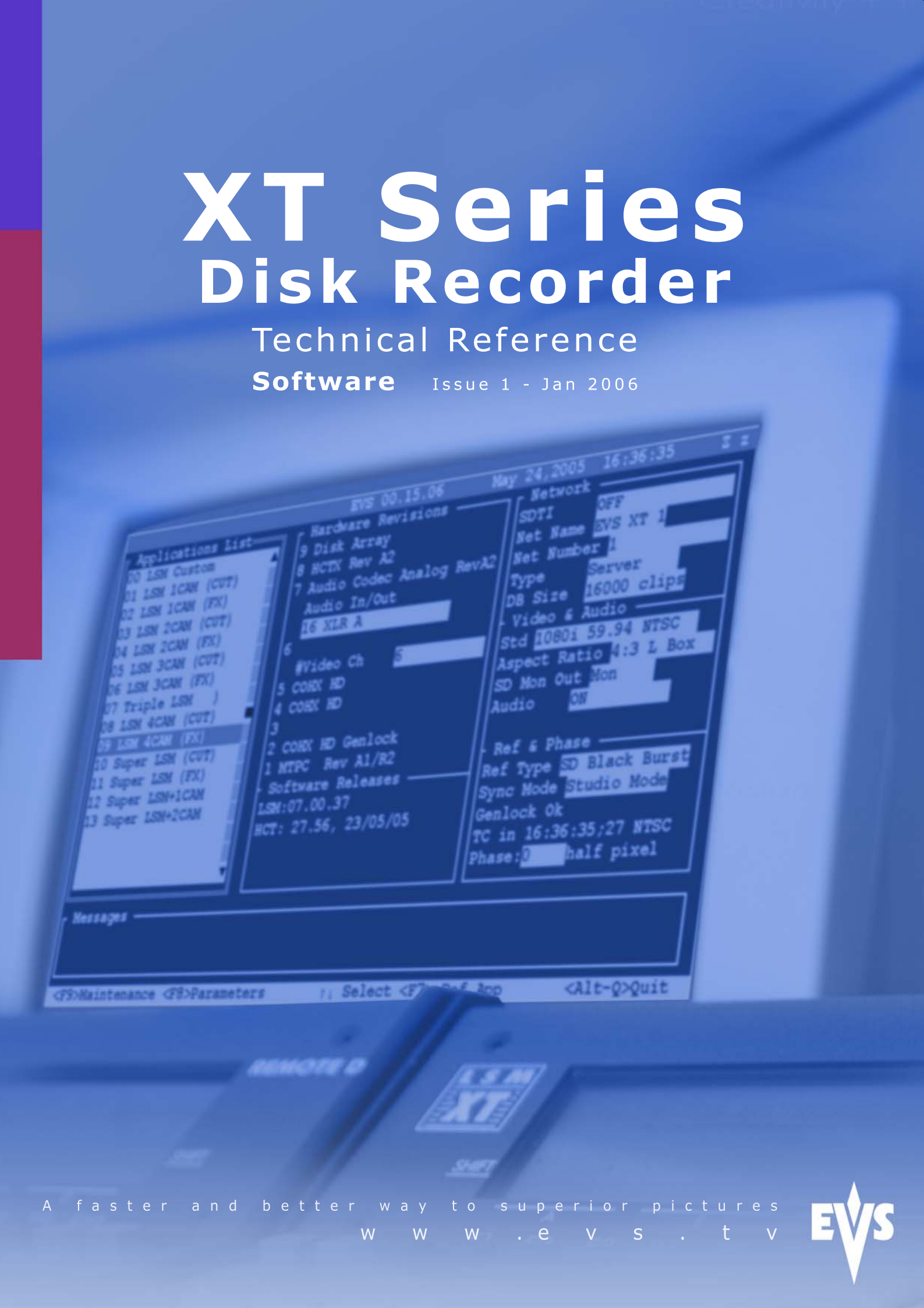
XT Series
Disk Recorder
Technical Reference
Software Issue 1 - Jan 2006



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1 Table of Contents

2 EVS software

Version 00.15.12

2.1 Introduction

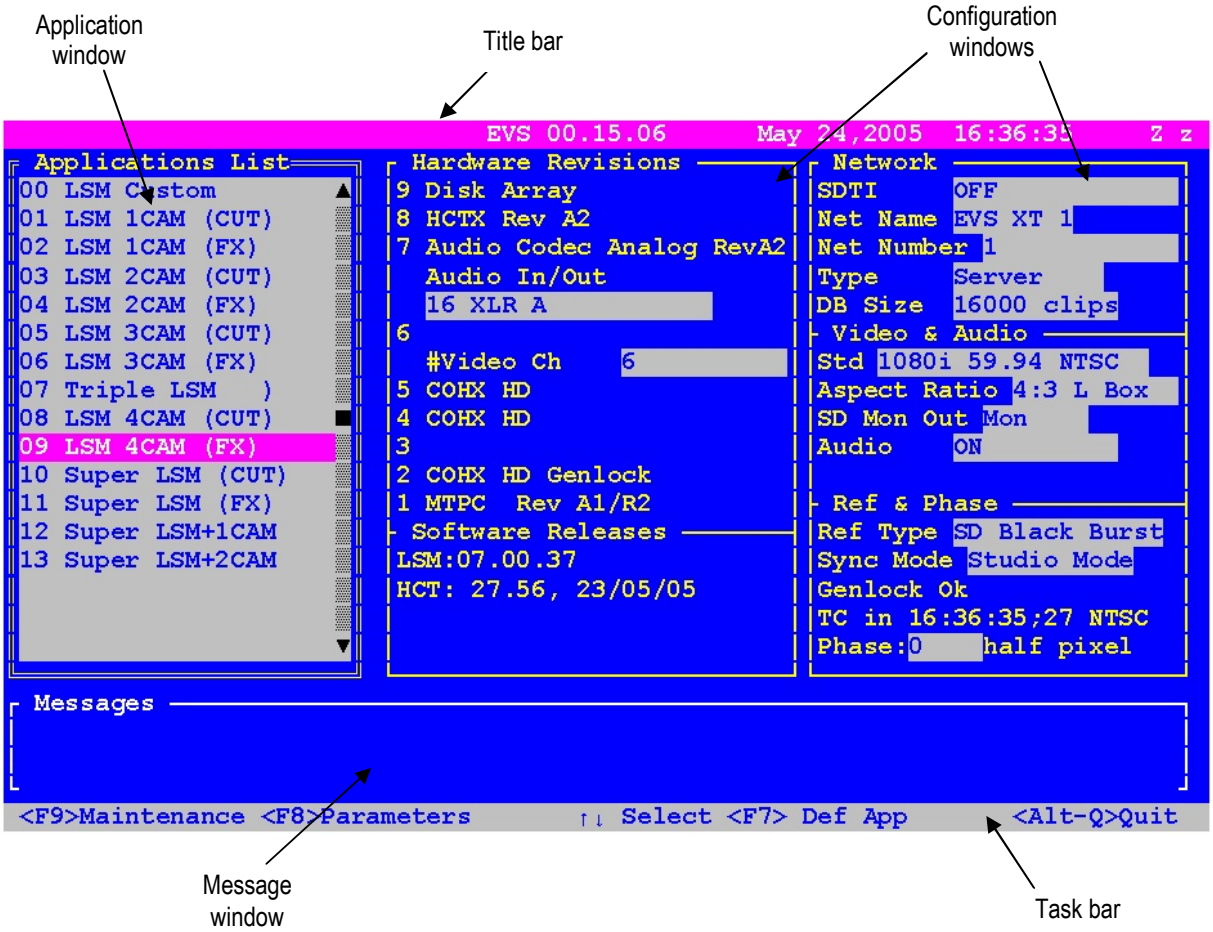
The EVS software is used for configuration and maintenance operations. It is also used to select which application to run, since EVS disk recorders have the ability to run various dedicated applications (Video Server, Slow Motion, ...).

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

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

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

2.2 EVS Main Menu :



2.2.1 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.

2.2.2 TIPS TO MOVE INSIDE THE EVS SOFTWARE:

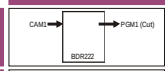
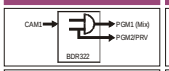
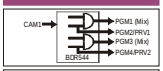
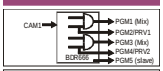
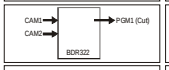
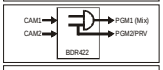
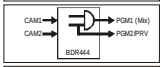
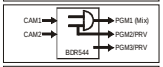
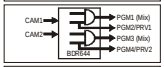
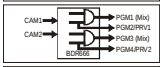
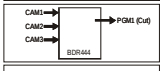
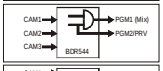
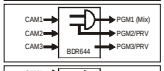
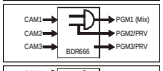
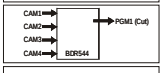
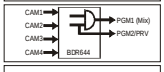
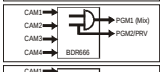
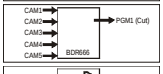
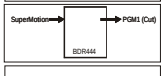
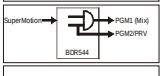
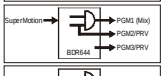
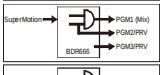
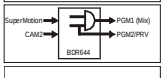
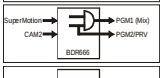
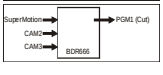
- The active window is always shown with a double frame.
- Use <↑>, <↓> and <TAB> keys to change the selection inside the active window.
- Use <SPACE BAR> to toggle between pre- defined values.
- Use <ENTER> to select an item or to confirm an entry.
- Use <ESC> to go back to the previous menu or to cancel an entry.

