Disk Recorder

Issue: 2.1 – Date: October 2000

Technical Reference

EVS BROADCAST EQUIPMENT

Overview

Welcome in the EVS range of products and thank you for your interest in the Disk Recorder System. We will do our best to satisfy your video production needs and we look forward to continuing working with you.

This manual is divided in 7 sections describing:

- The technical specifications of EVS disk recorder systems
- The cabling installation
- The bit rate compression
- The interpolation process
- The Hardware description
- The EVS software

Disk Recorder Main specifications

All EVS Disk recorder systems are full digital in PAL or NTSC standard with a Search function while recording live action, Clip Management and non-linear on line editing, instant playback. With the internal 10-bit digital keyer-mixer board, two synchronized clips can be displayed simultaneously in split screen mode and target tracking and painting features can be blended with recorded material.

Video

4:2.2 SMPTE/CCIR 601 digital 10-bit
NTSC: 525 lines / PAL: 625 lines
Inputs: 1 to 4 channels – Full frame Synchronizer at each input.
Outputs: 1 to 4 channels
Monitoring: PAL/NTSC/SDI with keying of TC and useful information
Genlock: BlackBurst
Internal 10-bit digital keyer–mixer board

Audio

Up to 16 channels of 16 bits, 48 kHz, analogue balanced

Capacity

Motion-JPEG compression @1,5:1 to 20:1
Internally: up to 12 hours @ 6:1
With external storage: Up to 24 hours @ 6:1

Raid level: 5

The Video Raid uses striping process across 5 disk drives. The video data is striped over the first 4 drives while the parity information is saved on the fifth drive. If one drive is damaged, the Video Raid can use the parity information to recover the missing information.

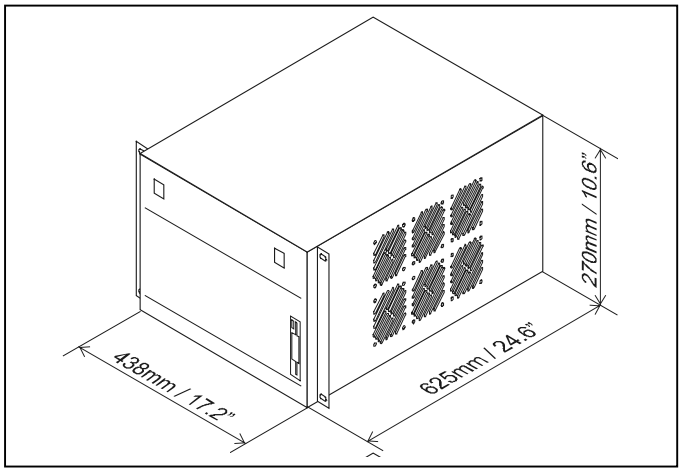
Chapter 1
Technical Specifications

1.1 Unpacking

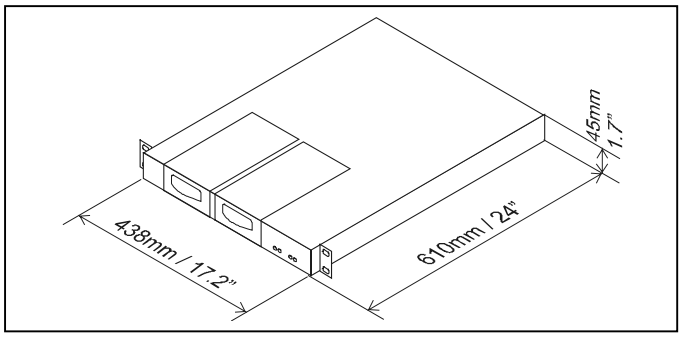
On receipt of the Equipment examine packing for obvious signs of damage. If damaged, do not unpack and inform the carrier immediately. Check thanks to the included packing list if all the items are present and if they show any mechanical damage. If yes, report damage or the missing parts to EVS or their appropriate representative.

1.2 Dimensions

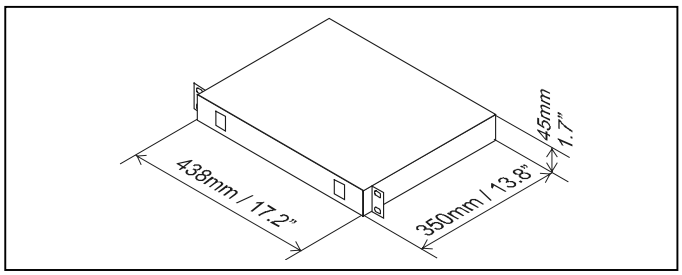
Video disk recorder Main frame 19 inches
Rackmount 6U – Weight: 32.5 Kg/ 71.5 Lbs.



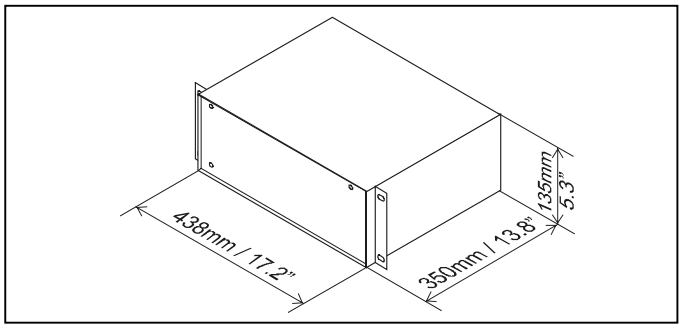
Audio disk recorder (ADR)
Rackmount 1U - Weight: 11.5 Kg / 25.3Lbs



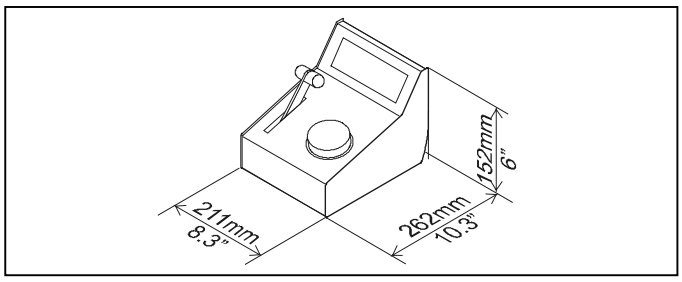
ADA Converter
Rackmount 1U (up to 6 boards) - Weight: 5.3 Kg / 11.6 Lbs.



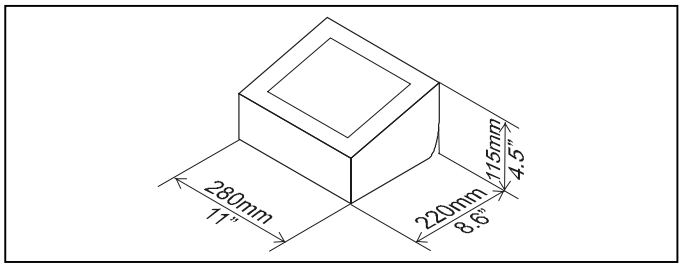
ADA Converter
Rackmount 3U (up to 16 boards) - Weight: 10.8 Kg / 23.9 Lbs.



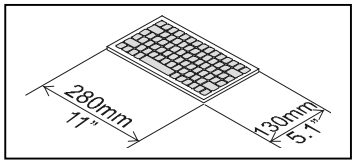
Remote control panel
Weight: 2.9 Kg / 6.3 Lbs.

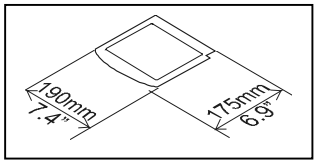


Touch Screen Video Monitor
Weight: 3.6 Kg / 7.8 Lbs.



Keyboard - Weight: 0.4 Kg / 0.9 Lbs.
Tablet - Weight: 0.5 Kg / 1.2 Lbs.





1.3 Installation

Verify the Disk recorder unit has the correct voltage specifications for your power source prior to applying power.
(rear panel selectable 110/230 VAC)

Video disk recorder unit:
Before turning on the power, open the front door of Video disk recorder unit to check if all boards fit into their guides. If a board is out of its guides, remove carefully the board and replace it in the same slot. If internal ADA converters are present (above the disk tray), do not remove the ADA board because this board is tied to the rear connectors.

Audio disk recorder unit:
Before turning on the power, check that both hard disk removable cartridges are fully engaged and locked. If a cartridge is not properly locked, the hard disk will not start.

Important remark :
It is recommended to connect the mains cable of the ADR to the mains plug available on the power supply unit of the mainframe and leave the ADR mains switch on the front panel turned ON permanently. This way, the mainframe and the ADR will always start simultaneously when turning on the mainframe.
If the mains of the mainframe and the ADR are independent, make sure the ADR is always turned on BEFORE the selected application starts loading.

1.4 Operating conditions

1.4.1 Power Supply

The EVS Disk recorder system operates on 220 VAC +/- 5% or 100 VAC +/- 15% (rear panel selectable), 47-63Hz, 400W maximum.
The remote panel, the touch screen, the external ADA rack and the 16-ch Audio Disk Recorder (ADR) are fitted with an AUTO SWITCH power supply.

1.4.2 Grounding

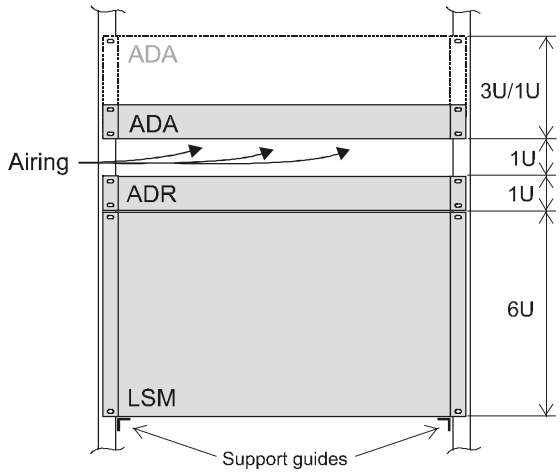
Ensure the Disk recorder unit is properly grounded at all times to avoid electrical shock hazard.

1.4.3 Location

Avoid using the Disk recorder unit in areas having high humidity (less 90% non-condensing), high temperature (+5°C to +35°C / 41°F to 95°F), or excessive dust.

1.4.4 Ventilation & Rack Mounting

Adequate ventilation is obviously required for optimum performance. As result of this consideration, ensure no other Equipment is located close to either unit. In order to avoid overheating problems we recommend the following rack mounting layout:



Remember that fans are used
to air cool Equipment to protect from overheating,
do not block fans intakes during operations

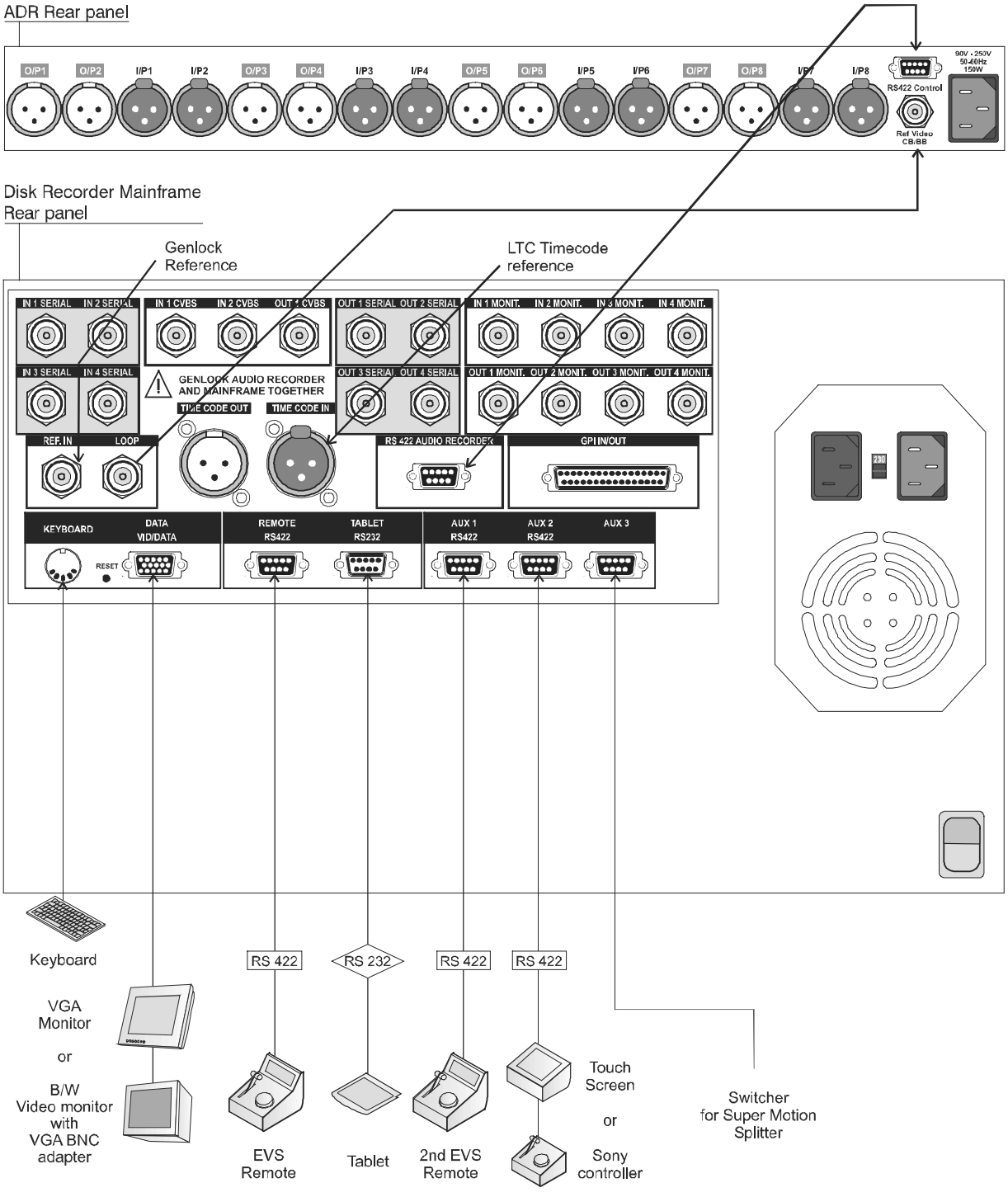
Having regard to the weight of the LSM and the ADR units, support guides are required for these units into the rack mount.
The front ears of these units are not designed to support their full weight. Applying full weight on these might result in bending the metal plate.

1.4.5 Compliance

The EVS Disk recorder systems are in compliance with the Class A norm of the FCC rules and have been verified to comply with the electromagnetic compatibility standards of the European Directive 89/336/EEC particularly standards EN50081-1 and EN50082-2. All EVS applications and products are Year 2000 compliant.

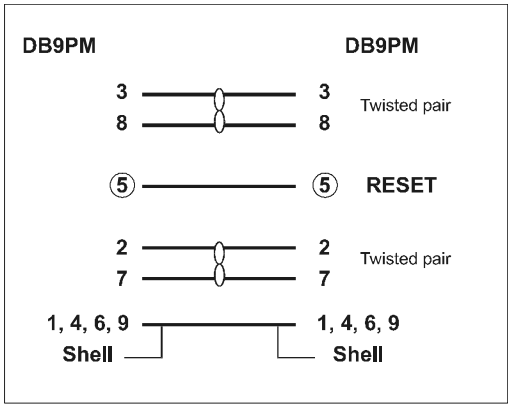
Chapter 2 – CABLING

Peripheral Equipment, Genlock and Timecode references



Comment 1: *Genlock loop must be terminated if not used.*
Comment 2: *The ADR and the Mainframe must be genlocked with the same reference signal, otherwise the synchronisation between audio and video might drift in time.*

RS422 connector of the Remote control panel



The RS 422 cable of the Remote control panel must be wired PIN TO PIN following the above diagram. Use shielded cable to avoid electromagnetic interference on long distances.

Important note: The Reset command from the Remote is sent through the Pin n°5 of RS422 connector.

Video disk recorder cabling:

Video and audio cables are differently wired up depending on the operating software used. Pay attention to the cameras location on input connectors.

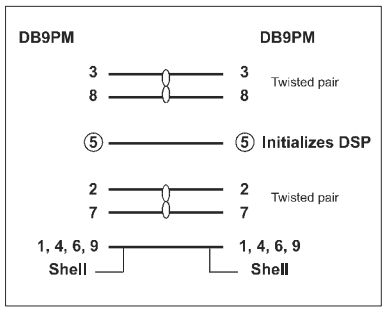
	IN 1 CVBS	IN 2 CVBS	OUT 1 CVBS	IN 1 SERIAL	IN 2 SERIAL	IN 3 SERIAL	IN 4 SERIAL	OUT 1 SERIAL	OUT 2 SERIAL	OUT 3 SERIAL	OUT 4 SERIAL	IN 1 MONITORING	IN 2 MONITORING	IN 3 MONITORING	IN 4 MONITORING	OUT 1 MONITORING	OUT 2 MONITORING	OUT 3 MONITORING	OUT 4 MONITORING
Application																			
LSM 1CAM	CAM A		PGM	CAM A				PGM				CAM A				PGM			
LSM 2CAM	CAM B	CAM A	PGM	CAM B	CAM A			PGM	PRV			CAM B	CAM A			PGM	PRV		
LSM 3CAM	CAM A	CAM B	PGM	CAM A	CAM B	CAM C		PGM				CAM A	CAM B	CAM C		PGM			
LSM 4CAM	CAM A	CAM B	PGM	CAM A	CAM B	CAM D	CAM C	PGM	PRV			CAM A	CAM B	CAM D	CAM C	PGM	PRV		
LSM 3IN + 3OUT	CAM A	CAM B	PGM	CAM A	CAM B		CAM C	PGM	PRV1	PRV2	PRV3	CAM A	CAM B		CAM C	PGM	PRV1	PRV2	PRV3
Super LSM			PGM	Phase 1	Phase 2	Phase 3		PGM				Phase 1	Phase 2	Phase 3		PGM			

Audio Disk Recorder cabling:

The ADR can be used in conjunction with a HCT2 or a HCT4 VideoRaid video disk recorder. The following schematics for audio cabling describe the various applications available with the HCT4 VideoRaid disk recorder. Please refer to the corresponding software manual for more details.

Comment:
As the VDR and the ADR are two separate units and in order to ensure the audio recording please check if the ADR rack unit is ON before loading the application, the Audio parameter in the EVS menu is enabled, the RS422 link between units is well connected, and both unit are genlocked with the same reference.

