Technical Reference - Software

Version 10.01 - October 2009

XT[2]

Production & Playout Server

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What's New?

The following table describes the sections updated to reflect the new features on Multicam versions 10.01.38, 10.01.57 and 10.01.65. Click the section number in the table to jump directly to the corresponding section.

Corrections for Multicam version 10.01.65	
1.2.5	Update of the Configurations with HD Super Motion 2 phases
1.3.4	Corrections in the audio gain range and the shortcut keys.

Updates for Multicam version 10.01.57	
1.4.1	Update : DVCPro 50 and DVCPro HD data on bitrates, recorded video lines and horizontal resolution

Updates for Multicam version 10.01.38	
1.3.3	Audio and Video Parameters Overview: • New values for the Audio Type parameter (16 audio channels) and Audio Tracks - Audio Channels • New parameter: 3D Dual-Stream • Update of the Audio Channel parameter due to the 16 audio channels
1.3.6	New section: 3D & 1080p Dual-Stream Management
1.3.7	New section: Hypermotion Management
1.4.1	Update: data for the new codec HD MPEG2 Intra
1.4.2	Update: new values for the Standard field in the Video & Audio Area: 1080p standards
1.4.3	Update in Options menu: display of valid or expired codes only.
3.2.7	Update: use of XNet Monitor to extract logs

1. EVS Software

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, ...).

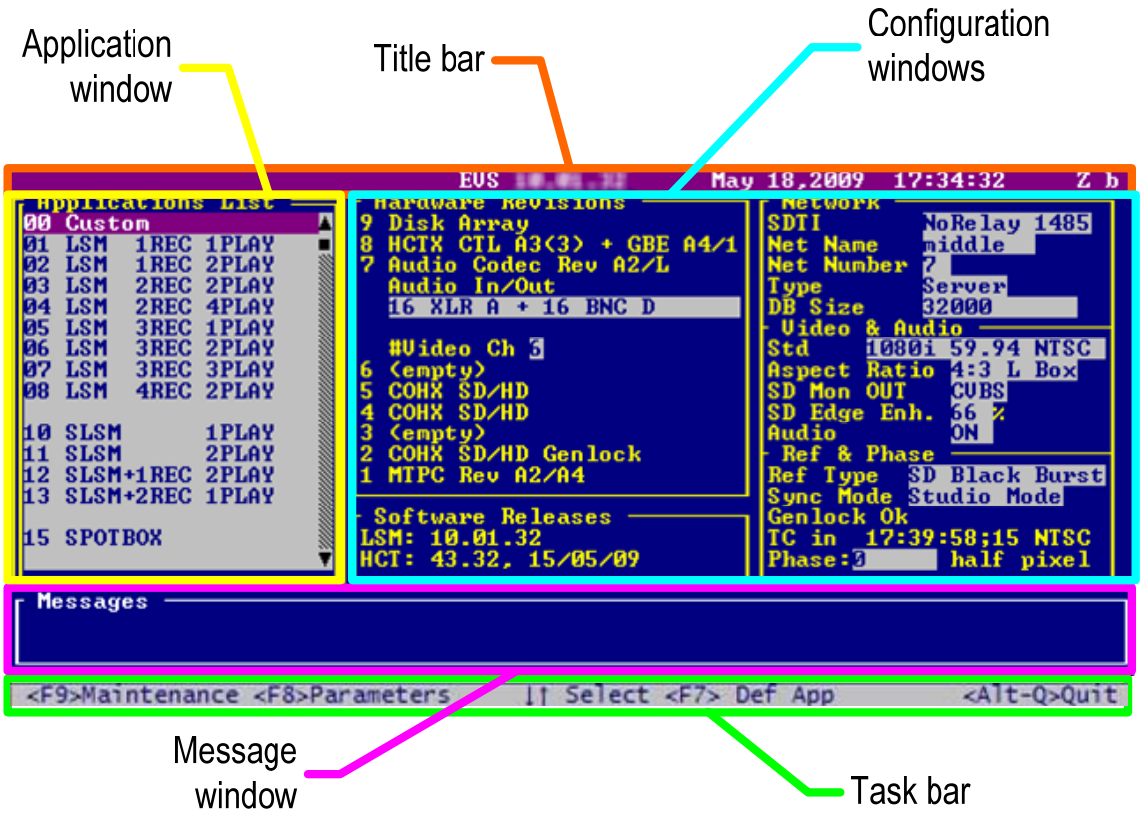
When turning on the EVS mainframe, the first step is the PC boot sequence, followed by the boot of the video I/O boards, and finally the EVS software is started.

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 on next page) and wait for the operator's next command.

1.2 EVS MAIN MENU

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 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 currently selected application the new default one. 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 immediately open 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**.

1.2.5 CONFIGURATIONS AVAILABLE ON XT[2] SYSTEMS

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

	2-Channel BDR222	4-Channel BDR444	6-Channel BDR666
1 CAM	CAM1 → BDR222 → PGM1 (Cut)		CAM1 → BDR666 → PGM1 (Mix), PGM2/PRV1, PGM3 (Mix), PGM4/PRV2, PGM5 (slave)
2 CAM		CAM1, CAM2 → BDR444 → PGM1 (Mix), PGM2/PRV	CAM1, CAM2 → BDR666 → PGM1 (Mix), PGM2/PRV1, PGM3 (Mix), PGM4/PRV2
3 CAM		CAM1, CAM2, CAM3 → BDR444 → PGM1 (Cut)	CAM1, CAM2, CAM3 → BDR666 → PGM1 (Mix), PGM2/PRV, PGM3/PRV
4 CAM			CAM1, CAM2, CAM3, CAM4 → BDR666 → PGM1 (Mix), PGM2/PRV
5 CAM			CAM1, CAM2, CAM3, CAM4, CAM5 → BDR666 → PGM1 (Cut)
Super LSM		SuperMotion → BDR444 → PGM1 (Cut)	SuperMotion → BDR666 → PGM1 (Mix), PGM2/PRV, PGM3/PRV
Super LSM + 1 CAM			SuperMotion, CAM2 → BDR666 → PGM1 (Mix), PGM2/PRV
Super LSM + 2 CAM			SuperMotion, CAM2, CAM3 → BDR666 → PGM1 (Cut)

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

	2-Channel BDR222	4-Channel BDR444	6-Channel BDR666
1 CAM	CAM1 → BDR222 → PGM1 (Cut)		
2 CAM		CAM1, CAM2 → BDR444 → PGM1 (Mix), PGM2/PRV	CAM1, CAM2 → BDR666 → PGM1 (Mix), PGM2/PRV1, PGM3 (Mix), PGM4/PRV2
3 CAM		CAM1, CAM2, CAM3 → BDR444 → PGM1 (Cut)	CAM1, CAM2, CAM3 → BDR666 → PGM1 (Mix), PGM2/PRV, PGM3/PRV
4 CAM			CAM1, CAM2, CAM3, CAM4 → BDR666 → PGM1 (Mix), PGM2/PRV
5 CAM			CAM1, CAM2, CAM3, CAM4, CAM5 → BDR666 → PGM1 (Cut)
1 Super LSM (100/120Hz)		SuperMotion → BDR444 → PGM1 (Mix), PGM2/PRV	SuperMotion → BDR666 → PGM1 (Mix), PGM2/PRV, PGM3/PRV
1 Super LSM + 1 CAM			SuperMotion, CAM2 → BDR666 → PGM1 (Mix), PGM2/PRV
1 Super LSM + 2 CAM			SuperMotion, CAM2, CAM3 → BDR666 → PGM1 (Cut), PGM2/PRV
2 Super LSM (100/120Hz)			SuperMotion → BDR666 → PGM1 (Mix), PGM2/PRV, PGM3/PRV
2 Super LSM + 1 CAM			SuperMotion, CAM2 → BDR666 → PGM1 (Mix), PGM2/PRV
2 Super LSM + 2 CAM			SuperMotion, CAM2, CAM3 → BDR666 → PGM1 (Cut), PGM2/PRV

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 → 2CAM (Fx): Record trains are lost.