2.2.3 STARTING AN APPLICATION

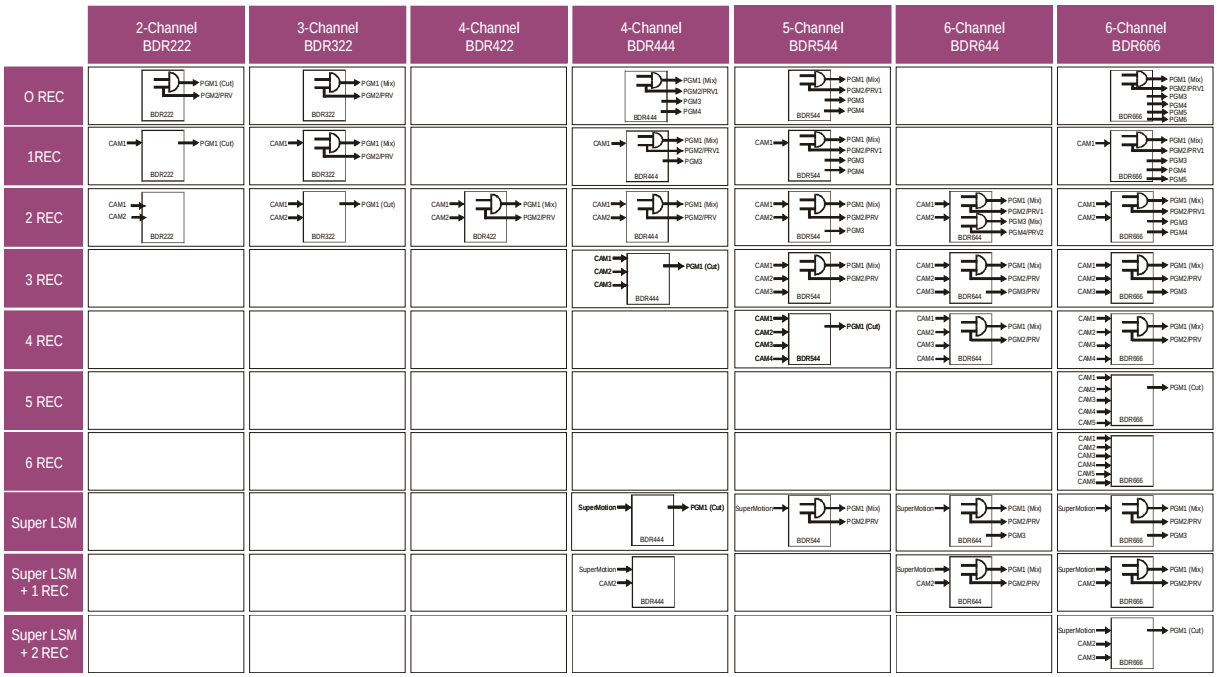
Select the appropriate application from the Applications list, then press ENTER to confirm the selection.

2.2.3.1 CONFIGURATIONS AVAILABLE ON XT SYSTEMS

EVS XT SD LSM : Configurations

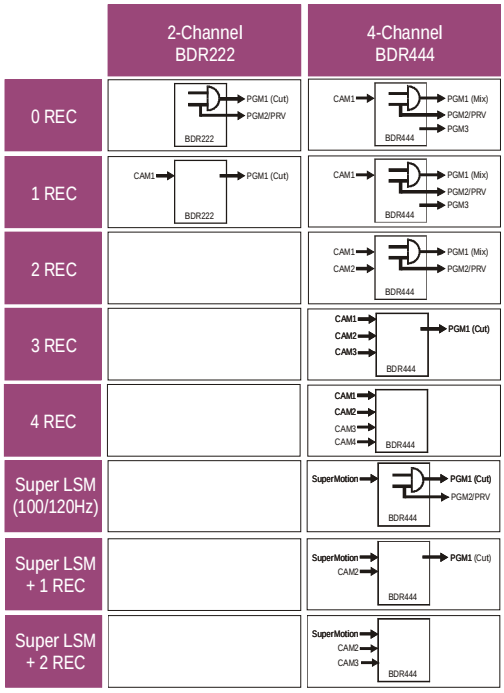
	2-Channel BDR222	3-Channel BDR322	4-Channel BDR422	4-Channel BDR444	5-Channel BDR544	6-Channel BDR644	6-Channel BDR666
1 CAM							
2 CAM							
3 CAM							
4 CAM							
5 CAM							
Super LSM							
Super LSM + 1 CAM							
Super LSM + 2 CAM							

EVS XT SD Servers : Configurations

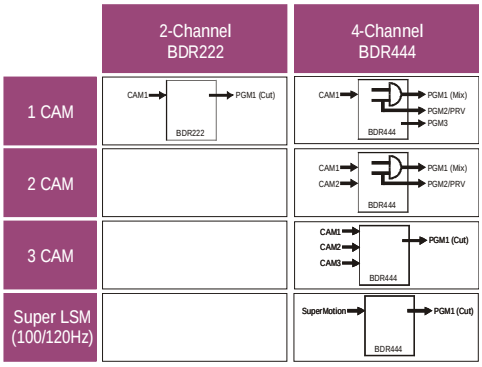


Configurations available on HD and HD/SD compatible systems :

