TView Pro AV
USER'S MANUAL
Rev. 2.01

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1 Introduction

The FOCUS Enhancements TView Pro AV product family is a series of products that produce standard, recordable NTSC or PAL base band video from High-Resolution Computer Graphics devices.

The TView Pro AV automatically senses the input resolution and frequency of the incoming Computer Graphics signal and transforms the resolution of input Computer Graphics to full screen, 24 bit color, NTSC or PAL Video. The TView Pro AV performs this transformation without disturbing the input Computer Graphics signal in any way; High-Resolution Computer Graphics appears on the System's Computer Graphics Monitor (using a buffered loop-through) exactly as if the TView Pro AV was not there.

The TView Pro AV's output is fully broadcast compatible, with the ability to Genlock to a reference video or black burst signal. Independent adjustments allow full control over H phase and subcarrier phase.

1.1 The TView Pro AV Family

The TView Pro AV Product Family consists of one common technology implemented on a common circuit board. Depending on the specific model, different ICs and accessories are added to the base product to provide specific options.

1.1.1 Board or Desktop or Rackmount

TView Pro AV units are configured as Board Units (PCI boards) or Desktop Units or Rackmount Units. The Board Units mount inside the PC and receive their electrical power from the computer.

Desktop Units are stand alone items that accept 12 VAC power from a UL listed power supply. Users of Desktop TView Pro AVs may choose between American compatible, wall mount transformers, with standard American plug configuration (shipped automatically with Pro AV Desktop, NTSC orders) or deskmount universal power supplies (shipped with Pro AV Desktop orders). Desktop universal power supplies terminate in an IEC-320 connector (the same connector that you see on the back of PC computers). You must supply the wall outlet to IEC-320 cable.

TView Pro AV is also available in an EIA 19 inch rack mount configuration. The TView Pro AV-R occupies 1 standard rack height. All TView Pro AV-R models are capable of accepting power in the range of 95 V - 250 V, 47Hz. to 63 Hz. FOCUS Enhancements does not supply the IEC-320 to wall outlet cable.

1.1.2 IBM or Mac or Workstation

The TView Pro AV is compatible with IBM PC (ISA) computers, MAC computers and many popular workstations. The same Desktop unit may be used with any personal computer or workstation, however the appropriate cable kits must be ordered. The Pro AV is shipped with a PC cable and a Mac Adapter Kit. Any cable or cable kit may be ordered separately at a later date.

In the IBM family, the Pro AV supports VGA and super VGA devices in all VGA standard modes (640 x 480, EGA, Text and 320 x 200 modes, all 800 x 600 modes from 56 - 76 Hz Vertical Non-Interlaced, all 1024 x 768 modes from 60 - 76 Hz and all 1280 x 1024 modes from 60 - 76 Hz Vertical Non-Interlaced. The 1024 x 768 Non-Interlaced modes of the XGA-2 are also supported.

In the Macintosh family, The Pro AV supports 640 x 480, 66.7 Vertical Non-Interlaced mode (Applecolor High-Resolution RGB Monitor, often referred to as the 13" display) and the 1024 x 768, 66.7 Hz Vertical Non-Interlaced mode (AppleVideo RGB Monitor, often referred to as the 21" display).

In addition to IBM PC and Macintosh video formats, the TView Pro AV also accepts computer video in popular workstation formats as well (up to its 1024 x 768 limit). The TView Pro AV is capable of decoding a separate composite synchronization signal, as well as a composite sync signal embedded in the green signal. The correct cable kit is required for successful use with a workstation.

1.1.3 Standard Packout for TView ProAV (Desktop) (SKU #444-5310)

1 TView ProAV desktop unit
1 American Wall Transformer
1 BNC Male – BNC Male cable
1 BNC Female – RCA Male adapter
1 S-VHS Male to S-VHS Male cable
1 HD-15 Male – HD –15 Female cable
1 TView Pro AV Remote Control
2 AAA Batteries
1 Tview Pro AV Manual

1.1.4 Standard Packout for TView ProAV International (Desktop) (SKU #444-5312)

1 TView ProAV desktop unit
1 IEC-320 International Power Supply
1 BNC Male – BNC Male cable
1 BNC Female – RCA Male adapter
1 S-VHS Male to S-VHS Male cable
1 HD-15 Male – HD –15 Female cable
1 TView Pro AV Remote Control
2 AAA Batteries
1 Tview Pro AV Manual

1.1.5 Standard Packout for TView ProAV (Desktop) (SKU #444-5330)

1 TView ProAV rackmount unit
1 BNC Male – BNC Male cable
1 BNC Female – RCA Male adapter
1 S-VHS Male to S-VHS Male cable
1 HD-15 Male – HD –15 Female cable
1 TView Pro AV Remote Control
2 AAA Batteries
1 Tview Pro AV Manual

1.1.6 Accessory Items

The following items may be ordered separately as accessories:

444-5906	HD15 Male – 5 BNC Male Cable (PC)
444-5907	HD15 Female – 5 BNC Male Cable (PC)
444-5908	DB-15 Male – 5 BNC Male Cable (Mac)
444-5909	DB-15 Female – 5 BNC Male Cable (Mac)
444-5910	13W3 Male – 5 BNC Male Cable(Sun)
444-5914	5 BNC-Male – 5 BNC Male Extender Cable
3201-0901	RS-232 Control Cable

1.2 Operational Specifications

1.2.1 Input Resolutions

All original IBM VGA Modes

640 x 480	72 Hz.	(S-VGA Vesa Spec. VS900101)
640 x 480	75 Hz.	(S-VGA Vesa Spec. VGMT)
800 x 600	56 Hz.	(S-VGA Vesa Spec. VG900601)
800 x 600	60 Hz.	(S-VGA Vesa Spec. VG900602)
800 x 600	72 Hz.	(S-VGA Vesa Spec. VS900603)
800 x 600	75 Hz.	(S-VGA Vesa Spec. VGMT)
1024 x 768	60 Hz.	(S-VGA Vesa Spec. VG901101)
1024 x 768	70 Hz.	(S-VGA Vesa Spec. VS910801)
1024 x 768	75 Hz.	(S-VGA Vesa Spec. VGMT)
1024 x 768	60-76 Hz.	(IBM XGA-2 Non-Interlaced modes) (requires 9515 or 9517 monitor)
640 x 480	66.7 Hz.	(AppleColor High-Resolution 13" RGB Monitor)
1024 x 768	60 Hz.	(AppleVideo 21" RGB Monitor)

Or any computer video resolution up to 1024x768 at up to 120Hz.