4CAM (Fx) → 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.

1.3 VIDEO & AUDIO CHANNEL PARAMETERS (AVCFG)

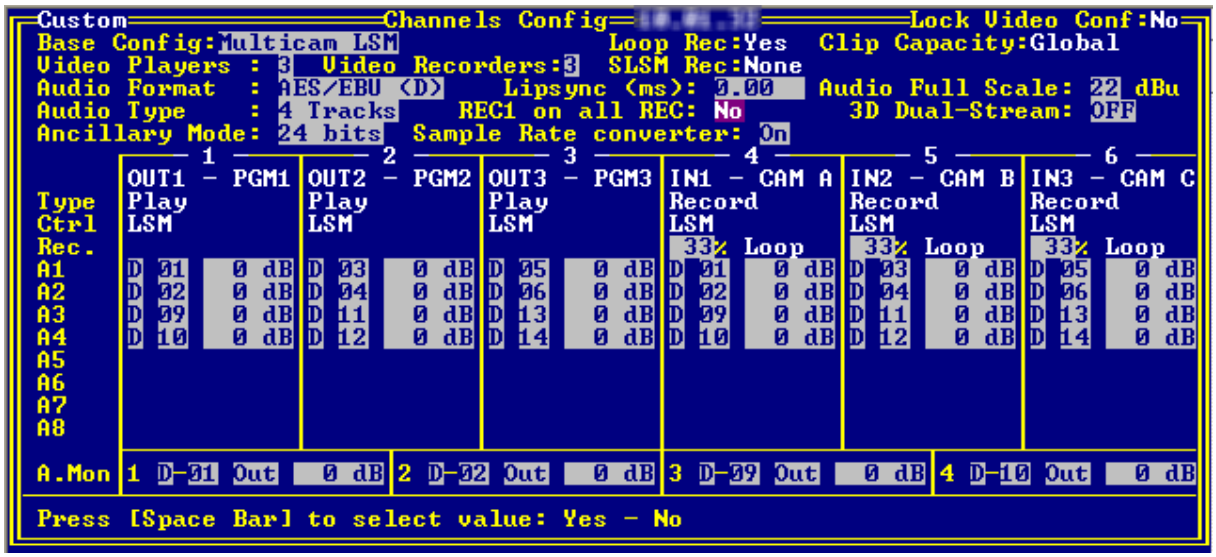
1.3.1 INTRODUCTION

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 1.4.8 'Default parameters', on page 39).

Every application has its own set of parameters. When the user selects an application in the EVS main menu and press **F8** (Parameters), the V/A Channels Configuration window (also called AVCFG) appears:



This window is used to define video & audio channels, type and configuration of recorders, audio format and audio-video synchronization parameter. All the parameters are described in this section.

1.3.2 HOW TO MODIFY A/V CHANNEL PARAMETERS

1. From the EVS main menu, 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' in the EVS main menu, select the application to configure and press **F8.**
2. Continue from step 4.

1.3.3 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 licence codes that have been enabled.

Note:

When you select a Spotbox configuration, you can define secondary controllers by pressing **CTRL-F1**.

LOOP REC

This parameter enables/disables the endless loop recording in AVSP Server/Spotbox configurations. It is forced to 'Yes' in LSM 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.

SLSM REC

This parameter defines the type of SLSM recorders. The parameter is only editable if at least 2 channels are available to be used as SLSM recorders. Otherwise, the parameter has the value “None” and is not editable.

Six types of record are available:

- None (Standard rate 50/60 Hz)
- Single SD SLSM 3x Alternate Parity – EVS mode (150/180 Hz)
- Single SD SLSM 3x Identical Parity (150/180 Hz)
- Single HD SLSM 2x Alternate Parity – EVS mode (100/120 Hz)
- Single HD SLSM 3x Alternate Parity – EVS mode
- Double HD SLSM 2x 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 section1.3.5 'Dolby Audio Management', on page 15.

AUDIO TYPE

Possible values: [1 Track, 2 Tracks, 4 Tracks, 8 Tracks, 16 Tracks]

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

The following table specifies the audio types available for the various audio formats:

Audio Type	Analog (A)	Digital (D - DY)	Embedded (E - EY)
1 track	X		
2 tracks	X	X	
4 tracks	X	X	X
8 tracks		X	X
16 tracks			X

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.

REC 1 ON 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.

3D DUAL-STREAM

Possible values: [OFF or ON]

This parameter activates the 3D Dual-Stream option, which makes it possible to use the server to record and playback 3D video. The parameter is only available for users who have subscribed to the 3D Dual-Stream option (licence code 23).

When the 3D Dual-Stream is set to ON, a message informs the user that the video and player configuration will automatically be adapted into a compatible configuration. For more information on the 3D Dual-Stream feature, please refer to the section 1.3.6 '3 D & 1080p Dual-Stream Management', on page 16.

ANCILLARY MODE

Possible values: [24 bits or 20 bits]

This parameter defines the encoding method used for Digital Audio.

This parameter is solely applicable in SD, allowing you to have the output of the embedded audio in 20 or 24 bits. In HD, it is always 24 bits.

SAMPLE RATE CONVERTER

Possible values: [OFF or ON]

This parameter is available with AES/EBU audio format.

If this parameter is set to OFF, the user has to ensure that the signals are properly synchronized.

1.3.4 CHANNELS OVERVIEW

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

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.

AUDIO TRACKS

The audio tracks are listed from A1 up to A16:

- A1 to A16 IN: Mono audio inputs of the current channel.
- A1 to A16 OUT: 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 ... 64]

This parameter allows selecting each audio channel in the selected audio format. In 16 audio configurations, the **PAGE DOWN** and **PAGE UP** keys make it possible to navigate through the list of 16 audio channels.

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 – 64
16 XLR Analog	1 – 8	n/a	1 – 64
16 XLR Digital	n/a	1 – 16	1 – 64
16 XLR Analog + 8 XLR Digital	1 – 8	1 – 8	1 – 64
16 XLR Analog + 16 BNC Digital or 16 XLR Analog + 4 DB15 Digital	1 – 8	1 – 16	1 – 64

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 tables specify the outputs the audio is sent to in the various audio formats at the same time. The following tables apply 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																

None / 16 XLR D / 16 BNC D / 4 DB15 D + 16 XLR A																
16 tracks	**PGM1**															
Embedded	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14	E15	E16
AES	D1	D2	D3	D4												
Analog	A1	A2														
	PGM2															
Embedded	E17	E18	E19	E20	E21	E22	E23	E24	E25	E26	E27	E28	E29	E30	E31	E32
AES	D5	D6	D7	D8												
Analog	A3	A4														
	PGM3															
Embedded	E33	E34	E35	E36	E37	E38	E39	E40	E41	E42	E43	E44	E45	E46	E47	E48
AES	D9	D10	D11	D12												
Analog	A5	A6														
	PGM4															
Embedded	E49	E50	E51	E52	E53	E54	E55	E56	E57	E58	E59	E60	E61	E62	E63	E64
AES	D13	D14	D15	D16												
Analog	A7	A8														

Audio Gain

Range: [from -78dB 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 **CTRL-**←/→ (±6dB steps).