EVS XT HD Servers : Configurations

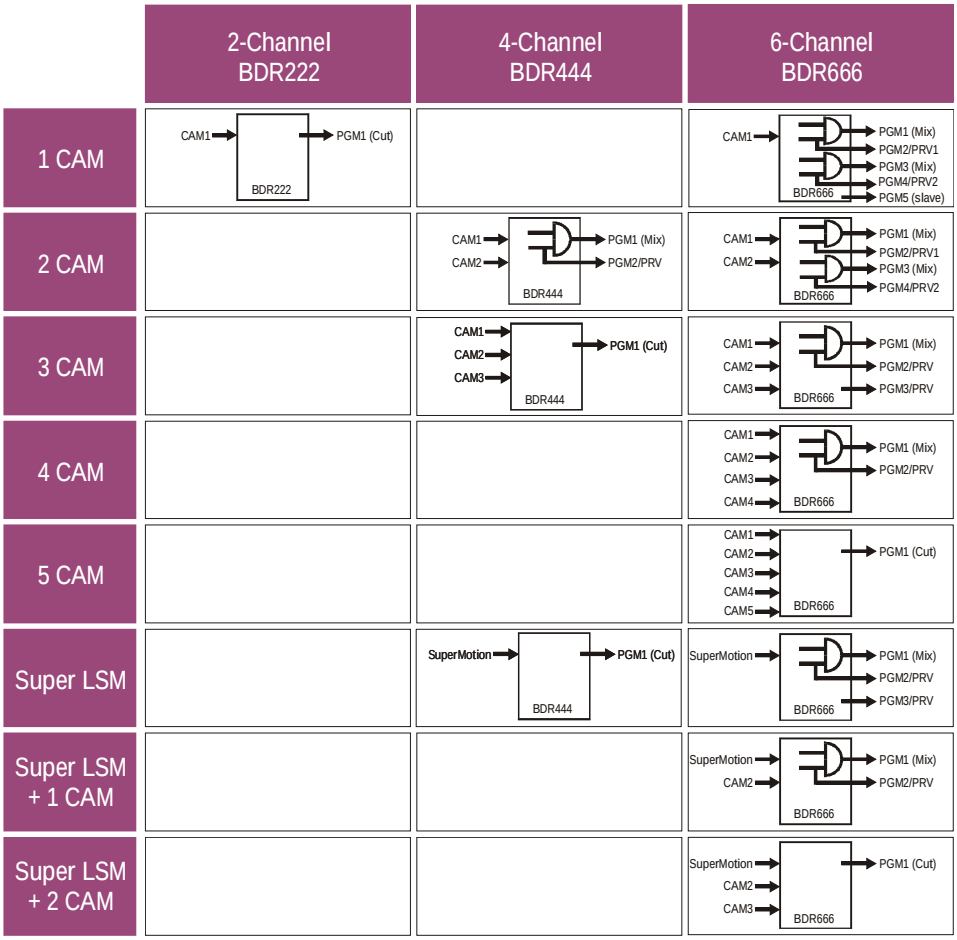


EVS XT HD LSM : Configurations

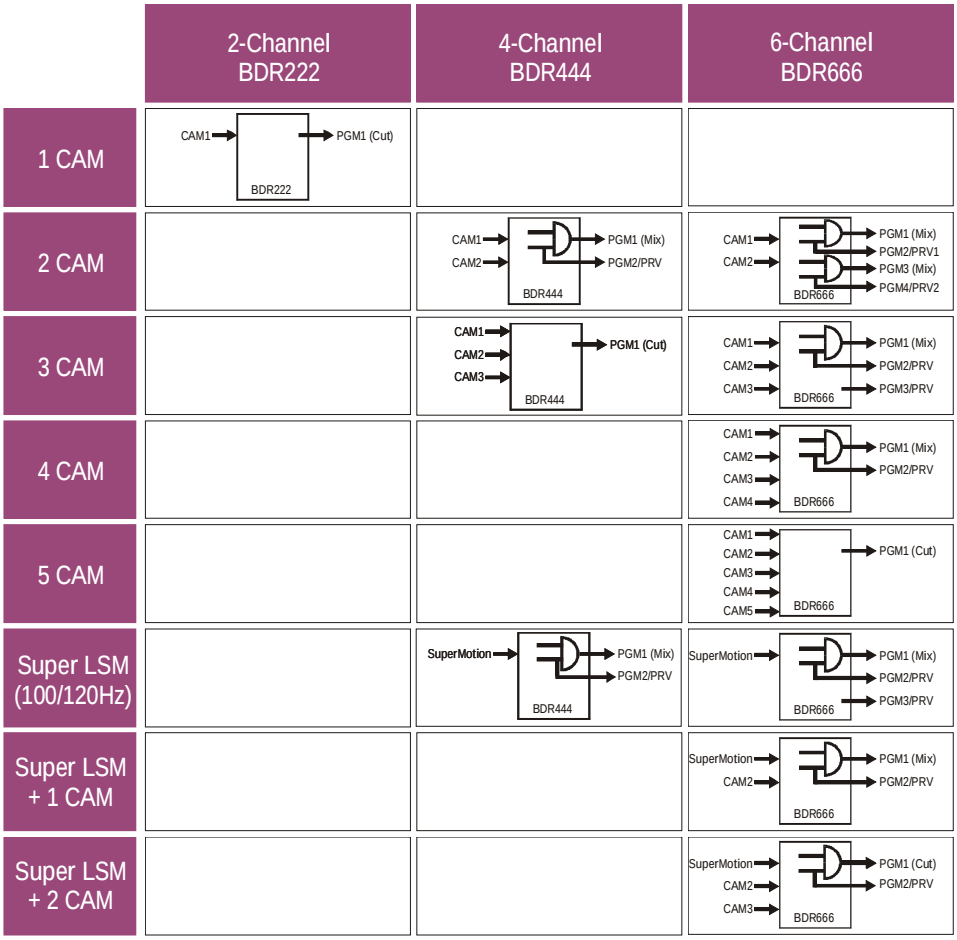


2.2.3.2 CONFIGURATIONS AVAILABLE ON XT[2] SYSTEMS

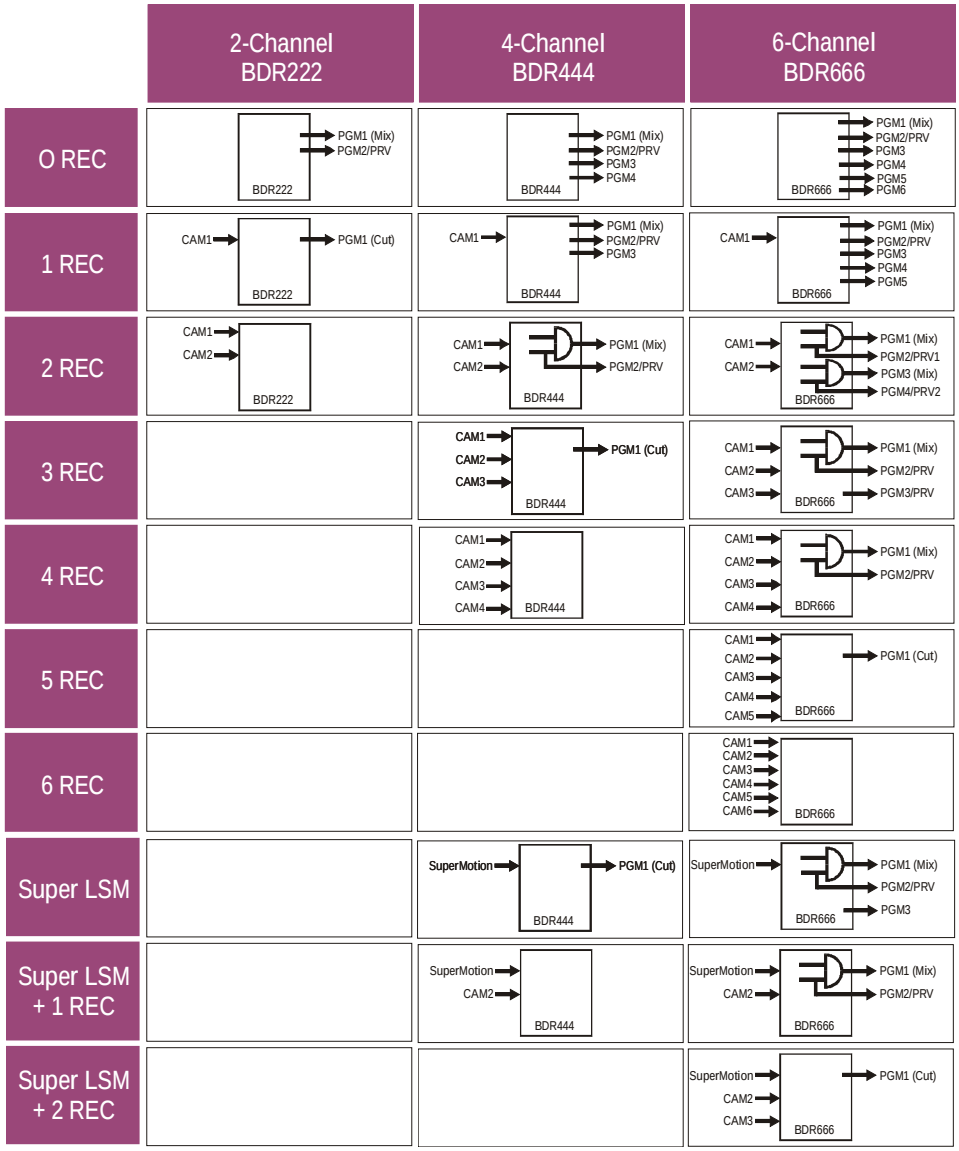
EVS XT[2] SD LSM : Configurations



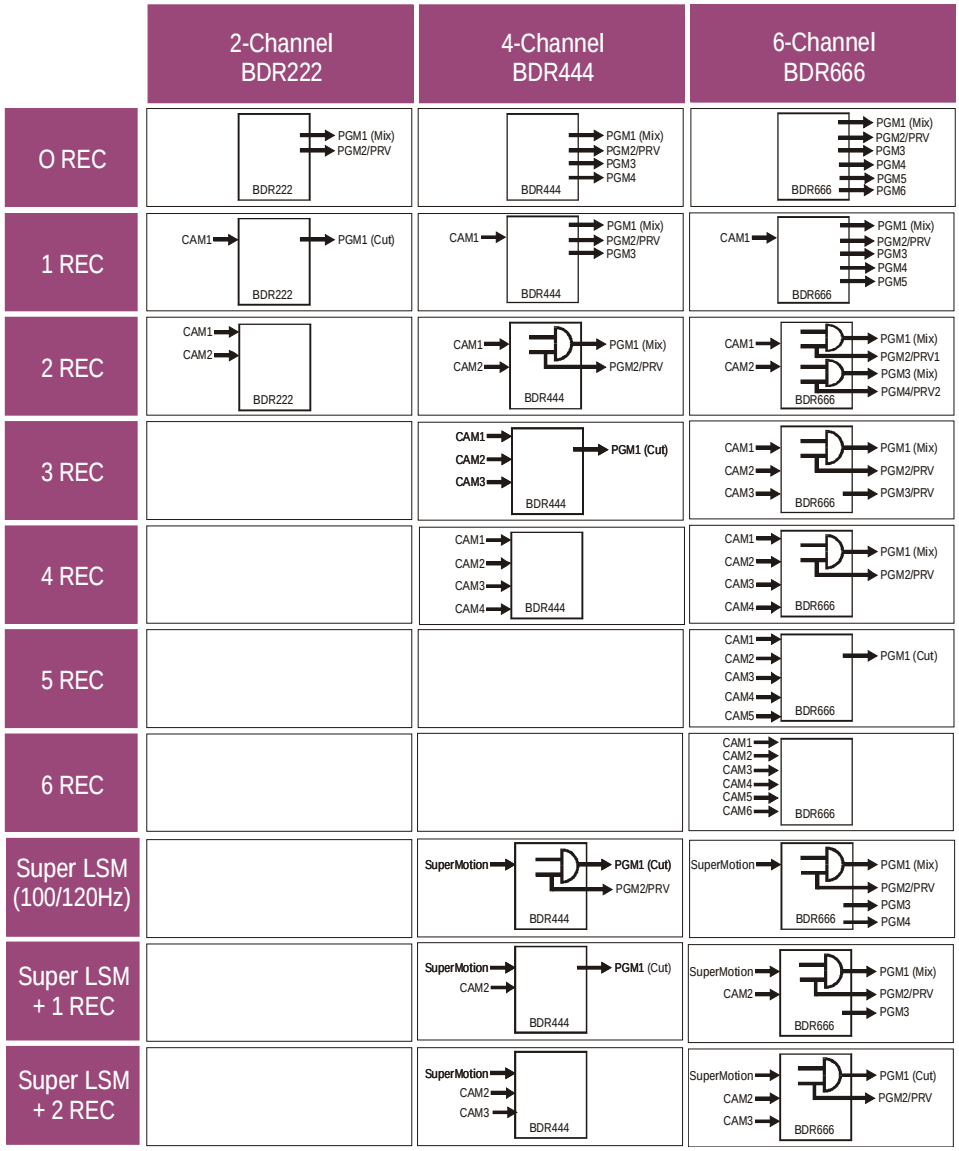
EVS XT[2] HD LSM : Configurations



EVS XT[2] SD Servers : Configurations



EVS XT[2] HD Servers : Configurations



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 increased 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 Slave mode (all modes except LSM), even when the number of record trains is increased.

