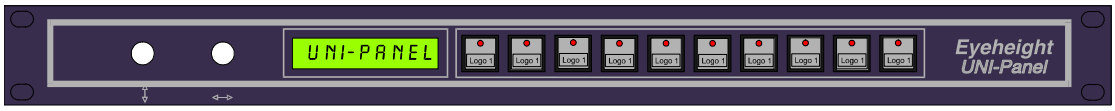
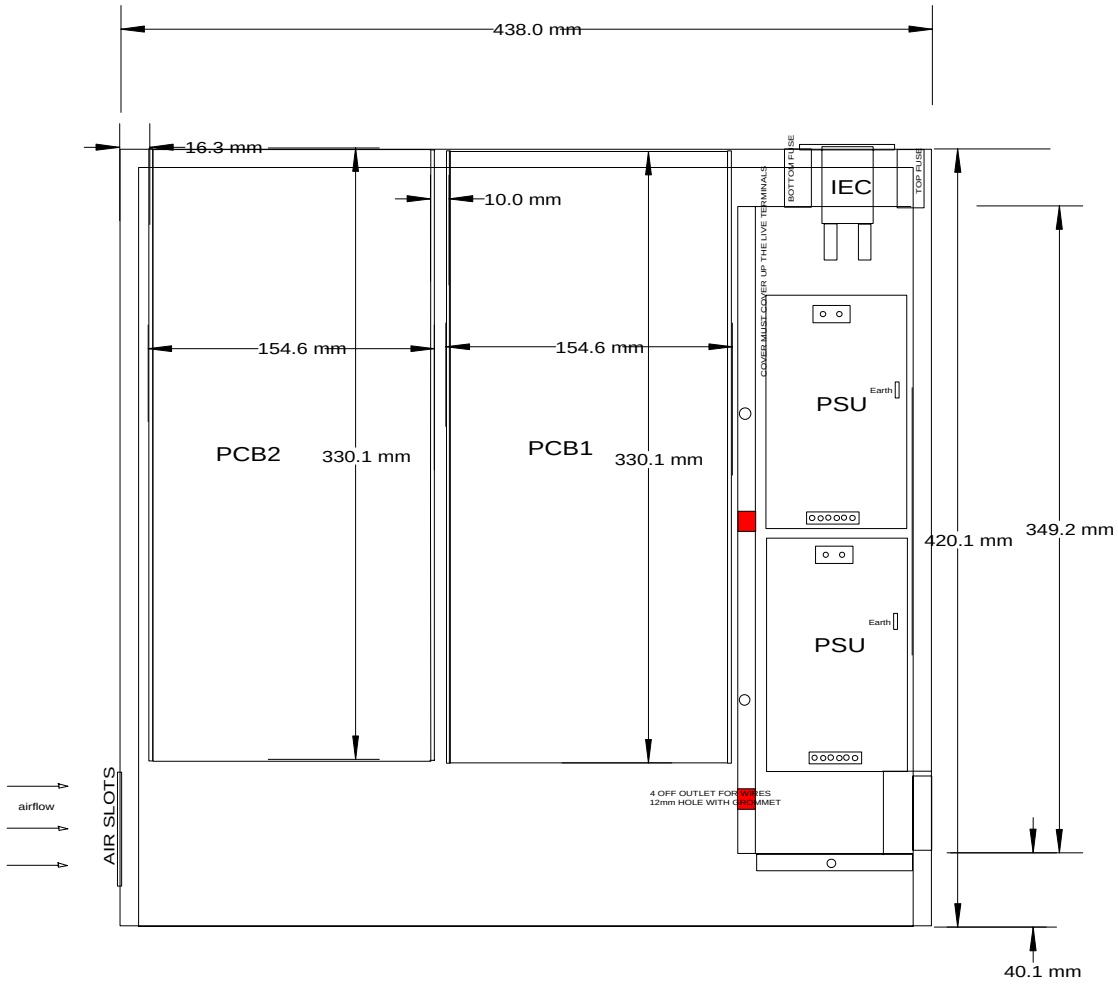
Operations Manual for the SQ-1000 Aspect Ratio Converter