AUDIO MONITORING (A. MON.)

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

1.3.5 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 analogue, 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
    - 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
    - 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.
    - 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

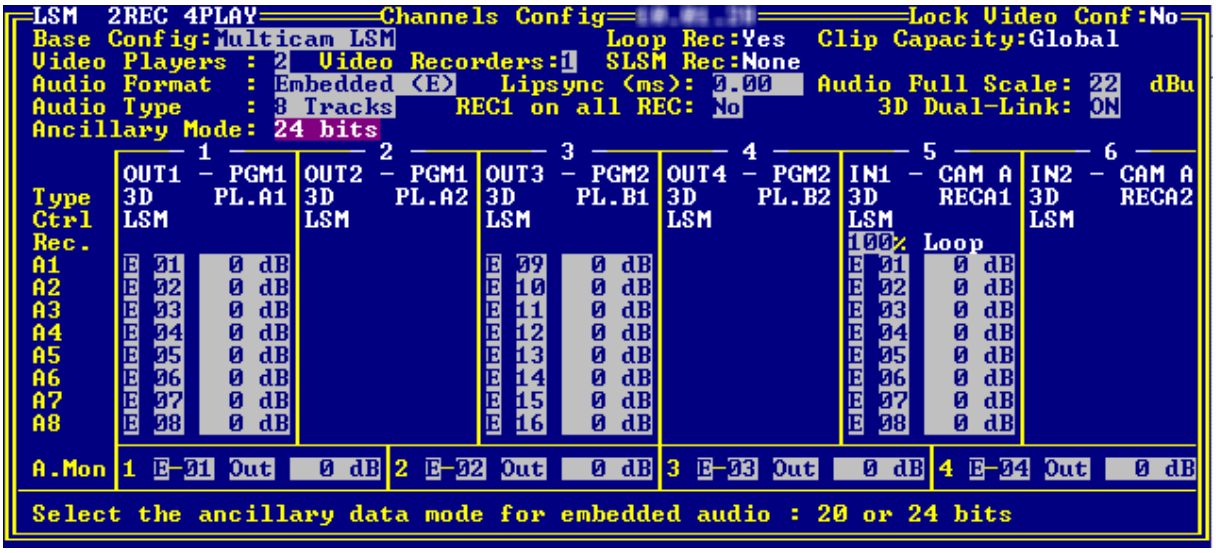
Dolby E transitions will <u>not</u> be correct (2 frames of mute at the transitions) if the AVCFG is set to E instead of EY or D instead of DY.

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

1.3.6 3 D & 1080P DUAL-STREAM MANAGEMENT

PRINCIPLE

The 3D and 1080p features is based on the use of two physical channels (recorders or players) seen by the server as a logical channel. Consequently, two physical recorders or players are required but only one is assigned in the Channels Configuration. These two configurations require the record and playout on synchronous channels.



Possible Channels Configurations

The possible video configurations are:

- 1IN 2 OUT
- 2IN 1 OUT

3D Configuration

With the 3D feature, the two physical cameras will record the same scene with a slightly different angle to mimic the angle difference between the human eyes.

The configuration is set up in the Channels Configuration screen, via the 3D Dual-Stream option. See also the section '3D Dual-Stream', on page 11.

1080p Configuration

With the 1080p feature, the two physical cameras make it possible to get the progressive image scan with a vertical resolution of 1080 pixels.

The configuration is adapted in the AVCFG when you select the 1080p video standard in the AVCFG main screen. See also the section 'Video & Audio Area', on page 29.

Important

When you activate or deactivate the 1080p video standard, it is highly recommended to check and set manually the desired channel configuration in the Channels Configuration screen before you launch the requested application.

1.3.7 HYPERMOTION MANAGEMENT

PRINCIPLES

The hypermotion cameras can now be controlled by the LSM Remote Panel. The camera is linked via a RS422 or Ethernet connector to the same XT[2] server as the controlling Remote Panel.

In setups including a hypermotion camera, the following principles apply:

- An XT[2] server can not control more than one hypermotion camera.
- The hypermotion camera is used with the classical channel configurations.
- Not all Multicam LSM configurations with several PGMs and several Remotes are supported within the current RS422 and channel configuration constraints.
- If the **Recorder Mode** setting on the Remote Panel setup (page 6.4, F3) is set to 'Hypermotion only', an additional Remote Panel is made available in the Main menu of the LSM Remote.

REMOTE PANEL ASSIGNMENT

In setups where several LSM Remotes and a hypermotion camera are defined, the assignment of the various PGMs and hypermotion camera to the Remote Panels is automatically performed as shown in the table below depending on:

- the number of PGMs in the selected channel configuration
- the selected Remote Mode (Hypermotion only or Hypermotion + LSM)
- the number of Remote Panels available

The following table presents the possible configurations:

	1 Remote Panel		2 Remote Panels		3 Remote Panels		4 Remote Panels	
Hypermotion Mode	**Hyp. Only**	**Hyp. + LSM**	**Hyp. Only**	**Hyp. + LSM**	**Hyp. Only**	**Hyp. + LSM**	**Hyp. Only**	**Hyp. + LSM**
1 OUT	NA	R1: PGM1+Hyp.	R1: PGM1 R2: Hyp.	NA	NA	NA	NA	NA
2 OUT	NA	NA	R1: PGM1+PGM2 R2: Hyp.	R1: PGM1 R2: PGM2+Hyp.	R1: PGM1 R2: PGM2 R3: Hyp.	NA	NA	NA
3 OUT	NA	NA	R1: PGM1+PGM2 +PGM3 R2: Hyp.	R1: PGM1+PGM2 R2: PGM3+Hyp.	R1: PGM1+PGM2 R2: PGM3 R3: Hyp.	R1: PGM1 R2: PGM2 R3: PGM3+Hyp.	R1: PGM1 R2: PGM2 R3: PGM3 R3: Hyp.	NA
4 OUT	NA	NA	NA	NA	R1: PGM1+PGM2 R2: PGM3+PGM4 R3: Hyp.	R1: PGM1+PGM2 R2: PGM3 R3: PGM4+Hyp.	R1: PGM1+PMG2 R2: PGM3 R3: PGM4 R3: Hyp.	R1: PGM1 R2: PGM2 R3: PGM3 R3: PGM4 +Hyp.