2.2.4 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 application currently selected the new default application. The default application is automatically started every time the EVS program is entered. When the application currently selected is already the default application, pressing <F7> will disable the default application and the system will remain in the EVS Main Menu every time the EVS software is entered.
- Press <F8> to open immediately the Channel Parameters window related to the selected application. Press <ALT + Q> to come back to main menu.
- Press <F9> to enter the Maintenance Menu.
- To exit the EVS software and go back to the DOS prompt, press simultaneously <ALT + Q> and confirm with <ENTER>. To restart the EVS software from the DOS, simply type RUN.

2.3 Maintenance Menu :

The Maintenance Menu contains various options to configure and check the system. These options are described in details in the next sections.

To select an option, use the <↑> and <↓> keys of the keyboard to highlight the corresponding line and press <ENTER> or press the key corresponding to the character between brackets.

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

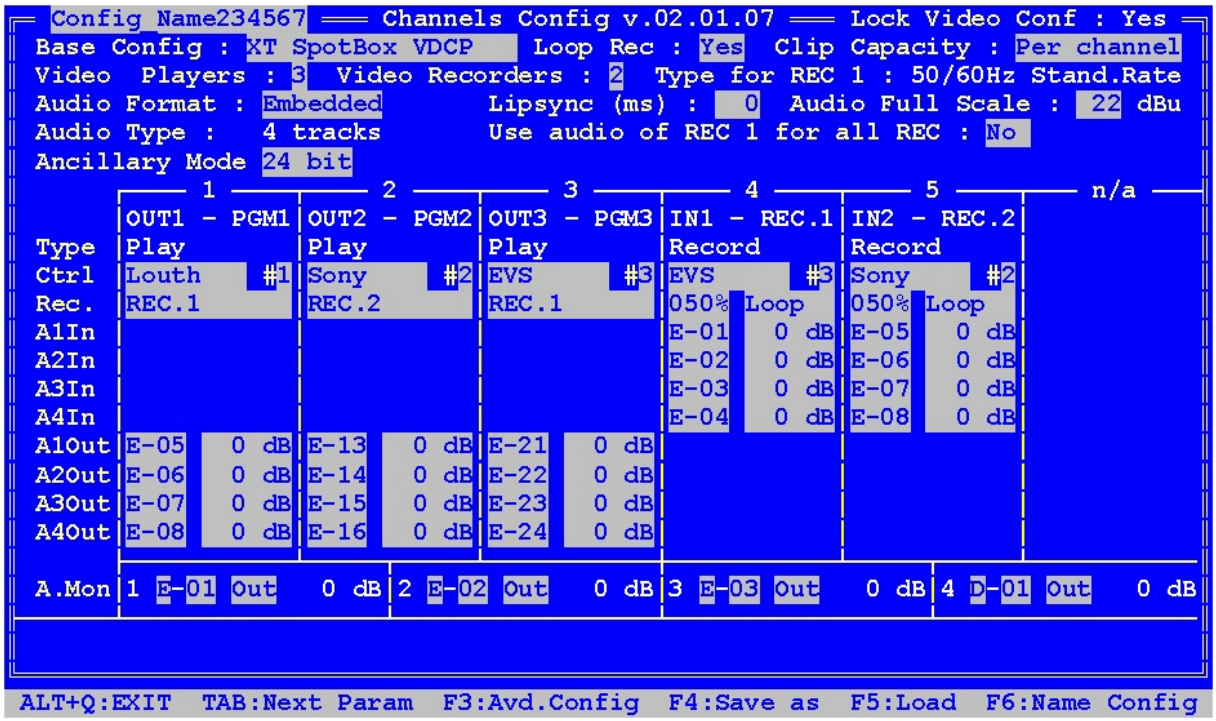
Note : the “ADA Adjustment” option appears only if a frame buffer/mixer board of rev. A3 (and not A3/R2) is installed.

2.3.1 VIDEO & AUDIO CHANNEL PARAMETERS

Important note: 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 3.9 Default parameters)

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

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



2.3.1.1 AUDIO & VIDEO PARAMETERS OVERVIEW:

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:
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 (cfr page 75 of this manual).

Base configuration:
Replay-Only LSM
Multicam LSM
XT Server Sony
XT Server DD35
XT Server Odetics
XT Server VDCP
XT Server AVSP
XT Server IPDP
XT SpotBox Sony
XT SpotBox DD35
XT SpotBox Odetics
XT SpotBox VDCP
XT SpotBox AVSP
XT SpotBox IPDP
Video Delay
2-ch VTR
The different configurations appear according to the license codes that have been enabled.

Loop Rec:
Always forced to YES. Enables/disables the endless loop recording in AVSP Server/Spotbox configurations. This function is applied to all record channels.

Clip Capacity:
Global / Per Channel
This parameter selects the recording mode. In Global mode, the clip capacity is shared through the different record trains, so the remaining the split of recording capacity of between record trains remains equal (example : with 3 record trains, creating a clip of 30 min on REC1 will take 10 min of recording capacity to each record train). In Per Channel mode, the clip capacity is only saved on its record train (example : with 3 record trains, creating a clip of 30 min on REC1 will take 30 min of recording capacity to 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]
selects the number of PLAY channels of the application and the associated audio channels.

Video recorders:
Range: [1...6]
selects the number of RECORD channels of the application. The partition of the disk storage between these channels, and the associated audio channels are automatically updated.

Type for REC1:
defines the type of recorder for the 1st record channel.
Three types of record are available:

- Standard rate 50/60 Hz
- SD SLSM Alternate Parity – EVS mode (150/180 Hz)
- SD SLSM Identical Parity (150/180 Hz)
- HD SLSM Alternate Parity – EVS mode (100/120 Hz)

Audio format:
Range: [Analog (A) or AES/EBU (D) or Embedded (E) or Dolby E]
Selects the AUDIO format.

Note:
When Audio Format is set to AES/EBU (D) or Embedded, the analog audio outputs (if installed on the server) are automatically activated and can be used for additional monitoring. When Audio Format is set to Embedded, the digital audio (AES/EBU) outputs (if installed on the server) are also active.

Audio Type:
Range: [1 Track, 2 Tracks, 4 Tracks, 8 Tracks]
Selects the type of AUDIO.

Note: AES/EBU or Dolby E = stereo or dual stereo
Embedded = dual stereo
8 Tracks available in AES/EBU only, for configurations with max. 2 video inputs and/or 2 video outputs.

Lipsync:
Range : -22ms to +17ms
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.
Default: 0

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

Use Audio of REC 1 for all REC:
Range: [Yes or No]
All audio channels associated to REC1 (CAM A) will be automatically used for all other RECORD channels.

Ancillary Mode:
Range: [24 bits or 20 bits]
Defines the encoding method used for Digital Audio.

Channels:
Channels input/output and name are automatically defined according to the parameters entered in the fields: Base configuration, Video Players, Video Recorders and Type of Rec.
The play 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:
Range: [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, and defines the type of channel and depends on the values of Video Players, Video Recorders and Type of REC1.

CTRL :
Range: [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]
1-6 defines the RS422 port number that controls each channel. These fields are not available with LSM and Video Delay configurations.

REC.:
For a PLAY channel, this parameter defines which record train is the

default source.
For a RECORD channel, two parameters are available:

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

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

A1 - A2 - A3 – A4 IN :
1st/2nd/3rd/4th mono audio input of the current channel.

A1 - A2 - A3 – A4 OUT :
1st/2nd/3rd/4th mono audio output of the current channel.

Audio format :
Range: [A, D, E] (Analog, Digital (AES/EBU) or Dolby E, Embedded). 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	E - A	E - D	E - A – D

Audio Channel :
Range: [1 ... 24]
This parameter selects the audio channel among the selected audio format. The values depend on the audio format and available connectors:

	Analog (A)	Digital (D)	Embedded (E)
Embedded only	n/a	n/a	1 – 24
16 XLR Analog	1 – 8	n/a	1 – 24
16 XLR Digital	n/a	1 – 16	1 – 24
16 XLR Analog + 8 XLR Digital	1 – 8	1 – 8	1 – 24
16 XLR Analog + 16 BNC Digital or 16 XLR Analog + 4 DB15 Digital	1 – 8	1 – 16	1 – 24

Note: the Digital (AES/EBU) or Dolby E inputs and outputs share the same internal audio channels with Embedded audio inputs and outputs.

Therefore, when an Embedded input is assigned to a record channel, it means that the corresponding Digital input can not be used. The opposite is true as well.

On the output side, it means that when an Embedded output is assigned to a play channel, the same audio will be automatically present on the corresponding Digital output.

The following table shows the correspondence between Digital (AES/EBU) or Dolby E and Embedded audio channels

Embedded Audio inputs/outputs	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16
AES/EBU or Dolby E inputs/outputs	1-2	9-10	3-4	11-12	5-6	13-14	7-8	15-16

Audio gain :
Range: [from -90dB to +23.5dB]
This parameter allows the operator to adjust the audio gain for each audio track. The adjustments are done by pressing CTRL+↓/↑ (±0.75dB steps) or SHIFT+↓/↑ (±6dB steps).