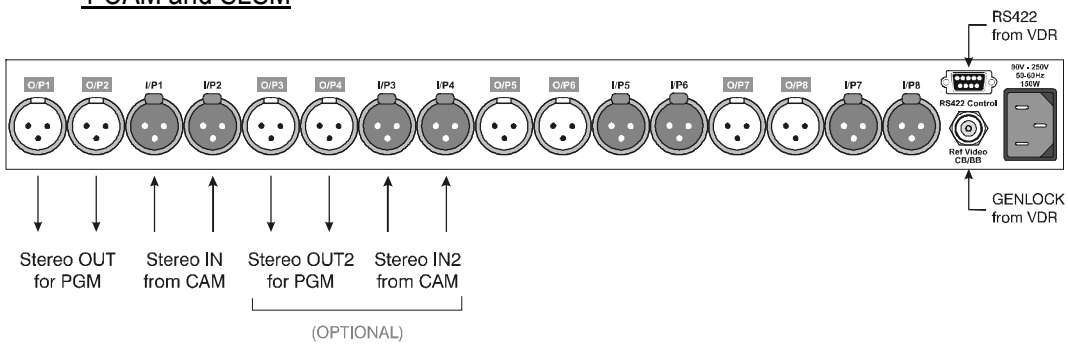
RS422 between the ADR and the VDR units



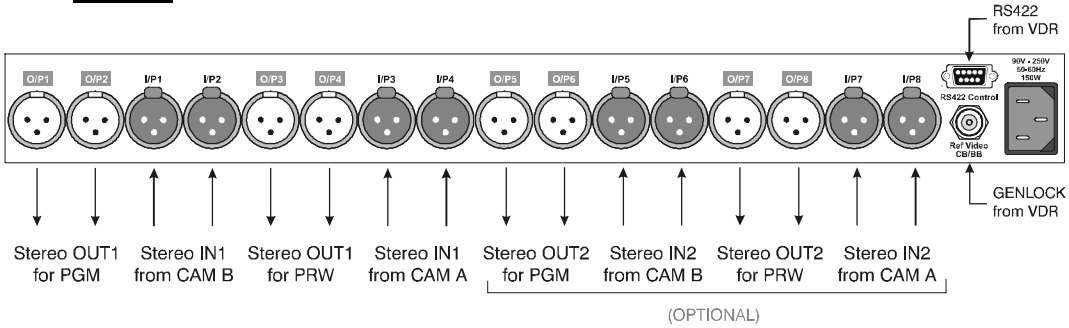
The RS 422 cable (like the Remote control cable) must be wired PIN TO PIN following the above diagram.

Important note: The Pin n°5 is used to initialize the DSP.

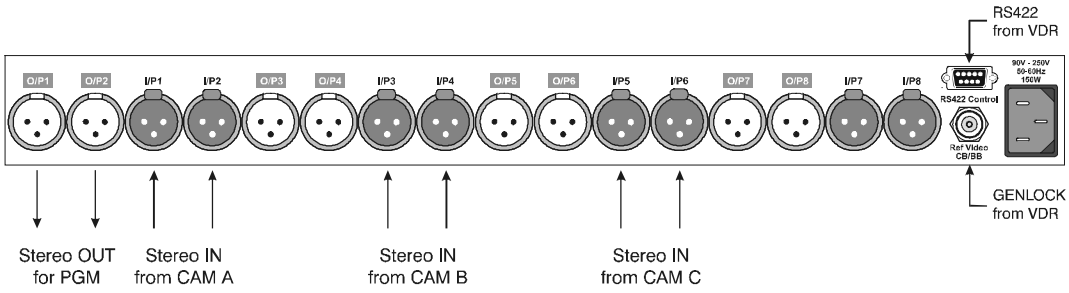
1 CAM and SLSM



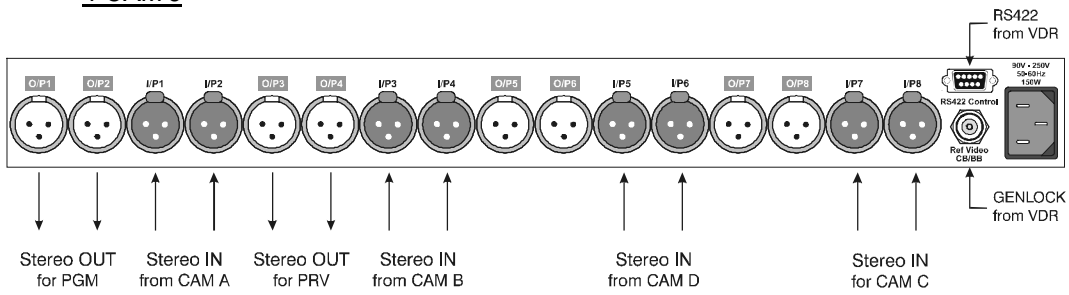
2 CAM's



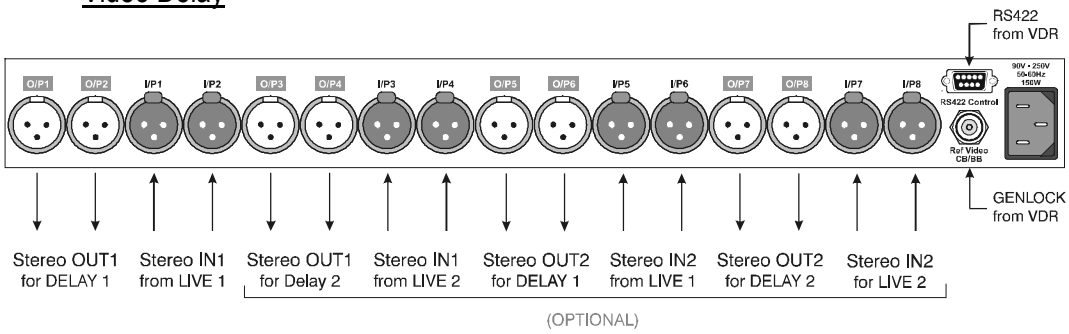
3 CAM's



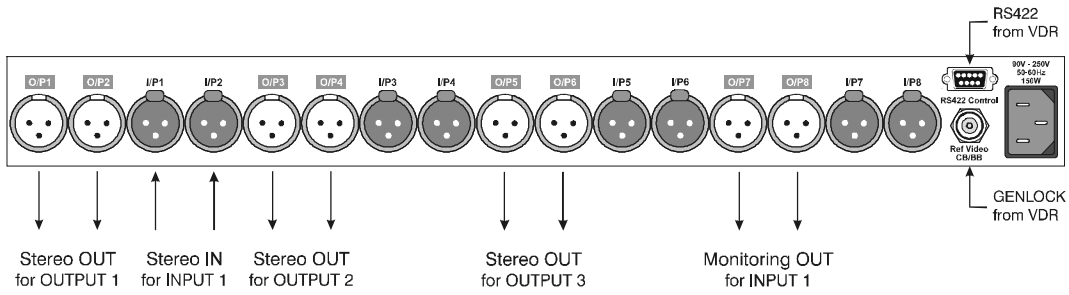
4 CAM's



Video Delay



Spot Box

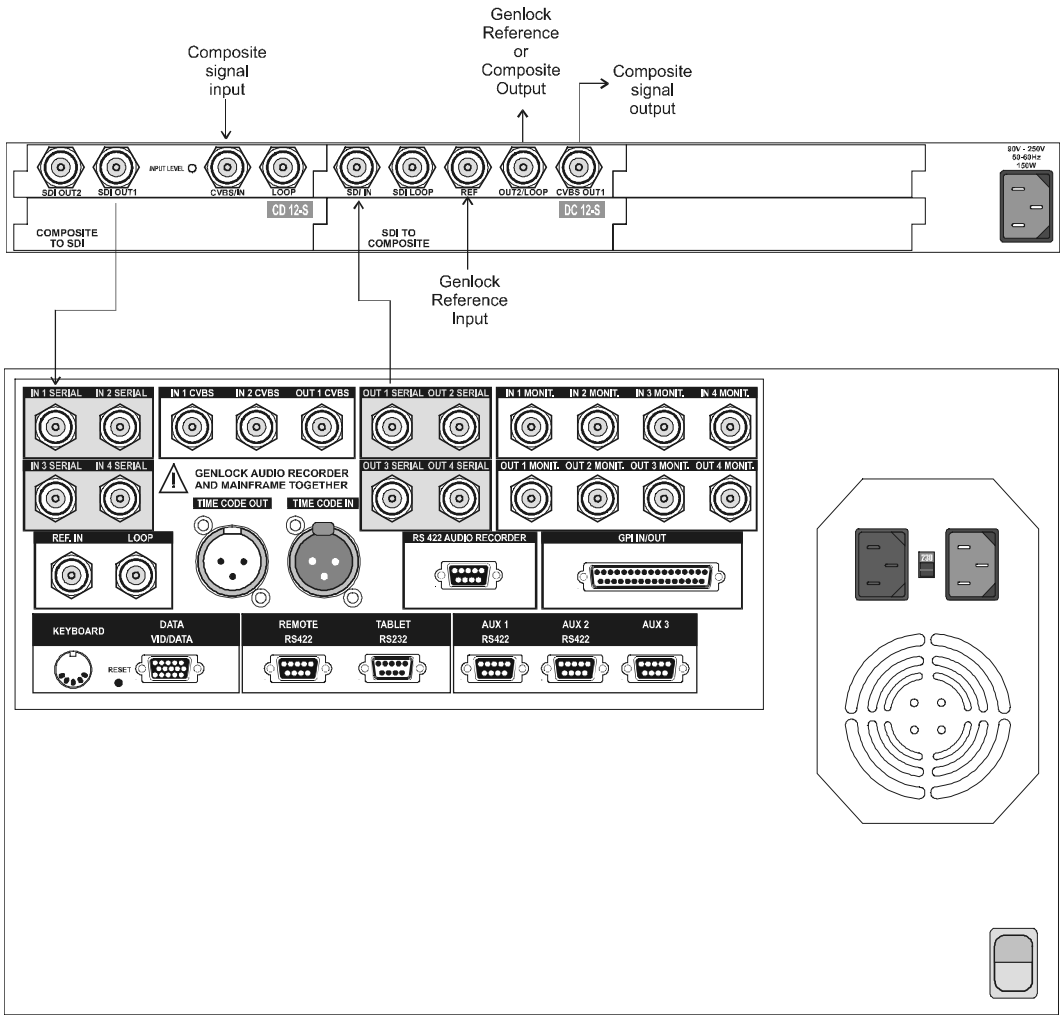


ADA converters:

The ADA converter boards fit into video disk recorder unit or can be used as a stand alone unit device: boards are mounted horizontally in 1U height rack or vertically in 3U rack and combined according to the requirements of each application:

Board	Model	converts	To
Single	CD12-S	Composite	4:2:2 serial digital
Single	CD10-S	Composite, Y/C, S-VHS	4:2:2 serial digital
Single	DC12-S	4:2:2 serial digital	Composite
Double	CD30/CD31-S	RGB/YUV	4:2:2 serial digital
Double	DC 30-S	4:2:2 serial digital	RGB/YUV

Example of video cabling with external ADA



Chapter 3 – COMPRESSION

Bit Rate Reduction - Table of quantization

The CODEC compression/decompression board uses 255 different quantization tables (Luminance and chrominance). Each table is numbered from 1 to 255.

Comment: *Normal Quantization level is defined from 1 to 510. The CODEC uses level 2, 4, 6, and 8…. 506, 508, 510 to obtain 255 tables.*

2 is a LOSSLESS table, which means that no quantization will be done after the DCT process. However, we know that this gives pictures with low compression like 2:1 or even less when the picture contains a lot of noise or high frequencies.
The 255th table has the maximum of quantization and might be used for a true noise picture. We know that if we increase the quantization, we increase the compression for a particular picture. It is then possible to select a quantization table, which gives a target compression ratio. The disk recorder automatically does this process.

The selection of the quantization table to use is done by linear interpolation process based on two values: quantization table and compression given by the two previous fields.

Each field is saved with its table number from 1 to 255. At playback, the controller will automatically decompress the picture with its own table. This allows almost constant compression ratio and thus constant capacity. It also allows the reading of fields recorded with various compression ratios.

So, in order to adjust the average compression ratio, the user must set the following parameters: *(see EVS software)*

LUMAMIN	minimum quantization table for luminance,
CHROMAMIN	minimum quantization table for chrominance,
Requested COMP	average compression requested

If each disk provides a sustained rate of 7,5 Mbytes per second, four hard disks provide 30 Mbytes per second. If the application requires simultaneously 4 channels, each channel will have 7,5 Mbytes per second (60 Mbps) which is about 2.6:1.

Ram video buffer - Block size

The VIDEO RAID Hard disk controller board has 5 SIMM banks. Each bank can receive a RAM module up to 128Mb.
The first bank is dedicated to the 68020 processor and the 4 remaining banks are dedicated to the onboard SCSI-2 controllers and compose the video RAM buffer of the unit.

Note: *SIMM specifications: 72-pin, 32-bit, EDO, no parity, Access-time: 60 ns.*

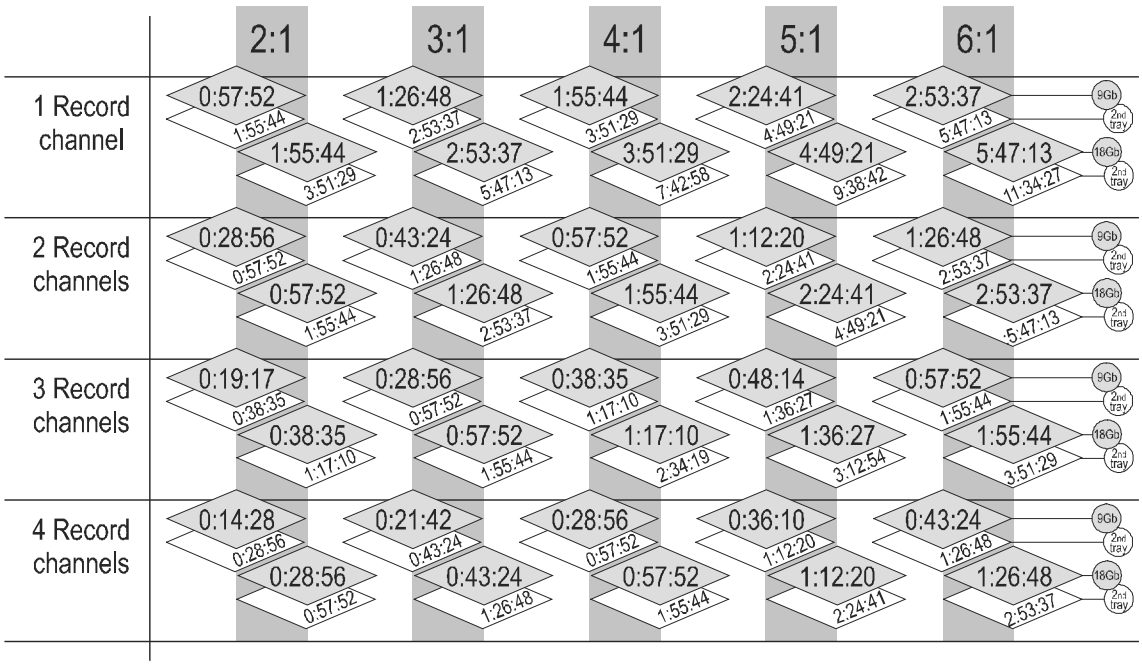
On record: The video buffer RAM is divided into different blocks, the number of blocks depends on the size of the video RAM buffer and of the size of each block. The compressed fields are stored in those blocks. As soon as a block is filled, it is transferred to the disks.

On play-back: The opposite processing is done. Blocks are sent one by one from the disks.

Working with large blocks is advised to improve the bandwidth of the disk in order to minimize the disk heads movements. However, large blocks are not agreeable when in search mode because it takes more time to load them. 256-KB blocks on disks are a good compromise. Therefore a block is 1 MB in RAM. If the compression is 4:1 or about 100 KB per field, each block contains about 10 fields or 200 milliseconds of video.

Disk duration and compression rate

The following schematic shows the record duration per channel with trays of 9Gb and 18Gb disks compared with the different compression rates. The Disk size parameter is set to 100%



Chapter 4 : Interpolation

The playing back of smooth slow motion pictures carries specific issues : since some fields must be repeated at regular interval to provide the video at the playback speed required by the operator, parity violation appears regularly on the output video signal.

If O and E represent respectively the odd and even fields of a standard video signal (50/60 Hz), we have:

- The original video signal :
  O E O E O E O E O E O E O E O E

- The output video signal at 50% speed :
  O **O** **E** E O **O** **E** E O **O** **E** E O **O** **E** E

- The output video signal at 33% speed :
  O **O** O E **E** E O **O** O E **E** E O **O** O E

- The output video signal at 25% speed :
  O **O** O **O** **E** E **E** E O **O** O **O** **E** E **E** E

Fields with parity violation are shown in bold, underlined letters. As it appears from the above table, whatever the playback speed (with the exception of the normal 100% playback speed), a number of fields violate the normal parity of the output signal. This parity violation induces a 1-line shift of the field, resulting in a vertical jitter of the picture. The jitter frequency depends upon the chosen playback speed.

To avoid this phenomenon and provide a stable output picture, EVS developed 2 types of line interpolator: 2-line and 4-line interpolators. The interpolation process can be enabled or disabled by the operator on all EVS slow motion systems.

2-line interpolator:

The 2-line interpolator actually generates a new field, when the original field is in parity violation. Each line of this new field is calculated by a weighted average of the 2 neighboring lines. This process solves the problem of parity violation and vertical jitter, but the drawback is a reduction of the vertical resolution on the interpolated fields, that appear unfocused. Another by-side effect is the alternation of original fields (perfectly focused) and interpolated fields (unfocused), resulting in a "pumping" video signal.

4-line interpolator:

The 4-line interpolator uses a more sophisticated calculation based on the 4 neighboring lines. By using suitable coefficients for the weight of each line in the resulting calculation, we apply this interpolation to all fields. The final result is a permanently, slightly unfocused picture. The advantage is a stable output signal with no jitter and no "pumping", but the vertical bandwidth is even more reduced.

The interpolator is of course always disabled at 100% playback speed, because there is no parity violation.

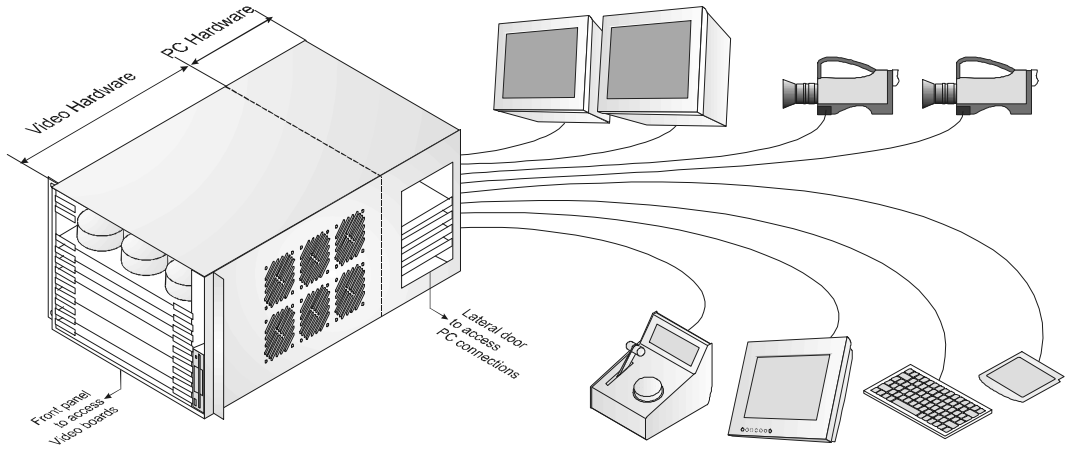
EVS use the same techniques with the Super Slow Motion disk recorder, working with all models of Super Motion cameras (150/180 Hz). The only difference between the processing of Super Motion and normal scan (50/60 Hz) signals is that the interpolator is always disabled at 33% playback speed, because the Super Motion signal do not cause parity violation at this particular speed.

Whatever the choice, the resulting picture is thus always a compromise between stability and resolution. With EVS systems, the operator always has got the choice between any of the 3 above described techniques : no interpolation, 2-line interpolation or 4-line interpolation. Even if the operator chooses to use the interpolation, this process will be automatically disabled when not necessary (100% playback for 50/60 Hz signal, 33% and 100% playback for 150/180 Hz signal).