Eyeheight UNI-System

--V 4.5 Software 29/06/00--





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Overall Specification

SQ-1000

Physical Format	Host PCB Subsystem for fitting into an Eyeheight Uni-Box System.
Power Requirements	+5V at 1.5 Amp, supplied from the Uni-Box. -5V at 100 mA, supplied from the Uni-Box.
General Features	●All common aspect ratios available as presets. ● Variable Vertical and Horizontal Magnification and Minification. ● Horizontal and Vertical aperture corrector. ● AES Audio delay automatically tracks the video delay. ● Linear Timecode delay, automatically tracks the video delay. ● Stereo Analogue Audio output converted from AES Input for Monitoring. ● Monitoring Quality PAL/NTSC output ● Monitoring Quality RGB/YUV output ● Monitoring Quality Y/C output ●Downstream EDH Re-insertion ●Fail-safe Dual Contact Relay bypass from input to output 1 on power failure.
Local Control	Standard Eyeheight Uni-Panel (UP-1000)
Remote Control	Standard Eyeheight Uni-Panel situated up to 50M remotely using RS422 control with power from the Uni-Box.
Accessories	●The SQ-1000 PCB requires a spare slot in an Eyeheight Uni-Box (UB-1000) ●Control is by Eyeheight Uni-Panel (UP-1000).
Input	270 Mbit Serial Digital with active loop through. Input R.L <=-15dB, 75 Ohm
Outputs	2 off Main Serial Digital outputs (BNC) (Output 1 is “Fail Safe”). 75 Ohm.
System Delay	The system delays the input signal by 1 Video Frame
Other Connections	RS422 control 9W D type (female) AES I/O, Timecode I/O, Stereo Audio output available on a high density 15 Way D-Type connector (female)

Technical Specification

SQ-1000

SDI Input	1 Off CCIR 601 Component 525/625, 10 bits data, Scrambled NRZI, 270 Mb/s. Complies with SMPTE 259M and CCIR 656. Input Impedance 75 Ohm Input Level 800mV +/- 80mV (Pk-Pk) at Signal Source. Return Loss >=-15dB from 1MHz to 270MHz Equalisation Minimum of 150 Metres PSF 1/2
SDI Output	2 off CCIR 601 Component 525/625, 10 bits data, Scrambled NRZI, 270 Mb/s. Complies with SMPTE 259M and CCIR 656. Output 1 Equipped with Relay Bypass from Input For Power failsafe situations. Output 2 Standard O/P not equipped with the above. Output Impedance 75 Ohm Output Level 800mV +/- 80mV (Pk-Pk) at BNC. Return Loss >=-15dB from 1MHz to 270MHz Jitter <= +/- 200pS + (Jitter on incoming Signal) Jitter on incoming signal <=+/- 200pS EDH Option Menu for EDH Re-Insertion
Analogue Video Outputs	4 BNC Connectors with 3 Soft Menus Selecting the Monitoring Quality Video Outputs as follows: Menu--CVBS/Y/U/V: CVBS PAL/NTSC Auto Configure. 0.7 Volt Pk-Pk Luma +/- 3% Fully Adjustable Chroma by menu Colour Burst 0.3V Pk-Pk +/-5% Sync 0.3V Pk-Pk +/- 5% Y 1 Volt Pk-Pk +/-3% with Sync (0.3V +/-5%) U 0.7 Volt Pk-Pk +/- 3% V 0.7 Volt Pk-Pk +/- 3% Menu--CVBS/R/G/B: CVBS As Above. G 1 Volt Pk-Pk +/-3% with Sync (0.3V +/-5%) B 0.7 Volt Pk-Pk +/- 3% R 0.7 Volt Pk-Pk +/- 3% Menu--Y/C/Off/Off: Y 1 Volt Pk-Pk +/-10% with Sync (0.3V +/-5%) C Fully Adjustable Chroma by menu. Off Unused BNC Off Unused BNC
Digital Audio Input	1 off AES EBU (AES 2) Input with Balancing Transformer. Input Impedance 110 Ohms. Input Level 500mV to 5V Pk-Pk Connector High Density 15W D type.
Digital Audio	1 off AES EBU (AES 2) Output with Balancing Transformer and equipped with passive relay bypass

Output	Transformer and equipped with passive relay bypass for power failsafe. Output Impedance 110 Ohms. Output Level 4V Pk-Pk +/-1 Volt Connector High Density 15W D type. Output Delay Exactly 1 Video Frame with respect to The Digital Audio Input.
Timecode Input	1 off Longitudinal Timecode input, Electronically Balanced Input. Level 0 dB +6dB/-12dB Input Impedance 10 K Ohms Connector High Density 15W D type. Operation Range From 1/5 to +10 Normal speed Min.
Timecode Output	1 off Longitudinal Timecode output Electronically Balanced and equipped with passive relay bypass for power failsafe. Output Level 0 dB +/- 1dB Output Impedance 100 Ohms a.c. coupled Output Delay Exactly 1 Video Frame with respect to the Timecode Input. Connector High Density 15W D type.
Analogue Audio Outputs	1 off monitoring quality stereo output pair converted from the Digital Audio Input. Electronically Balanced. Output Level 2V Pk-Pk at –18dB Digital level. Output Loading 600 Ohms max load, dc coupled. Output Delay Exactly 1 Video Frame with respect to the Digital Audio (AES EBU) Input. Connector High Density 15W D type.
Processing	Field Based Processing using an 8 Bit Image Reduction Engine with 3 line Vertical aperture corrector and 3 pixel Horizontal Aperture corrector.
System Delay	Dependent On menu Selection: Option1/ Min Delay Mode OFF One video Frame +/- 1 uS 1/50th Sec 625 Lines 1/60th Sec 525 Lines Option2/ Min Delay Mode ON Approx. 125 Video Lines. Approx. 1/250th Sec.
Auxiliary Information	All Auxiliary Data is passed to full 10 Bit resolution in Normal operation. (In Minimum Delay mode this is not guaranteed)
Bypass Mode	Full 10 Bit Bypass mode with all Picture and Auxiliary data being Bypassed. Processing Delay stays at 1 Video Frame. (Auto Bypass must be “ON” for this to be true)
Other Connections	RS422 control 9W D type (female) Min 50 Metres Operation Power for Remote Uni-panel optionally down Pin 5