Important

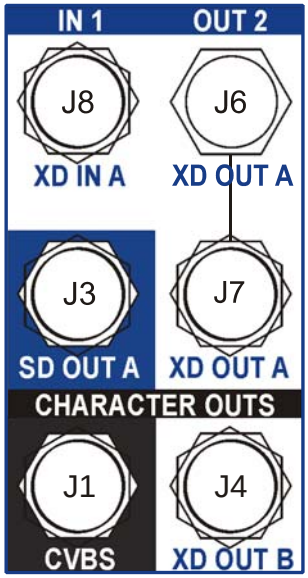
The cells with 'NA' correspond to impossible configurations taking into account the existing constraints. In this case, the Hypermotion option is not available in the operational menu even if the Hypermotion setting is set to 'Yes'.

1.3.8 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 summarizes 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 J8 (IN1)	Audio of J8	n/a	n/a
J7	HD signal of J8	Audio of J8	n/a	n/a
J3	SD downconverted signal of BNC 1	Audio of BNC 1	No*	Adjustable
J1	SD SDI or CVBS signal of BNC 1 with OSD (08.03)	Audio of BNC 1 only in SDI	No*	Adjustable
J4	HD signal of BNC 1 with OSD	Audio of BNC 1	n/a	n/a

* No delay if the **Rec HD -> SD Low Latency** setting is set to 'ON' in the Advanced Parameters window of the selected application in the EVS software.

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 J8 (IN1)	Audio of J8	n/a	n/a
J7	SD signal of J8	Audio of J8	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

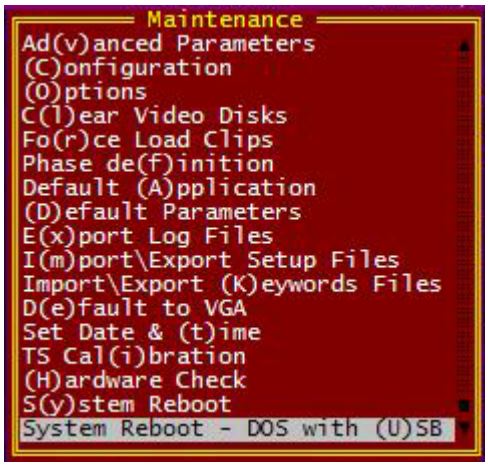
BNCs	Video	Embedded Audio (depending on the avcfg configuration)
J8	n/a	n/a
J6	HD output	Yes
J7	HD output	Yes
J3	SD downconverted output	Yes
J1	SD SDI or CVBS signal output with OSD	Only in SDI
J4	HD output with OSD	Yes

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

1.4 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.

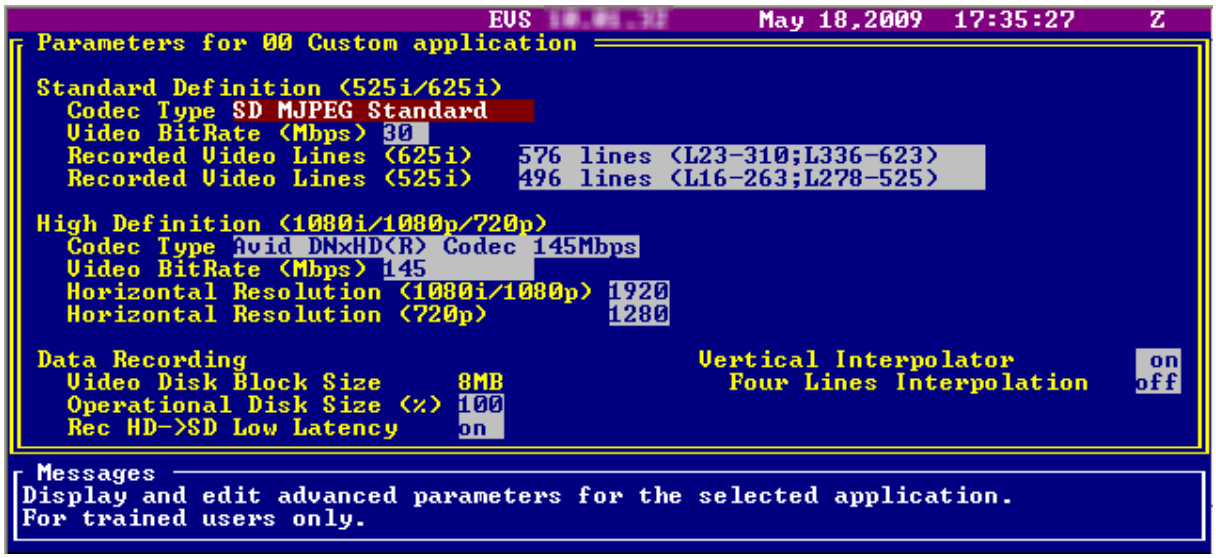
To go back to the Application window, press **ESC** on the keyboard.

1.4.1 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 1.4.8 'Default parameters', on page 39)



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.**

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

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

SD 625i

	COHX		
Codec Type	**SD MJPEG Standard**	**SD IMX (D10)**	**DVCPro 50**
Bitrate	20-200 Mbps	30 ; 40 ; 50 Mbps	50 Mbps
	Default : 30 Mbps	Default : 30 Mbps	Default : 50 Mbps
Recorded video lines	576 lines (L23-310 ; L336-623) default	608 lines (L7-310 ; L320-623)	576 lines (L23-310 ; L335-622)
	592 lines (L15-310 ; L328-623)		
	608 lines (L7-310 ; L320-623)		

SD 525i

	COHX		
Codec Type	**SD MJPEG Standard**	**SD IMX (D10)**	**DVCPro 50**
Bitrate	20-200 Mbps	30 ; 40 ; 50 Mbps	50 Mbps
	Default : 30 Mbps	Default : 30 Mbps	Default : 50 Mbps
Recorded video lines	496 lines (L16-23 ; L278-525) default	512 lines (L7-262 ; L270-525)	480 lines (L23-262 ; L285-524)
	480 lines (L23-262 ; L286-525)		
	512 lines (L7-262 ; L270-525)		

HD 1080i/1080p 50Hz

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

HD 1080i/1080p 59,94Hz

	COHX							
Codec Type	**HD MJPEG EVS**	**HD MJPEG Standard**	**HD MPEG2 Intra**	**AVID DNxHD 145 Mbps**	**AVID DNxHD 220 Mbps**	**Apple ProRes 422 145 Mbps**	**Apple ProRes 422 HQ 220 Mbps**	**DVCPro HD 100 Mbps**
Bitrate	20-360 Mbps	20-360 Mbps	20-360 Mbps	1-145 Mbps	146-220 Mbps	145 Mbps	220 Mbps	100 Mbps
	Default : 100 Mbps	Default : 100 Mbps	Default : 100 Mbps	Default : 145 Mbps	Default : 220 Mbps	Default : 145 Mbps	Default : 220 Mbps	Default : 100 Mbps
Horizontal Resolution	960	960	960	1920	1920	1920	1920	1280
	1152	1152	1152					
	1280 (default)	1280 (default)	1280 (default)					
	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 Intra**	**AVID DNxHD 120 Mbps**	**AVID DNxHD 185 Mbps**	**Apple ProRes 422 120 Mbps**	**Apple ProRes 422 HQ 185 Mbps**	**DVCPro HD 100 Mbps**
Bitrate	20-360 Mbps	20-360 Mbps	20-360 Mbps	1-120 Mbps	121-185 Mbps	120 Mbps	185 Mbps	100 Mbps
	Default : 100 Mbps	Default : 100 Mbps	Default : 100 Mbps	Default : 120 Mbps	Default : 185 Mbps	Default : 120 Mbps	Default : 185 Mbps	Default : 100 Mbps
Horizontal Resolution	640	640	640	1280	1280	1280	1280	960
	768 (default)	768 (default)	768					
	960	960	960					
	1024	1024	1024					
	1280	1280	1280 (default)					

HD 720p 59,94Hz

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

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.