All workstation modes in the range of 640 x 480 to 1024 x 768

THE TVIEW PRO AV DOES NOT SUPPORT INTERLACED INPUT.

1.2.2 Input Color Capability

All input formats are internally converted, and processed as 24 bit RGB signals. The TView Pro AV is therefore capable of handling an input color space of up to 16.8 million colors.

1.2.3 Output Resolutions

NTSC
484 displayed lines vertically
Underscan/Overscan Switch selectable

PAL
576 displayed lines vertically
Underscan/Overscan Switch selectable

1.2.4 Digital Flicker Reduction Filter

A Digital Flicker Reduction Filter is a standard feature of all models of the TView Pro AV. The Flicker Filter may be engaged or disengaged by any one of the control methods.

1.2.5 TView Pro AV Connectors (Desktop Model)

(with reference to TView Pro AV)

Computer Video Input	HD15 Male
Computer Video Output	HD15 Female
Composite Video Output	Female BNC (Female RCA optionally available)
S-Video	Mini-Din 4 position female
Genlock	Female BNC
Component	Female BNC
RS-232/422	Female DB9
Power	2.5 mm Barrel Connector male

1.2.6 Power Consumption

Desktop Unit:

120 V.	0.25 A.
240 V.	0.15 A.

1.2.7 Physical Size

Desktop Unit:

7.5" X 7.25" X 2.0”"

1.2.8 Environmental

Temperature:

Operating:	0 – 40 degrees Celsius
Non-Operating:	-40 to 70 degrees Celsius

Humidity:

Operating:	15% to 80% non-condensing
Non-Operating:	10% to 95% non-condensing

Altitude:

Operating:	-500 to 15000 ft. ASL
Non-Operating:	-1000 to 50000 ft. ASL

Electromagnetic:

Susceptibility:	EN50082-1
Radiation:	CISPR 22 (1993-12), FCC Class B

2 Installation

Installation of all TView Pro AV products is a simple and quick procedure, but is slightly different for each of the following versions.

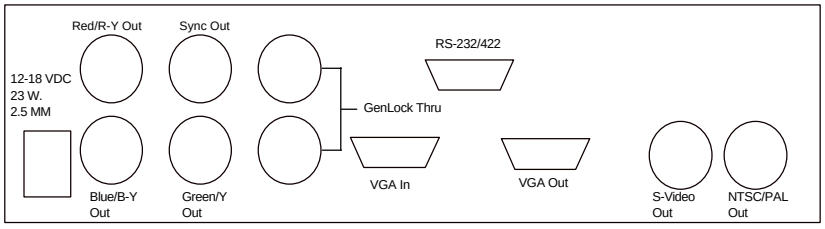

Figure 1: TView Pro AV Desktop Back Plate Diagram

2.1 PC Desktop Version

All TView Pro AV Desktop Units will work with IBM PC family computers. Units are shipped with a PC cable, and Macintosh Adapter. Workstation cables can be ordered.

Follow these steps to install your Desktop TView Pro AV for PC or MAC systems. If you intend to use the TView Pro AV with Genlock or component output please see Appendix C (Genlock operation) and Appendix D (Component output) for further information on these features.

1. Turn the computer off.

2. Select a convenient location for the TView Pro AV.

3. Disconnect the Computer Display from the Graphics Card on the Computer .

4. Connect one end of the PC video cable into the graphics card on the computer (The location from which the computer display was removed). Connect the other end of the cable into the VGA In connector of the TView Pro AV

5. Connect the Computer Display to the VGA Out Connector of the TView Pro AV..

6. Connect your Video Device to the Composite Video and/or S-Video output connector. (You may connect both outputs simultaneously to the same or different Video Devices: Video is always available on both these outputs.)

7. Plug the 12 VAC Power Supply's jack into the TView Pro AV's power input (marked 12-18 VDC, 23W, 2.5 mm).

8. Plug the 12 VAC Power Supply into an electrical outlet. (If you have a Universal Power Supply, you will have to supply an appropriate IEC-320 compatible power cord for your country).

9. Turn the TView Pro AV On.

10. From the Front Panel or RS-232/422 control, set the Sync Selection to "IN= VGA SYNC". (See section 3.1.19 for additional details on Sync Selection.)

11. Turn the System On. If everything is correctly installed, you will see your computer's normal power up sequence appearing on both the Computer Display and the Video Device (if the Video Device has a visible display).

2.2 MAC Desktop Version

Follow these steps to install your Desktop TView Pro AV for Macintosh systems. If you intend to use the TView Pro AV with Genlock or component output please see Appendix C (Genlock operation) and Appendix D (Component output) for further information on these features.

1. Turn the computer off.

2. Select a convenient location for the TView Pro AV.

3. Disconnect the Computer Display from the Computer Graphics device at the Computer Graphics device.

4. Using the Macintosh Adapters connect one end of the PC video cable into the graphics card on the computer (The location from which the computer display was removed). Connect the other end of the cable into the VGA In connector of the TView Pro AV

5. Using the Macintosh Adapter connect the computer display to the video out connector on the TView Pro AV

6. Connect your Video Device to the Composite Video and/or S-Video output connector. (You may connect both outputs simultaneously to the same or different Video Devices: Video is always available on both these outputs.)