Comment: *All professional VTR's use line interpolation in PlayVar mode to avoid vertical jitters.*

Chapter 5
Hardware description

Physical Specifications



The EVS Disk Recorder is housed in a 19 " (485 mm) rack frame with extended depth and 6 rack unit (266 mm) height.
It contains all the EVS developed boards: namely, the JPEG digital video compression board (CODEC's), the VIDEO RAID board (save/re-call the digital video data to/from hard disks) with 5 separate standard SCSI-2 busses, a Keyer / Mixer / Frame Buffer board and the Digital I/O board (CCIR601).

The unit is controlled by an internally installed IBM compatible PC motherboard with its own separate floppy, IDE hard drive, VGA graphic board and keyboard.

Typically, five 9 GB hard disk drives are mounted internally in the unit. The record capacity with two arrays disks (2 x 5 x 9GB) can reach 12 hours (@ 6:1 compression rate. For higher capacity (up to 24 hours at 6:1), the additional drives are fitted internally and/or in external chassis.

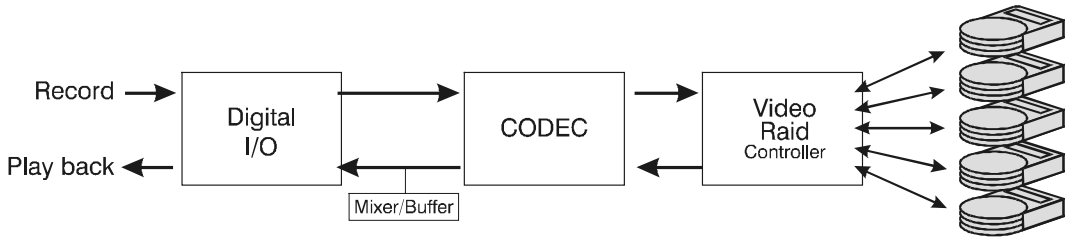
The user interface is made through the keyboard and different menus rolling on the VGA monitor, one or two dedicated remote control panels with lever, jog-knob and LCD display, and tablet or touch screen for specials effects.

Internal PC Specifications:

The PC controls the operation of the Disk Recorder unit. The boards plugged into the PC ISA bus are:

- ICP Pentium motherboard
- Adrienne LTC reader card.
- EVS CPI PC card
  (interface between the PC and the Video hardware)
- EVS SIO3 Multi I/O for COM 9, 10, LPT2
- Classical Multi I/O for COM 3, 4 or COM 1, 2

EVS boards:



The boards installed in the EVS Disk Recorder unit are:

1. I/O board with 4:2:2 CCIR601 10-bit inputs (x2), outputs (x2) and 2 onboard monitoring outputs (PAL/NTSC/SDI) which provide T/C and other information readout on rear BNC video monitoring outputs.

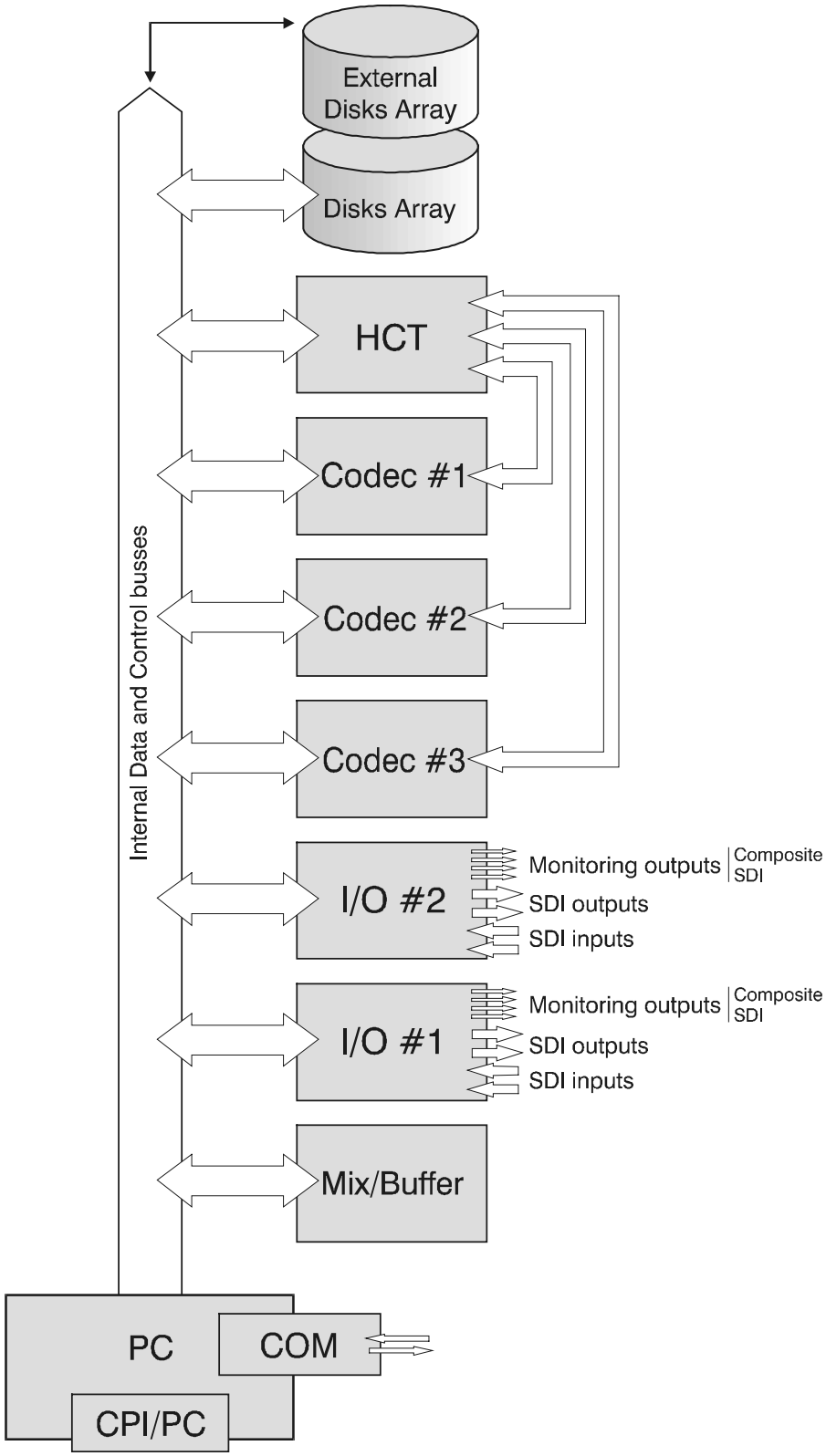
2. One, two or three CODEC boards - with two JPEG LSI chipsets per board (each chipset can be set up to either encode or decode) - with parallel 601 input/output and software set quantization quality.

3. VIDEO RAID controller board (HCT4) with 5 onboard National Semiconductor SCSI-2 controllers. The 5 controllers spread the video read-write data access across 5 SCSI busses to give a 36 Mbytes per second (288 Mbps) effective rate.
   Each controller is fitted with a RAM cache to cope with interruptions to the disk data flow caused by long disk seek times or disk thermal re-calibration, if used. This RAM cache allows instant access to the material recorded moments ago.

4. Digital mixer/buffer card for transition effects, targeting/painting module and split screen option.

All those EVS developed boards are plugged horizontally into a proprietary bus-board with 96-pin connectors.

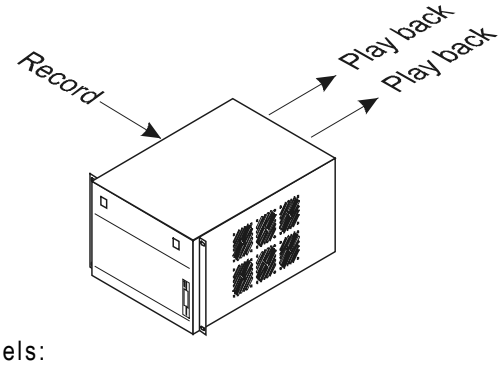
Block Diagram



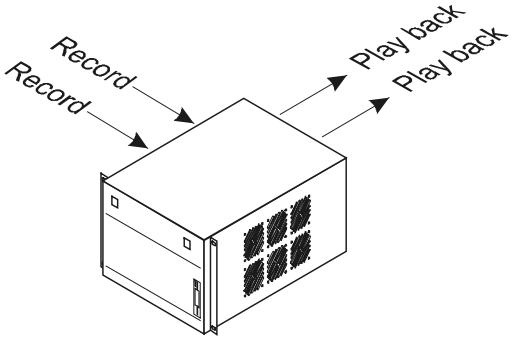
Multi-access - Drives capacity

The basic EVS disk recorder is a 2-channel unit with one recording channel and one independent play or search channel, built with two CODEC boards. Other configurations are available, such as:

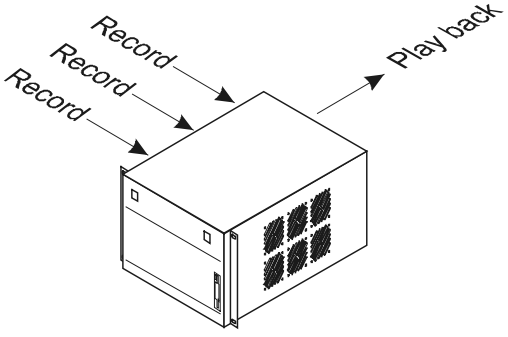
1 REC and 2 independent PLAY channels:



2 REC and 2 independent PLAY channels:



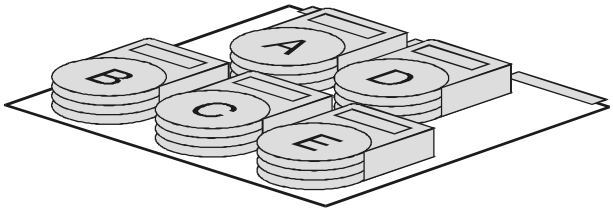
3 REC and 1 independent PLAY channel:



The different drive arrangements are:

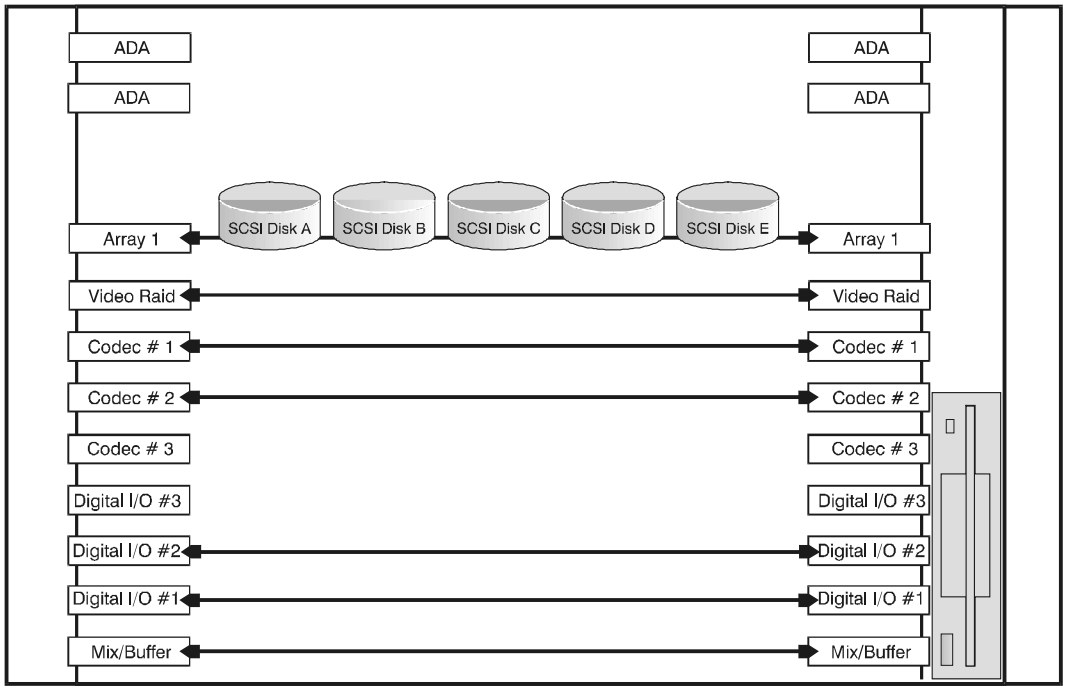
Module (4 + 1) x 4 GB drives (total 20 GB) : 80 minutes @ 6:1
Module (4 + 1) x 9 GB drives (total 45 GB) : 3 hours @ 6:1.
Module (4 + 1) x 18 GB drives (total 90 GB) : 6 hours @ 6:1.
Module (8 + 2) x 18 GB drives (total 180 GB) : 12 hours @ 6:1

Comment: *The Video Raid uses striping process across 5 disk drives. The video data is striped over the first 4 drives (A, B, C, D) while the parity information is saved on the fifth drive (E). If one drive (A, B, C or D) is damaged, the Video Raid can use the parity information to recover the missing information if the RAID5 option is installed.*



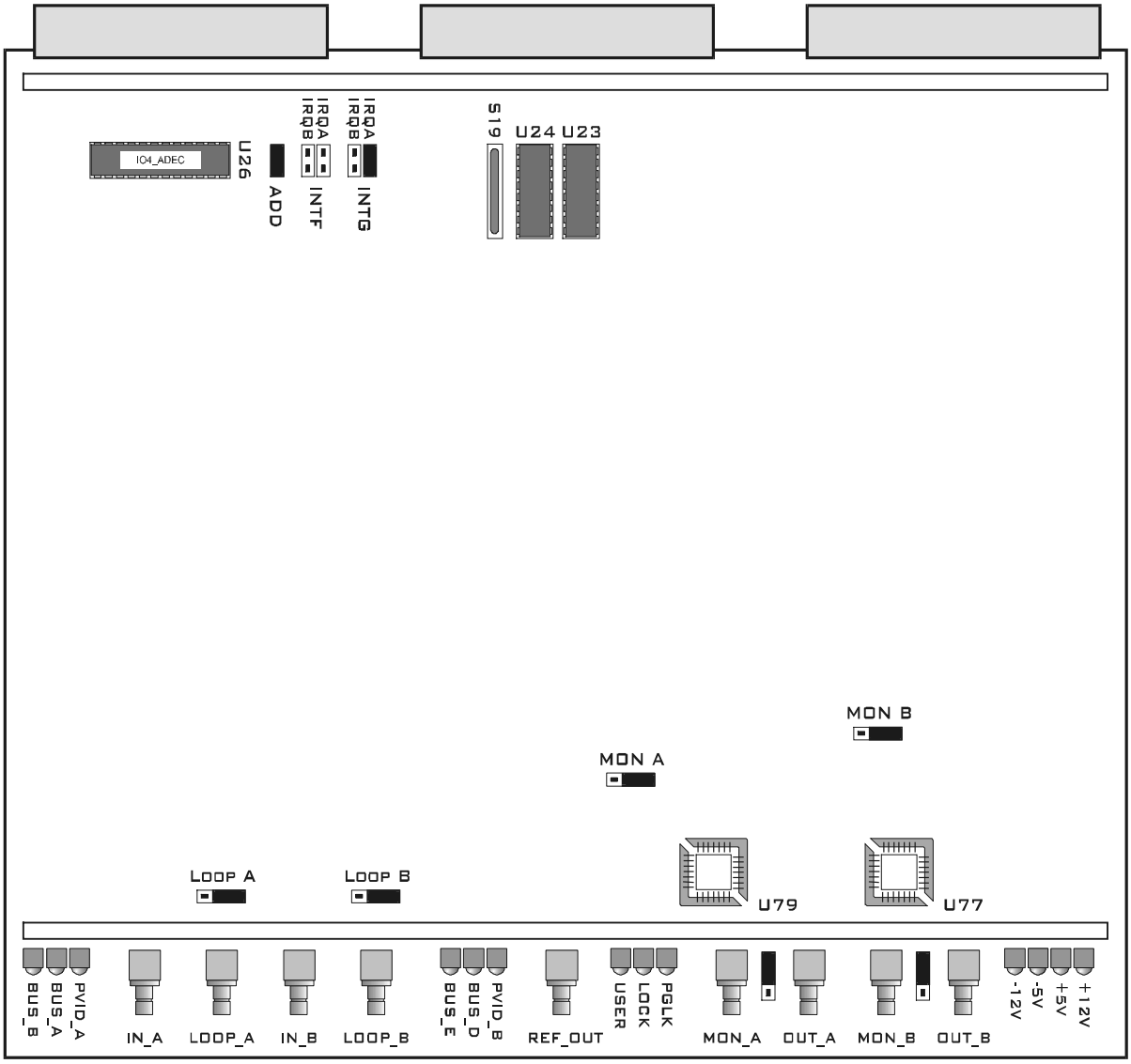
Video Hardware Presentation

This section describes in details the location and configuration of the electronic boards developed by EVS for its Video Disk Recorder.



Digital I/O4

The Digital I/O boards manage the video inputs and outputs and send/receive the video information to/from the CODEC's.
The digital I/O4 has two digital inputs, two digital outputs, and 2 onboard monitoring PAL/NTSC outputs.



LED's Information:

Bus_A/B/D/E: shows the video input A is sent to bus A/B and the video input B is sent to bus D/E
PVID_ A/B: shows the video signal is present on input A/B
USER:
LOCK: shows the unit is actually locked on the Reference signal.
PGLCK: shows the presence of the reference signal
+12V, -5V, +5V, +12V: show all tensions are OK.

Connectors:

IN_A/B:	Serial Digital video inputs
LOOP_A/B:	Loop through of digital input A/B
REF_OUT:	Genlock output
MON_A/B:	*Optional:* Serial digital monitoring outputs (requires chips U79 and U77)
OUT_A/B:	Serial Digital video outputs

Board configuration:

1. Adding a second Digital I/O (I/O4 model) :

Comment: *The Digital I/O boards have different configurations, depending on the location inside the mainframe.*

On Digital I/O at location #1:

ADD jumper:	ON
INTG jumper:	on IRQ A
S19 resistor:	ON
U24 chip:	ON

On Digital I/O at location #2:

ADD jumper:	OFF
INTG jumper:	remove IRQ A
S19 resistor:	OFF
U24 chip:	OFF

Before adding the second Digital I/O board into the Disk recorder system, the ADD jumper, the INTG jumper on IRQ A, the S19 resistor and the U24 chip must be removed from the I/O board.

2. Digital / Analog monitoring:

Moving the MON_A and MON_B jumpers allows you to select analog or digital monitoring from the connectors on the rear panel.

MON A / B: 
The monitoring output from the rear panel is analog.

Adding chips to U79 and U77:
The monitoring output from the rear panel is analog AND digital monitoring is available from the front connectors (MON_A and MON_B)

MON A /B :  + Adding chips to U79 and U77:
The monitoring from the rear panel are digital.