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

2.3.1.2 TO MODIFY A/V CHANNEL PARAMETERS :

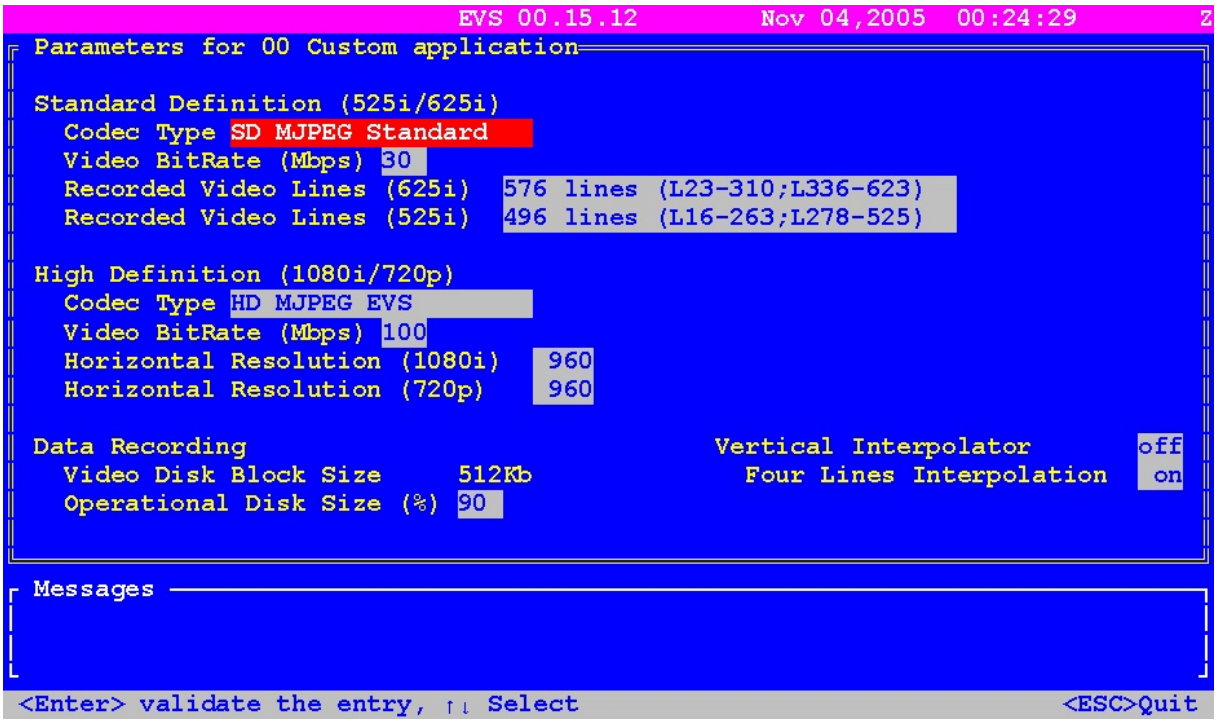
1. Press <F9> to open the Maintenance menu.
2. Select the 'Channel Parameters' item and press <ENTER>
3. Select the Application to configure and press <ENTER>
4. The Audio Video Channel Parameters window appears. Use the <TAB> key to move from one box to the next one. Some information about the current parameter is displayed in the INFO area.
5. Press <TAB> or the arrow keys (←,→,↑,↓) to move across the different parameters in the window.
6. When the desired field is selected, modify the parameter to its new value with <SPACE BAR> or by entering its numeric value and then press <ENTER> to validate.
7. Press <F3> to enter the Advanced Parameters.
8. Press <F4> to save the current configuration. A dialog Box appears to enter a name.
9. Press <F5> to load the list of configurations previously saved.
10. Press <ALT + Q> to exit the A/V Channel parameters window.

OR:

1. From the 'Application List', select the application to configure and press <F8>
2. Then continue from Step 4.

2.3.2 ADVANCED PARAMETERS

Important note: 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 3.9 Default parameters)



- Standard Definition (525i / 625i)
  - Codec Type :
    - With XT CODEC6 h/w : (1) SD MJPEG Standard (default)
    - With XT COHD h/w : n.a.
    - With XT COHU h/w : (1) SD MJPEG Standard (default)
    - With XT[2] COHX h/w : (1) SD MJPEG Standard (default) ; (2) SD IMX (D10) ; (3) SD MPEG2 i-field
  - Video Bitrate :
    - When Codec Type = SD MJPEG Standard or SD MPEG2 i-field : 20-100Mbps ; default : 30Mbps
    - When Codec Type = SD IMX (D10) : 30Mbps (default) ; 40Mbps ; 50Mbps
  - Recorded Video Lines (625i) : Allows to set which lines are recorded
    - CODEC6/COHU in SD M-JPEG standard :
      - 576 lines (L23-310 ; L336-623) (default)
      - 592 lines (L15-310 ; L328-623)

        - COHX in SD M-JPEG standard :
            - 576 lines (L23-310 ; L336-623) (default)
            - 592 lines (L15-310 ; L328-623)
            - 608 lines (L7-310 ; L320-623)
        - COHX in SD IMX (D10) or SD MPEG2 i-field
            - 608 lines (L7-310 ; L320-623) (default)
    - Recorded Video Lines (525i)
        - CODEC6/COHU in SD M-JPEG standard
            - 496 lines (L16-263 ; L278-525) (default)
            - 487 lines (L20-263 ; L283-525)
        - COHX in SD M-JPEG standard
            - 496 lines (L16-263 ; L278-525) (default)
            - 480 lines (L23-262 ; L286-525)
            - 512 lines (L7-262 ; L270-525)
        - COHX in SD IMX (D10) or SD MPEG2 i-field
            - 512 lines (L7-262 ; L270-525) (default)

- High Definition (1080i / 720p)
    - Codec Type
        - CODEC6 h/w : n.a.
        - XT COHD or COHU : HD MJPEG EVS (default)
        - XT[2] COHX :
            - HD MJPEG EVS (default)
            - HD MJPEG Standard (use only if files needs to be used on a NLE)
            - HD MPEG2 i-field
    - Video Bitrate :
        - 20-360Mbps ; default 100Mbps
    - Horizontal Resolution (720p)
        - COHD/COHU
            - 768 (default)
            - 960
            - 1024
        - COHX
            - 640
            - 768 (default)
            - 960
            - 1024
            - 1280
    - Horizontal Resolution (1080i)
        - COHD/COHU
            - 960 (default)
            - 1152
            - 1280
            - 1372
            - 1440
        - COHX
            - 960 (default)
            - 1152
            - 1280
            - 1372

- 1440
- 1536
- 1600
- 1920

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 note: 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].
Indicates the size (in KB) of data blocks to be recorded to or read from the disks.

Operational disk size:
Range: [0...100].
Percentage of the disks actually used to store the data. Restricting access to the centre part of the drives increases the performance of the system but decreases capacity.

Vertical Interpolator and Four Lines Interpolation :
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]


All VTRs use interpolation in PLAY VAR mode.

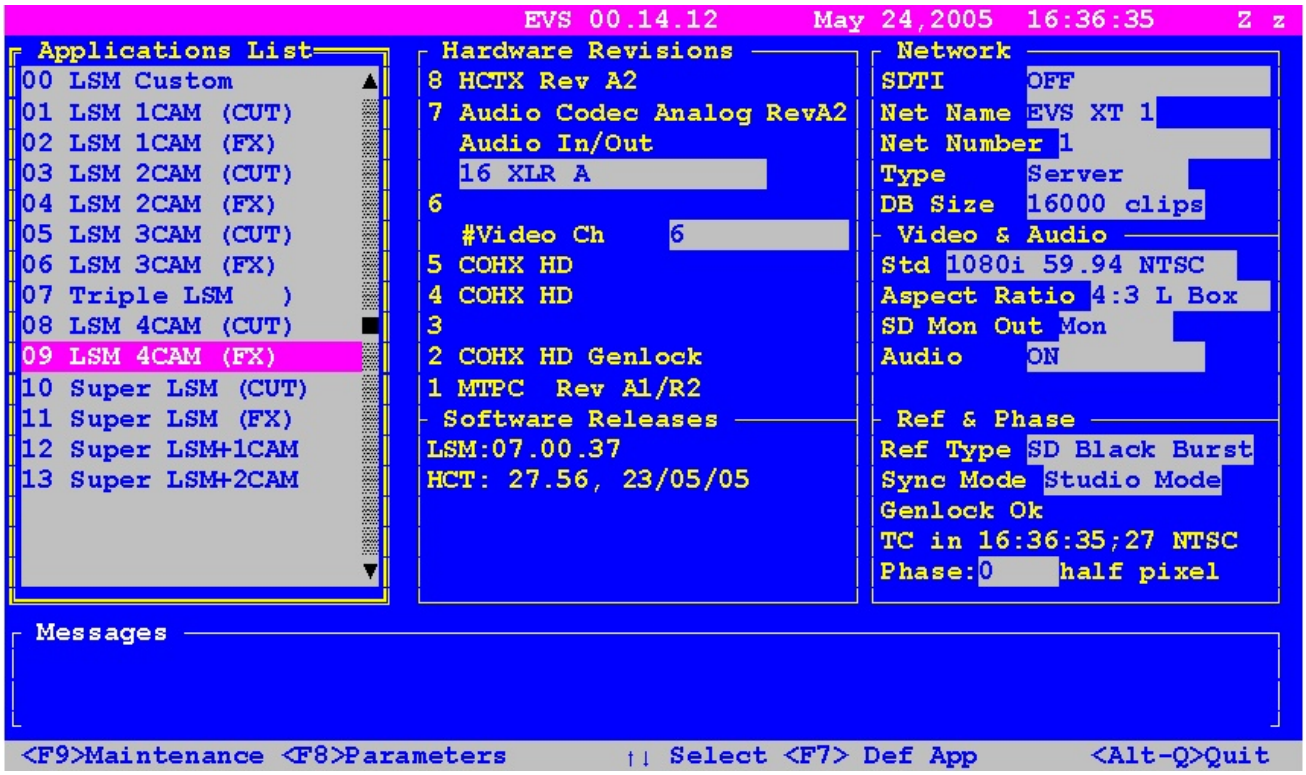
2.3.2.1 TO MODIFY ADVANCED PARAMETERS :

1. Press <F9> to open the Maintenance menu.
2. Select the ‘Advanced Parameters’ item and press <ENTER>
3. Use the <↑> and <↓> keys to select the parameter to modify and press <ENTER>
4. Enter the desired value, then press <ENTER>
5. When all parameters are set, press <ESC>
6. A confirmation message is displayed, press <ENTER>

2.3.3 CONFIGURATION

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

Important notice: The configuration is 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.