7. Plug the 12 VAC Power Supply's jack into the TView Pro AV's power input (marked 12-18 VDC, 23W, 2.5 mm).

8. Plug the 12 VAC Power Supply into an electrical outlet. (If you have a Universal Power Supply, you will have to supply an appropriate IEC-320 compatible power cord for your country).

9. Turn the TView Pro AV On.

10. From the Front Panel or RS-232/422 control, set the Sync Selection to "IN= MAC SYNC". (See section 3.1.19 for additional details on Sync Selection.)

11. Turn the System On. If everything is correctly installed, you will see your computer's normal power up sequence appearing on both the Computer Display and the Video Device (if the Video Device has a visible display).

2.3 Sun or SGI Desktop Version

Follow these steps to install your Desktop TView Pro AV for SGI or Sun systems. If you intend to use the TView Pro AV with Genlock or component output please see Appendix C (Genlock operation) and Appendix D (Component output) for further information on these specialty items.

1. Turn the computer off.

2. Select a convenient location for the TView Pro AV.

3. Disconnect the Computer Display from the Computer Graphics device at the Computer Graphics device.

4. Connect the HyperCableGOLD-13W,13W3M-HD15F cable into the Computer Graphics Device. Connect the other end of the HyperCableGOLD-13W,13W3M-HD15Fcable into the VGA In connector of the TView Pro AV.

5. Connect the HyperCableGOLD-13W,HF15M-13W3F cable into the VGA Out connector of the TView Pro AV.

6. Connect the Computer Display to the female end of the HyperCableGOLD-13W,HF15M-13W3F cable.

7. Connect your Video Device to the Composite Video or S-Video output connector. (You may connect both outputs simultaneously to the same or different Video Devices: Video is always available on both these outputs.)

8. Plug the 12 VAC Power Supply's jack into the TView Pro AV's power input (marked 12-18 VDC, 23W, 2.5 mm).

9. Plug the 12 VAC Power Supply into an electrical outlet. (If you have a Universal Power Supply, you will have to supply an appropriate IEC-320 compatible power cord for your country).

10. Turn the TView Pro AV On.

11. From the Front Panel or RS-232/422 control, set the Sync Selection to "IN= MAC SYNC" or "IN= GRN SYNC", depending on whether your workstation delivers separate composite sync (also referred to as 4 wire) or composite sync on green (also referred to as 3 wire). As a general rule, Sun systems are 4 wire, SGI systems are 3 wire and all other workstation (DEC, HP, IBM, etc. are 3 wire). See section 3.1.19 for additional details on Sync Selection.

12. Turn the System On. If everything is correctly installed, you will see your computer's normal power up sequence appearing on both the Computer Display and the Video Device (if the Video Device has a visible display).

2.4 Workstation Desktop Version

Follow these steps to install your Desktop TView Pro AV for Workstations that use BNC connectors for output video. If you intend to use the TView Pro AV with Genlock or component output please see Appendix C (Genlock operation) and Appendix D (Component output) for further information on these specialty items.

1. Turn the computer off.

2. Select a convenient location for the TView Pro AV.

3. Disconnect the Computer Display from the Computer Graphics device at the Computer Graphics device.

4. Connect the BNC connectors of the Cable, HD15 M to 5 BNC M cable into the Computer Graphics Device. Connect the other end of the Cable, HD15 M to 5 BNC M cable into the HD15 F to F, Genderchanger. Finally connect the other end of the HD15 F to F, Genderchanger into the VGA In connector of the TView Pro AV.

5. Connect another Cable, HD15 M to 5 BNC M cable into the VGA Out connector of the TView Pro AV. Finally connect the BNC Connectors of the Cable, HD15 M to 5 BNC M into the Display Device.

6. Connect your Video Device to the Composite Video or S-Video output connector. (You may connect both outputs simultaneously to the same or different Video Devices: Video is always available on both these outputs.)

7. Plug the 12 VAC Power Supply's jack into the TView Pro AV's power input (marked 12-18 VDC, 23W, 2.5 mm).

8. Plug the 12 VAC Power Supply into an electrical outlet. (If you have a Universal Power Supply, you will have to supply an appropriate IEC-320 compatible power cord for your country).

9. Turn the TView Pro AV On.

10. From the Front Panel or RS-232/422 control, set the Sync Selection to "IN= MAC SYNC" or "IN= GRN SYNC", depending on whether your workstation delivers separate composite sync (also referred to as 4 wire) or composite sync on green (also referred to as 3 wire). As a general rule, Sun systems are 4 wire, SGI systems are 3 wire and all other workstation (DEC, HP, IBM, etc. are 3 wire). See section 3.1.19 for additional details on Sync Selection.

11. Turn the System On. If everything is correctly installed, you will see your computer's normal power up sequence appearing on both the Computer Display and the Video Device (if the Video Device has a visible display).

3 TView Pro AV controls and adjustments

There are several parameters on the TView Pro AV that can be controlled through by the TView Pro AV's control interfaces. TView Pro AV models have three methods of control: front panel control, RS-232/422 and IR remote control. All methods are interchangeable and simultaneously active (i. e. a front panel button push can be followed by an IR remote control command).

Not all controllable items are accessible by the IR remote mouse. This provision is deliberately intended to prevent the user of an IR remote mouse from accidentally changing the video standard from NTSC to PAL, etc., at a critical moment in a presentation.

Additional adjustments to functions that are likely to accessed infrequently - or are intended to be adjusted by service personnel only - are available in the form of potentiometers, variable capacitors and jumpers on the TView Pro AV board itself. Access to these internal adjustments requires the removal of the TView Pro AV's cover.

3.1 TView Pro AV Interface Controllable Functions

The following parameters are accessible using the TView Pro AV's control interfaces. Each of the controls has one of three possible types of parameters associated with it, Toggle (the function is either on or off), Multiple Choice (there are several, mutually exclusive options) or Range (the parameter varies over a range of values for a particular function). Section 4 details the use of each of the Control interfaces.