3. Digital / Analog signal loop:

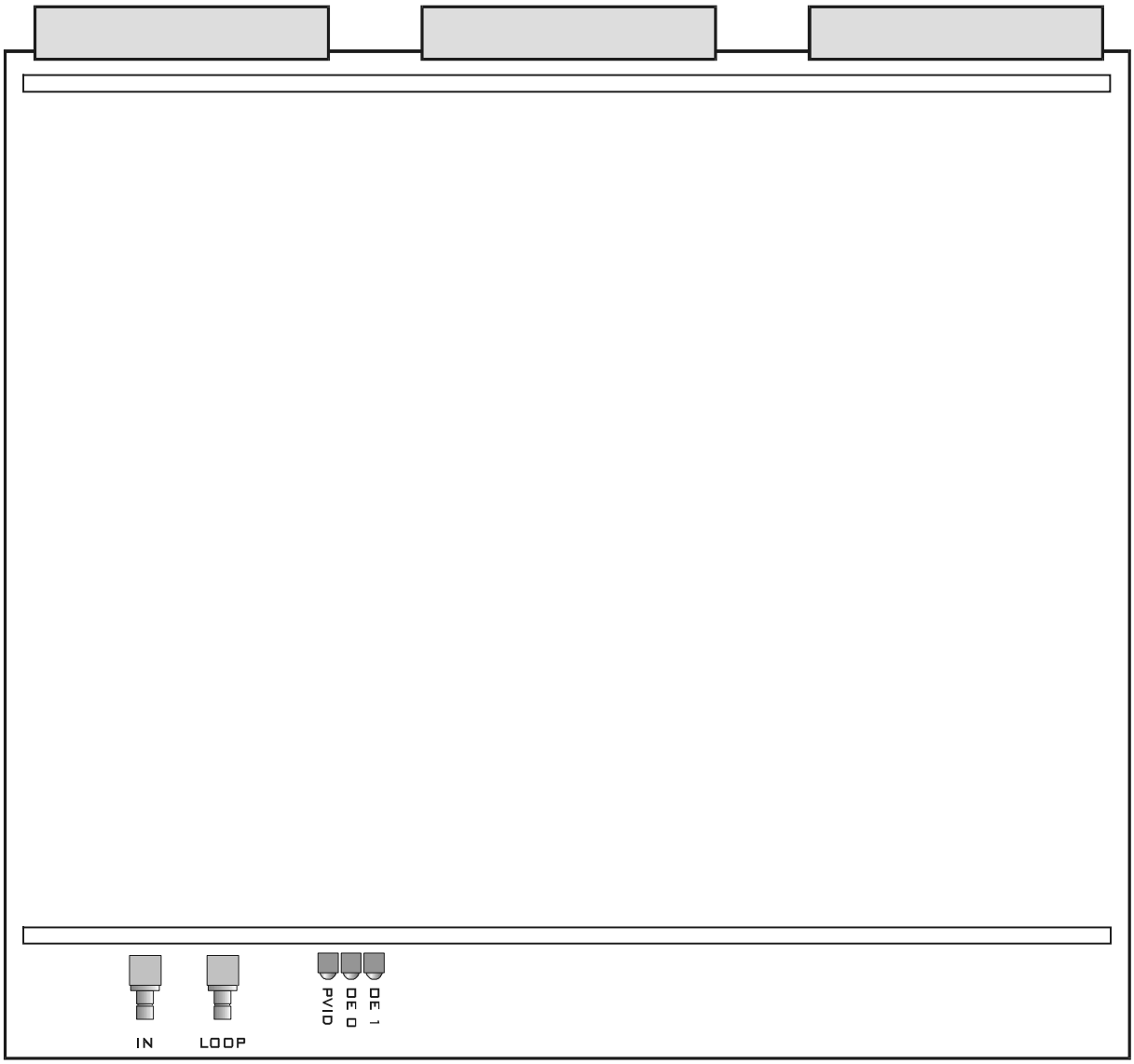
Moving the LOOP_A and LOOP_B jumpers allows to select analog or digital input loop (IN1, IN2, IN3, IN4) from the connectors of the rear panel:

LOOP A / B:
The signal loop from the rear panel is analog.

LOOP A / B:
The signal loop from the rear panel is digital.

Single input Digital I/O:

In LSM3CAM and Super LSM configurations, an additional Digital I/O board is required. The second I/O board may be one Digital I/O4 or one Digital I/O with a single input channel, with no monitoring output and no digital output. In this case, the single input I/O board is located in the I/O #3 slot of the mainframe



LED's information:

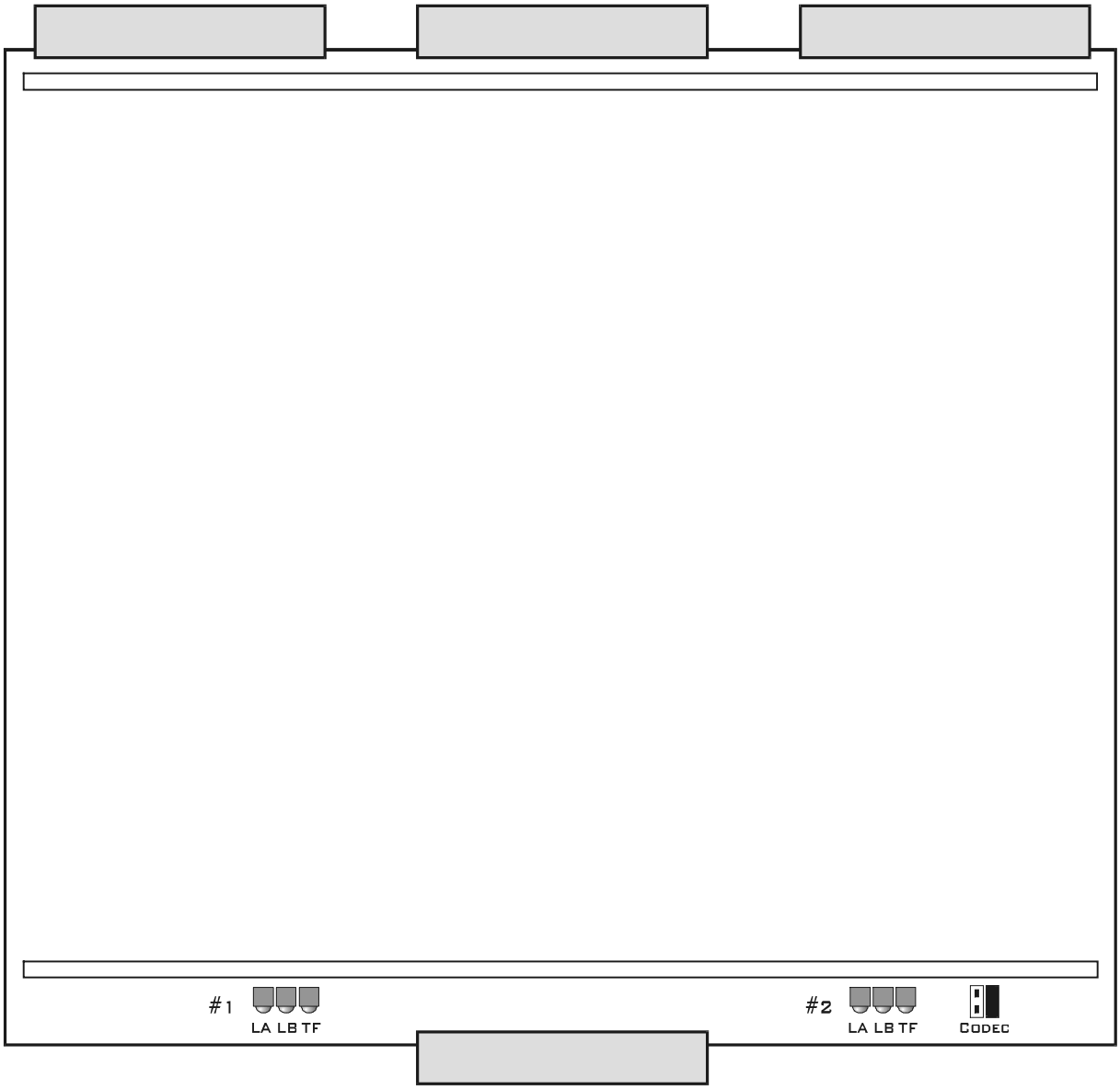
PVID: shows the video signal is present on input
OE1/OE2: shows the video input is sent to bus OE1/OE2

Connectors:

IN: Serial Digital video input
LOOP: Loop through of digital input

CODEC board:

The CODEC board is the interface between the I/O and the Video Raid controller boards. It manages the compression and the decompression processes. One CODEC board handles simultaneously 2 channels, either record or playback channels, and proceeds with the video compression and decompression in 4:2:2 quality. CODEC boards are tied to the HCT board with one Bus Connector on the front side.



LED's information:

LA: flashes when the DSP program is running.
LB: lights when the channel #1/#2 is in use, either in record or in playback mode.
TF: flashes while data transfer is in process between the CODEC and the HCT boards

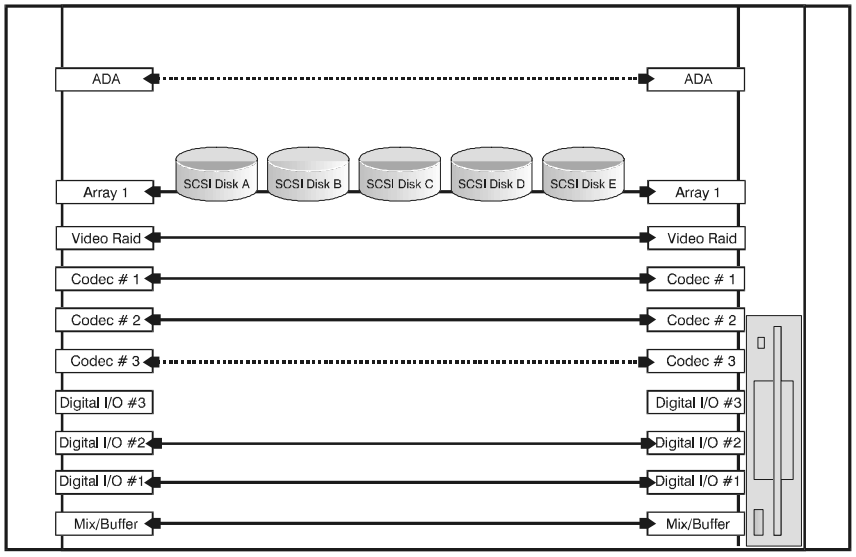
Jumpers Addresses:

Depending on the configuration, one to three CODEC boards are required. The CODEC jumper must be moved as followed:

First CODEC :  to location #1

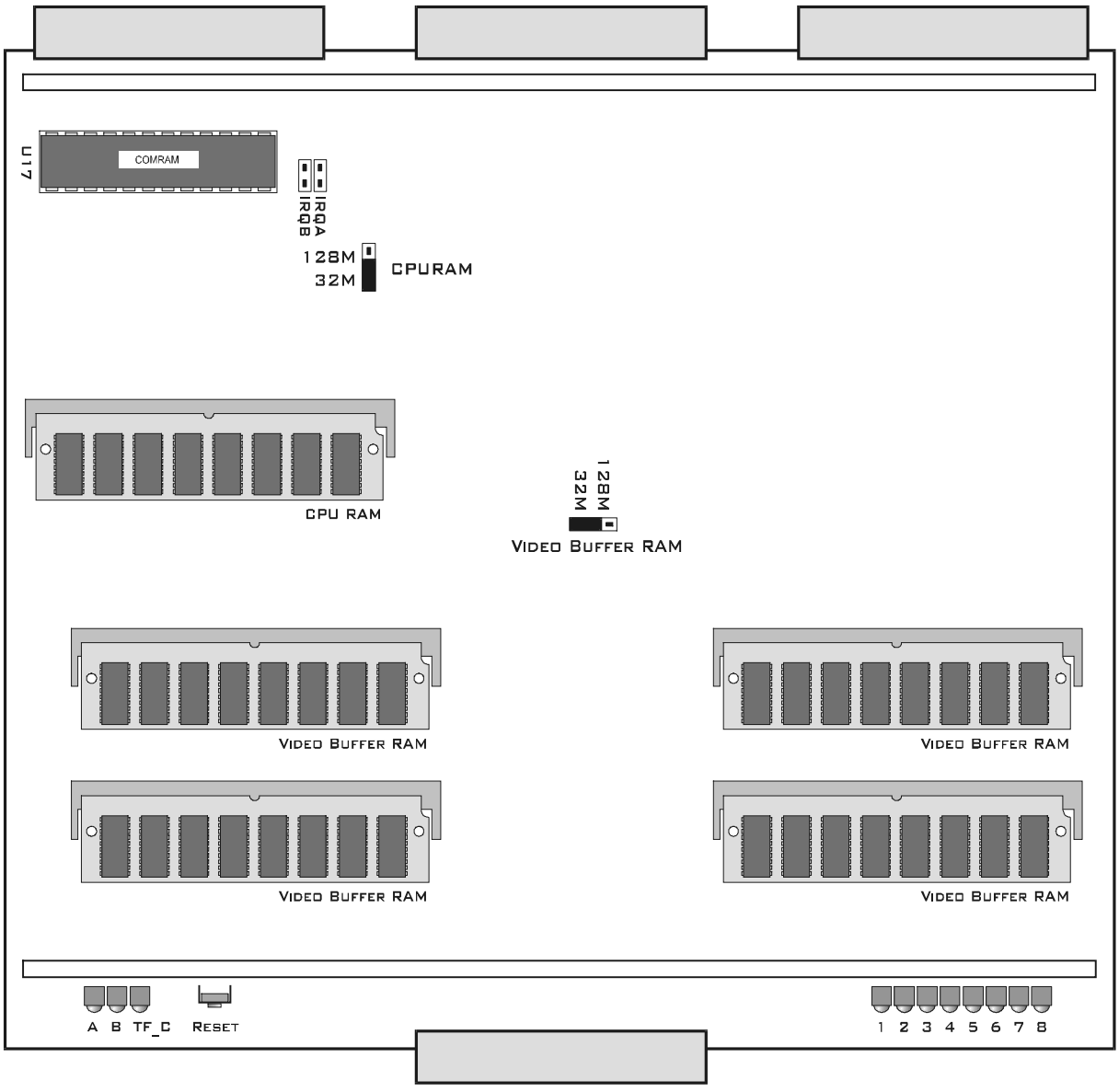
Second CODEC:  to location #2

Third CODEC:  to location #3

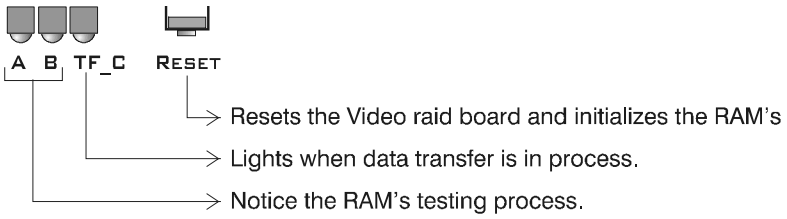


VIDEO RAID board:

The Video Raid or HCT4 board is a RAID controller that receives data from the CODEC boards in Record mode and sends data for storage to SCSI disks. In Playback mode, the HCT board calls back the data from the disks and transfers it to the CODEC boards. One Video Raid board can manage up to 3 CODEC boards.



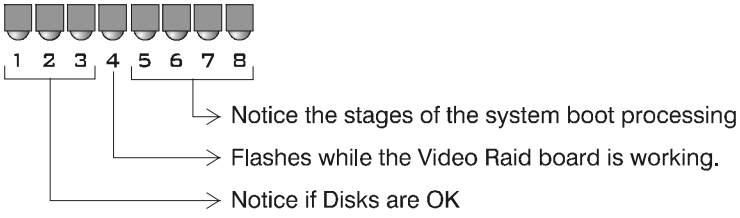
LED's information:



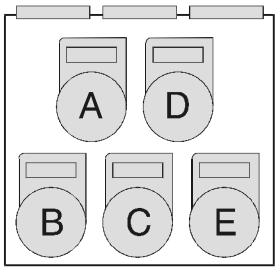
While the program is loading, LED's A and B give the following information about RAM SIMM's testing process:

A	B	
-	-	At start-up
On	-	COMRAM is faulty
On	On	CPU RAM is faulty
-	On	All RAM's are OK

When the program loading is complete, both A and B are On.

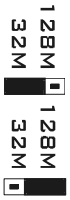


1	2	3	
-	-	-	At start-up
On	On	On	VIDEO raid controller is OK
-	On	On	Two disks or more are faulty
On	-	-	Disk A is faulty
-		-	Disk B is faulty
On	On	-	Disk C is faulty
-	-	On	Disk D is faulty
On	-	On	Disk E is faulty



Jumpers settings:

The Video Raid board can accept up to 128Mb RAM for the CPU, likewise for the Video buffering.



up to 32MB of RAM installed in each bank

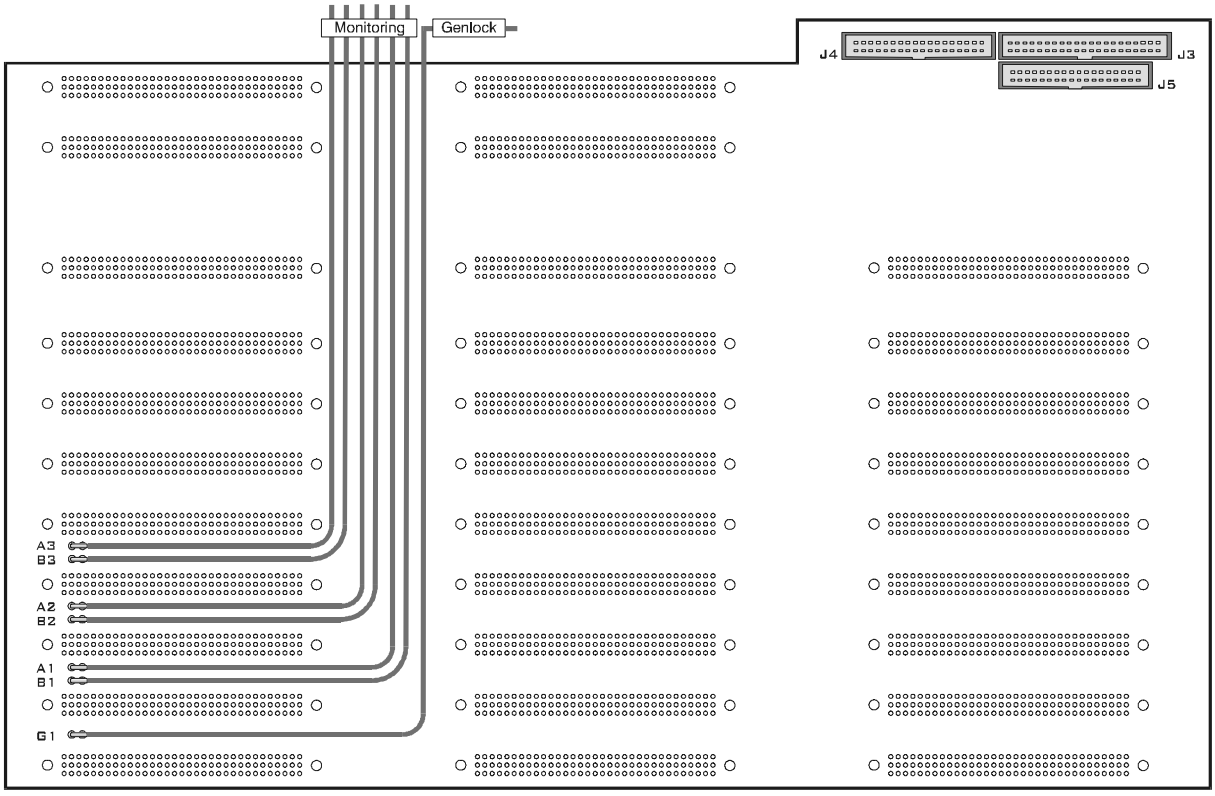
up to 128MB of RAM installed in each bank

Comment: *The VIDEO RAID Hard disk controller board has 5 SIMM's RAM banks. The CPU RAM is dedicated to the processor and the 4 video buffer RAM's are dedicated to the onboard SCSI-2 controllers. In standard configuration, the Video Raid board is provided with 16Mb for the CPU and 32Mb for the Video buffering. Therefore jumpers onto HCT are set on 32Mb (means: up to 32Mb).*

Video Backplane:

All boards above described are plugged into the video back plane.
The monitoring output cables and the Genlock input cable are available on the rear of the backplane and are directly fixed to the connectors on the rear panel of the Video Disk recorder.

