Mask       255.255.255.  0          Subnet Mask       255.255.255.  0
  Default Gateway   128.  1.254.  1          Default Gateway   128.  1.254.  1

FTP Login
  User name         bha
  Password          bha!

LAN IP connection settings

Port #1
  IP Address        192.168. 23.238
  Subnet Mask       255.255.255.  0
  Default Gateway   192.168. 23.  1

                                                          [APPLY]
```

3.1.8.1 SETTINGS DESCRIPTION

The MTPC board connection settings are described in the table below:

Port #1

IP Address	Specifies the IP address to connect to the port 1 of the MTPC board on the XT[2] server.
Subnet Mask	Specifies the range of logical addresses within the address space assigned to the MTPC board connection.
Default Gateway	Specifies the IP address of the router on the XNet network that the MTPC board can use as an access point to external networks.

Note

The modifications of parameter values in this screen are not applied when you leave the field. You need to select the **APPLY** option at the bottom right of the screen and press **ENTER** to apply the modifications.

3.1.9 SAVING AND LOADING SETUP FILES

Twenty setup files can be saved on the XT system disk.

3.1.9.1 HOW TO SAVE CURRENT SETUP

To save the current setup, proceed as follows:

1. Press **F4**.

2. Enter a file name. The file name contains max. 8 characters, no space or special character.

3. Press **ENTER**.

3.1.9.2 HOW TO LOAD A SETUP FILE

1. Press **F5**.

2. Select the desired file with the ↑/↓ arrow keys.

3. Press **ENTER**.
    A user message pops-up for the user to confirm which settings to load back.

4. Answer to the message by selecting the letter corresponding to the requested settings to load back :
    - (O) Operational settings (pages 1 to 6 of the remote setup)
    - (T) Technical settings (RS422 ports, GPI, PGM names and TC settings)
    - (A) All settings (operational and technical)

## 3.1.9.3 HOW TO DELETE A SETUP FILE

1. Press **F5**.

2. Select the desired file with the ↑/↓ arrow keys.

3. Press **DEL**.
    The setup file is immediately deleted.

3.1.9.4 IMPORTING/EXPORTING A SETUP FILE

Setup files can be imported from/exported to a floppy disk using the 'Import/Export Setup Files' option in the EVS Maintenance menu.

3.2 SDTI NETWORK MONITORING

The SDTI Network Monitoring screen, available via **SHIFT-F4,** enables more accurate monitoring of the SDTI network status (the screen background is black).
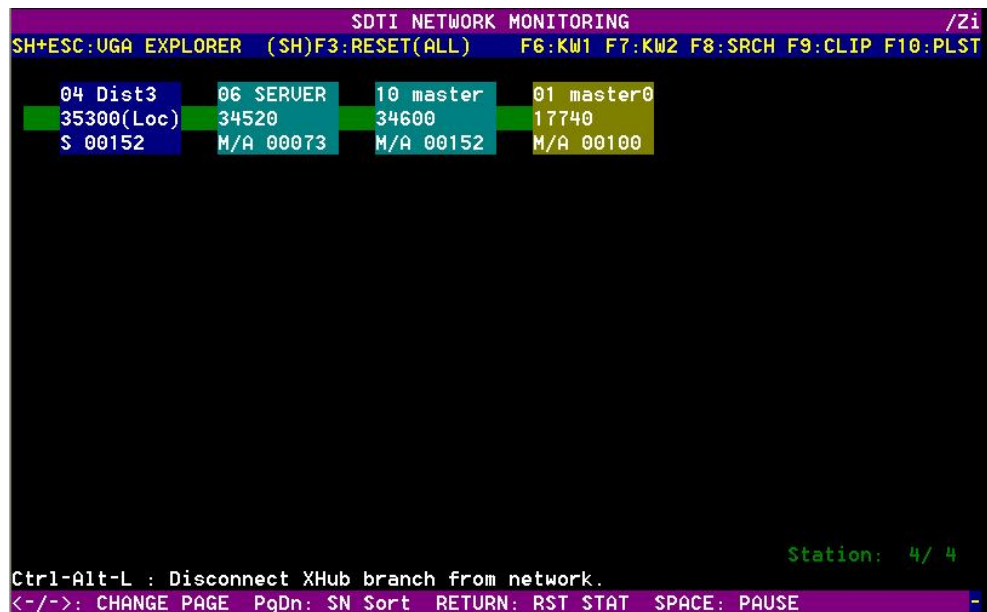
3.2.1 INFORMATION AVAILABLE ON THE SCREEN

Data displayed

All the machines are displayed in the logical connection order, i.e. the way they are effectively connected on the network.

For each machine, the following information is displayed:

- net number + name
- serial number
- main network configuration setting (server, master client) as defined in the EVS application.

Background Colour

The background colour of the data related to a given machine means:

- blue: effective server
- grey: not currently server

Text Colour

The colour of the text indicates the video network overload, based on how many SDTI network mailboxes are used:

- White: ok, less than 90% capacity

- Red (over 90%): risk of network overload.

Link Colour

The colour of the link indicates the physical link status between two machines:

- green: OK

- red: errors

Possible Actions

- Pressing the Space bar pauses or restarts the monitoring.

- Pressing [Enter] resets the counters.

- Pressing [PgDn] displays a new screen with the information of the list of machines sorted by serial number with error counters information.