3.1.1 Horizontal/Vertical Position (Range)

This control enables the user to position the converted Computer Graphics with respect to the output television. The actual functioning of this control is dependent on the state of the Zoom function. If Zoom is off, H/V Position enables minor changes in position of the full screen image. If Zoom is on, H/V position functions as a pan and scroll control, positioning the input window for zooming.

3.1.2 Horizontal/Vertical Size (Range)

This control enables the user to size the converted Computer Graphics with respect to the output television. The actual functioning of this control is dependent on the state of the Zoom function. If Zoom is off, H/V Size enables minor changes in size of the full screen image. If Zoom is on, the H/V Size Control is inactive. To properly size the PC output to the television screen follow these steps

1. Position the underscanned image to the top, left corner of the television screen
2. Toggle the Pro AV control panel to H,V Sizing
3. Use the IR remote control pad or arrow keys to size the screen both horizonally and vertically

3.1.3 Zoom (Toggle)

This control applies a 2X Zoom to a portion of the input Computer Graphics. The position of the window is determined by the H/V Position control.

3.1.4 Compression (Toggle) (Not available from IR remote mouse)

This control compresses the Television Output in the vertical direction. It is similar to the Underscan control, except that it is operational in the vertical direction only.

3.1.5 UnderScan (Toggle)

This control selects whether Underscan is applied to the Television Output. An "UnderScanned" picture slightly shrinks the whole display such that information in the corners is visible. Select “UNDERSCAN” when you have text or detail oriented pictures that requires you to preserve fine detail in the corner regions of the display. An "OverScanned" picture fills the entire area of the screen, which is the natural way of presenting material in television. Select “OVERSCAN” to present photo-realistic and animation oriented material.

3.1.6 Terminate VGA (Toggle)

This control connects the TView Pro AV's 75 Ohm termination resistors onto the computer's RGB output lines. Select “TERMINATED” unless you are using the TView Pro AV with a pass through monitor cable (such as a HyperCable-PC, intended for use with the Pro AVCP product line).

3.1.7 Fine Genlock H Position (Range) (Not available from IR remote mouse)

This control adjusts the relative horizontal picture position of the Television Output with respect to a Reference Television signal. This control is only operational when using the Genlock capability of the TView Pro AV.

3.1.8 Coarse Genlock H Position (Range) (Not available from IR remote mouse)

This control adjusts the relative horizontal picture position of the Television Output with respect to a Reference Television signal. This control is only operational when using the Genlock capability of the TView Pro AV.

3.1.9 Genlock Subcarrier Phase (Range) (Not available from IR remote mouse)

This control adjusts the relative Subcarrier Phase of the Television Output with respect to a Reference Television signal. This control provides slightly more than 180 degrees of variable phase control and most be used in conjunction with the Genlock Subcarrier Phase Reverse Control to establish 360 degrees of phase control. This control is only operational when using the Genlock capability of the TView Pro AV.

3.1.10 Genlock Subcarrier Phase Reverse (Toggle) (Not available from IR remote mouse)

This control selects 180 degrees of Television Output Subcarrier Phase shift with respect to a Reference Television signal. This control is only operational when using the Genlock capability of the TView Pro AV.

3.1.11 Genlock Termination (Toggle) (Not available from IR remote mouse)

This control applies a 75 Ohm termination to the Genlock input. This control is always operational.

3.1.12 NTSC/PAL (Toggle) (Not available from IR remote mouse)

This control selects between PAL and NTSC operation. Set this control to PAL for European operation. Set this control to NTSC for American operation.

3.1.13 Sharpness (Flicker Reduction Filter) (Toggle)

This control operates the Flicker Reduction Filter. Set Sharpness "Off" (also referred to as Flicker Off) to reduce the amount of flicker in the output NTSC or PAL. Set “SHARPNESS ON" to maximize the vertical sharpness. (Use maximum sharpness for displays that have already been prepared for Interlaced operation, i. e. photo-realistic image oriented presentations or animations). Use "FLICKER OFF" to reduce the flicker of Text and GUI oriented applications (such as the Windows Desktop).

3.1.14 Luminance Filter (Toggle) (Not available from IR remote mouse)

This control operates the Luminance Bandwidth Filter. Set “L FILTER ON” to reduce the effects of aliasing when using the higher resolutions and vertical refresh rates (e. g. 1024 x 768 at 75Hz.). Set “L FILTER OFF “ to preserve the highest possible luminance bandwidth.

3.1.15 Brightness Boost (Toggle) (Not available from IR remote mouse)

This control applies a Brightness Boost to the Television Output. Set “BRIGHT MAX” to raise the brightness of the Television Output. Set “BRIGHT NORM” to set the Television Output to regulation brightness level.

3.1.16 Saturation Attenuation (Toggle) (Not available from IR remote mouse)

This control applies a Saturation Attenuation the Television Output. Set “COLOR MIN” to lower the saturation of the Television Output. Set “COLOR NORM” to set the Television Output to regulation saturation level. This control is useful in producing legal NTSC or PAL signals with highly saturated input program material.

3.1.17 Freeze Frame (Toggle)

This control freezes the output video of the TView Pro AV. Select “INPUT FROZEN” to freeze the picture. Select “INPUT LIVE” to view live input.

3.1.18 YUV /RGB Selection mechanism (Toggle) (Not available from IR remote mouse)

This control selects the color space of the component output. Select “RGB OUTPUT” for RGB appearing on the R-Y, Y and B-Y connectors respectively. Select “YUV OUTPUT” for BetaCam levels of R-Y, Y and B-Y appearing on the R-Y, Y and B-Y connectors respectively.