REC HD-> SD LOW LATENCY

Possible Values: Off / On

This parameter prevents the downconverted output of the record channels from being delayed. This is very useful in setups including high resolution and low resolution servers.

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]

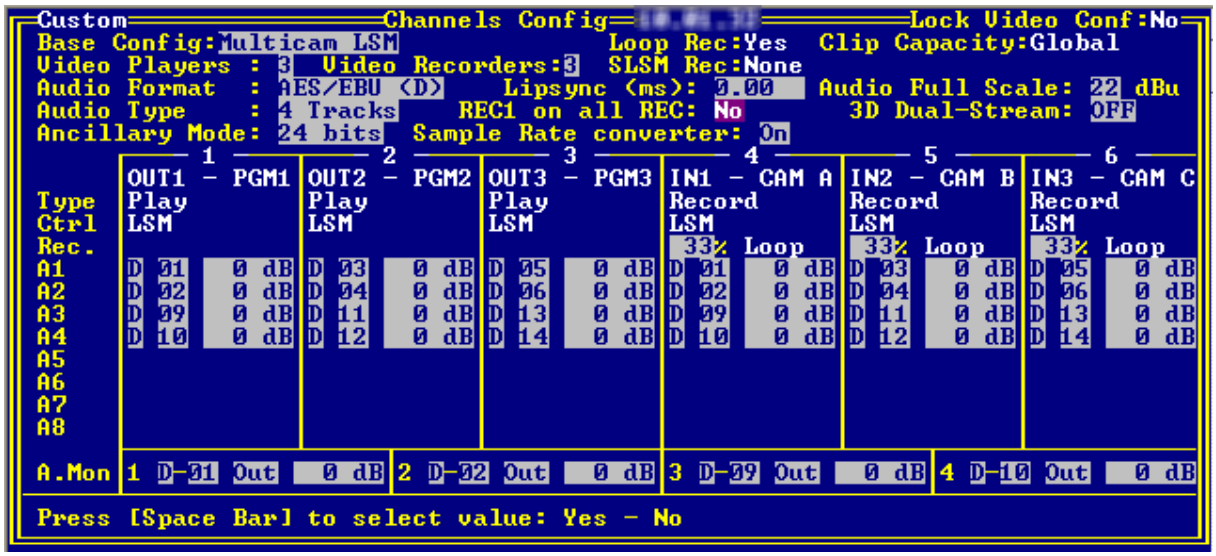
4-line interpolator: the picture is perfectly steady but the vertical bandwidth is even more reduced. [set 'Four lines interpolation' to on and 'Interpolation validation' to on]

Note:

All VTRs use interpolation in PLAY VAR mode.

1.4.2 CONFIGURATION

This function is used to set the hardware configuration of the system (boards release numbers, port settings,...).



HOW TO ENTER THE CONFIGURATION WINDOW

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.

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.

HARDWARE REVISIONS AREA

This area indicates, board by board, the detected hardware inside the chassis. Please refer to the XT Technical Reference Hardware manual 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]

- 16 XLR Analog,
- 16 XLR Digital,
- 16 XLR Analog + 8 XLR Digital,
- 16 XLR Analog + 16 BNC Digital
- 16 XLR Analog + 4 DB15 Digital
- 8 XLR Analog + 16 XLR Digital
- None

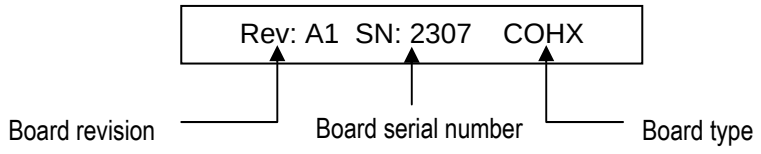
On a 4RU XT[2]

- 4 DB15 Analog + 16 BNC Digital,
- 4 DB15 Analog + 4 DB15 Digital
- 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.



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.

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.

When 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: [32000 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.

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
- 1080p 50.00 PAL
- 1080p 59.94 NTSC
- 1080p 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 Enhancement

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.

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”.

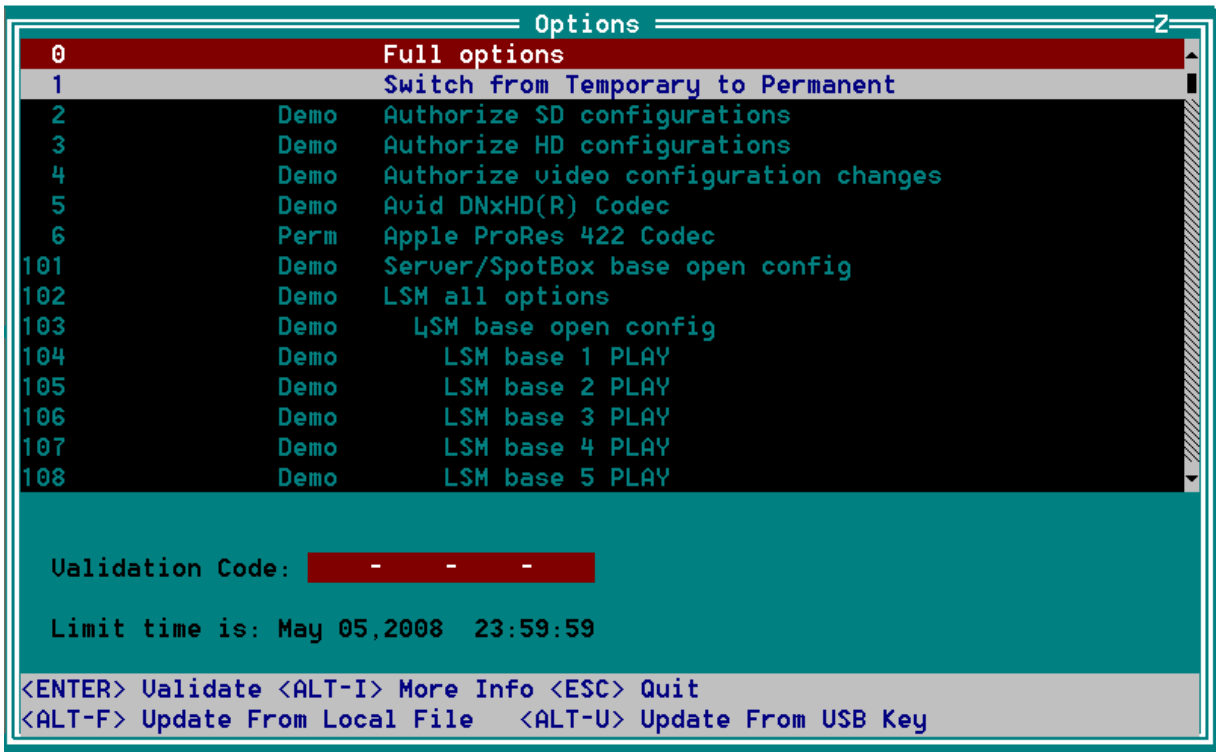
Phase

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.