```
SH+ESC:UGA EXPLORER  <SH>F3:RESET<ALL>     F6:KW1 F7:KW2 F8:SRCH F9:CLIP F10:PLST
SDTI Sn     PrvSn Name    CpLk Frm  Mb
S11L 29010  23650 mdu xt2 0000 0000 11
M01  23650  51980 MDU 1   0000 0000 11
M28  51980  29010 XFile   0000 0000 11




Refresh time: 023/030 s  [+/-] Change time   [F5] Refresh      Station:  3/ 3
Database check: Ok  [Size 00005320 Nb 000015]
<-/->: CHANGE PAGE   PgDn: SN Sort   RETURN: RST STAT   SPACE: PAUSE
```

In operating conditions, when all machines are connected, the CpLk (electrical quality of the network) and Frm (checksum on the packets) counters should not increase at all.

At the contrary, the counters will increase during disconnection/connection of/to the network.

3.2.2 HOW TO DISCONNECT A MACHINE FROM THE SERVER

The operator has the possibility to disconnect a machine from the XNet network. This can be useful when setting up an SDTI network or troubleshooting an SDTI network issue. This is only possible when using a XHub with version 3.01.

To disconnect a machine from the server, proceed as follows:

1. Press **SHIFT-F4** to access the SDTI Network Monitoring screen.

2. Press **CTRL-ALT-L** to disconnect the XHub branch from the network.
The following warning is displayed:

```
                       Warning

        The network branch you are connected on
         will be disconnected from the network.
          All network actions will be disabled.