SQ-1000 UNI-Panel

The SQ-1000 Aspect Ratio Converter is generally controlled from an Eyeheight Uni-Panel either locally mounted on the front of a Uni-Box or remotely sited using the rear RS422 control system. Optionally the user may wish to control the system from a computer system simulating a Uni-Panel. The RS422 Protocol for the Uni-Panel is published in the Manual for the Uni-Panel/Box. Fig. 1 shows the 10 Pre-set switches for the SQ-1000 operation.

SQ-1-> SQ-2->	**4/3**	**16/9 LB**	**16/9WS**	**14/9 LB * 16/9 Crop**	Mem 1	Mem 2	Mem 3	Mem 4	Setup
SW 1	SW 2	SW 3	SW 4	SW 5*	SW 6	SW 7	SW 8	SW 9	SW10
Selects between the Two possible Systems	Bypass Mode, Selects 4/3 Aspect.	Converts 16/9 Widescr'n to Letterbox on a 4/3 Monitor.	Converts 16/9 Letterbx to Widescr'n 16/9 Format	Converts 16/9 Widescr'n to 14/9 on a 4/3 Monitor.	Memory 1 can store any user defined Aspect Ratio	Memory 2 can store any user defined Aspect Ratio	Memory 3 can store any user defined Aspect Ratio	Memory 4 can store any user defined Aspect Ratio	Enables the user to setup any aspect ratio and store it

Fig. 1 Uni-Panel Pre-set Switches for Single SQ-1000 Unit

- 14/9 Letter Box applies for the 625 Video Standard, In 525 this button is a 16/9 Crop.

UNI-Panel Set-up

Before describing the Aspect Ratio Converter unit in detail, some general features of a Uni-panel should be noted pertaining to possible problems if control of an SQ-1000 unit cannot be obtained.

The Uni-Panel has a number of set-up features that are important to know about. These set-up features are permanently stored in EE-prom such that once they are set up there should be little or no need to change them again.

Pressing certain keys on the Uni-Panel while the unit is being powered up activates the set up modes. If the Uni-Panel is locally situated on the front of a Uni-Box, then the whole Uni-box must be re-powered while the set-up keys are pressed in. If the Uni-panel is remotely sited, then it may be easier to re-power the panel only by disconnecting and reconnecting the 9W D type, while the set-up keys are being pressed.

In the following text the terminology “**slot 0**” refers to the PCB system on the Right Hand side looking from the **rear** of the Uni-Box.

The terminology “**slot 1**” refers to the PCB system on the Left Hand side looking from the **rear** of the Uni-Box.

First Birthday:

Pressing switches 1 and 10 together when power-up happens will cause a 1st Birthday to occur. This will clear the EE-prom to 00h, **and consequently put the panel into ‘Local’ mode and lose all the SQ-1000 start-up data and the user set device names.** Re-powering will however put the system into a sensible default mode.

After EE-Prom is cleared, the message ‘EE-OK’ will appear on the LCD display and the host systems must be restarted by a total power down.

Protocol Change:

Pressing switches 3 and 8 together when power-up happens, will cause the panel protocol to toggle between ‘Eyeheight 2 wire local talk’ and RS422. If the panel is remotely sited ‘RS422’ is required. If the panel is on the front of a Uni-Box then ‘Local’ is required.

Slot Identification Text:

Pressing switches 5 and 6 together when power-up happens, will cause a mode to be entered such that the "user slot text" can be changed and stored in EE-prom.

The Text is displayed when a user uses SW 1 to switch between
slot 0/1. This announces that now you are controlling, for example ‘Studio1 ARC’ or ‘EDIT 1 ARC’.

The default text after a first birthday is ‘Dev 1’ for slot 0 and ‘Dev 2’ for slot 1.

To change the text for slot 0, enter this mode by powering up with sw 5 and 6 pressed. You will now see the Slot 0 text (Dev 1). adjust character under the underscore by moving the ‘adj.’ digipot. To move the underscore use the ‘menu’ digipot.

When you have completed the slot 0 text, press sw 10 (Flashing led). this will then do the same for the slot 1 text. When this is complete press
SW 10 and after a few seconds re-power the system.