The J3, J4, J5 connectors are connected to the CPI/PC card. Ensure connector plugs J4 and J5 are not inverted, otherwise the Video Hardware will not be correctly initialized.



Video boards layout

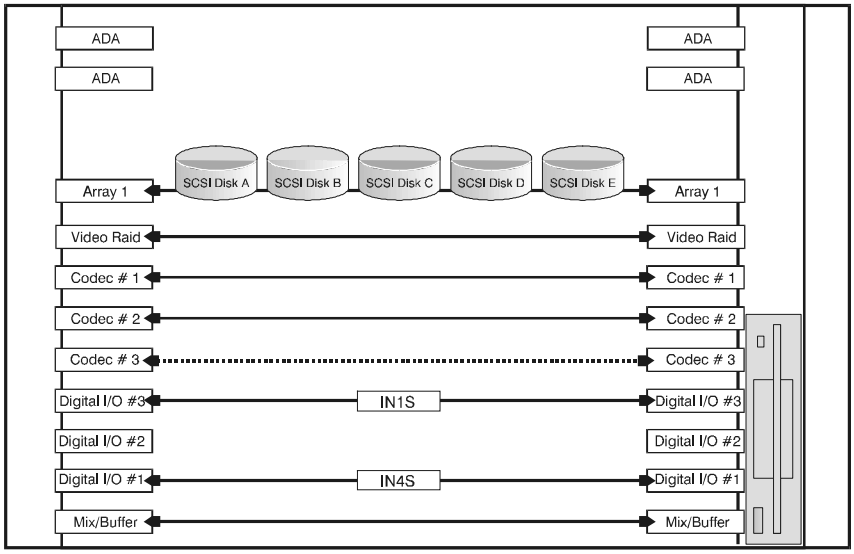
Depending on the features required, the board arrangements are different:

Software	HCT	CODEC	Digital I/O # 1/ # 2	Single Input Digital I/O # 3	Mix/Buffer
SPOT BOX – 2 ch.	1	2	1	0	0
SPOT BOX – 4 ch.	1	2	1 or 2	0	0
LSM1CAM	1	2	1	0	1
LSM2CAM	1	2	1	0	1
LSM3CAM	1	2	1 or 2	0 or 1	0
SLSM	1	2	1 or 2	0 or 1	1

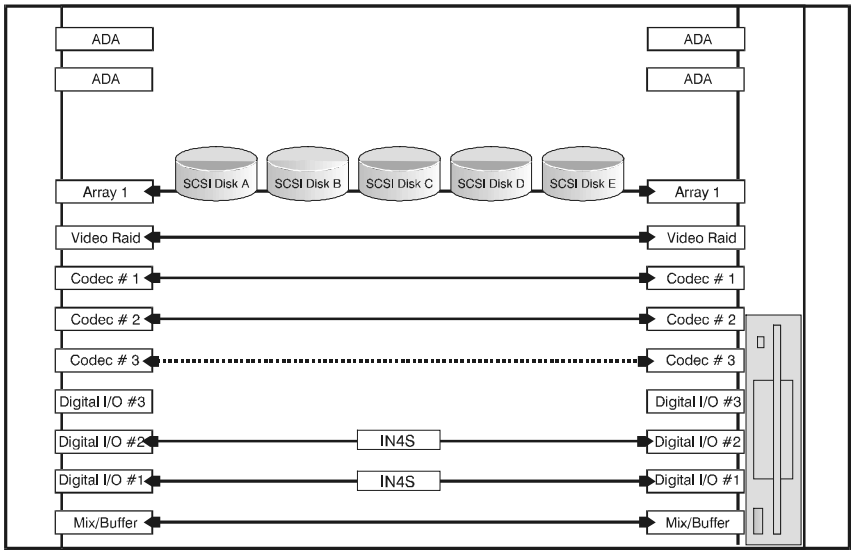
Note: *IN1S – IN2S – IN4S naming.*
Digital I/O boards were previously named:
IN1S has 1 Input (= Single Input Digital I/O #3)
IN2S has 1 input and 2 outputs
IN4S has 2 inputs and 2 outputs (= Digital I/O #1 / #2)

Boards have a defined location on the video back plane in order to respect the control busses organization and the internal data transfer.

Example 1 : LSM2CAM / LSM3CAM / SLSM



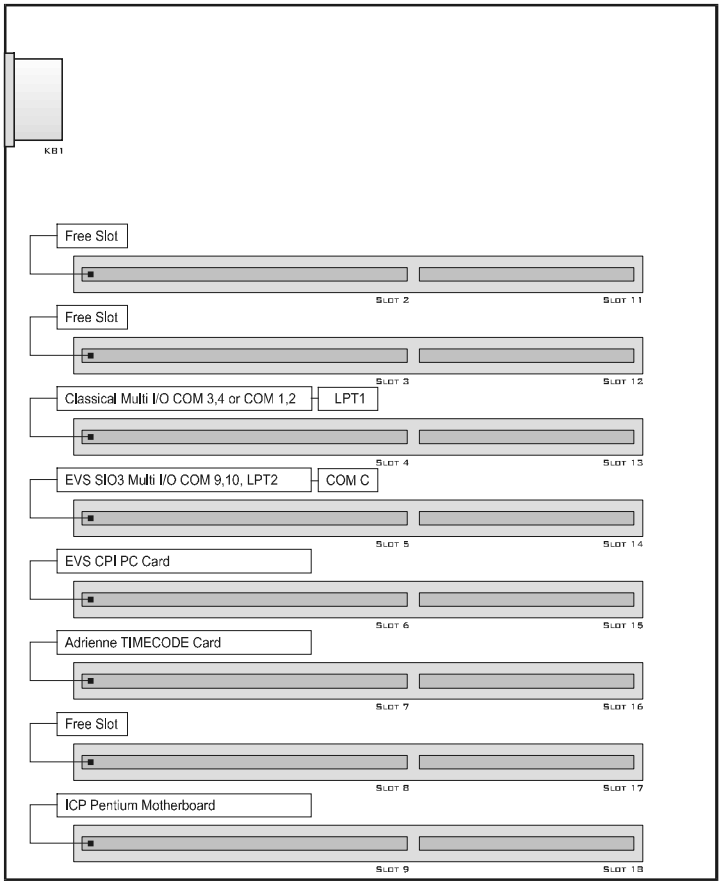
Example 2 : LSM2CAM / LSM3CAM / SLSM



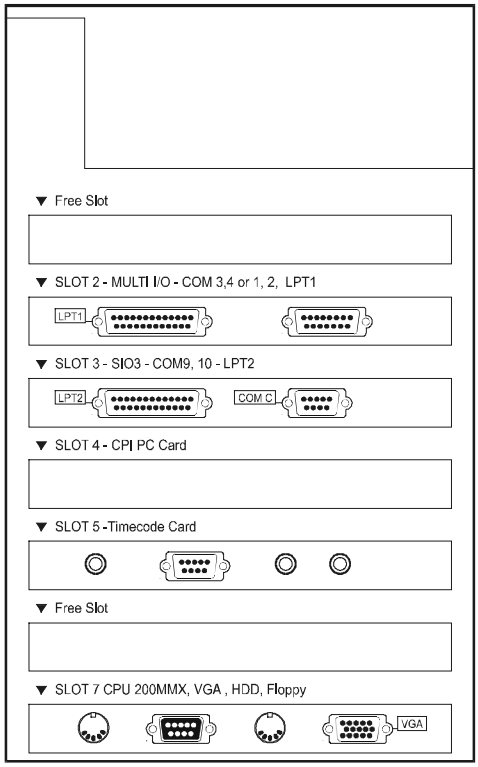
PC Pentium Hardware Configuration

The function of the PC hardware is mainly the control of the Video hardware via the software and to interface the peripheral Equipment (i.e. Remote control panel) with the video hardware.

In standard configuration the PC hardware is composed of a Pentium Motherboard with 200MMX processor and an onboard VGA card, provided with 4Mb DRAM, and a 2Gb IDE HDD.



Lateral door to access the PC connections



The use and the configuration of each board is detailed in the next section.

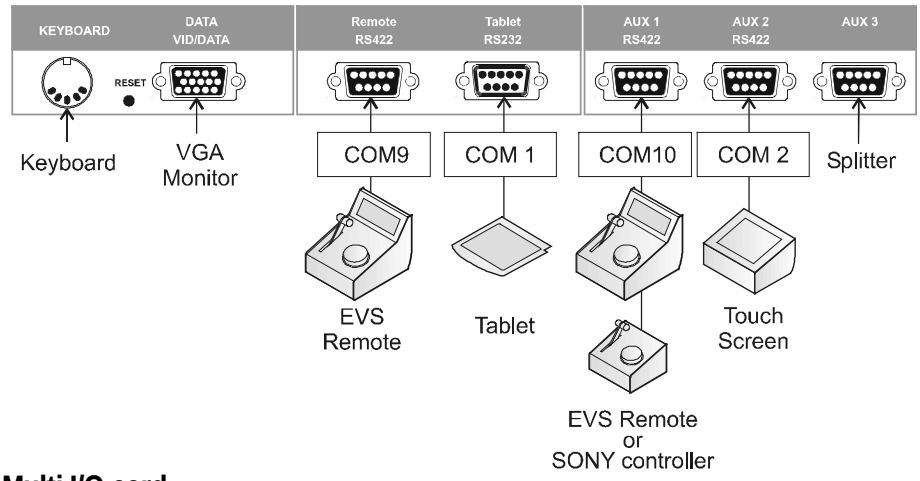
Classical Multi I/O card:

The common use (Type 2) of the communication ports is defined as follows:

I/O Type 2:

COM1: The Painting tablet is connected to this port through the J11 connector of SIO card.
COM2: The Touch Screen video monitor is connected to this port through the J9 on SIO card. (RS232 is converted into RS422)
LPT1: The switcher of the Splitter (in SLSM configuration) is connected to this port through the J8 connector on SIO card.

Figure – Type 2 :



EVS SIO3 Multi I/O card:

The communication ports on the SIO3 card are set as follows:

I/O Type 2:

COM9: The main remote control panel is connected to this port through the J12 connector of the SIO card. RS422 signal is converted within the SIO card.
COM10: The second remote control panel (or the Sony © control panel) is connected to this port through the J10 connector of the SIO board. RS422 signal is converted within the SIO card.
LPT2: The dongle key is directly connected to this port.

Comment: *In Spot Box system configuration, an additional EVS SIO3 Multi I/O card replaces the Classical Multi I/O card in order to increase buffering capabilities of serial ports.*

EVS CPI PC card:

The CPI PC card is the interface between the PC hardware and the video hardware boards. The link is physically done with 3 flat cables directly connected from the CPI PC card to the J3, J4, and J5 connectors of the video back plane. Only control data is transferred through this link.

Adrienne LTC reader card:

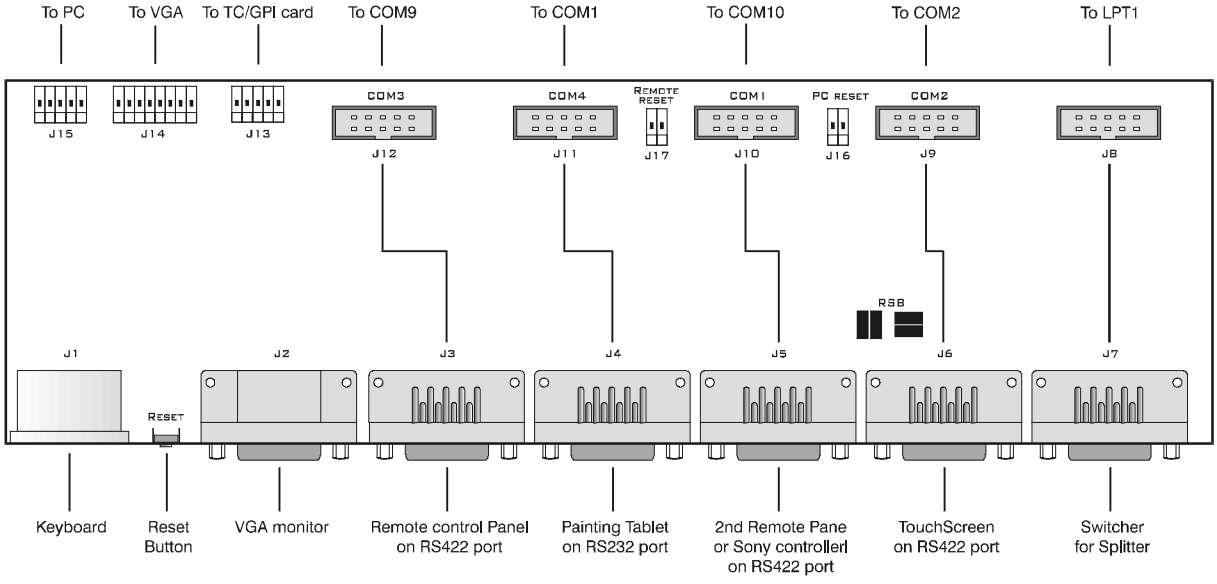
The LTC card reads the Timecode reference coming from an external source (VTR, camera, T/C generator...) If the Timecode reference is discontinued or if the card is damaged, the system will automatically select the PC internal clock as reference at start-up.

2Gb Hard disk:

The IDE disk drive is used for storing the EVS software and the DOS operating system. Neither audio nor video data is saved on this disk.

The SIO card:

The SIO card, screwed into the rear panel, is the hardware link between the PC motherboard and the peripheral Equipment: Remote control panel, keyboard, VGA, painting tablet. It converts RS232 signal in RS422 signal. RS422 is used for control links for EVS remote control panels, the Sony© remote controller, the Touch Screen controller but the Painting tablet uses RS232 port to communicate.

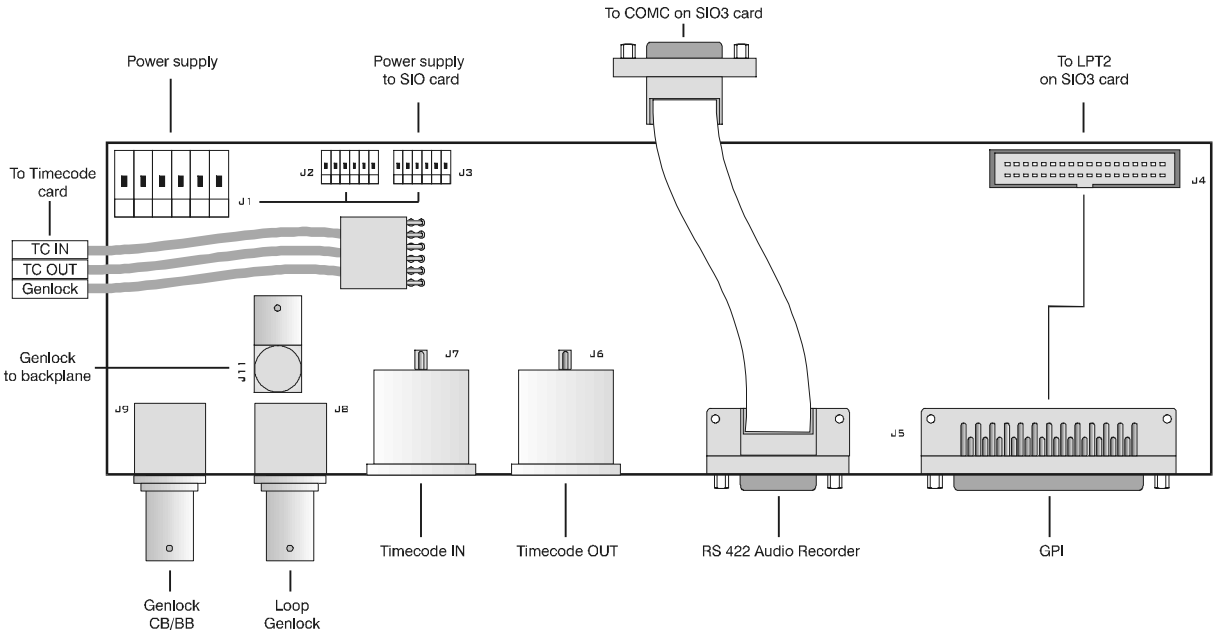


The J16 connector (Reset PC) is connected to the motherboard in order to directly reset the PC hardware from the rear panel (Reset button) or from the remote control panel.
The J17 connector (Remote Reset) is not used.

The Reset command from the Remote is sent through the Pin #5 of RS422 connector. A PIN-TO-PIN cable is required with the Pin 5 connected/assigned to the reset command. (see connector diagram - chapter 2)

The TC/GPI card:

The TC/GPI card, screwed into the rear panel, receives the external Genlock signal, the external TimeCode reference and distributes them to the video hardware and to the PC hardware.



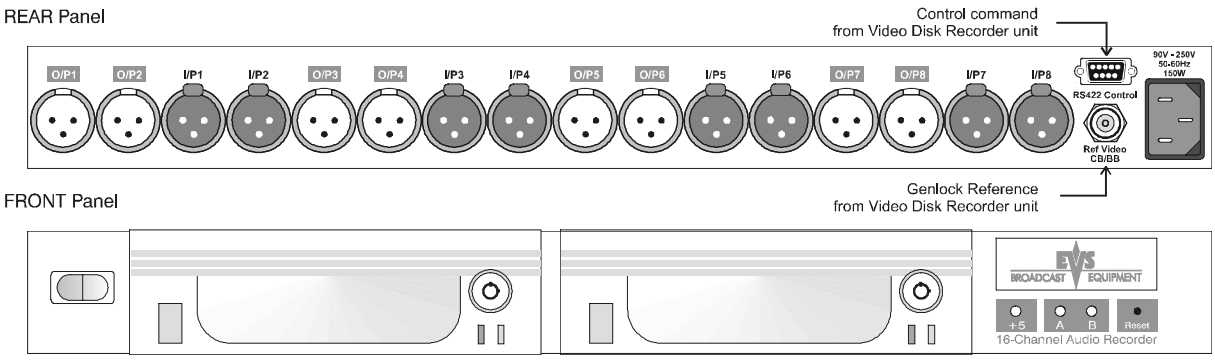
The RS 422 input is assigned to the control data of the ADR and it is directly connected with a flat cable to the COM C on SIO3 card.

The GPI input connected to the LPT2 port (SIO3 Card) allows the control of some functions within the software (Air Edit and LSM2Cam configurations) Refer to the application user's manual for details.

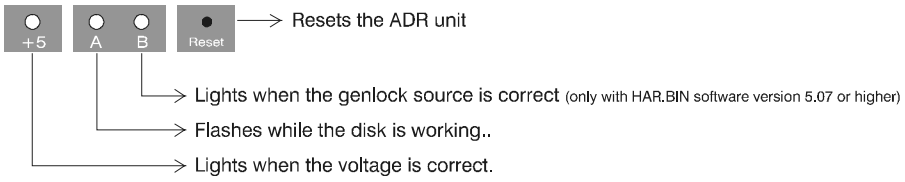
Chapter 6 - ADR (Audio Disk Recorder) hardware description

Audio data is recorded uncompressed in the ADR unit (Audio Disk recorder)
The inputs / outputs are available from the rear panel of the 1 U external rack:
Analogue Audio Channels 4 stereo IN / 4 stereo OUT 600 Ohms Balanced XLR.