              ESC: Cancel     ENTER: Confirm
```

3. Press **ENTER** to confirm that you want to disconnect the XHub branch from the network.

On the SDTI Network Monitoring screen, the following message in red font informs that the machine is disconnected and how it can be connected again:

"XHub branch disconnected from the network. Press **CTRL-ALT-L** to reconnect."

3.3   SERVER MONITORING

The first page of the Server Monitoring section makes it possible to monitor the recording activity and the timecodes on the XT[2] server. It is also used to set up how the timecodes are managed in the timecode jump tables. It is available by selecting **SHIFT-F5** in Multicam.

3.3.1   DISK STATUS

In this section, the Raid Map indicates the position of the disks on the disk array and the status of each disk on each existing raid on the right.

/	Disk not present
Dsk!	Disk disconnected
OK	Disk present

When a disk is disconnected, the message "Rebuild xx.xx%" will appear next to the disk array to which the disconnected disk belongs. This value shows the progress of the rebuild process. For more information on the rebuild, please go to section 1.3.14.2 'Disks Monitoring', on page 38.

3.3.2   GENLOCK STATUS

This section displays the current status of the genlock.

3.3.3   ANALOG LTC STATUS

This section specifies the current status of the analogue LTC timecode and specifies the number of drifts detected compared to the genlock.

The possible status values are the following depending on the MTPC board used:

MTPC A1/A2 & A2/A3

OK	The timecode is incremented in a normal way.
Lost	No timecode is available.

MTPC A2/A4

OK	The timecode is incremented in a normal way.
Drift	The timecode received and the genlock are not synchronous.
Bad	The timecode received is not correct. For example when an NTSC timecode is received instead of a PAL timecode (freq. error), when there are disturbances in the timecode reception (bad signal).
Lost	No timecode is available.

3.3.4   TIMECODE STATUSES

This section displays the settings for managing and monitoring the timecode jump tables. Records are created in these tables when a break, or jump, in the timecodes occurs in the recorded material. The records in the timecode jump tables are then used to search for and manipulate the video material on the XT[2] server.

There are two timecode jump tables:

- Timecode jump table for the LTC timecodes
- Timecode jump table for the timecodes specified by the user in the VITC setting on the first page of the Setup screen.

LTC		Default Values
LTC jumps	Number of timecode jumps calculated in the LTC timecode jump table for the given recorder since the last start of the server.	1
LTC threshold	Number of continuous timecodes to be received, after a break in LTC timecodes in the recorded material, in order to create a new record in the LTC timecode jump table.	50
Peak alerts	Number of peak alerts generated for the recorder since the last start of the server. A peak alert is generated each time the peak limit specified in the Peak Limit field is reached. In this case, this field is automatically incremented by one.	0
Peak limits (sec)	Period of time (in seconds) of continuous timecodes after which a break in timecodes in the recorded material will generate a peak alert. When a peak alert is generated, the value in Peak Alerts field is incremented by one.	10
Frequency alert	Number of frequency alerts generated for the recorder since the last start of the server. A frequency alert is generated when X timecode jumps have been detected in Y seconds. The X value is defined in the Frequency Number field. The Y value is defined in the Frequency Time field. In this case, this field is automatically incremented by one.	0
Frequency: Number	Number of timecode jumps detected for the recorder after which a frequency alert can be generated.	10
Frequency: Time	Period of time (in seconds) after which a frequency alert can be generated.	50

VITC		Default Values
VITC jumps	Number of timecode jumps calculated in the VITC timecode jump table for the given recorder since the last start of the server.	1
VITC threshold	Number of continuous timecodes to be received, after a break in VITC timecodes in the recorded material, in order to create a new record in the VITC timecode jump table.	50

3.3.5 TIMECODE MONITORING ON SD RECORDERS

The second page of the Server Monitoring section displays the following information:

- LTC timecode on the XT[2] server

- VITC timecode on the various recorders

3.3.6 TIMECODE MONITORING ON HD RECORDERS

The second page of the Server Monitoring section displays the following information:

- LTC timecode on the XT[2] server

- VITC timecode on the various recorders

3.3.7 LOG MANAGEMENT

The 3rd page of the Server Monitoring section displays a menu dedicated to log management. This new page allows a user-friendly and easy management of the logs where log files can be accessed from a remote computer while the Multicam is still in use.