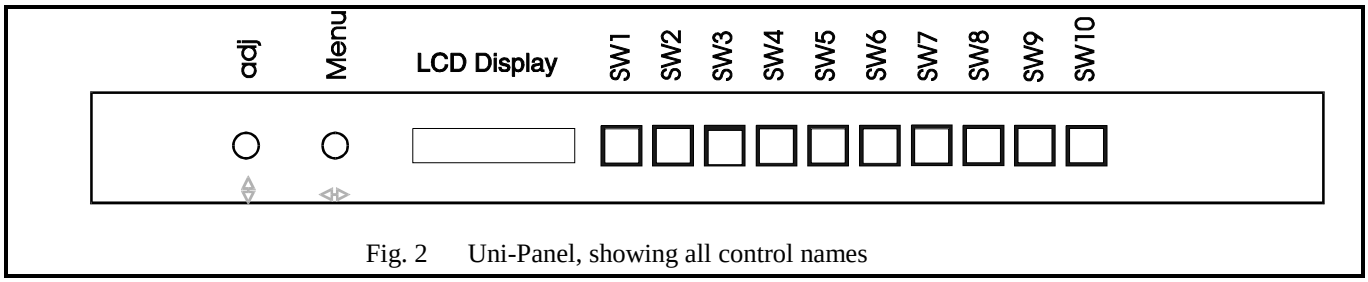


Fig. 2 Uni-Panel, showing all control names

Operation of the SQ-1000 Aspect Ratio Converter

The SQ-1000 is controlled from the 10 front panel switches as follows:

SW 1 - Device Select	This button toggles between the Two possible systems being controlled by the Uni-Panel. In the case where there is only one SQ-1000 system installed, this button does nothing. If a second SQ-1000 was installed in the second slot, control would toggle between the two SQ-1000 Aspect Ratio Converters.
SW 2 - 4/3 Aspect	This button selects a 4/3 Aspect ratio from a 4/3 source. Another words it is a bypass mode. In this mode the Full 10 bit resolution is maintained for the unit.
SW 3 - 16/9 Letterbox	This button converts From 16/9 Widescreen format to a 16/9 Letterbox viewed on a Standard monitor.
SW 4 - 16/9 Widescrn	This button converts From a 16/9 Letterbox format viewed on a Standard Monitor to a 16/9 Widescreen format. It effectively does the reverse of the above button. (Sw 3)
SW 5 - 14/9 Letterbox	This button converts From 16/9 Widescreen format to a 14/9 Letterbox viewed on a Standard monitor. In this mode horizontal magnification is used and therefore approximately 5% of the picture is lost on each edge.
SW 6 - Memory 1	There are 4 Memories which can be used to store 4 User Preset Aspect Ratios. These are not lost on power down. In order to Store a User Aspect Ratio the Setup mode must be entered (See Sw10)
SW 7 - Memory 2	See above
SW 8 - Memory 3	See above
SW 9 - Memory 4	See above
SW10- Setup	This button is used to enter the setup mode. Entering Setup mode is done by

	keeping this button pressed in for more than 2 Seconds. This mode enables the User to set up his or her own user presets and gives full control of vertical and horizontal size and position. For a full explanation see the section titled “Setup Mode”.

Full Menu Set

This set of set-ups is adjusted using the “Menu” and “adj” knobs while observing the LCD Display on the front of the Uni-Panel.

MENU (SELECT -“MENU” KNOB)	EFFECT (CHANGE-“ADJ” KNOB)
< ASpect list>	This will Toggle through all the List of preset aspect ratios available to the user. (Except the user defined aspect ratios in Memories 1-4)
horz pos=<nnn>	This enables adjustment of the horizontal position. The units are in luminance pixels. (720 per full screen width)
vert pos= <nnn.	This enables adjustment of the vertical position. The units are in video lines. (576 per full screen height)
Horz Size= <nnn>	This enables the adjustment of the picture width. The units are in luminance pixels. (720 per full screen width). This is ONLY adjustable in SETUP mode
vert size= <nnn>	This enables the adjustment of the picture height. The units are in video lines. (576 per full screen height). This is ONLY adjustable in SETUP mode
Left Blank= <0-15>	This will adjust the blanking position on the left hand side of the picture
Right Blnk= <0-15>	This will adjust the blanking position on the left hand side of the picture
HAK level <0-7>	This introduces variable horizontal aperture correction from 0-7.
VAK level <0-9>	This introduces variable Vertical aperture correction