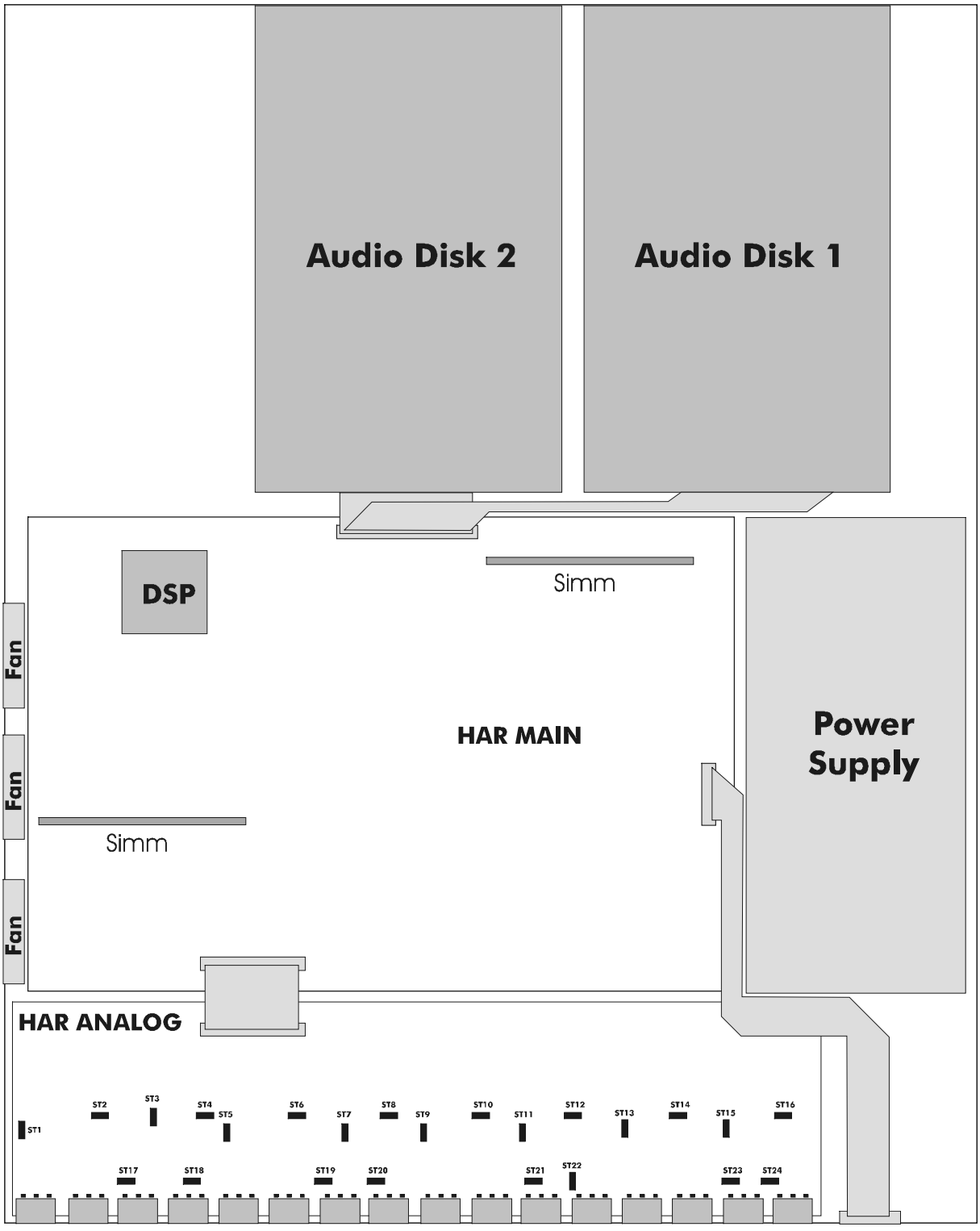
Comment: *As the VDR (Video Disk Recorder) and the ADR are two separate units, the Genlock source is primordial and must be identical in order to avoid non-synchronism problems (lipsync) between the video and the audio while recording or playing back the material. On the rear panel of the Video Disk recorder unit, the LOOP connector of the REF CB/BB is assigned to that end.*



LED's information:



ADR internal configuration



Audio Level adjustements:

Peak and nominal audio levels of each channel can be adjusted independently. These adjustments are made by changing jumpers' positions inside the ADR.

To access the jumper's positions, the cover of the ADR must be removed. This operation should be reserved to a qualified EVS technician. If you wish to perform these adjustments yourself, remove gently all screws to release cover plate.

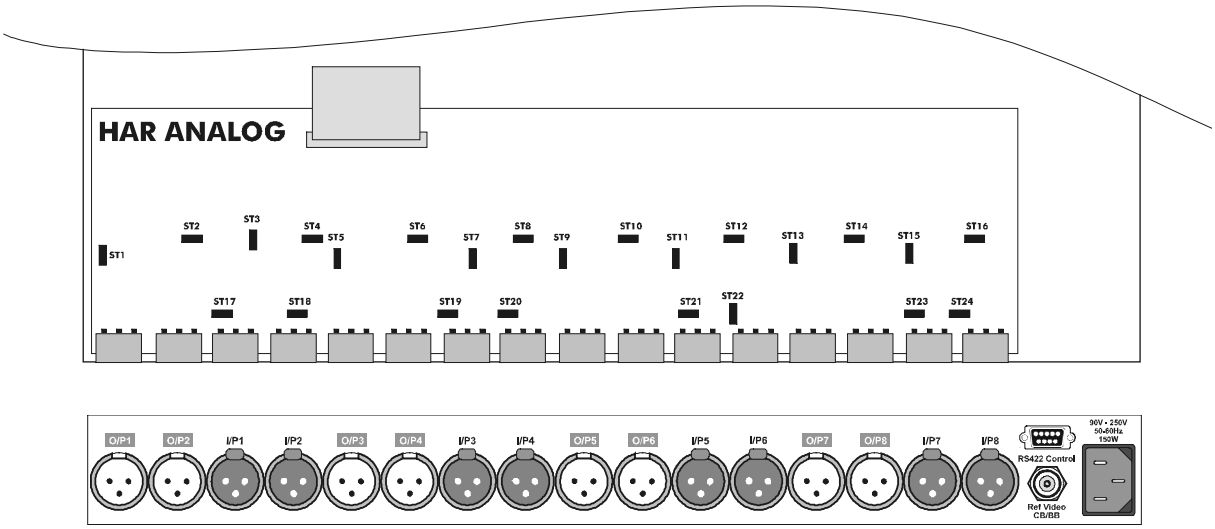
Caution : *High voltage is present inside the ADR and can cause electric shocks resulting in serious hazards. Make sure the mains power cable is unplugged and wait at least 5 minutes to let electric capacitors discharge before opening the ADR.*

1. Peak levels: jumper select 12 or 18dBu
2. Nominal levels: jumper select –2 or 4 dBu
3. Input impedance: jumper select 47K or 600 Ohms
4. Output impedance: 600 Ohms
5. Software selectable input gain: 0 to 22.5 dB (step 1.5 dB)
6. Default: 0 dB otherwise change levels specs
7. Software selectable output attenuation: 0 dB to –46.5 dB (step 1.5 dB)

Comment:

1. The jumpers for selecting the input impedance are located next to the corresponding XLR connectors.

2. The jumpers for selecting the input and the output levels are located opposite the corresponding XLR connectors, next to the operational amplifiers.



Jumpers Settings:

ST17-24: Input impedance
Closed: 600 Ohms
(Default) Open: 47Kohms

ST 1-2, 5-6, 9-10, 13-14: Peak & Nominal output levels
(Default) Closed: Peak level 18 dBu, Nominal level 4dBu
Open: Peak level 12dBu, Nominal level –2dBu

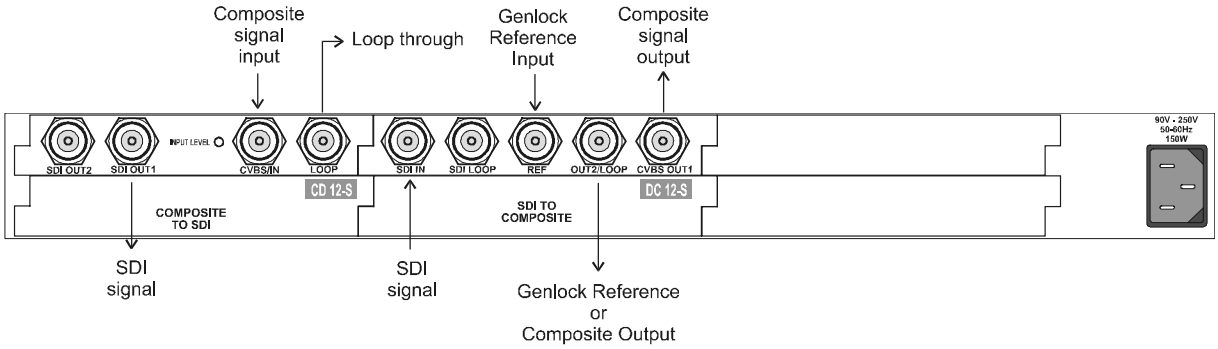
ST 3-4, 7-8, 11-12, 15-16: Peak & Nominal Inputs levels
Closed: Peak level 12 dBu, Nominal level –2 dBu
(Default) Open: Peak level 18 dBu, Nominal level 4 dBu

Make sure that settings are consistent for all channels. Should this not be the case, it would result in different audio levels, depending on the selected channels.

Chapter 7 - ADA converters

The digital video inputs and outputs on the BNC connectors on the rear of the mainframe are standard CCIR601/656, 10-bit Serial Digital Interface, and 270 MHz. Separate analogue PAL/NTSC encoders are installed on the I/O board to provide monitoring outputs.

EVS has a range of cards, which perform conversion between analogue composite PAL/NTSC or analogue component and SDI serial digital component. These can be mounted either internally or in 1RU (up to 6 boards) or 3RU (up to 16 boards) frames. The cards are fitted with adjustments for video timing and TV standard (625 line/50Hz PAL or 525 line/59.94Hz NTSC) is set by push buttons.



Note: *Loop must be terminated if not used*

In some configuration, the second signal output could be assigned as a Genlock Reference output. Please refer to the ADA manual for jumpers' settings.

Chapter 8 - EVS software

Version 6.17

Introduction

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

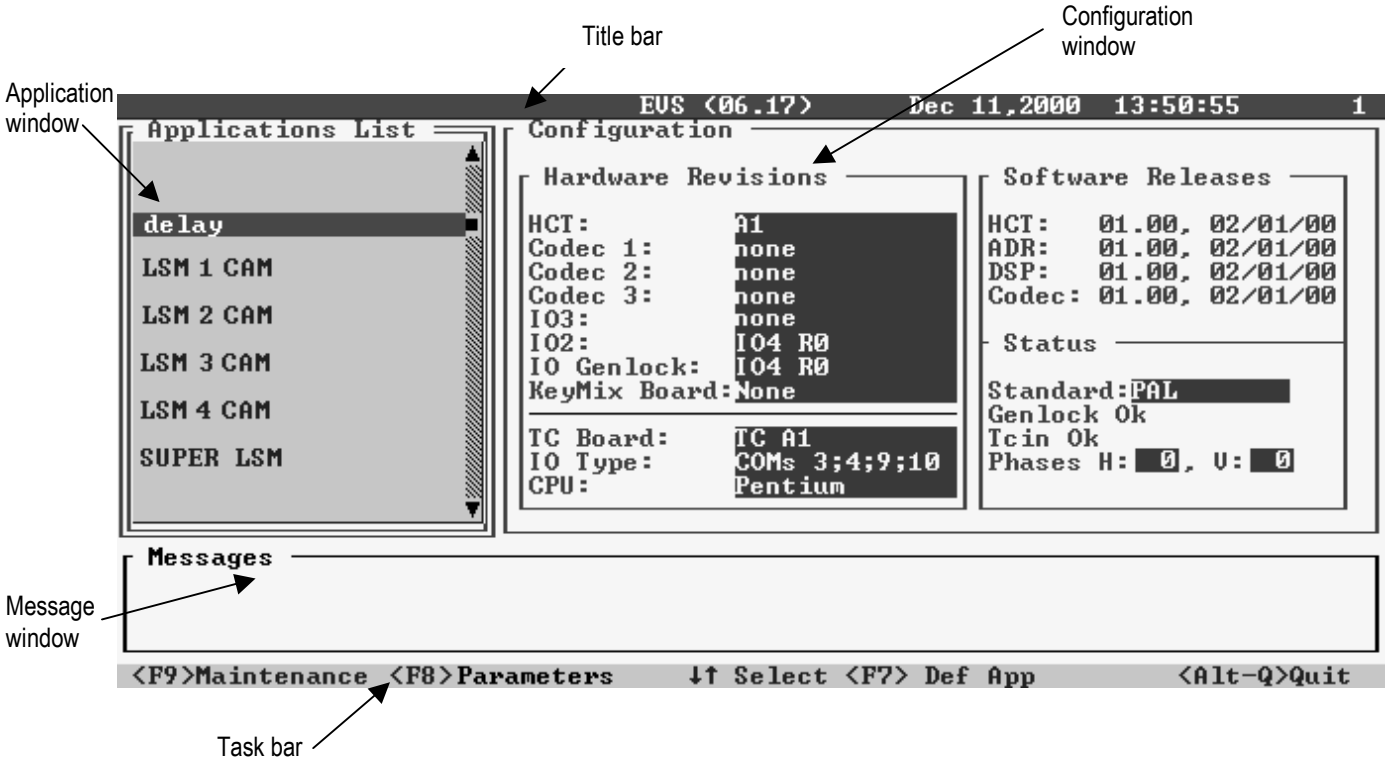
When turning on the EVS mainframe, the first step is the PC boot sequence, followed by a check of the hardware status, and finally the EVS software is started. If a default application has been previously selected, this application will start automatically after a few seconds if no key is hit. If a default application hasn't been defined or if the space bar is hit, the system will remain in the EVS main menu (see snapshot next page) and wait for the operator's next command.

1. VGA↔B&W Video Driver :

Between the PC boot and the hardware check, the video driver is loaded and the display is automatically switched to 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. If a VGA screen is directly connected to the VGA connector of the mainframe, press simultaneously < ALT > and <Backspace> on the keyboard to switch back to the VGA mode.

Pressing < ALT > and <Backspace> again will switch again to B&W video mode.

2. EVS Main Menu :



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 window: this window shows the hardware configuration of the system.

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

2.2 Tips to move inside the EVS software:

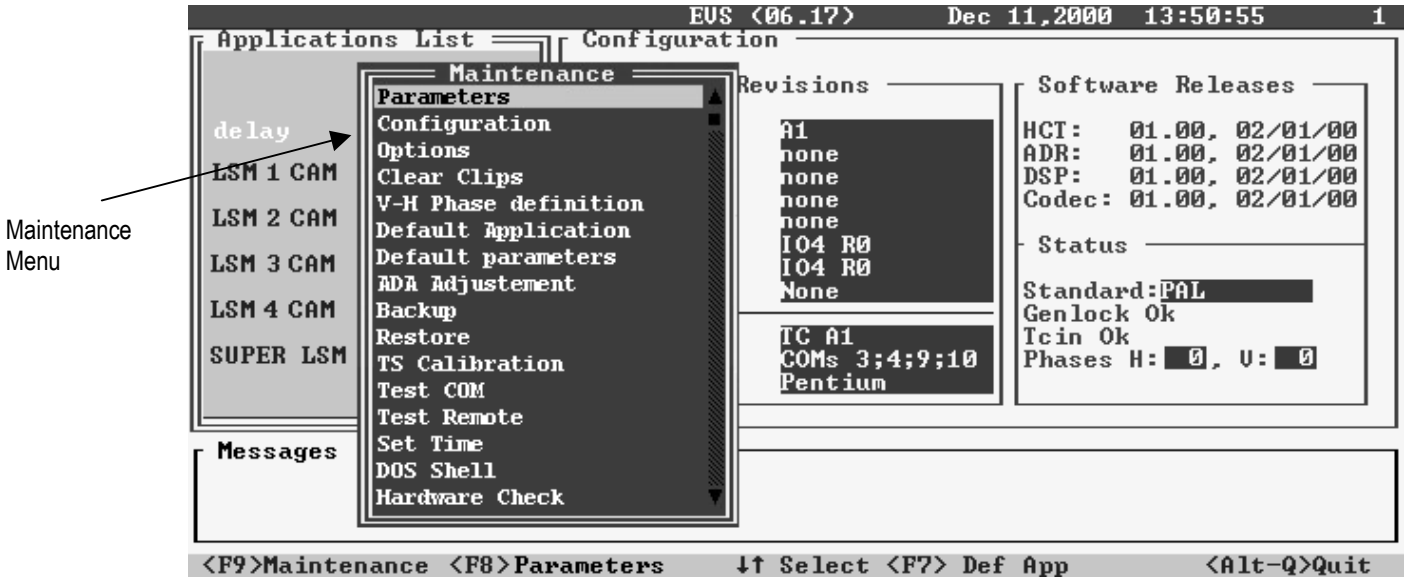
- The active window is always shown with a double frame
- Use <↑>, <↓> and <TAB> keys to change the selection inside the active window
- Use <ENTER> to select an item or to confirm an entry
- Use <ESC> to go back to the previous menu or to cancel an entry

2.3 Commands available from the main menu:

- The **<↑>** and **<↓>** keys of the keyboard can be used to select an application. The blue line shows the current selection. The pink 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 Parameters window related to the selected application. Press <ESC> 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 start the EVS software from the DOS (except from the DOS Shell mentioned above), simply type RUN.

3. EVS Maintenance Menu :

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



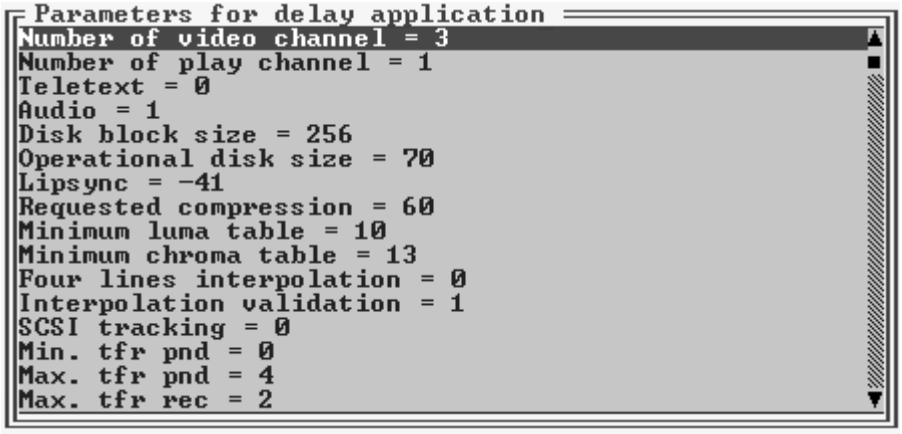
Maintenance Menu

To select an option, use the <↑> and <↓> keys of the keyboard to highlight the corresponding line and press <ENTER>

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

3.1 Parameters

Every application has its own set of parameters. The current application is shown in the title of the Parameters window. Parameters are used to define video & audio channels, adjust compression ratios & picture quality, etc.