```
                        SERVER MONITORING                            -Zi
SH+ESC:UGA EXPLORER                  Sh+F4:Network Monitoring F9:CLIP F10:PLST

                          Log Gestion Menu
   MicroCode Logs                      Multicam Logs

    0 mC_General        - Critical  128 Mul_General        -     Debug
    1 mC_Train_Gestion  - Critical  129 Mul_Database       - Critical
    2 mC_GBE_Driver     - Critical  130 Mul_Sdti_Cmd       - Critical
    3 mC_SCSI           - Critical  131 Mul_Console        - Critical
    4 mC_Cache          - Critical  132 Mul_Remote_0       - Critical
    5 mC_CnlMgr         - Critical  133 Mul_Remote_1       - Critical
                                    134 Mul_Remote_2       -     Debug
                                    135 Mul_Remote_3       - Critical
                                    136 Mul_Remote_4       - Critical
                                    137 Mul_Remote_5       - Critical
                                    138 Mul_PlayList       - Critical
                                    139 Mul_TimeLine       - Critical
                                    140 Mul_Incrust        -     Debug
                                    141 Mul_Player_0       - Critical
                                    142 Mul_Player_1       - Critical
                                    143 Mul_Player_2       - Critical
                                    144 Mul_Player_3       - Critical

TAB:SELECT <-/->:CHANGE    PgUp:Pg2           Sh+F1:Menu  ALT+Q:EXIT MULTICAM=
```

Log File Types

The left column displays items related to microcode. The right column displays those of the Multicam.

Each item has two associated log files:

- a regular log file

- a log file logging only errors

Criticality Levels

Each item has a criticality level that can be modified:

- The lowest and default level of criticality is 'Critical', where the log is limited to recording critical and important commands.

- An intermediate level is 'Normal'

- The highest level is 'Debug' which basically records every command.

  This highest level should never be chosen without advice of qualified EVS staff.

The default value for all items is "Critical".

A help screen can be reached by pressing **SHIFT+F1**.

Extracting Log Files

This screen also offers the ability to extract log files when the Multicam is running. On this 3ʳᵈ page of the Server Monitoring section, pressing **E** extracts the log files instantly so that a user can access them through a common FTP client application from a remote computer.

The extracted files are located in `C:\LSMCE\DATA\LOG`. Their name starts with an underscore: The regular log file "Multicam_Database.log" is renamed "_Multicam_Database.log" once extracted when the application is running.

4. Sony, XtenDD35, Odetics & VDCP Protocols

4.1 PROTOCOL OVERVIEW

These protocols allow the XT[2] server to be controlled by external devices.

SONY BVW75 PROTOCOL

This protocol allows the server to be seen as a VTR by the controlling device. On a playback channel, all usual transport commands (play, PlayVar, pause, goto timecode, pause, stop, etc...) are supported. On a record channel, only Rec and Stop commands are supported.

This protocol is the simplest one but does not support clip management. It should be used when the controlling device does not support the XtenDD35, Odetics or Louth VDCP protocols (ex: edit controllers, NLE applications, some video switchers, VTR controllers, etc.)

XTENDD35 PROTOCOL

This protocol is based on the Sony BVW75 protocol for all standard transport commands. It has extended commands so that it supports clip management: using this protocol, the controlling device can create, name, recall and delete clips.

This protocol can be used with Thomson/GVG XtenDD range of switchers, and with DNF ST300-EVS and 4040CL-EVS controllers.

ODETICS PROTOCOL

This protocol is based on the Sony BVW75 protocol for all standard transport commands. It has extended commands so that it supports clip and playlist management: using this protocol, the controlling device can create, name, recall and delete clips, but it can also manage playlists.

This protocol can be used with many different control devices and automations software, including DNF ST300 and 4040CL controllers.

Non standard commands in Sony, XtenDD35 and Odetics protocols on the player channel of an EVS server:

REC: when a REC command is sent to a player channel, this channel will return in E2E mode on its default record train. If the default recorder channel associated to that player is currently stopped, it will jump to the last recorded picture and pause.

EJECT: if the player channel is not yet in E2E mode when the command is sent, it will return to E2E mode on its default record train (similar to receiving a REC command). If the player channel is already in E2E mode, it will switch to the next recorder channel available (A→B→C→...→A→...). This is for example useful with a BVE edit controller to allow the editor to select the record train he wants to work with.

LOUTH VDCP PROTOCOL

This protocol is a more complex protocol mainly used by automation systems but also by video switchers. It is based on Louth VDCP protocol standard, and can handle clips as well as playlists.

AVSP PROTOCOL

AVSP is a proprietary serial protocol giving quite full access to XT server resources:

- simultaneous multi-port control from one serial link @115kbps.

- dynamic channel configuration including mixed channel for effect (audio and/or video)

- playlist management including train (record in progress) with or without fixed delay

- start/stop mode and GPI conditional events

- slow-motion clips

- extended channel and clip status reporting

- ganged channels control

- duplication or move of clips among network XT servers

- auto-backup to XFile

- metadata management (1 name + 3 keywords of 12 bytes each)

This protocol is used for other EVS products interfaced to the server, like AIRBOX, AIREDIT, EDIT2AIR and by third-party partners for specific applications.

IPDP PROTOCOL

For more information on how the IP Director application controls the XT[2] server, refer to the IP Director Technical Reference manual and User manual.

4.2 PROTOCOL IDENTIFIER MANAGEMENT WITH PROTOCOLS

4.2.1 POSSIBLE CLIP IDENTIFIERS

LSM ID

The clips are identified with three different fields. The protocols can access the clips via one of these fields:

LSM ID

The LSM ID is a clip identifier based on the XT[2] server structure.

The LSM ID is made up of 3 digits and 1 letter, for example 112B, where the digits and letter represent the following elements in the server structure:
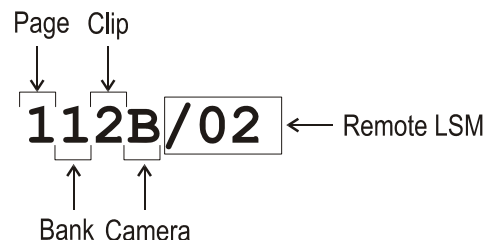
The digits after the LMS ID correspond to the Net Number of the server on which the clip is stored, i.e. the XT[2] server ID on the XNet network. They are not part of the LSM ID.

UmID

The UmID is an 8-bytes ID with fixed length. It is used for the unique clip identification on the SDTI network.

By default, all the protocols access and identify the clips via the UmID.

VAR ID

The VAR ID is a 32-bytes ID with variable length and format.

It can only be used in the VDCP protocol. When this protocol uses the VAR ID, the following VAR ID parameters need to be set up:

- Length (8 bytes, 32 bytes)
- Format (ASCII, binary)
- Uniqueness level (local = server level, global = network level)
- Protocol visibility (list of Net Numbers of the servers)

For more information on the parameters, refer to the "RS422 Protocol Settings" page in the VGA Setup screen. This page is described in the XT Software Technical Reference manual.

> **Note**
>
> From Multicam 9, the VAR ID has been introduced to allow a redundant architecture where the VARID can be identical on two different servers. All servers can stay on the same SDTI network. Consequently, this does not require a full replication of the XNet network. With the Um ID, the full replication was necessary as this clip ID has to be unique on the XNet network.

4.2.2   CLIP IDENTIFIERS USED BY THE PROTOCOLS

VDCP PROTOCOL

The VDCP can use two identifier types, the 'fixed 8-byte length' identifier and the 'variable length' identifier. The XT[2] server imposes the maximum length for the variable ID, i.e. 32 characters in this instance. The VDCP protocol will use completely different commands depending on the ID that will be used. The VDCP protocol provides only this variable ID management.

The uniqueness and visibility functions are provided by the XT[2] servers to allow the network architecture and redundancy management.

The protocol configuration for the ID management is performed via two interfaces:

- Multicam Application