	from 0-7.
insert edh <on-off>	Inserts an EDH Checksum into the final output stage. It can be switched on or off.
GPIS are <on-off>	There are 2 input GPI's that call up Memories 1 and 2 respectively. They can be enabled or disabled with this menu.
Mon Op= <X+R+B+G> <X+V+U+Y> <Y+C+X+X> <cvbs+X+X+X>	This menu changes the Analogue Video options available from the Four Analog BNC Connectors at the rear of the unit. NOTE THAT NOT ALL ANALOGUE OUTPUT TYPES ARE AVAILABLE SIMULTANEOUSLY.
Chroma level=<0-127>	This adjusts the chroma level on the CVBS and the Y/C Analogue outputs. 127 is maximum chroma and 0 is monochrome
Vitc on cvbs= <on/off>	This option decides whether vertical interval information from lines 10-19 in 525, and lines 15-22 in 625, are to be allowed through on the CVBS output.
Min Delay= <on/off>	In normal operation this is OFF and the unit has exactly one frame delay. In Minimum Delay Mode (ON) the unit has approximately 125 Line delay. This is useful for situations where the Audio is not being delayed with the Video. NOTE THAT IN MINIMUM DELAY MODE THE AUXILIARY DATA MAY NOT BE PASSED THROUGH THE UNIT TRANSPARENTLY.
Luma Clipper= <on/off>	This provides the user with the option of clipping the luminance at dec 940 (0.7V) in the whites and dec 64 (0V). This keeps the luminance within analogue "Legal" Limits. This is particularly useful to suppress ringing caused by the effect of the vertical and horizontal aperture correctors
Auto Bypass= <on/off>	With Auto Bypass on, the system will automatically

	bypass all processing when in 4/3 (Bypass) mode. This means that in 4/3 mode the Luma clipper and the aperture correction and the noise reduction will be unusable in this mode. (i.e. what comes in will be exactly what comes out of the unit, but one video frame late.)
Vert Blank=<0-3>	This will blank out 0 to 3 lines of picture, on each field, at top of the picture. This is because certain data information often appears here (for example Line 23 Wide Screen Signalling or Closed caption data) and it is undesirable to have them visible in the aspect ratio converted picture.
Embedded Ctl = <List>	The four pre-set memories on the SQ-1000 can be used remotely by the use of embedded control. There are 2 styles of embedded control 1…WSS (Wide Screen Signalling). This enables the unit to be controlled from the data in the first half of line 23 according to either the ETSI 294 Specification, or the UK modified Line 23 Specification. 2… VLI (Video Index). This enables the unit to be controlled from the data SDI data on line 11/324 according to either the UK modified SMPTE 186 Video Index specification. 3… The “Off” setting will disable embedded control.
WSS=<ETSI294/UK_L23>	This selects the WSS mode to be either the ETSI specification or the UK modified version.
Map mem1 to <afd0-7>	This selects the “Compartment” within the “Active Format Descriptor” of the Embedded data from which Memory 1 will respond. For example if the AFD of 5 is

	sent within the embedded data, and Memory 1 is set to map to AFD 5 then Memory 1 will be recalled
Map mem2 to <afd0-7>	This selects the “Compartment” within the “Active Format Descriptor” of the Embedded data from which Memory 2 will respond. For example if the AFD of 5 is sent within the embedded data, and Memory 2 is set to map to AFD 5 then Memory 2 will be recalled
Map mem3 to <afd0-7>	This selects the “Compartment” within the “Active Format Descriptor” of the Embedded data from which Memory 3 will respond. For example if the AFD of 5 is sent within the embedded data, and Memory 3 is set to map to AFD 5 then Memory 3 will be recalled
Map mem4 to <afd0-7>	This selects the “Compartment” within the “Active Format Descriptor” of the Embedded data from which Memory 4 will respond. For example if the AFD of 5 is sent within the embedded data, and Memory 4 is set to map to AFD 5 then Memory 4 will be recalled

Operation of the SQ-1000 Aspect Ratio Converter

The unit has two modes of operation, *User mode* and *Setup Mode*. Setup mode is described in a later section.

In user mode there are 4 preset aspect buttons. These are

- 4/3, bypass mode
- Widescreen to 16/9 Letterbox
- 16/9 Letterbox to Widescreen
- Widescreen to 14/9 Letterbox (625) or cropped 16/9 (525)

Pre-set Aspect Ratios

Further explanations of these are given below:

4/3 (Bypass mode)

This mode basically leaves the picture unchanged. In this mode all “picture modifiers” such as aperture correction, Noise reduction, Luma clipping are also bypassed. The delay from input to output will be 1 Frame in normal mode and approximately 125 Video lines in Minimum delay mode.

If Auto Bypass is ON, then in 4/3 mode all Picture modifiers will be disabled, ensuring that a true bypass is selected. With Auto bypass OFF, the user can still process the picture using the Picture modifiers. (HAK,VAK, Clip etc)

Widescreen to 16/9 Letterbox

This mode converts a Widescreen picture (as viewed on a 16/9 monitor) into a 16/9 letterbox as viewed on a 4/3 Monitor. In order to maintain the correct aspect ratio, the picture is squeezed vertically, inserting black at the top and bottom of the picture. The horizontal magnification is not changed.