Important notice: *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 parameter's charts for correct values*

To modify a parameter :

1. Select the desired parameters using the <↑> and <↓> keys of the keyboard to highlight the corresponding line and press <ENTER>

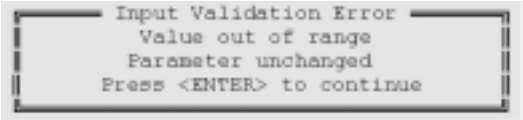
2. Then select the application to modify and press <ENTER>

3. A new window appears, with information related to the selected parameter. The current value of the parameter is displayed in a small box and can be modified to enter the new value. In some cases, several values can be adjusted from the same window. Use the <TAB> key to move from one box to the next one. The selected box is shown with a RED background, the other accessible boxes are shown with a BLUE background. Some information about the current parameter is displayed in the center of the window.

3. When the desired box is selected, modify the parameter to its new value and press <ENTER> to validate. If several values can be adjusted in the same window, pressing <ENTER> will validate the current entry and place the cursor in the next box. If the current box is the last one, the system will go back to the general Parameters window

4. When you are back to the general Parameters window, you can either select a new parameter to adjust using the <↑> and <↓> keys, or press <ESC> to go back to the Maintenance Menu

If the new value of the parameters is out of range, the old value is not changed and the following message appears:



Default parameters for all applications:

Application	LSM 1CAM	VDL 2CH	VDL 4CH	LSM 2CAM	SLSM	LSM 3CAM	LSM4CAM	SPOTBOX
NbrRecChnl (*)	1 (100) (1)	1 (100) (1)	2 (50,50) (1,1)	2 (50,50) (1,1)	1 (100) 1	3 (33,33,33) (1,1,1)	4 (25,25,25,25) (1,1,1,1)	1 (100) (1)
Multi Audio Options	*(2)*	*(2) or (4)*	*(2,2)*	*N/A*	*(2)*	*N/A*	*N/A*	*N/A*
nbrPlayChnl	1	1	2	2	1	1	2	3
teletex	0	0	0	0	0	0	0	0
audio	1	1	1	1	1	1	1	1
diskBlkSize	256	256	256	256	256	256	256	256
operationalDiskSize	90	100	100	90	90	90	90	100
lip-sync	-6	-6	-6	-6	-6	-6	-6	-6
requestedComp	30	25	40	40	55	50	70	30
minLumaTbl	16	16	16	16	16	16	16	16
MinChromaTbl	19	19	19	19	19	19	19	19
interpol4L	1	1	1	1	1	1	1	1
interpolValid	0	0	0	0	1	0	0	0
enableSCSITracking	0	0	1	1	1	1	1	0
MinTfrPnd (**)	0	0	2	2	2	2	2	0
MaxTfrPnd (**)	6	6	7	7	7	7	7	6
MaxTfrRec (**)	4	4	5	5	5	5	5	4
AdjFactMin	1000	1000	1000	1000	1000	1000	1000	1000
AdjFactMax	3000	3000	3000	3000	3000	3000	3000	3000
Vigour	10	10	10	10	10	10	10	10

(*) Syntax : NbrRecChnl (% per channel) (nbr stereo inputs per video channel). Ex : 2 (50,50) (1,1) means 2 record channels, 50% of available storage for each channel, 1 stereo input for each video channel.

(**) SCSI Tracking parameters are valid only with 32 MB Video Buffer installed on the HCT4 controller.

Parameters overview**:**

1.1.1 **Number of video channel**: selects the number of RECORD channels of the application, the partition of the disk storage between these channels, and the associated audio channels. Not all combinations are valid. Refer to the corresponding application's user's manual for more details.

nbrRecChnl : number of RECORD channels. Range: [0...8]
ChnlSize X : percentage of disk space allocated to channel # X. Range : [0...100]. Total of all ChnlSize values for one application must not exceed 100%.
nbrAudio X : number of audio channels associated to record channel # X.

1.1.2 **Number of play channel**: defines the number of PLAY channels. Range: [0...8]

1.1.3 **Teletext**: enables or disables the record/playback of teletext information. Range : [0 or 1].

The EVS JPEG disk recorder can record/playback VBI information in lines 15 to 22 for PAL standard and in lines 16 to 23 for NTSC standard (even field) and the corresponding lines in the odd field. If ADA converters are used with the system, make sure the Teletext mode is also enabled on these (refer to the associated ADA user's manual)

1.1.4 **Audio**: enables or disables the audio. Range: [0 or 1].

If the external EVS 16-ch Audio Disk Recorder (ADR) is ***not*** connected, the audio parameter ***must*** be set to ***0*** (zero). Otherwise, the system might not work properly.

1.1.5 **Disk block size**: defines the size (in KB) of data blocks to be recorded to or read from the disks. Range: [64...1024]. Standard value is 256 KB.

1.1.6 **Operational disk size**: percentage of the disks actually used to store the data. Range: [0...100].

Restricting access to the center part of the drives increases the performance of the system but decreases capacity. Standard value is 70 %.

1.1.7 **Lipsync**: delay (in field) between video and audio signals. Range: [-50...50].

A positive value means video is ahead of audio. A negative value means audio ahead of video. This adjustment is done during the RECORD process. A new Lipsync value will apply for the next recorded pictures only.

1.1.8 **Requested compression**: M-JPEG compression ratio (x 10) that the system must reach. Range: [17...32767].

The dynamic compression management system modify compression tables for each recorded field to keep the compression ratio as close as possible to the target. A value of **60** for this parameters means an actual compression ration of **6** (comparable to ßetacam SP quality). A value of **30** means an actual ratio of **3** (comparable to Digital ßetacam quality). A lower compression 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.

1.1.9 **Minimum luma table**: value of the lowest table to use for quantization of luminance. Range: [2...255].

The lower the table, the better the final picture quality. However, lower tables require a higher bandwidth. Improper values can lead to exceed disks performance, causing frozen pictures during playback.

1.1.10 **Minimum chroma table**: value of the lowest table to use for quantization of chrominance. Range: [2...255].

The same remark applies for this parameter. Since the chrominance is not as critical as luminance for picture quality, slightly higher values can be used. A typical ratio between chrominance and luminance tables is 1.2.

1.1.11 **Four lines interpolation**: selects between 2-line and 4-line interpolation process. Range: [0 or 1]. Select 0 for 2-line interpolation and 1 for 4-line interpolation. Refer to the next parameter for details.

1.1.12 **Interpolation validation**: enables or disables the interpolation process. Range: [0 or 1]. Select 0 to disable the interpolation process, or 1 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. 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 0, 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 0 and 'Interpolation validation' to 1]

- **4-line interpolator**: the picture is perfectly steady but the vertical bandwidth is even more reduced. [set 'Four lines interpolation' to 1 and 'Interpolation validation' to 1]

Note that all VTRs use interpolation in PLAY VAR mode.

1.1.13 **SCSI tracking**: enable or disable the tracking of the disk bandwidth to adjust automatically compression parameters in order to achieve the best picture quality. Range: [0 or 1]

1.1.14 **Min. tfr pnd**: internal EVS parameter.
Do not modify.

1.1.15 **Max. tfr. Pnd**: internal EVS parameter.
Do not modify.

1.1.16 **Max. tfr. rec**: internal EVS parameter.
Do not modify.

1.1.17 **Min. Adjusting Factor**: internal EVS parameter.
Do not modify.

1.1.18 **Max. Adjusting Factor**: internal EVS parameter.
Do not modify.

1.1.19 **Vigor**: internal EVS parameter. Do not modify.

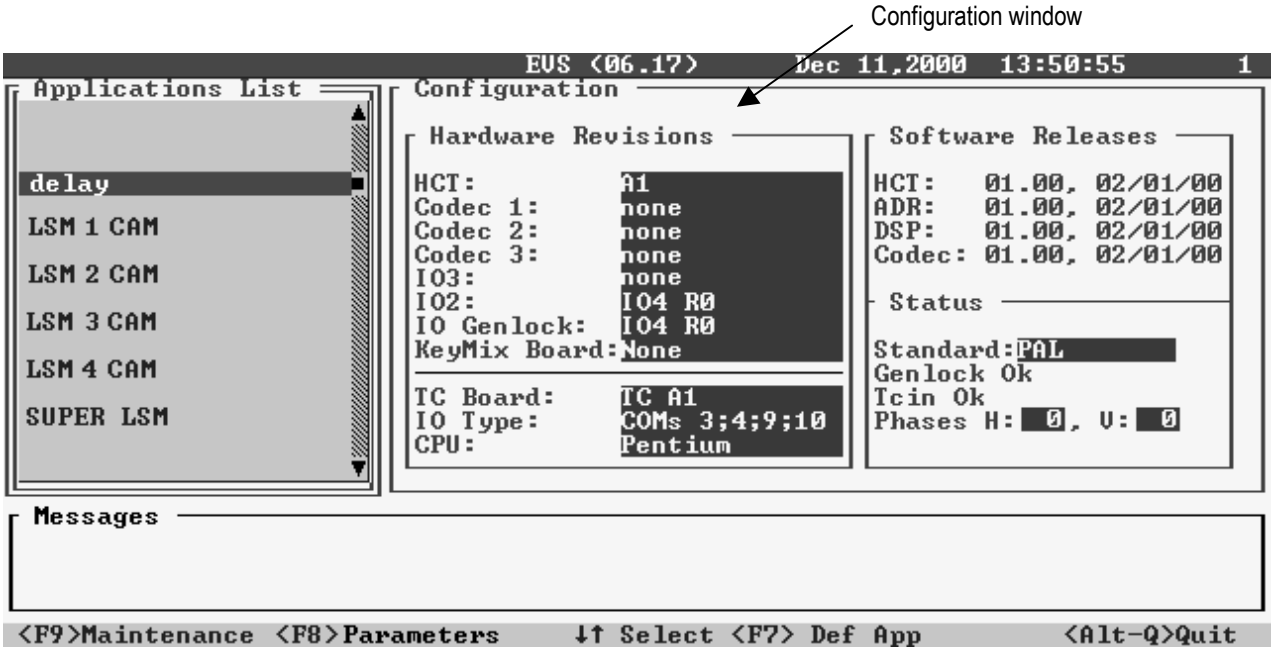
Example:
Modifying the audio-video synchronisation ('Lipsync' parameter)

- In the EVS Main Menu, use <↑> and <↓> keys to select the application for which you want to modify the parameter
- Press <F9> to open the Maintenance Menu
- Use <↑> and <↓> keys to move inside the list until 'Parameters' is highlighted
- Press <ENTER> to select this feature. The Parameter window is displayed on the right side of the screen
- Use <↑> and <↓> keys to move inside the list until 'Lipsync' is highlighted
- Press <ENTER> to select this parameter. A new window appears in the center of the screen.
- Type in the new value of the lipsync.
- Press <ENTER> to validate and return to the general Parameters window.
- Select another parameter to modify or press <ESC> to return to the Maintenance Menu.

3.2 Configuration

This function is used to set the hardware configuration of the system (boards release numbers, port settings,...). There's only one configuration of hardware for the whole system.

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.*



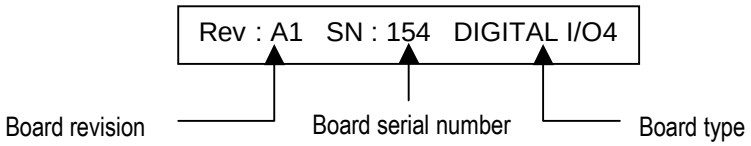
To enter the configuration window, press <F9> to open the Maintenance menu, select 'Configuration' and press <ENTER>. A double frame appears around the Configuration window, and the cursor blinks next to the 'HCT' label.

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

Configuration items overview :

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*



1.1.1. **HCT**: revision of the HCT board (Video Raid controller). The HCT board is located immediately underneath the disk tray and is present on all systems.
1.1.2. **CODEC 1**: revision of the first CODEC board (immediately underneath the HCT board). This board is present on all systems
1.1.3. **CODEC 2**: revision of the second CODEC board (located underneath CODEC1). Not present on all systems.
1.1.4. **CODEC 3**: revision of the third CODEC board (located underneath CODEC2). Not present on all systems.
1.1.5. **IO3**: revision of the third digital I/O board (*) (located underneath CODEC3). Not present on all systems.
1.1.6. **IO2**: revision of the second digital I/O board (*) (located underneath IO3). Not present on all systems.
1.1.7. **IO Genlock**: revision of the first digital I/O board (*) (located underneath IO2). This board is present on all systems.
1.1.8. **KeyMix Board**: revision of the Keyer/Mixer board (located underneath IO Genlock). Not present on all systems.

*(*) There are 2 types of digital I/O boards: Digital I/O and Digital I/O4. Make sure to check the revision number **and** the board type written on the left front end of the I/O board. If the I/O board type is DIGITAL I/O, the revision number in the configuration window can be A4, A5 or A6. If the I/O board type is DIGITAL I/O4, the revision number in the configuration can be IO4 R0, IO4 R1, etc …*

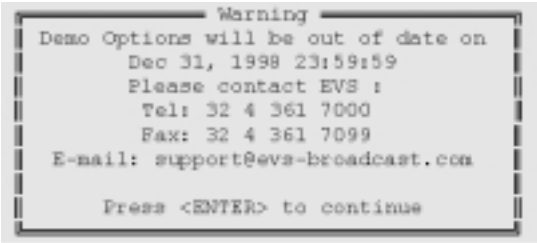
1.1.9. **TC Board**: revision of the TimeCode board. This board is plugged into the PC motherboard at the back of the system.
1.1.10. **IO Type**: settings of the serial ports of the PC and the standard multi-I/O board. Most applications use COMs 1, 2, 9, 10. Refer to the application's operation manual for detailed settings.
1.1.11. **CPU** : type of processor used on the PC motherboard (486 or Pentium)
1.1.12. **Standard** : video standard PAL or NTSC

3.3 Options

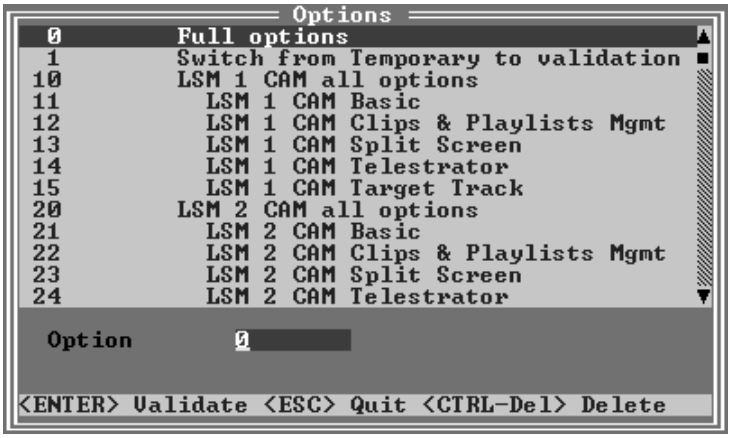
This function is used to manage software license codes for all applications. To run particular application software and/or specific software options, not only the software itself is required but also a license key, which is unique for every option on every system.

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 a few days before the expiry 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 (yellow characters on a blue background) 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>.

Example of line for a PERMANENT option:

10	**PERM**	**LSM 1 CAM all options**

Example of line for a TEMPORARY option:

21	**DEMO**	**LSM 2 CAM Basic**

To enter new license codes:

- 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

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>.

To check hardware key (dongle) information:

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

The following information is available:

System ID: ID code of the hardware key. This information is necessary for license code calculation
User: user's name. This information is a label and is for information only
Serial #: serial number of the mainframe. The S/N is also written on the back plate of the mainframe
Limit time: expiry date & time for temporary license codes. When the limit date is Jan 01, 1970, it means that no temporary codes are present
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.
Press <ENTER> to go back to the Options window

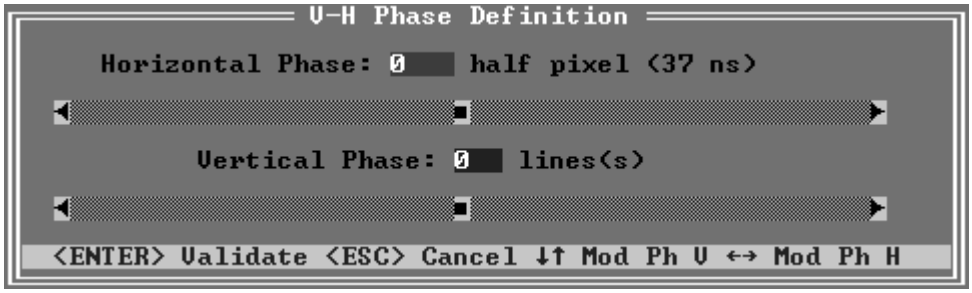
3.4 Clear Clips

This function is used to erase all clips and playlists of all applications present on the system.

- Use the <↑> and <↓> keys to select the 'Clear Clips' line and press <ENTER>
- You are asked to confirm (<ENTER>) or cancel (<ESC>) the command

3.5 V-H Phase definition

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



The horizontal phase can be adjusted between - 25900 ns and +25900 ns by 37 ns steps.
The vertical phase can be adjusted between -6 and +6 video lines by one-line steps.

Commands:

- Use <↑> and <↓> keys to adjust the **horizontal phase** or type in the value in the 'Horizontal Phase' box
- Use <←> and <→> keys to adjust the **vertical phase** or type in the value in the 'Vertical Phase' box
- Use <TAB> key to toggle between 'Horizontal Phase' and 'Vertical Phase' boxes
- 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

3.6 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 with yellow characters and a blue background in the Application window.

To define a default application:

- In the Application window, select the new default application using the <↑> and <↓> keys.
- Press <F7> or call the Maintenance menu (<F9>) and select 'Default Application'
- 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.

To remove the default application :

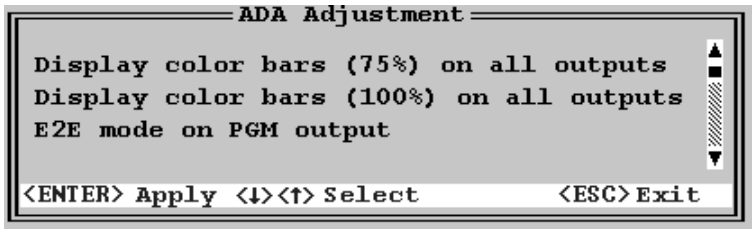
- In the Application window, select the application that is the current default application (yellow characters with blue background) using <↑> and <↓> keys.
- Press <F7> or call the Maintenance menu (<F9>) and select 'Default Application'
- a message warns the operator that the current default application will be disabled. The command can be confirmed with <ENTER> or cancelled with <ESC>

3.7 Default parameters

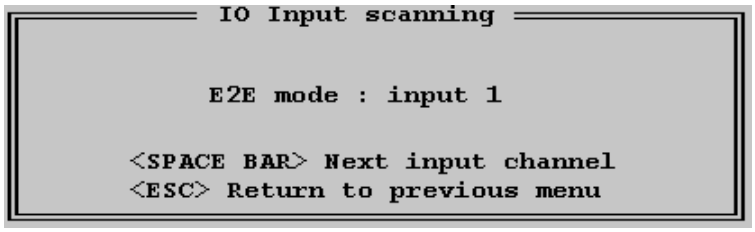
This command erases all current parameters settings and restore the default factory settings for all applications. When selecting this option, you are asked to confirm the command or cancel it.