1.4.3 OPTIONS

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:



INTRODUCTION

This window is used to manage software licence codes for all applications. This window only displays the permanent codes you have subscribed to, as well as valid or expired temporary codes.

To run particular application software and/or specific software options, not only the software itself is required but also a licence key, which is unique for every option on every system.

This licence 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

DISPLAY

In the Options menu, 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.**

EXPIRATION AND WARNING

When a temporary licence 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
```

HOW TO ENTER NEW LICENCE CODES

To enter new licence 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 USB key and press simultaneously **ALT+U** keys. The licence codes will be automatically read from the USB key 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+F** keys. The codes will be read from the local file on 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 (licence codes are sent by EVS Technical Support Dpt) and press **ENTER**.
3. Repeat this operation for the next licence code.
4. You can check that the corresponding options are enabled by scrolling into the options list.

HOW TO REMOVE A LICENCE CODE

To remove a licence 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.**

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 licence 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 licence 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 licence codes has been reached or not. Factory setting only.

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

1.4.4 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.

1.4.5 FORCE LOAD CLIPS

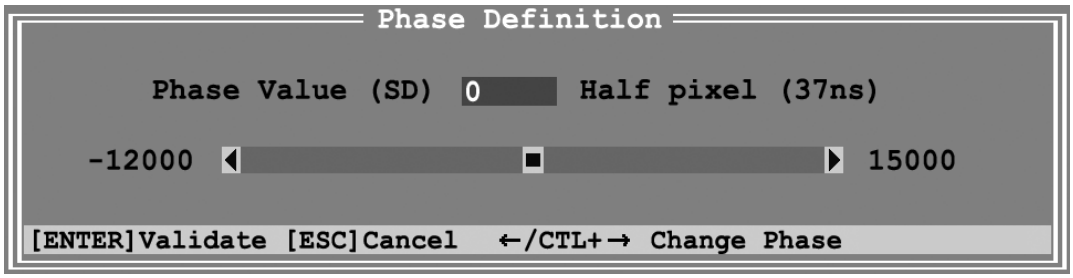
This function is used when swapping disks arrays between XT[2] servers. If clips are saved to disks, this command forces the system to re-load the clips.

1.4.6 PHASE DEFINITION

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

STANDARD DEFINITION

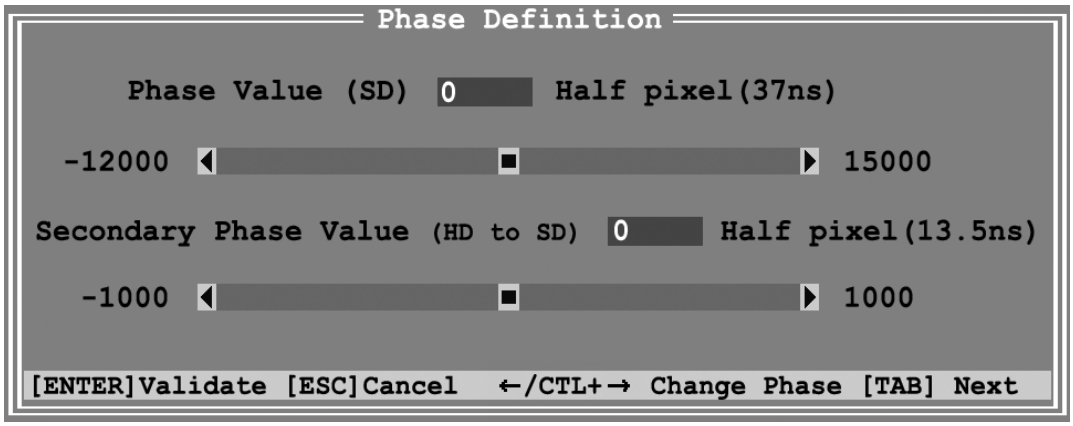
If the REF TYPE (see Configuration windows) is set to 'SD BlackBurst', the phase definition window is as follows:



The phase value for SD can be adjusted between - 12000 ns and +15000 ns by 37 ns steps.

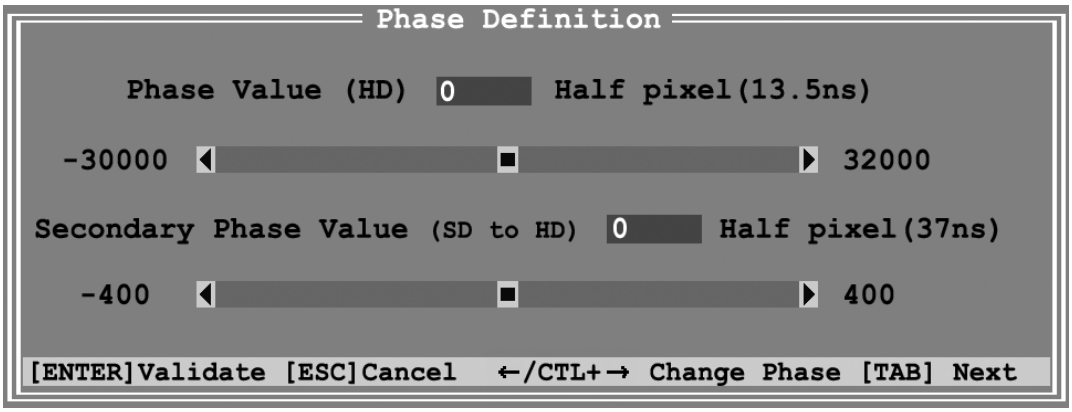
HIGH DEFINITION

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



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:



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

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.

1.4.7 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.

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

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.**

1.4.8 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.

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

1.4.9 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.

1.4.10 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.

1.4.11 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

1.4.12 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.

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
```