16/9 Letterbox to Widescreen

This mode converts a 16/9 letterbox as viewed on a 4/3 Monitor into a Widescreen picture (as viewed on a 16/9 monitor). In this case the picture is vertically magnified to keep the correct aspect ratio. The horizontal magnification is not changed. This is basically the inverse to the “Widescreen to 16/9 Letterbox” button above.

Widescreen to 14/9 Letterbox (625) or cropped 16/9 (525)

This button performs a different function dependent on whether the input is 525 or 625 lines.

In 625 lines this button does a Widescreen to 14/9 Letterbox conversion. This requires a Widescreen (16/9) picture on the input of the device. When the output of the device is seen on a 4/3 monitor it will have the correct aspect ratio, with black inserted at the top and bottom of the picture and the each edge missing 4% of the picture. The purpose of the (Largely European) 14/9 format is to provide a conversion with smaller black bands at the top and bottom of the picture at the expense of losing a small amount of the picture edge.

In 525 lines this button does a Widescreen to 16/9 Crop. Essentially this requires a Widescreen (16/9) picture on the input of the device. The output of the device when viewed on a 4/3 monitor will be the correct aspect ratio, but approximately 16% of the picture edge

are lost on each side. The picture can then, if desired, be panned using the “Hor Pos” Menu to obtain the part of the picture with the scene action.

At the current time these are considered to be the most widely used aspect ratios.

These four buttons can be further modified by some (but not all) of the menus in the full menu set. For example the position and aperture correction can be adjusted while in this mode whereas horizontal and vertical size cannot be changed in this mode.

Picture Modifiers

The following is a list of further modifying parameters:

Horizontal Position (Hor Pos=)

When the unit performs horizontal reduction to the source picture, the user can use this menu to

Aperture Correction (VAK=, HAK=)

This unit is provided with a Vertical and Horizontal 3 Pixel luminance aperture correction system. This will subjectively “Sharpen up” the picture independently in the vertical and horizontal directions. It is best to adjust these depending on the picture content. The user needs to be aware that overuse of this will cause “Ringing” (Overshoots and undershoots) on the picture. (See “Luma Clipper” Below)

Luma Clipper (Luma Clip=)

The Luma clipper has been provided to keep the Digital signal within the limits of Analogue luminance Legality (0V-0.7V). This is particularly useful when the user is using aperture correction as this may cause the signal to go analogue “Illegal”, due to overshoots and undershoots.

Left and Right Picture Blanking (Right Blank= Left Blank=)

This enables the user to blank the Left and right edges of the picture and replaces it with digital black. This can be useful in certain aspect ratio conversions that cause the extreme edges of the picture to end up in a more central position in it’s destination format. This means that any edge tearing, or edge artefacts, that normally would have been “Unseen” by the viewer on an overscanned Television set may become visible. The edge blanking can be wound in to cover this up.

Minimum Delay Mode (Min Delay=)

Minimum delay mode has been provided largely for picture monitoring situations where the audio is left unprocessed. Because the delay in this mode is only 1/250th second, for normal viewing the audio stays “More or less” in sync. The intended uses are for Audience monitoring of Widescreen signals on 4/3 Monitors or for example Simple VHS Dubs.

It is worth knowing that in Minimum delay mode not all of the auxiliary information is passed cleanly (i.e. vertical and horizontal blanking). And also VITC will not be passed through on either the SDI or the CVBS outputs of the device.

Luminance Clipper (Luma Clip=)

With the Luma Clipper ON, the unit will clip the Luminance to Analogue “Legal” Levels. (0V-0.7V). This is particularly useful if using large amounts of aperture correction which may cause Undershoots or Overshoots on the luminance signal. The Clipper will stop these Undershoots and overshoots going “Illegal”.

Auto Bypass Mode (Auto Bypass=)

With Auto Bypass on, the system will automatically bypass all processing when in 4/3 (Bypass) mode. This means that in 4/3 mode the Luma clipper and the aperture correction and the noise reduction will be unusable in this mode. (I.e. what comes in will be exactly what comes out of the unit, but one video frame late). With Auto Bypass ON, the unit will also put in a pre-defined amount of aperture correction whilst in reduction or Magnification. This is used to “Sharpen up” the look of the picture in order to compensate for the natural filtering required to reduce or magnify the picture.

With Auto Bypass OFF, the user is free to adjust all the picture modifiers without any “Automatic” Correction.

Embedded Control (embedded ctl=)

Embedded control is the ability of the aspect ratio converter to respond to data in the incoming SDI signal. This data is used to control the aspect converter remotely. Embedded data is widely used in the UK Transmission chain to signal to remote regions the aspect ratio conversion required for the incoming feeds.

There are two basic forms of embedded data that is used in the UK. These are “Wide Screen Signalling” (WSS) and “Video Index”, (VLI). This menu chooses between the styles of embedded data that the SQ-1000 will respond to.