  In the 'RS422 Protocols' Section, on page 1 of the Setup menu (**SHIFT-F2**), the ID type field allows the users to select the ID type to be used for all relevant protocols, i.e. Xten DD35, Odetics and VDCP. The other protocols (Sony BVW, AVSP et IPDP) do not manage the ID type, except for OSD display.

- VARID.ini File

  The configuration of the VAR ID settings is performed via the VARID.ini file. The content of this file is displayed in page 5 of the Setup menu. For more information, refer to Section 1.3.1.2 'Dolby Audio Management', on page 14.

  Depending on how the VDCP protocol will be used, various configurations detailed in the table below can be performed in the Setup menu and the VARID.ini file. When the parameter is not specified in the table ("-" symbol), its value does not influence the configuration.

Use	ID Type	VARID.ini
8-byte UmID & global uniqueness (network level)	UmID value	-
8-byte LSM ID & global uniqueness	LSM ID value	-
8-byte UmID & local uniqueness (server level)	UmID value	Local uniqueness VAR ID length = 32 In this case, the VARID is indirectly used to ensure the local uniqueness.
Variable ID & global uniqueness	-	Global uniqueness VAR ID length = 32
Variable ID & local uniqueness	-	Local uniqueness VAR ID length = 32

OTHER PROTOCOLS

For the Xten DD35 and Odetics Protocols, the identifier type is defined in the **ID type** field, in the 'RS422 Protocols' Section, on page 1 of the Setup menu (**SHIFT-F2**). The protocol has to use the syntax of the ID type specified in this setting, i.e. UmID or LSM ID, in the commands sent. Otherwise, the commands will be rejected with the error message "not existing ID".

4.3 FILL AND KEY MANAGEMENT FROM VDCP AND ODETICS PROTOCOLS

The Fill and Key management allow the VDCP and Odetics protocols to control two paired PGM channels from a single Odetics or VDCP serial connection. This makes it possible to perform, in a simultaneous and synchronous way, any transport command on both the Fill channel and the Key channel.

To this end, it is therefore possible to assign the same RS422 port number (#n), which corresponds to a VDCP or Odetics protocol, to the Fill and Key player channels of one XT server. The first channel will be assigned as the Fill channel and the second will automatically be the Key channel.

The Fill and Key channels should be configured exclusively in one or more of the following configurations:

Fill Channel	Key Channel
PGM 1	PGM 2
PGM 3	PGM 4
PGM 5	PGM 6

Consequently, maximum three pairs of Fill and Key channels can be defined on 6 PGM configuration.

The situations described below are supported:

- If the FILL/KEY assignment has been defined by an IP Director:

  Loading the Fill clip by means of the corresponding VDCP command will load the Fill clip onto the Fill channel and automatically load the associated Key clip on the Key channel.

- If the FILL/KEY assignment has NOT been defined by an IP Director:

  Loading the clip by means of the corresponding VDCP command will load this clip onto the Fill channel and automatically load the clip stored in the corresponding B position on the Key channel.

Example: If the clip 256A is loaded, the clip 256B will be automatically loaded onto the Key channel. Both channels will be played in a synchronous way.

> **Note**
>
> If the clips have not be defined as Fill or Key clips in IP Director, it is recommended to position them in the following way:
> - Locate the Fill clips in A positions.
> - Locate the Key clips in B positions.
> - When more than one Fill clip is associated to the same key clip, you can also use the positions C, D, E and F for these Fill clips.

GLOSSARY

Dolby Digital	Also called Dolby 5.1 or AC-3. It is an audio coding system containing up to **6 discrete channels of sound**, with 5 channels for normal-range speakers (20 Hz - 20,000 Hz) (Right front, Center, Left Front, Right Rear and Left Rear) and one channel (20 Hz - 120 Hz) for the LFE, or subwoofer.
Dolby E	It is a professional **coding system** optimized for the distribution of surround and multichannel audio **through two-channel** postproduction and broadcasting infrastructures, or for recording surround audio on two audio tracks of conventional digital video tapes, video servers, communication links, switchers, and routers.

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