3.1.19 Sync Selection (Multiple) (Not available from IR remote mouse)

This control determines how the TView Pro AV will interpret input synchronization signals from the Computer Graphics device. Select “IN= VGA SYNC” for VGA input and other devices that provide 5 wire video signals (i. e. Red, Green, Blue, and H and V sync). Select “IN= MAC SYNC” for Macintosh input and other devices that provide 4 wire video signals (i. e. Red, Green, Blue, and a composite sync). Select “IN= GRN SYNC” for Workstation input and other devices that provide 3 wire video signals (i. e. Red, Green, Blue, with composite sync on Green).

3.1.20 Auto Reset

This control resets the TView Pro AV to its default settings. Default Settings are as follows:

Function	**Auto Reset Parameter Value**
Horizontal/Vertical Position	Best Factory Estimate
Horizontal/Vertical Size	Best Factory Estimate
Zoom	Off
Compress	Off
UnderScan	Overscanned
Terminate	TERMINATED
Fine Genlock H Position	Best Factory Estimate
Coarse Genlock H Position	Best Factory Estimate
Genlock Subcarrier Phase	Best Factory Estimate
Genlock Subcarrier Phase Reverse	0 degrees
Genlock Termination	Genlock input Unterminated
NTSC/PAL	as originally shipped
Sharpness	FLICKER OFF
LumaFilter	Off
Brightness Boost	Off
Saturation Attenuation	Off
Freeze Frame	INPUT LIVE
YUV/RGB Selection	RGB OUTPUT
Sync Selection	IN = VGA SYNC

3.2 Internal Adjustments

The following adjustments are internal adjustments. These control require the user to remove the TView Pro AV's cover and make the indicated adjustment with an adjustment tool.

3.2.1 Input Video Level VR5

This potentiometer adjusts the gain of the Input RGB Computer Video.

3.2.2 Output Video Level VR4

This potentiometer adjusts the gain of the Output Television RGB Video.

3.2.3 Input RGB Offset Level VR3

This control adjusts the Input Blanking level.

3.2.4 Output NTSC Pedestal VR2

This potentiometer adjusts the level of the NTSC Pedestal.

3.2.5 Sync on Y output Insertion JP6

This jumper determines whether composite sync is inserted on the Y output. Connect the 2 posts of this jumper together to produce sync on the Y output. Sync is always available on the dedicated component sync output connector. The factory default is Sync on Y selected (Jumper JP6 installed).

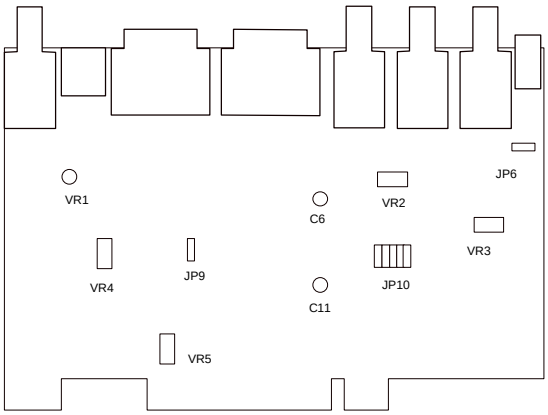

Figure 2: Adjustments and Jumpers

4 TView Pro AV Control Methods

TView Pro AV models can be controlled in one of 3 different ways: Front Panel, RS-232/422, or InfraRed Remote Control. The following sections detail the use of each of these control mechanisms. In all cases, the state of a particular function of the Pro AV-GOLD is indicated on the TView Pro AV's Front Panel LED readout.

4.1 Front Panel Control

The TView Pro AV Front Panel gives the user access to all of the control parameters detailed in section 3.1. Figure 3 indicates the placement of the buttons and LED display on the Front Panel of the TView Pro AV..

The controls are arranged such that the user can cycle through a circular list of controllable functions with the + or - buttons. Using the + button advances the controlled item to the next item in the list. Using the - button reverses the controlled item to the previous item in the list. Depending on the nature of the controlled item, the directional arrow buttons function differently.

If the controlled item is a Toggle (i. e. Underscan, Sharpness, NTSC/PAL, etc.) with a position of either On or Off, then the activation of any one of the arrow buttons will toggle the state of the controlled item.

If the controlled item is a Multiple Choice (i. e. Sync Selection) with several mutually exclusive positions, then the activation of any one of the arrow buttons will change the state of the controlled item to the next state. When the last state is reached, the next state will be the first state.

If the controlled item is a Range (i. e. Horizontal/Vertical Size, Horizontal/Vertical Position, Genlock H Position, etc), then the arrow buttons increase or decrease the value of these quantities. The increase or decrease is proportional to the length of time that the button is pressed.

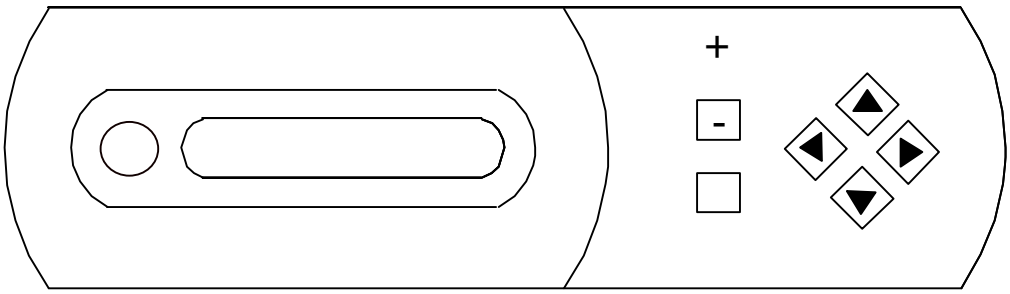

Figure 3: Position of Front Panel Controls

4.1.1 Locking the Front

A special combination of buttons (the Locking Sequence) makes it possible to freeze control input such that the TView Pro AV will not respond to Control Panel or IR remote or RS-232/422 commands until a second special combination of buttons (the Unlocking Sequence) is entered. If both the + and - buttons and the down arrow button are all pressed simultaneously, the LED readout will indicate "LOCKED" and all further input will be ignored until the Unlocking Sequence is entered. The Unlocking Sequence consists of the + and - and up arrow buttons all pressed simultaneously. Locking will persist even after the TView Pro AV is Power cycled. All input from the IR remote control will be ignored. The Unlocking Sequence may be delivered by the RS-232/422 link.