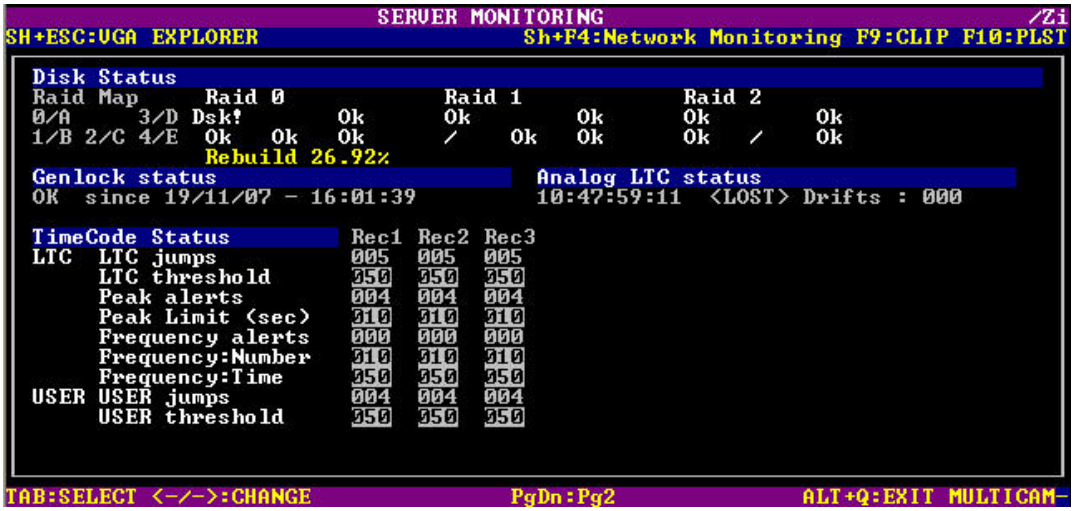
If the Multicam is restarted without the RAID being rebuilt, the following message is blinking during the Bootwins: “SCSI Controller #C disconnected in operation!”. Then when entering the Multicam, another message appears:

```
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.

DISKS MONITORING

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



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%.

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
  - Start the Multicam application. The rebuild process will start automatically.
  - 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 (that is to say postpone 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 you will see a warning message appearing every time you start or close 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.

Important:

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

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.

1.4.13 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 1.4.4 'Clear Video Disks', on page 35.

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: diskBlockSize and operationalDiskSize.

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.

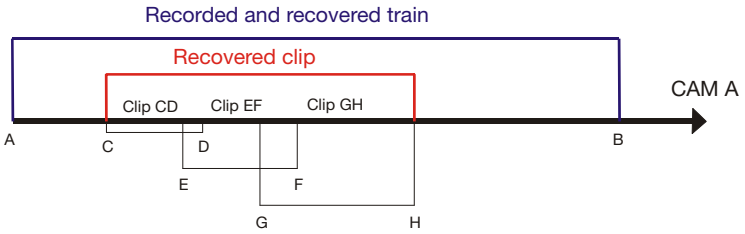
2.6 DISK DATA RECOVERY

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.

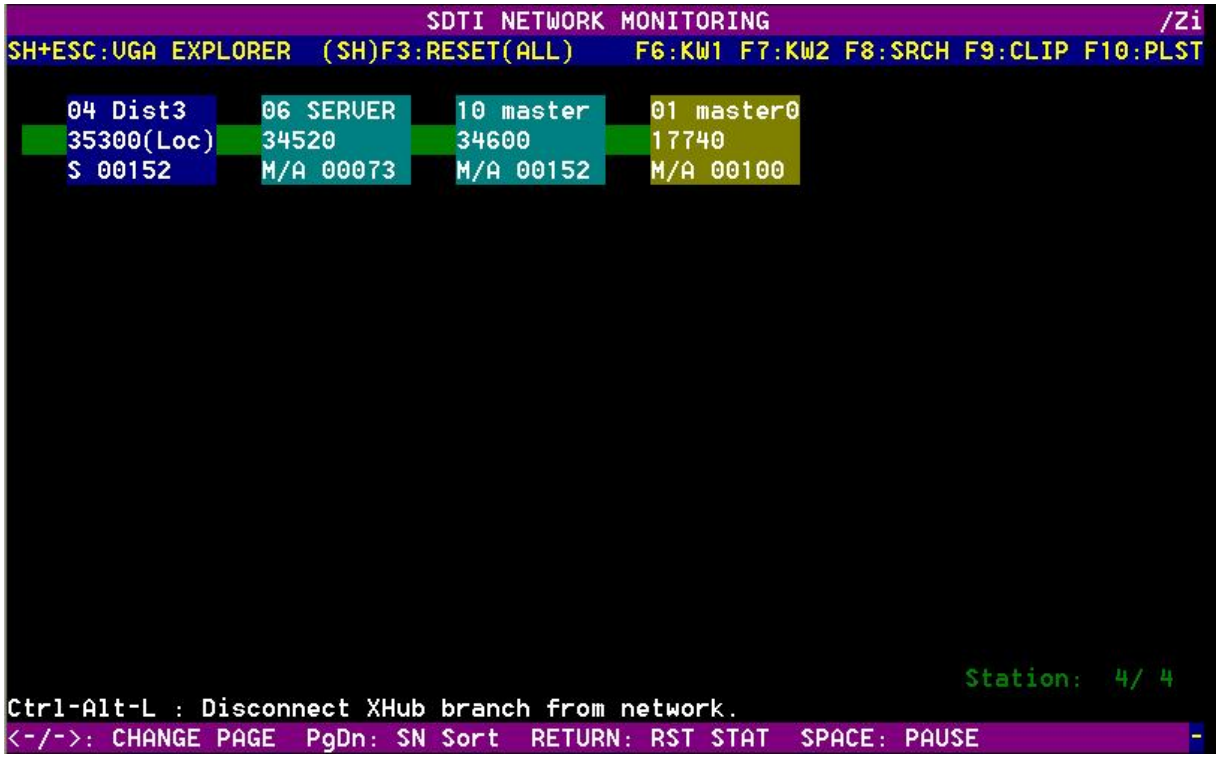


If you want to use this tool, please contact the EVS support.

3. Monitoring

3.1 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).



3.1.1 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.

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.

3.1.2 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 3.03.

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

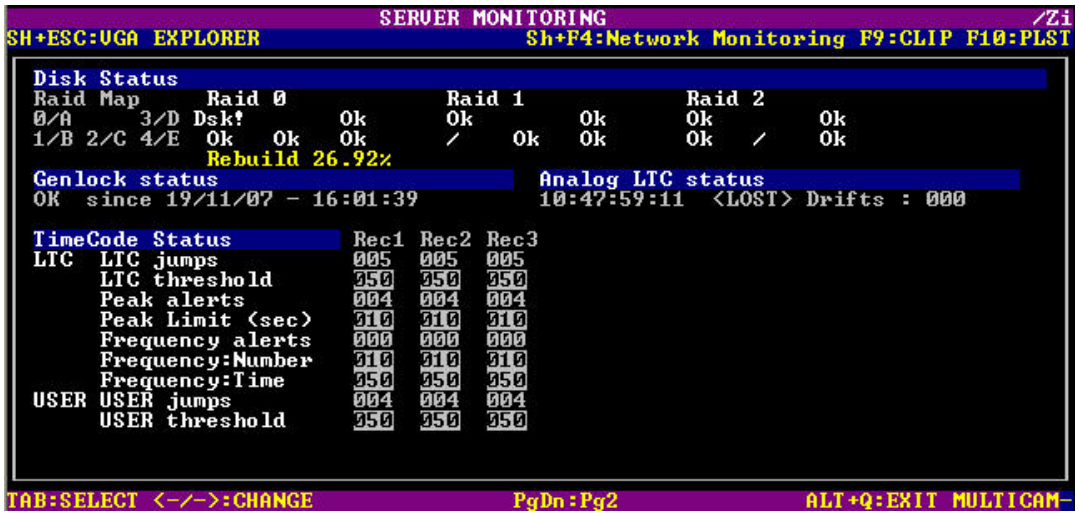
1.	Press **SHIFT-F4** to access the SDTI Network Monitoring screen.
2.	Press **CTRL-ALT-L** to disconnect the XHub branch from the network. The following warning is displayed: Warning The network branch you are connected on will be disconnected from the network. All network actions will be disabled. 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."

3.2 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.



3.2.1 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 0 ‘Disks Monitoring’, on page 42.