WSS Format (WSS=)

There are two forms of WSS used in the UK. This is the Original ETSI 294 Specification which was designed for PAL+ Wide screen signalling and also the more recent UK Line 23 Standard which is specifically orientated around Digital Terrestrial Television.

With the UK Line 23 Specification provision has been made for the “Active Format Descriptor” (AFD). This is a number from 0-7, which indicates how the picture should be displayed on a 4:3 or a 16:9 glass.

The original ETSI Specification also has a number from 0-7 but this indicates different information relevant to PAL+. We have called this number the “AFD” for the purposes of the SQ-1000 functionality even though this is technically incorrect.

Memory Mapping (map mem{x} to afd{y})

The incoming AFD number (0-7) is used to call up a Memory from 1-4 by using these menus. Each of the 4 Memories has a Menu and may be mapped to respond to any one of the 7 AFD Values in the incoming Embedded Data.

Setup Mode and User Memories

The unit also has four “User defined Memories”. These are labelled as Mem <1-4>. They can be used to set up user defined states of the machine rather than using the preset buttons. In user mode the user simply hits the button to recall the memory.

Setup Mode is used to set up new states of the Aspect Ratio Converter into the four User Memories. You enter the setup mode by pressing the setup key for more than 2 seconds before releasing it.

Once you are in setup mode the four LEDS flash on the memory buttons. You can now use the Menu and adjust keys to set up the full menu set in any way the user desires.

Once the User has set up the required state, it can be saved in a memory. One of the four memory buttons can be hit, which will prompt a “Save or Abort” message. To save the setting press the memory button again. Aborting a save can be done at any time by pressing the setup button to bring the user into “User mode”.

Below is a list of the features that are stored in the memories:

Feature	Stored	Not Stored
Horizontal Position	▩	
Vertical Position	▩	
Horizontal Size		

Vertical Size	▩	
	▩	
Left Blanking		▩
Right Blanking		▩
Horizontal Aperture Correction	▩	
Vertical Aperture Correction	▩	
EDH Insertion		▩
GPI Enable		▩
Monitoring Output Video		▩
Monitoring Output Chroma Level		▩
Minimum Delay Mode		▩
Luma Clipping		▩
Auto Bypass		▩

List of Parameters that are retained in the Memory Presets

GPI Operation

There are Two external Triggers (GPI's) that can remotely change the state of the Aspect Ratio Converter. These are called GPI1 and GPI2. They can be triggered by a short to ground on the RS422 remote 9W D type at the rear of the unit. Pin 4 is GPI1 and Pin 6 is GPI2. Ground is available on Pin 1 and 9 of the connector.

Activating GPI1 will cause the System to change to the Memory 1 Setting.
Activating GPI2 will cause the System to change to the Memory 2 Setting.

The GPI's are edge rather than state sensitive, and will automatically be mapped out on power up. (If a GPI is permanently ON, i.e. always shorted to ground by accident, the software will recognise this and always ignore it, even on power up of the unit).

The GPI's can be enabled or disabled by the software on the appropriate menu on the full menu set. The GPI enable status is always remembered after power down. The Memories do not store the GPI enable status (Otherwise this could cause them to automatically disable themselves!!)

Assembly of the SQ-1000 PCB into a Uni-box.

Normally a system will be assembled and set-up at the factory, However a user may wish to move cards from one Uni-Box to another and change user settings from time to time.

The procedure for assembling a SQ-1000 into a Uni-Box is as follows:

1)... Remove the mains from the Uni-Box.

2)... Remove the blank rear cover, by unscrewing the six M2.5 screws at the rear slot. If there is already one PCB Subsystem in the rear of the unit there will only be one rear blank cover over Slot 1 and this will be on the LEFT looking from the rear of the unit. If for and reason there are NO PCB Subsystems in this Uni-Box, then the SQ-1000 MUST be inserted into Slot 0, which is the Right Hand slot looking from the rear.

3)... Insert the SQ-1000 PCB into the slot and affix the six M2.5 screws.
Take care not to snag the Coaxial cables as you do this, the connections are delicate.

4)... Re-apply the mains to the Uni-Box and the systems will start-up.

5)... On start-up you should now get the message “SQ-1000 V1.0”
either once or twice depending on whether there are one or two
SQ-1000 PCBs in this Uni-Box. On the first power-up you should also observe the message “EE-upload” rather than the usual EE-download message on the LCD Display of the Uni-Panel.

6)... Refer to the “Slot Identification text” section of this manual under “Uni-Panel” set-up for instruction on how to personalise the name of the Aspect Ratio Converter (e.g. “ARC 1”)

SQ-1000 RS422 And GPI Connection

This is the Pinout for the 9W D-type RS422 Connector

Pin 1	Ground 0V
Pin 2	Tx-
Pin 3	Rx+
Pin 4	GPI 1
Pin 5	+12V dc Power (UP-1000)

Pin 6	GPI 2
Pin 7	Tx+
Pin 8	Rx-
Pin 9	Ground 0V

A short to ground (Pin 1) activates a GPI.