4.1.2 User Selected Auto Reset

A user selected Auto Reset may be programmed into the TView Pro AV via the Front Panel Control. If both the + and - buttons and the right arrow button are all pressed simultaneously, a User Reset memory will be loaded with the parameters that are in effect at the time that the above button combination is pressed. When the User Selected Reset is in effect, the LED readout will indicate "USER RESET" rather than "AUTO RESET". User Selected Auto Reset will persist even after the TView Pro AV is Power cycled. User Reset will affect the operation of all TView Pro AV control methods (i. e. Reset functions from RS232/422 and the IR Remote). The TView Pro AV Auto Reset may be returned to its factory default position by simultaneously pressing + and - and left arrow. Alternatively, Auto Reset may be returned to the factory default position from the RS232-422 link.

The factory selected default options described in section 3.1.20.

4.2 Remote Control

The hand held IR remote control enables the user to access many of the functions of the TView Pro AV. Since the IR unit is intended to be used in presentation situations, certain functions of the TView Pro AV may only be accessed via the Front Panel or via RS-232/422. This prevents the accidental use of some controls (i. e. switching from NTSC to PAL inadvertently in a presentation; a presentation disaster!) and keeps the interface simple. The Remote Control interface is indicated in Figure 3. The Remote Control is a line of sight device; the IR receiver is mounted inside the TView Pro AV next to the LED displays. The Remote Control will only operated when it is within the line of sight of the LEDs of the TView Pro AV. The maximum range is about 25 feet.

Several controls are available from the IR unit. Flicker Filter, UnderScan/Overscan, Freeze Frame, Auto Reset and Horizontal and Vertical Size, Position and Zoom. Of these, the first three controls (Flicker Filter, Underscan and Freeze Frame) are simple toggle switches that activate or de-activate the indicated function. Auto Reset performs a Reset to a known state (see section 4.2.2 below). Horizontal/Vertical Size, Position and Zoom cycles the function of the Directional button between Size, Position and Zoom Position. Depending on the state of the Size, Position and Zoom switch, the Directional Control will influence either the size, position or zoomed position of the converter output. In all cases, the currently operating function will be indicated on the LED display of the TView Pro AV.

4.2.1 Control Locking and Remote Control (not currently implemented)

The TView Pro AV has a Control Locking feature that freezes the operation of the Control (see section 4.1.1 above). When this function is enabled, the IR Remote Control is completely inoperative. (The LED Display will indicate "LOCKED" in this condition). The only way to restore control to the Remote Control Unit is to de-activate locking via the Front Panel or RS-232/422 link (see section 4.1.1 above).

4.2.2 Auto Reset with the Remote Control

The Remote Control unit will return the TView Pro AV to a known state (as indicated in section 4.1.2 above). The Auto Reset button on the Remote Control is the large button indicated in figure 4.

4.3 RS-232/422 Control

All of the functions detailed in section 3.1 are available from RS-232/422 control. Every TView Pro AV is operable in both RS-232 and RS-422, but must be correctly set up for each standard. When configured for RS-422, up to 8 TView Pro AVs may be connected in a single RS-422 wired system. The TView Pro AVs will react to controls that are delivered to a unique address that is programmed into each TView Pro AV via the Front Panel control.

When configured for RS-232, only a single TView Pro AV may be attached to the RS-232 link. The default configuration is RS-232.

Figure 4: Remote Control Interface

4.3.1 Configuring the TView Pro AV for RS-232 or RS-422

Jumper JP3 on the TView Pro AV's Control Interface board selects RS-232 or RS-422. Depending on the configuration of this jumper, the DB-9 communications connector located on the rear panel of the TView Pro AV will accept either RS-232 or RS-422.

Figure 5 indicates the positioning of Jumper JP3. In the case of RS-422, the user has the additional choice of selecting a 120 Ohm termination.