3.2.2 GENLOCK STATUS

This section displays the current status of the genlock.

3.2.3 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 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.

3.2.4 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:

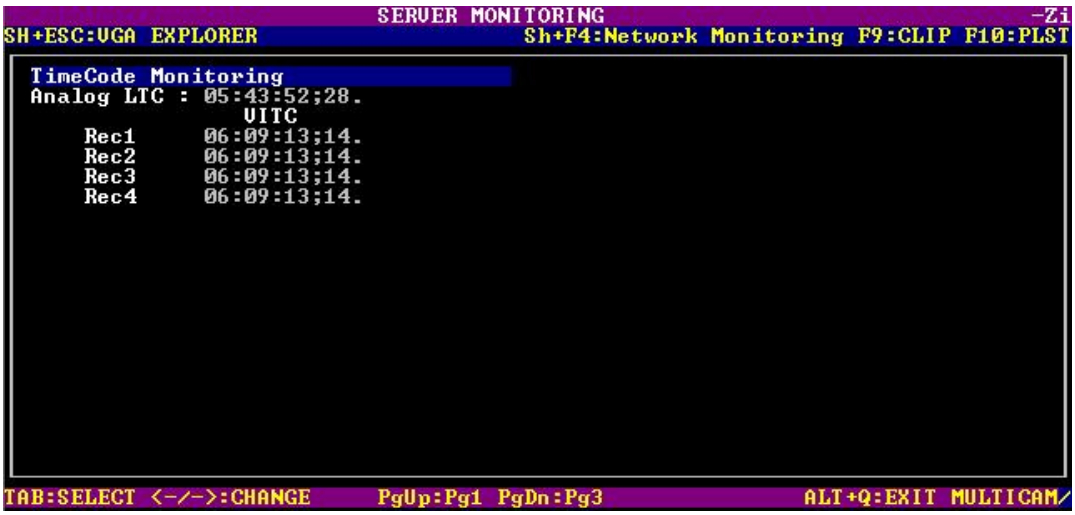
- Timecode jump table for the LTC timecodes
- Timecode jump table for the timecodes specified by the user in the VITC setting on the first page of the Setup screen.

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

3.2.5 TIMECODE MONITORING ON SD RECORDERS

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

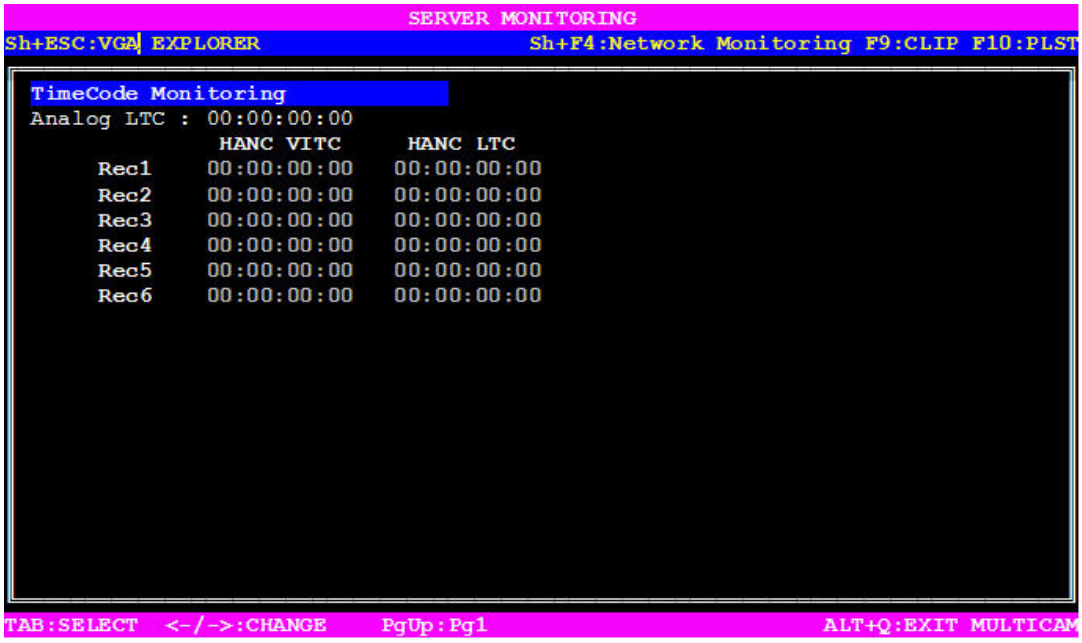
- LTC timecode on the XT[2] server
- VITC timecode on the various recorders



3.2.6 TIMECODE MONITORING ON HD RECORDERS

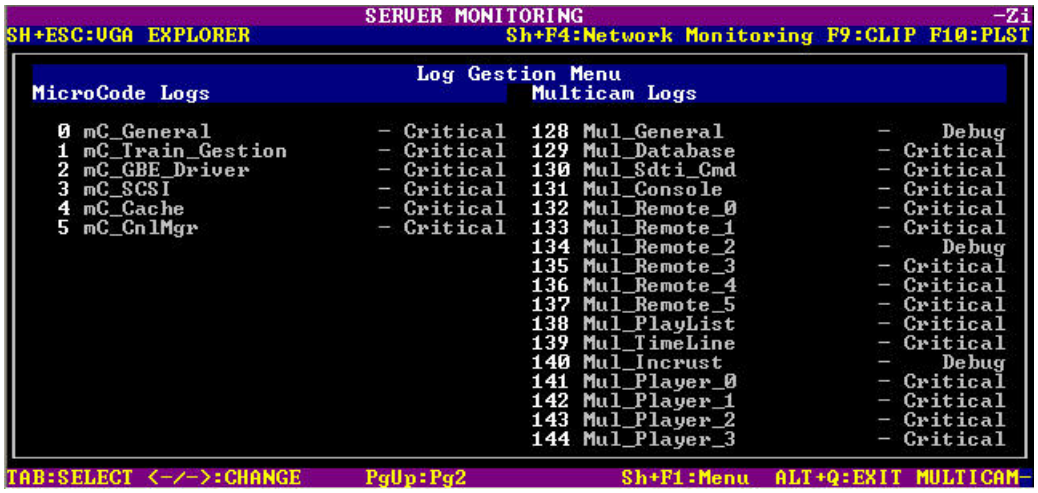
The second page of the Server Monitoring section displays the following information:

- LTC timecode on the XT[2] server
- VITC timecode on the various recorders



3.2.7 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.



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.

Note:

From Multicam version 10.01, you will be able to extract the logs from the XNet Monitor for any server running on the XNet network. For more information, refer to the XNet Monitor manual.

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 CLIP IDENTIFIER MANAGEMENT WITH PROTOCOLS

4.2.1 POSSIBLE CLIP IDENTIFIERS

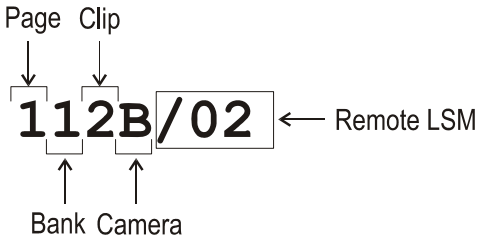
LSM ID

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.

VarID

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

It can only be used in the VDCP protocol. When this protocol uses the VarID, the following VarID 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 VarID 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 VarID 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 1.3.5 'Dolby Audio Management', on page 15.

  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 VarID length = 32 In this case, the VarID is indirectly used to ensure the local uniqueness.
Variable ID & global uniqueness	-	Global uniqueness VarID length = 32
Variable ID & local uniqueness	-	Local uniqueness VarID 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.

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