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.

2.3.3.1 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.

2.3.3.2 CONFIGURATION ITEMS OVERVIEW :

2.3.3.2.1 Hardware Revisions area

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

Three information can not be detected :

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

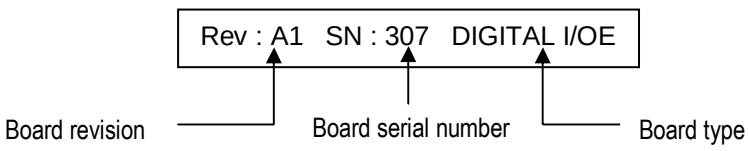
  On a 6RU XT/XT[2] :
  - 16 XLR Analog,
  - 16 XLR Digital,
  - 16 XLR Analog + 8 XLR Digital,
  - 16 XLR Analog + 16 BNC Digital
  - 16 XLR Analog + 4 DB15 Digital
  - None

  On a 4RU XT :
  - 16 XLR Analog,
  - 16 XLR Digital,
  - 16 XLR Analog + 8 XLR Digital,
  - 16 XLR Analog + 8 BNC Digital
  - 16 XLR Analog + 2 DB15 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.
- Frame buffer board type

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



2.3.3.2.2 Software releases Area:

LSM: displays the version number of Multicam software installed.

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

2.3.3.2.3 Network area:

SDTI :
(off / 270 Mbps Relay / 270Mbps Non-Relay / 540Mbps Relay / 540Mbps Non-Relay / 1485Mbps Non-Relay)
Enables the SDTI option and select the bandwidth of the network.

On XT[2] servers there are two pairs of SDTI connectors :
- the Relay ones can be used at 270 and 540 Mbps
- the Non-Relay can be used at 270, 540 and 1485 Mbps.

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

Note 1: The bandwidth must be identical on all LSM-XTs connected to the XNet.
If one system is configured with a different bandwidth, it will block the entire network.

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 the server is really recognized by its network number and not its name, but it is recommended for operator to easily identify all XTs connected to XNet.

Net Number:
Range: [1 ... 29]
The Net number defines the machine number on the network. This number is user-defined and must be different for all servers connected to the network. When entering a new number if this number is already assigned to another machine, an error message will notify the user.

Type :
Range: [Client, Master, Server]
Defines the privileges of the XT server on the SDTI network. One and only one XT server on the network must 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 servers on the network can be set either to MASTER type

if they need to access clips from other XTs, or to CLIENT type if their clips must be available on the network but they don't need to call clips from other XTs.

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

DB Size :
Range: [6000 clips, 16000 clips]
If the XT is equipped with the latest revision of MTPC (A1/R2), the size of the clips database for an entire XNet network can be increased to 16,000 clips. For older revisions of MTPC (A1 or A1/R), the network database is limited to 6,000 clips. This parameter must be identical on all XTs on the network. If an XT is started with the wrong database size, a warning message will appear and the system will not be able to connect to the network as long as this parameter is not changed.


Note : 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. The maximum number of clips that can be saved locally on a server is determined by the size of the CPU RAM of the HCTS board : 2048 clips with 64MB CPU RAM on the HCTS, 4096 clips with 128MB CPU RAM on the HCTS or HCTX. The RAM size of the HCTS board is automatically detected when starting the Multicam application.

2.3.3.2.4 Video & Audio area:

Std:
Selects the video standard:

- 625i 50.00 PAL *(default for SD)*
- 525i 59.94 NTSC
- 525i 59.94 NTSC Japan
- 1080i 50.00 PAL *(default for HD)*
- 1080i 59.94 NTSC
- 1080i 59.94 NTSC Japan
- 720p 50.00 PAL
- 720p 59.94 NTSC
- 720p 59.94 NTSC Japan

Aspect Ratio :
In High Definition, selects the format of the image for the downconverted outputs of the HD-LSM (not used for SD LSM)

- 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.*

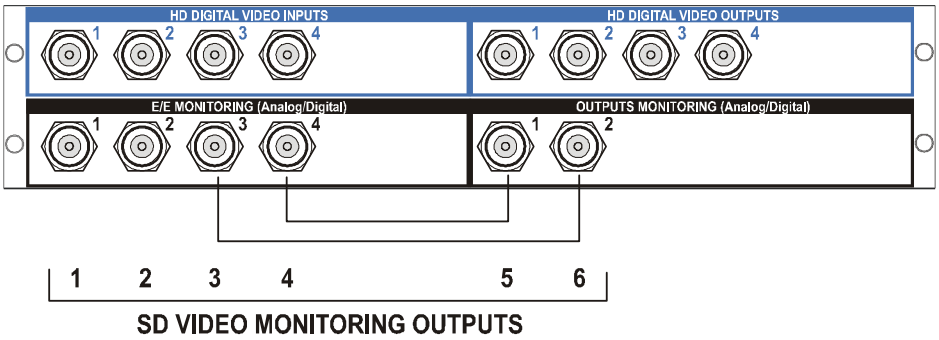
In Standard Definition, defines the aspect ratio of the incoming video feeds to adjust the aspect ratio of the graphics when drawing circles in Target Tracking and Painting modes.

HD/SD out (For XT systems equipped with HCTS controller):
HD systems only. Defines the assignment of SD down-converted outputs :

- Monitoring *(default)*
- PGM+Monitoring: the E/E monitoring outputs are re-assigned to produce SD PGM outputs.

When looking at the rear panel of an HD XT server, there are 6 SD outputs. 4 of them are located on the left immediately below HD SDI inputs 1 to 4, the other 2 are located on the right immediately below HD SDI outputs 1 and 2. Let's call them, from left to right, SD outputs 1 to 6.

The first remark is that SD output 3 and 6 are actually the same, as well as 4 and 5. The system has only 4 internal SD outputs, but the last two are duplicated on the rear panel to make the connection easier in most configurations.



SD VIDEO MONITORING OUTPUTS

SD outputs assignment on 2-ch XT HD server when set to Monitoring only :

	SD Out 1	SD Out 2	SD Out 3	SD Out 4	SD Out 5	SD Out 6
0 REC + 2 PLAY	n.a.	n.a.	PGM2+OSD	PGM1+OSD	PGM1+OSD	PGM2+OSD
1 REC + 1 PLAY	REC1 clean	n.a.	n.a.	PGM1+OSD	PGM1+OSD	n.a.
2 REC + 0 PLAY	REC1 clean	REC2 clean	n.a.	n.a.	n.a.	n.a.

SD outputs assignment on 2-ch XT HD server when set to PGM+Monitoring :

	SD Out 1	SD Out 2	SD Out 3	SD Out 4	SD Out 5	SD Out 6
0 REC + 2 PLAY	PGM1 clean	PGM2 clean	PGM2+OSD	PGM1+OSD	PGM1+OSD	PGM2+OSD
1 REC + 1 PLAY	PGM1 clean	REC1 clean	n.a.	PGM1+OSD	PGM1+OSD	n.a.
2 REC + 0 PLAY	REC1 clean	REC2 clean	n.a.	n.a.	n.a.	n.a.

SD outputs assignment on 4-ch XT HD server when set to Monitoring only :

	SD Out 1	SD Out 2	SD Out 3	SD Out 4	SD Out 5	SD Out 6
0 REC + 4 PLAY	PGM4+OSD	PGM3+OSD	PGM2+OSD	PGM1+OSD	PGM1+OSD	PGM2+OSD
1 REC + 3 PLAY	REC1 clean	PGM3+OSD	PGM2+OSD	PGM1+OSD	PGM1+OSD	PGM2+OSD
2 REC + 2 PLAY	REC1 clean	REC2 clean	PGM2+OSD	PGM1+OSD	PGM1+OSD	PGM2+OSD
3 REC + 1 PLAY	REC1 clean	REC2 clean	REC3 clean	PGM1+OSD	PGM1+OSD	REC3 clean
4 REC + 0 PLAY	REC1 clean	REC2 clean	REC3 clean	REC4 clean	REC4 clean	REC3 clean

SD outputs assignment on 4-ch XT HD server when set to PGM+Monitoring :

	SD Out 1	SD Out 2	SD Out 3	SD Out 4	SD Out 5	SD Out 6
0 REC + 4 PLAY	PGM1 clean	PGM2 clean	PGM3 clean	PGM4 clean	PGM4 clean	PGM3 clean
1 REC + 3 PLAY	PGM1 clean	PGM2 clean	PGM3 clean	PGM1+OSD	PGM1+OSD	PGM3 clean
2 REC + 2 PLAY	PGM1 clean	PGM2 clean	PGM2+OSD	PGM1+OSD	PGM1+OSD	PGM2+OSD
3 REC + 1 PLAY	PGM1 clean	REC2 clean	REC3 clean	PGM1+OSD	PGM1+OSD	REC3 clean
4 REC + 0 PLAY	REC1 clean	REC2 clean	REC3 clean	REC4 clean	REC4 clean	REC3 clean

SD Mon OUT (on XT[2] hardware):
Range: [CVBS or SDI]
Specifies the type of output monitoring.