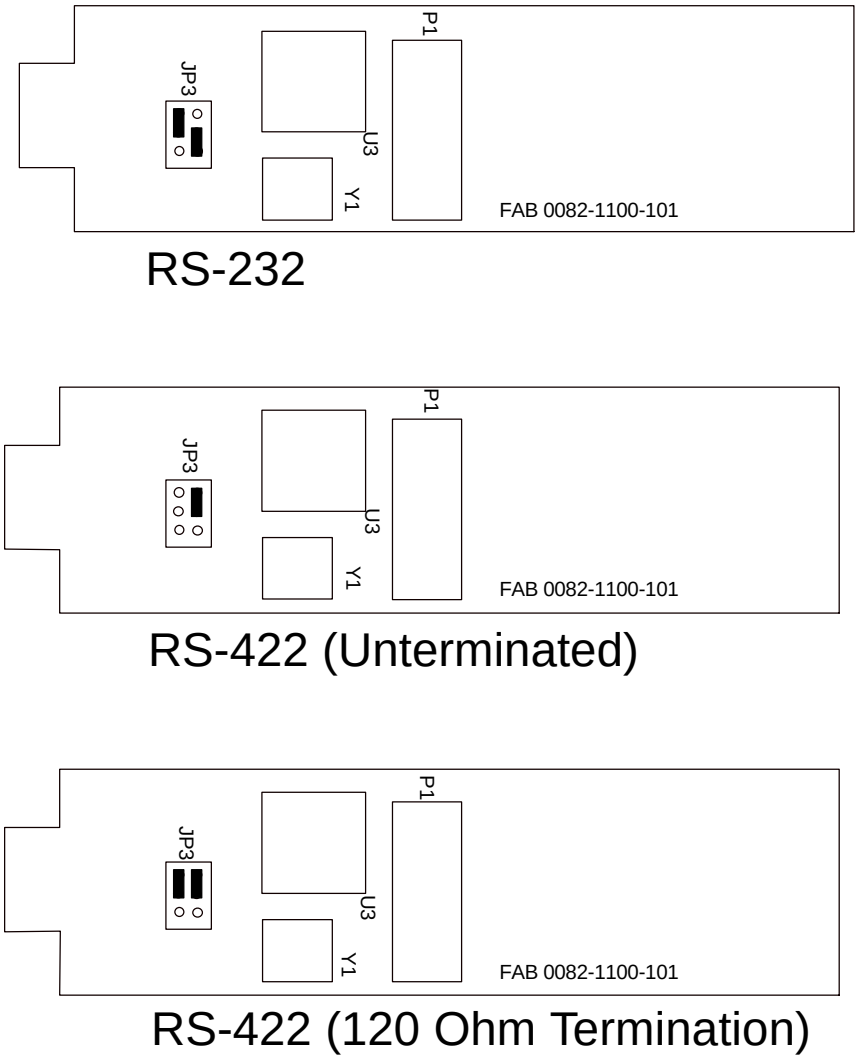

Figure 5: Position of Jumper JP3 for RS232 or RS422 Control

4.3.2 Connecting the TView Pro AV to communications devices

Slightly different connections schemes are required for RS-232 and RS-422 operation.

Figure 6 indicates the recommended connections from a DB-9 connector for RS-232 operation. Depending on the way that the controlling port is programmed, other connections may work as well. The TView Pro AV has no way of handling the RTS/CTS and DSR/DCD signals.

Figure 7 indicates the recommended connections from a DB-9 connector for RS-422 operation. In this case, a simple 9 pin to 9 pin cable will work in all cases.

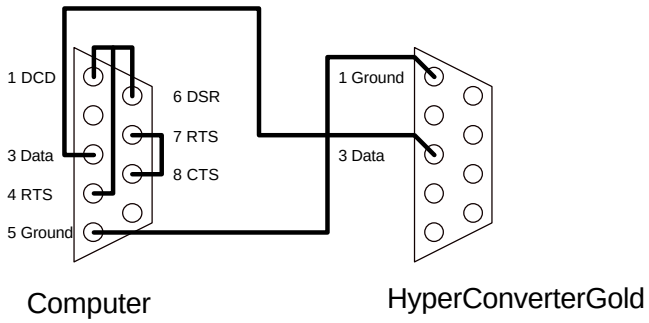

Figure 6: Recommended RS232 Wiring

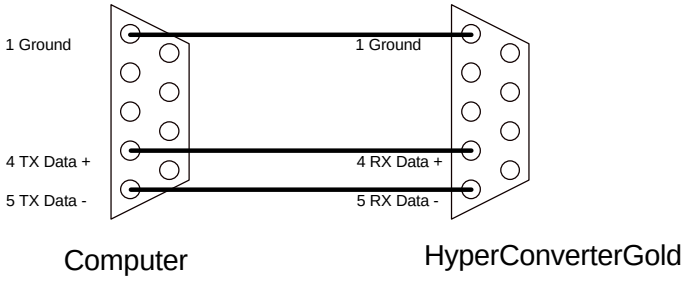

Figure 7: Recommended RS422 Wiring

4.3.3 Selecting the TView Pro AV's address

In an RS-422, there may be as many as 8 TView Pro AVs operating within a system. In order to provide a control mechanism to differentiate each TView Pro AV, the user must program each TView Pro AV's address using the Front Panel.

Programming the address is a simple procedure. Turn the TView Pro AV on, or cycle the control sequence such that the Power Up Identification is visible (i. e. Model 1024 or Model 1280) on the LED display. Press the Right Arrow Button. You will see the TView Pro AV's address indicated on the LED display. When you are finished, press either the + button or the - button. The TView Pro AV will remember its address until you change it in the same fashion.

The address circuitry is active even you are using the RS-232 link (which does not permit multiple Pro AVs or other devices to be connected in a multiple unit configuration). The default address is 0.

4.3.4 Sending Communications Commands to the TView Pro AV

The serial port of the TView Pro AV accepts serial data at 9600 baud, 8data bits, no parity bit, 1 stop bit. It is essential that the serial communications device that delivers commands to the Pro AV be set up in this fashion. M

The TView Pro AV accepts 8 bit characters as commands. The commands to turn the TView Pro AV on and off are received as strings of ASCII alphabetic characters and binary numbers. For the purposes of this manual, all ASCII characters and binary numbers will be referred to with the decimal numbering sequence (i. e. the minimum value of a byte is 0, the maximum value of a byte is 255, the value of an upper case A is 65).

The Command sequence for communicating with the TView Pro AV is as follows:

1) The Activation Command is given. The Activation Command consists of the character string: HCRONx (where x is the address of the TView Pro AV). The Activation Command (and all other commands) must be followed by a Carriage Return (ASCII character value of 13 decimal) to be accepted.

The following byte string (using decimal values for ASCII characters) indicates a valid Activation Command for a TView Pro AV previously programmed to be address 3:

72	67	82	79	78	03	13
H	C	R	O	N	3	<CR>

If the TView Pro AV receives any unexpected input before the reception of the Activation Command, it will ignore it. If it receives an unexpected byte during the transmission of the Activation Command, the Activation Command must be re-transmitted (the Activation sequence is reset).

2) Individual Commands are given. Any number of commands may be given after the TView Pro AV is activated. The TView Pro AV individual commands consist of 2 byte strings. Each 2 byte string is an internal Register Number Byte (23 registers exist) followed by a Value Byte. The Value Byte has a different meaning and legal range for each register. Each command (i. e. Register Number Byte, followed by Value Byte) must be concluded with a Carriage Return.

The Value Byte provides “absolute information” if the parameter in question is a Toggle or Multiple Choice Item. If the parameter in question is a range item, the Value Byte provides “relative information” incrementing or decrementing the existing value of that parameter by on count.