3.8 ADA adjustment

This command allows you to adjust the luminance and chrominance levels on all outputs according to the color bars displays (75% and 100%). This option acts as a color bar generator and is useful to adjust the ADA converters settings.



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.*

3.9 Backup

Not yet available

3.10 Restore

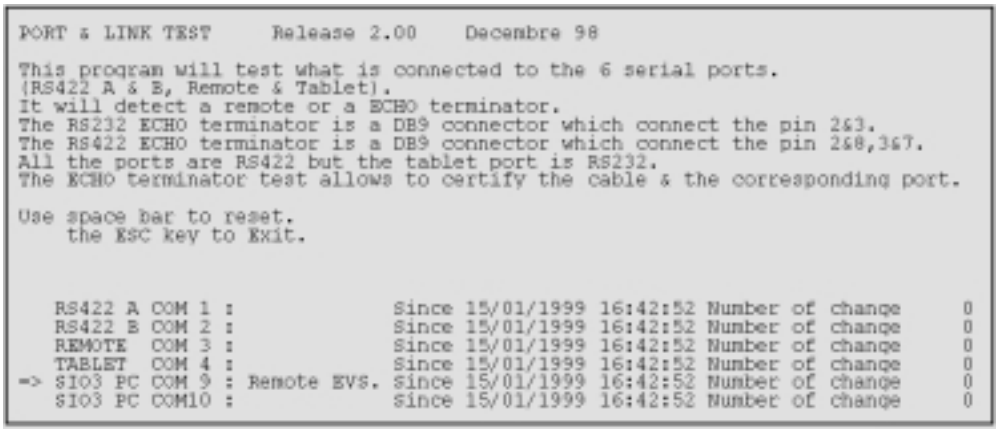
Not yet available

3.11 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.

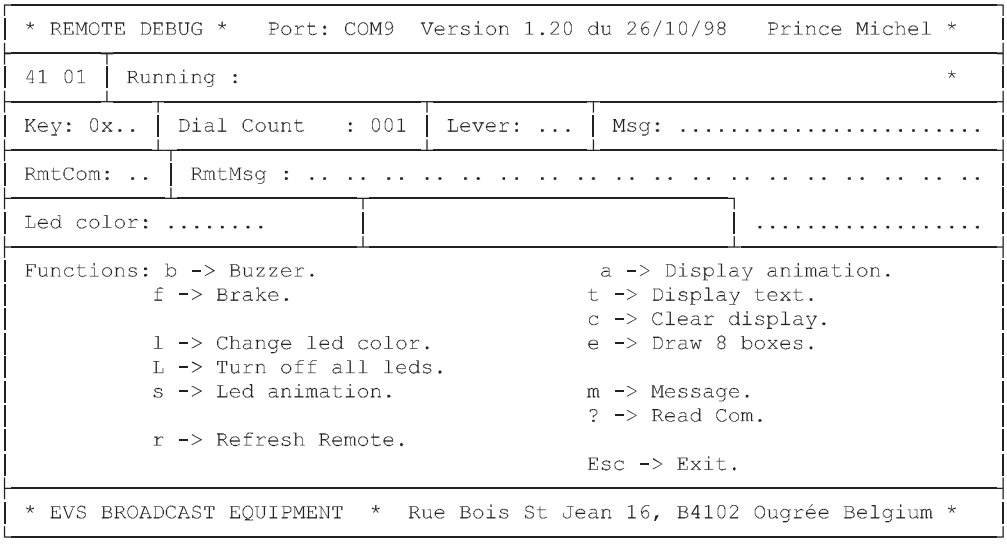
3.12 Test COM

This option is used to test all serial ports of the system. It will show peripherals connected to the ports or echo terminator. It can be used to identify problems on RS232 and RS422 links.



3.13 Test Remote

This option is used to test the link between the remote panel and the mainframe, and the proper operation of the keys and display of the remote panel. Several commands can be sent to the remote:



3.14 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

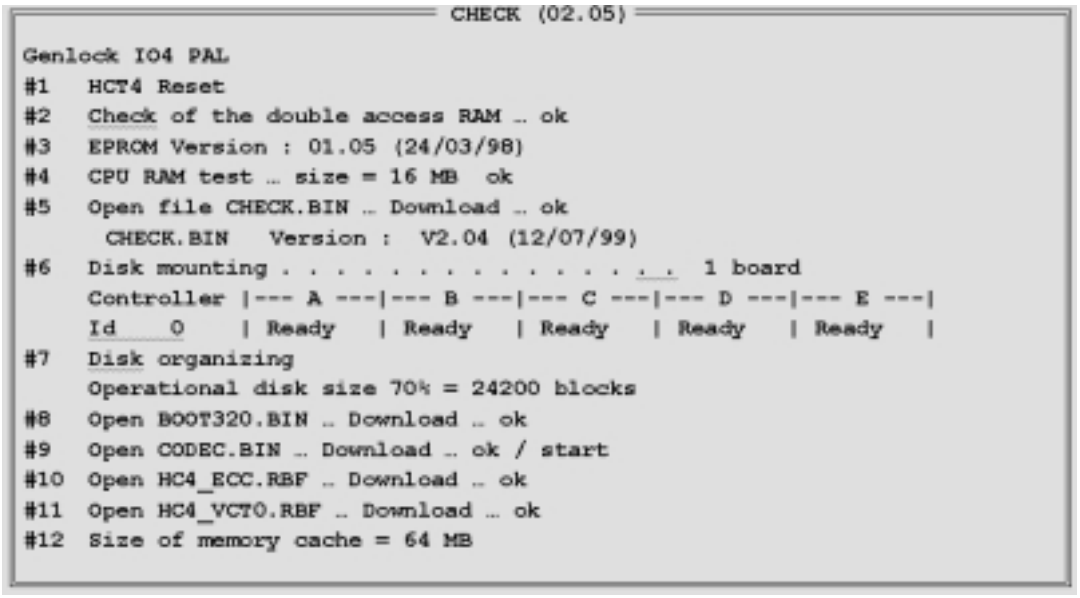
3.15 DOS Shell

The DOS Shell allows the operator to access temporarily the DOS prompt without really exiting the EVS software. The EVS software is still present in the background. All DOS commands are available from the DOS Shell (to look for a file, check PC drive capacity, edit files,...). To exit the DOS Shell and return to EVS, type EXIT.

3.16 Hardware Check

Automatic test

The aim of this software is to check the hardware and to verify the validity of the data recorded to disks. After the selection of this command from the Maintenance menu, the system automatically starts the test processing. One after the other, the different stages are displayed in the Check window:



Note: *During the test process some error messages could appear. In this case, please note the error message and contact EVS for support.*

The first four stages examine the HCT4 board:

#1: resets the HCT4 board

The LED B on the HCT4 board flashes during this stage. This reset command never stops the check process.

#2: checks the double access RAM by successively writing and reading codes into the COMRAM (U17) of the HCT4 board

If the test stops at this stage, an error message advises you to check if the HCT4 board is well plugged or if the U17 device is present on the HCT4 board

#3: checks the EPROM version

If the test stops here, an error message notices the EPROM code is not found and advises you to check the U23 device on the HCT4 board.

#4: checks the validity and the size of the CPU RAM of the HCT4 board.

If the test stops here, an error message notices the size of the CPU RAM is insufficient or another message notices the CPU RAM is defect. In this case, we advise you to start the MEMORY CACHE test for more details.

The next stage downloads/reads the CHECK.BIN file:

#5: checks the presence, the validity and the version of the file.

If the test stops here, an error message notices the CHECK.BIN file cannot be read. So this file is probably not present in the current directory or is damaged. In this case we advise you to re-install completely the software.

The next two stages examine the disks. As this concerns the complete SCSI system, this section of the test lasts much longer.

#6: checks the number of disks' trays and tests the disk controllers. The status for each disk is noticed as follows: Ready, No disk, or Not ready.

During this stage, the CHECK.LOG file is updated. A Time Out message appears when a major defect has been detected in the disks or in the disk connectors. In order to locate precisely the defect, we advise you to read the LOG file or start the DISK READ & VERIFY test.

#7: checks disk organizing and calculates the disks' capacity available according to operational disk size parameter.

If the test stops here, this means that the HCT4 board is not working properly but a dysfunction has been previously detected during stage #1, #2, #3 or #4.

The stages from 8 to 11 download/read the microcode software:

#8: downloads BOOT320.BIN file (program file)
#9: downloads CODEC.BIN file (program file)
#10: downloads HC4_ECC.RBF file (configuration file)
#11: downloads HC4_VCT0.RBF file (configuration file)

If the test stops at stage #8, #9, #10 or #11, an error message notices the file cannot be read. So the file is probably missing or damaged. In this case we advise you to re-install the complete software.

The last stage examines the size of memory cache:

#12: checks the cache RAM and notices the size available.

If the test stops here, a message mentions a Time Out error.
This means that the microcode is not properly responding and the video buffer RAM's are probably implicated. In this case, we advise you to start the MEMORY CACHE test for more details.

Diagnostic test

After the automatic test process, a selection menu is available in the lower right corner in the CHECK window. This menu allows you to complete and to refine the hardware check.

Disk defect

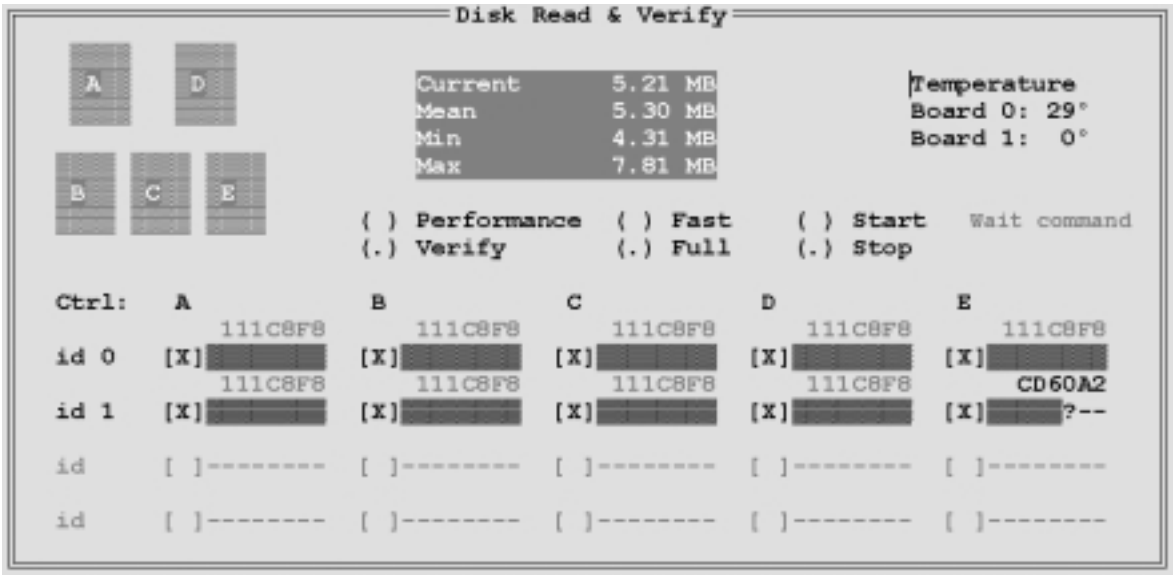
This test gives you details about the disks used: Status, Manufacturer, Product type, Capacity, Primary and Grown defects.

Id 0	A	B	C	D	E
Status	Ready	Ready	Ready	Ready	Ready
Manufact.	QUANTUM	QUANTUM	QUANTUM	QUANTUM	QUANTUM
Product	ATLASIV9WLS	ATLASIVWLS	ATLASIVWLS	ATLASIVWLS	ATLASIVWLS
Capacity	8 971 292 K	8 971 292 K	8 971 292 K	8 971 292 K	8 971 292 K
Primary d	259	333	558	220	446
Grown def	0	0	20	0	0
Id 1	**A**	**B**	**C**	**D**	**E**
Status	Ready	Ready	Ready	Ready	Ready
Manufact.	QUANTUM	QUANTUM	QUANTUM	QUANTUM	QUANTUM
Product	ATLASIV9WLS	ATLASIVWLS	ATLASIVWLS	ATLASIVWLS	ATLASIVWLS
Capacity	8 971 292 K	8 971 292 K	8 971 292 K	8 971 292 K	8 971 292 K
Primary d	212	198	456	250	334
Grown def	0	0	0	0	2

The primary defects are normal defects detected at factory. The grown defects are linked to the working and should be monitored if the number increases.

Disk Read & Verify

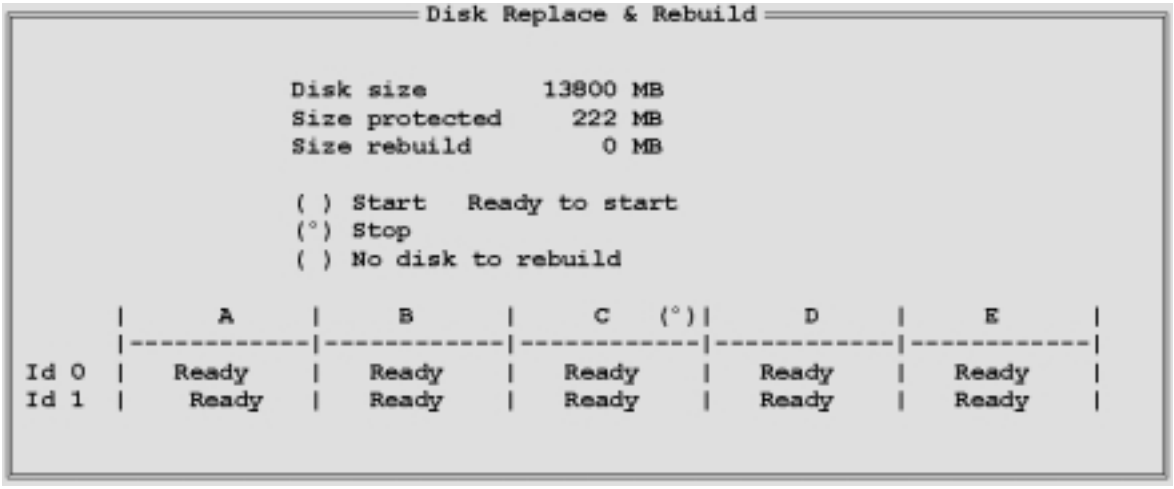
This menu tests the reading performance of disks and checks the validity of the Data recorded.



To move the cursor along by the selection boxes, press <TABS>. To mark a selection box, press <SPACE BAR>
The **Performance** test checks the disks' access and controls the bandwidth.
The **Verify** test checks the validity of Data recorded to disks
Each disk can be controlled separately: press <TABS> and then <SPACE BAR> to select the desired disk.
If one disk is faulty, the test processing stops and the <?> sign appears on the error location. In this case, we advice to start the SCSI Info test in order to determine precisely the error.

Disk Replace & Rebuild

This item is only available with the RAID5 option.



While the window opens, the software loads the Protects table in order to detect which part of the disk has to be rebuilt. The disk to rebuild is automatically detected and marked with a (°) sign.

To move the cursor along by the selection boxes, press <TABS>. To mark a selection box, press <SPACE BAR>

When a disk problem is detected, the RAID5 option allows you to work with only 4 disks Select the **No disk to rebuild** item to bypass the recovering process, if this one is not necessary, and then to avoid the error messages at start up.

After the disk replacement, you have to start the REBUILD process in order to authorize anew the working with 5 disks.

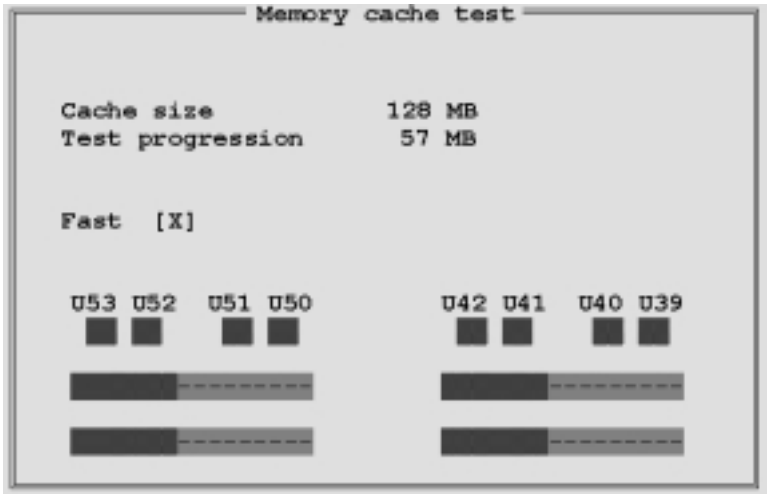
SCSI Info

This information is reserved to qualified EVS technicians.

The SCSI information traces the history of the different defects spotted in the entire SCSI system.

Memory cache test

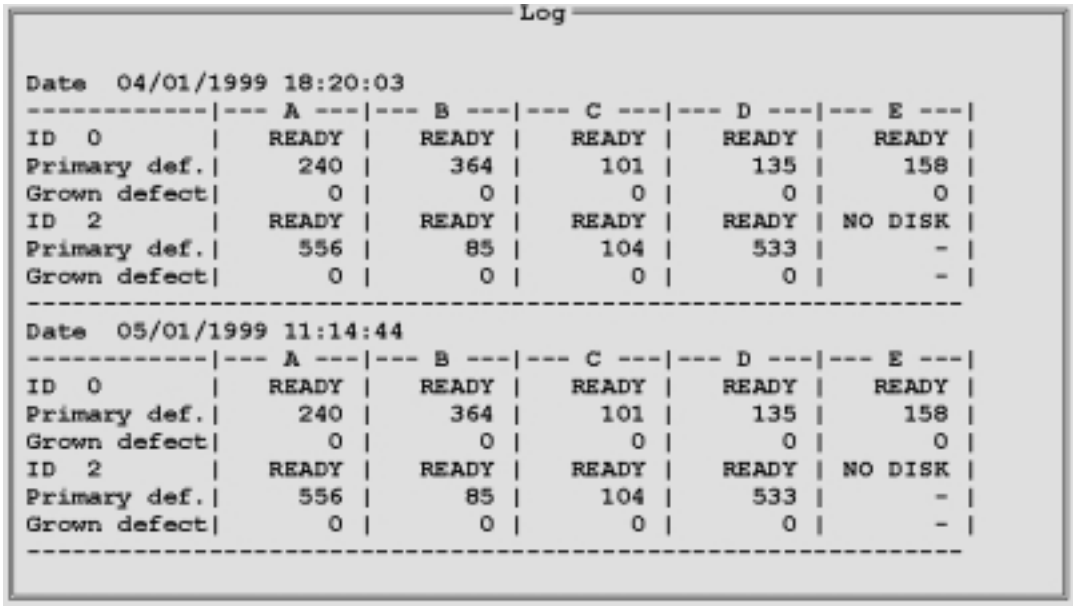
This item tests the video buffer RAM's and the MAC chipsets located on the HCT4 board. The above screen represents graphically the location of components on board.



If one component is faulty, the test processing stops and the <?> sign appears on the error location. The complete test for a 128MB cache size lasts 12 minutes. For a quick test, mark the Fast option box by pressing <SPACE BAR>

Log

The CHECK.LOG file traces the history of disks over the successive uses.
This file keeps watch on the disks' defects.



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