SD Edge Enh. (on XT[2] hardware):
Range: [0 – 200%]
Specifies the value of the edge enhancer for the SD downconverted outputs of the XT[2] servers set in HD.

Audio:
Range: [On or Off]
Enables or disables the Audio.

2.3.3.2.5 Ref & Phase area:

Ref Type:
Selects the genlock reference input between:
- SD Black Burst *(default)*
- HD Tri-Level Sync (HD only)

Sync Mode:
Select 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:
Range:[OK or BAD] This information is automatically displayed.
Checks if the Genlock input is valid.

TC In:
Display 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".

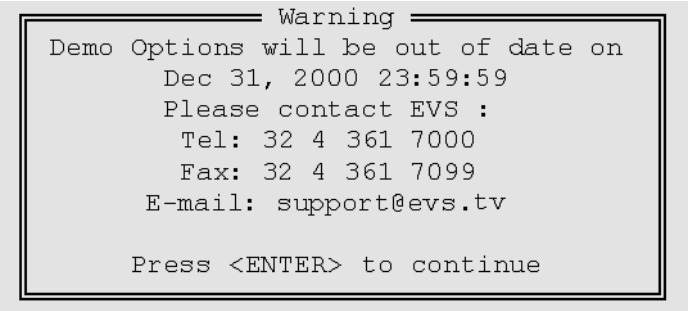
Phase:
This parameter shows the value currently set for the main video phase of the digital video outputs. Refer to the 'Phase Definition' section for details.

2.3.4 OPTIONS

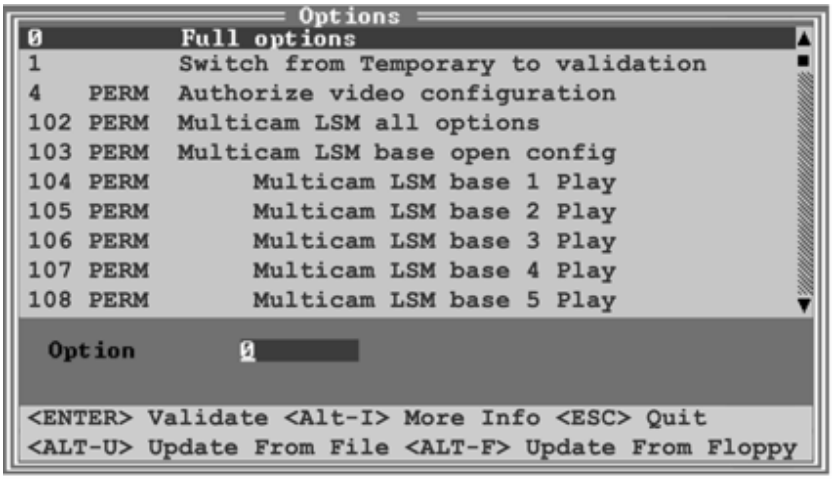
This function is used to manage software license codes for all applications. To run particular application software and/or specific software options, not only the software itself is required but also a license key, which is unique for every option on every system.

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

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



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:



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>.

2.3.4.1 EXAMPLE OF LINE FOR A PERMANENT OPTION:

104	**PERM**	**Multicam LSM Base 1 PLAY**

2.3.4.2 EXAMPLE OF LINE FOR A TEMPORARY OPTION:

108	**DEMO**	**Multicam LSM Base 5 PLAY**

2.3.4.3 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**

2.3.4.4 TO ENTER NEW LICENSE CODES:

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

or

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

or

- Make sure the cursor blinks in the 'Option' box in the lower part of the Options windows.
- Type in the code corresponding to the desired option (license codes are sent by EVS Technical Support Dpt) and press <ENTER>.
- Repeat this operation for the next license code.
- You can check that the corresponding options are enabled by scrolling into the options list.

2.3.4.5 TO REMOVE A LICENSE CODE:

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

- When the option is selected (white characters), press simultaneously <CTRL+ DEL> on the keyboard.

- Confirm the delete of the option with <ENTER> or cancel with <ESC>.

2.3.4.6 TO CHECK HARDWARE KEY (DONGLE) INFORMATION:

When the Options window is open, press simultaneously <ALT + I>
A new window 'Option Info' appears.

The following information is available:

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

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

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

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

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

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

Key time: current date & time of the hardware key. This is the date used to determine whether limit time for temporary license codes has been reached or not. Factory setting only.

Press <ENTER> to go back to the Options window

2.3.5 CLEAR VIDEO DISKS

This function is used to erase all clips and playlists of all applications present on the system.
Caution : This will definitely delete all video and audio data, including protected clip and record trains.

- Use the <↑> and <↓> keys to select the 'Clear Clips' line and press <ENTER>

- You are asked to confirm <ENTER> or cancel <ESC> the command.

2.3.6 FORCE LOAD CLIPS

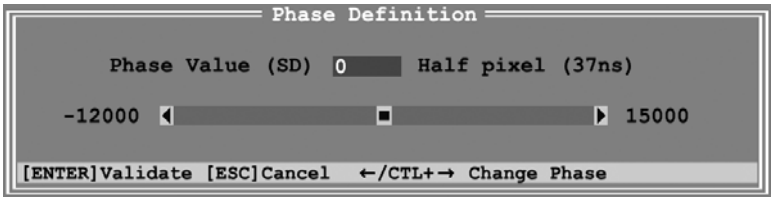
This function is used when swapping disks arrays between XT's. If clips are saved to disks, this command forces the system to re-load the clips.

2.3.7 PHASE DEFINITION

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

2.3.7.1 STANDARD DEFINITION:

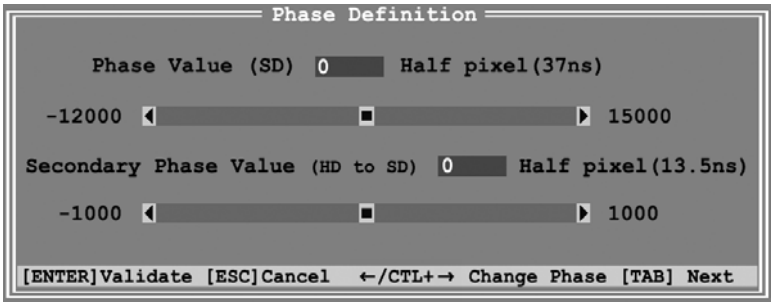
If the REF TYPE (see Configuration windows) is set to "SD BlackBurst", the phase definition window is as follows:



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

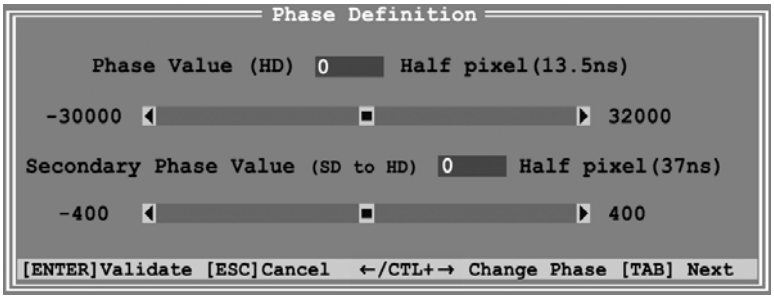
2.3.7.2 HIGH DEFINITION:

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



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

2.3.7.3 COMMANDS:

- Use <←> and <→> keys to adjust the main phase value by half pixel (i.e. SD: 37 ns or HD:13.5 ns) steps or type in the value in the "pahse value" box.
- 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" boxes.
- 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" box.
- 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.

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.

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.

2.3.8 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.

2.3.8.1 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.

2.3.8.2 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>.