SQ-1000 AES Audio and Timecode Connections

This is the Pinout for the 15W High Density D-type AES and Timecode Connector.

THIS IS CORRECT FOR ISSUE 3 PCB's

Pin 1	Timecode GND
Pin 2	Timecode Input +
Pin 3	Timecode Input -
Pin 4	Timecode Output +
Pin 5	Timecode Output -
Pin 6	AES Input +
Pin 7	AES Input -
Pin 8	AES Delay Output +
Pin 9	AES Delay Output -
Pin 10	AES GND
Pin 11	Analogue Audio Out Left +
Pin 12	Analogue Audio Out Left -
Pin 13	Analogue Audio Out Right +
Pin 14	Analogue Audio Out Right -
Pin 15	Analogue Audio GND

SQ-1000 AES Audio and Timecode Connections

This is the Pinout for the 15W Standard Density D-type AES and Timecode Connector.
THIS IS CORRECT FOR ISSUE 4 PCB's

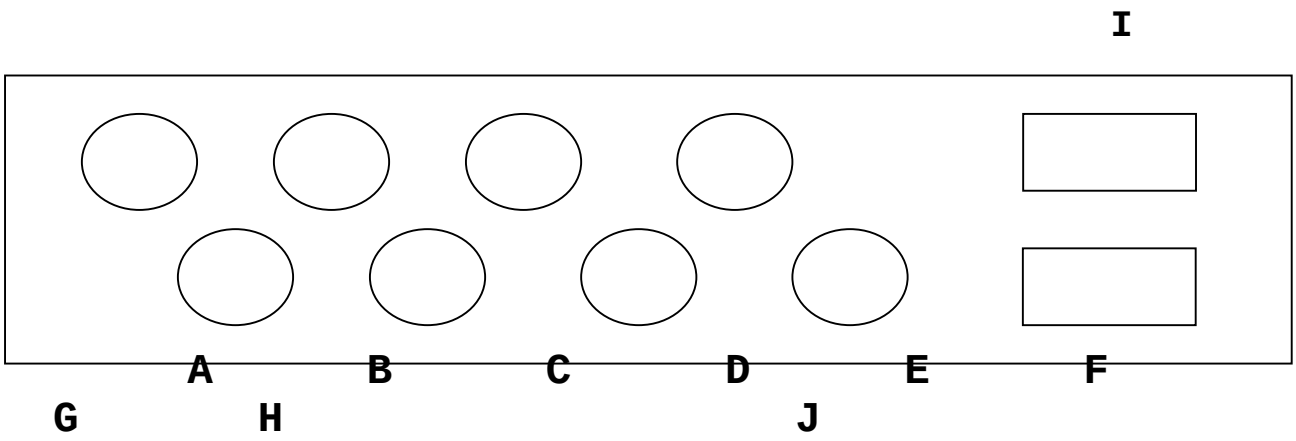
Pin 1	Analogue Audio GND
Pin 2	Analogue Audio Out Right +
Pin 3	Analogue Audio Out Left +
Pin 4	AES Delay Output -
Pin 5	AES Input -
Pin 6	Timecode Output -
Pin 7	Timecode Input -
Pin 8	Timecode GND
Pin 9	Analogue Audio Out Right -
Pin 10	Analogue Audio Out Left -
Pin 11	AES GND
Pin 12	AES Delay Output +
Pin 13	AES Input +
Pin 14	Timecode Output +
Pin 15	Timecode Input +

User Jumpers on the SQ-1000 PCB

The Following is a list of the User Jumpers on the Aspect Ratio Converter PCB (Issue 3)

Jumper	Function Of Jumper	Status
LK1	Computer Reset	Do Not Jumper
LK2	Firmware Load Input	Must Jumper
LK3	Firmware Load Output	Must Jumper
LK4	Syncs Off on Analogue “Y” or “G” Output	User Selectable
LK5	Firmware Load Post-processing	Must Jumper
LK6	Audio Clock Select	Must Jumper (Centre-In)
LK7	Remote Uni-Panel +12Volts Power Enable	User Selectable
LK8	GPI 1 Enable	User Selectable
LK9	GPI 2 Enable	User Selectable

Rear Panel Connections



A	Serial Digital Input
B	Serial Digital Active Loop Through
C	Serial Digital Output 1, with failsafe relay bypass from input A
D	Serial Digital Output 2
E	Analogue Output 4 Y/Green/Off
F	Analogue Output 3, Cb/Blue/Off
G	Analogue Output 2, Cr/Red/ Chroma (C)
H	Analogue Output 1, CVBS/CVBS/Luma (Y)
I	RS422, Uni-Panel Connection
J	AES EBU/Timecode/Analogue Audio Connections