2.3.9 DEFAULT PARAMETERS

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

2.3.9.1 DEFAULT PARAMETERS FOR ALL APPLICATIONS:

Multicam LSM	Replay Only LSM	HD XT[2] 6U	HD XT[2] 4U HD XT 6U	HD XT 4U	SD XT[2] 6U SD XT 6U	SD XT[2] 4U	SD XT 4U
00 Custom	00 Custom	Y	Y	Y	Y	Y	Y
01 MultiLSM 1cam Cut	01 R.O. LSM 1cam Cut	Y	Y	Y	Y	Y	Y
02 MultiLSM 1cam Fx	02 R.O. LSM 1cam Fx	Y	Y		Y	Y	Y
03 MultiLSM 2cam Cut	03 R.O. LSM 2cam Cut	Y	Y		Y	Y	Y
04 MultiLSM 2cam Fx	04 R.O. LSM 2cam Fx	Y	Y		Y	Y	Y
05 MultiLSM 2cam 4Out	05 R.O. LSM 2cam 4Out	Y			Y		
06 MultiLSM 3cam Cut	06 R.O. LSM 3cam Cut	Y	Y		Y	Y	
07 MultiLSM 3cam Fx	07 R.O. LSM 3cam Fx	Y			Y		
08 MultiLSM Triple	08 R.O. LSM Triple	Y			Y		
09 MultiLSM 4cam Cut	09 R.O. LSM 4cam Cut	Y			Y		
10 MultiLSM 4cam Fx	10 R.O. LSM 4cam Fx	Y			Y		
11 MultiLSM SLSM Cut	11 R.O. LSM SLSM Cut	Y	Y		Y	Y	Y
12 MultiLSM SLSM Fx	12 R.O. LSM SLSM Fx	Y	Y		Y		
13 MultiLSM SLSM+1 C	13 R.O. LSM SLSM+1 C	Y	Y		Y		
14 MultiLSM SLSM+1 F	14 R.O. LSM SLSM+1 F	Y			Y		
15 MultiLSM SLSM+2 C	15 R.O. LSM SLSM+2 C	Y			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	Analog	Analog	Analog	Analog	Analog	Analog	Analog	Analog	Analog
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	Analog	Analog	Analog	Analog	Analog	Analog	Analog	Analog
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 HD XT 6U	HD XT 4U	SD XT[2] 6U SD XT 6U	SD XT[2] 4U	SD XT 4U
00 Custom	00 Custom	Y	Y	Y	Y	Y	Y
01 XT SpotBox BVW75	01 XT Server BVW75	Y	Y	Y	Y	Y	Y
02 XT SpotBox DD35	02 XT Server DD35	Y	Y	Y	Y	Y	Y
03 XT SpotBox Odetics	03 XT Server Odetics	Y	Y	Y	Y	Y	Y
04 XT SpotBox VDCP	04 XT Server VDCP	Y	Y	Y	Y	Y	Y
05 XT SpotBox AVSP	05 XT Server AVSP	Y	Y	Y	Y	Y	Y

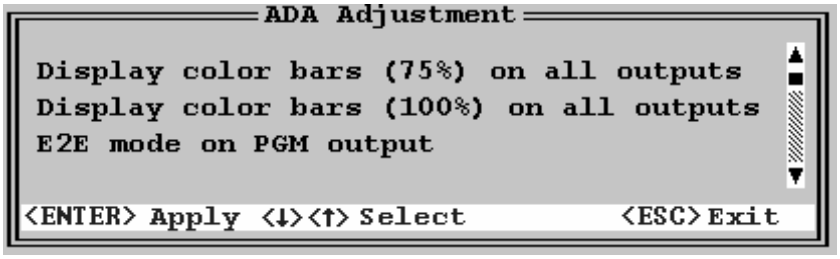
* (% per channel)
Ex: 50/50 means 2 record channels, 50% of available storage for each channel.

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

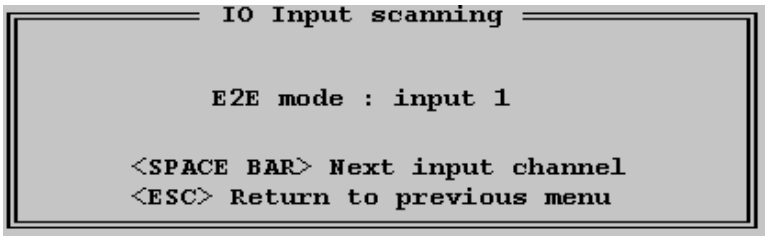
2.3.10 ADA ADJUSTMENT

This option is only available when the server is equipped with a frame buffer/mixer board of rev. A3 (not A3/R2 !)

This command displays colour bars (75% and 100%) on all outputs. It is useful to adjust the luminance and chrominance of ADA converters.



The E2E mode (Live) displays one input on the PGM output. So the video signal passes through the disk recorder system and through the ADA converters.
To switch inputs, press <SPACE BAR> in the I/O INPUT SCANNING window:



Note: To perform properly the ADA adjustments, please refer the ADA user's manual.

2.3.11 DEFAULT TO VGA

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

- VGA mode
- or 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.

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

2.3.12 TS CALIBRATION

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

2.3.13 SET TIME

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

Example of time format:

11:24:32a for 11 h 24 min 32 sec (a.m.)
10:58:00p for 10 h 58 min 00 sec (p.m.)

Example of date format:

10-24-1999 for October 24, 1999
03-15-2001 for March 15, 2001

2.3.14 HARDWARE CHECK / RAID REBUILD

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

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

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

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 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 an offline
      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 :

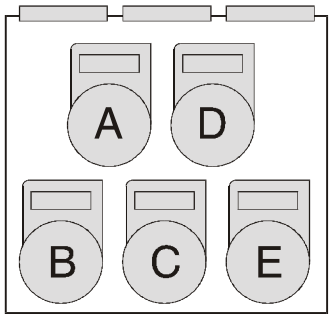
```
To protect disk array integrity, a disk has
been disconnected. At the next opportunity
please perform a hardware check to evaluate
the faulty disk, and perform an offline
rebuild to correct the problem..
ESC : Exit        Enter : Continue
```

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.

From EVS Maintenance Menu, select the "Hardware Check" option. This allows the operator to identify the faulty disk. When the following message appears, turn off the system and replace the faulty drive :

```
REBUILD YOUR SYSTEM ?
SCSI Controller #C disconnected in
operation !
Do you want to REBUILD your system on 5
disks ?
[Y]es  [N]o  [C]lear Clips
```

The faulty disk on the disk tray can be identified using the following diagram :



Then run Hardware Check again and answer "Yes" this time. Rebuild time takes about 1h for 5x18GB disks, 2h for 5x36GB disks, 4h for 5x73GB disks, 6h for 5x300GB disks (on HCTX). A progress bar shows the rebuild status.

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

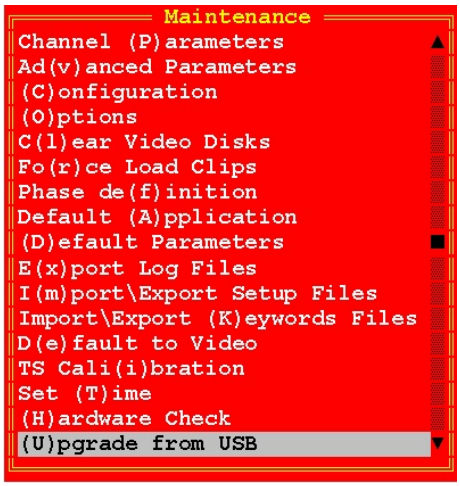
If you don't rebuild the RAID array or if you don't clear clips, the XT will keep running on 4 disks only, and the operator will see a warning message appearing every time he starts or closes the multicam application. Normal operation can be achieved on 4 disks, but then, if another disk fails, the system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

Note : If you suspect that the drive disconnection in operation was not due to an 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 and run a hardware check. Don't rebuild the RAID, but press simultaneously the [ALT] and [L] keys to generate the log file C:\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.

2.3.15 UPGRADE FROM USB

Restarts the server with USB support for software upgrade.

Choose 'upgrade from USB' from the EVS maintenance menu.



The VGA displays the following message :

```
The system needs to reboot to enter the USB
Upgrade Mode.
Please insert the USB memory stick now.
```

- Insert the USB key and press any key
- The server will restart and recognize the usb device.
- The following message appears on the DOS VGA :

```
ID 0 = HD .. OTi    Flash Disk
#1 : PRI DOS        32MB drive = D:
```

In this example, D: is the drive letter assigned to the USB device.

Please note that if you want to exit the USB upgrade mode without installing a new Multicam software, it is mandatory to use the CANCEL command, otherwise the server will not start normally.

If the USB device is used to collect log files from the server, it is advisable to use the bootable floppy disk. If you are using the command from the maintenance menu, when the file transfer is done, use the CANCEL command to reboot the machine in its normal operation.

3 Bootwin & Error Messages

3.1 Introduction

This section of the manual describes the sequences of the system's 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 a relevant solution.

3.2 Disk initialization

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.
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 status 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.

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

the number of defects found on each disks.

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.

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. Start 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.

It is also possible that a major error occurred on the board or the board is not correctly plugged or simply missing, ... In this case, the system displays the message :

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

In that case, check board installation. If the error persists, plug a new board.

3.3 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.

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

3.3.1 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 colunms 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.

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

3.3.2 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.

3.3.3 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.

3.4 Formating 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 messages appears:

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

If an error occurs, the message *"FORMAT ERROR : TIMED OUT – state = [ST]"* is displayed. 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.

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

3.5 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 *"HCTS board initialized"* and the system is ready. If an error occurs, the message *"ERROR (0xErr) : HCTS board not correctly initialized"* is displayed". The error (Err) can be :

If an error is detected while loading tables, the following message is displayed : *" LOAD TABLE ERROR – state = [St]"*. 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.
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.
4. overflow error. The size of the data saved on disk is higher than the size of the table. Software error. Immediately contact EVS.

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 the multicam, the bootwins must successfully initialize the microcode. In that case, the message *"HCTS board initialized"* is displayed. In all other error case, the boot sequence or initialization phase is cancelled and multicam cannot be started.

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