In addition to the above commands, two additional commands are provided for control information. Writing Value Byte = 01 to register 22 will cause an Auto Reset operation to occur. Writing Value Byte = 01 to register 23 will cause the existing parameter set to be written in to NOVRAM. The TView Pro AV will power up with these parameters until the NOVRAM is changed by writing another set of parameters.

The following table indicates the Register Functions, the Register Number, Parameter Type and action of the legal values of the Value Byte.

Register Name	**Number**	**Type**	**Value Byte Actions**		
Horizontal Position	1	Range	=01 increment,	=00 decrement	
Horizontal Size	2	Range	=01 increment,	=00 decrement	
Vertical Position	3	Range	=01 increment,	=00 decrement	
Vertical Size	4	Range	=01 increment,	=00 decrement	
Zoom	5	Toggle	=01 Zoom On,	=00 Zoom Off	
Compress	6	Toggle	=01 Comp On,	=00 Comp Off	
UnderScan	7	Toggle	=01 UnderScan,	=00 OverScan	
Terminate	8	Toggle	=01 Terminated,	=00 Unterminated	
Fine Genlock H Position	9	Range	=01 increment,	=00 decrement	
Coarse Genlock H Position	10	Range	=01 increment,	=00 decrement	
Genlock Subcarrier Phase	11	Range	=01 increment,	=00 decrement	
Genlock Subcarrier Phase Reverse	12	Toggle	=01 180 degrees,	=00 0 degrees	
Genlock Termination	13	Toggle	=01 Terminated,	=00 Unterminated	
NTSC/PAL	14	Toggle	=01 NTSC,	=00 PAL	
Sharpness (Flicker Filter)	15	Toggle	=01 Flicker Filter,	=00 Sharp	
LumaFilter	16	Toggle	=01 Filter On,	=00 Filter Off	
Brighness Boost	17	Toggle	=01 Boost On,	=00 Boost Off	
Saturation Boost	18	Toggle	=01 Boost On,	=00 Boost Off	
Freeze Frame	19	Toggle	=01 Freeze,	=00 Live Input	
YUV/RGB Selection	18	Toggle	=01 RGB,	=00 YUV	
Sync Selection	19	Multiple	=01 VGA,	=02 MAC,	=03 GRN
Reset	22		=01 Reset		
NOVRAM Save Parameters	23		=01 Save		

For example, the following byte sequences perform the indicated functions:

Output Set to PAL

14	0	13
NTSC/PAL register	0, therefore PAL	<CR>

Flicker Filter Turned On

7	1	13
Flicker Filter register	1, therefore On	<CR>

Decrement Horizontal Size

2	0	13
Horizontal Size	Decrement by 1	<CR>

Delay time between each transmitted character of a command does not matter. Each command will not be completed until the Carriage Return is received. If incorrect register numbers are given at the start of any command (i. e. byte with a register value greater than 23), the TView Pro AV will ignore that byte.

Special caution should be used when using the Save Settings Command (Register 23). Excessive repeated use of this command (i. e. inside an endless loop) will damage the TView Pro AV's Non-Volatile memory.

3) The De-Activation Command is given. When a TView Pro AV is used in an RS-422 system with several other TView Pro AVs, it will be necessary to De-Activate the currently selected TView Pro AV to issue commands to another TView Pro AV in the system. If you are using a single TView Pro AV, it will not be necessary to De-Activate the TView Pro AV.

The De-Activation Command consists of the character string: RSOFFx (where x is the address of the TView Pro AV). The De-Activation Command (and all other commands) must be followed by a Carriage Return (ASCII character value of 13 decimal) to be accepted.

The following byte string (using decimal values for ASCII characters) indicates a valid De-Activation Command for a TView Pro AV previously programmed to be address 3:

82	83	79	70	70	03	13
R	S	O	F	F	3	<CR>

If the TView Pro AV receives any unexpected input before the reception of the De-Activation Command, it will ignore it. If it receives an unexpected byte during the transmission of the De-Activation Command, the De-Activation Command must be re-transmitted (the De-Activation sequence is reset).

5 Hyperformance Utility Software

A DOS test program for IBM PCs, entitled Hyperformance, can be downloaded from the FOCUS Enhancements web site. If you would like to obtain a copy of Hyperformance, please log onto www.focusinfo.com. The Hyperperformance software is available at the downloads page which is in the Tech Support section of the website.

5.1 Hyperformance Components

Hyperformance Software consists of a DOS application program with some sample images.

The release contains the following files:

Hyperformance Test Software Disk

HYPER.EXE	Hyperformance Test Software
PICTURE8.PCX	A 256 color image
PICTURE4.PCX	A 16 color image

5.1.1 Installing and Running Hyperformance Tests Software

To install the software, copy the contents of the Hyperformance PC Test Software diskette to your hard disk, as follows:

COPY A:*.* C: or B:*.* C:

This command should copy HYPER.EXE, PICTURE8.PCX, and PICTURE4.PCX to your hard disk.

To execute the program, type "HYPER".

5.1.2 The Main Menu

Upon execution, the utility software displays the following menu:

PRO AV UTILITY SOFTWARE

1	Text Mode 720 x 400 (Mode 3 hex)
2	16 color 640 x 350 (Mode 10 hex)
3	16 color 640 x 480 (Mode 12 hex)
4	256 color 320 x 200 (Mode 13 hex)
5	16 color VESA 800x600 (Mode 102h)
6	256 color VESA 800x600 (Mode 103h)
7	16 color VESA 1024x768 (Mode 104h)
8	256 color VESA 1280 x 1024 (Mode 107H)

I	Images
C	Change Menu Color
S	Clear Screen
M	Display Menu
Q	Quit

Commands 1-8 set the Video Mode. The current video mode is always displayed at the bottom of the screen. The default video mode is Mode 12 Hex: 16 Color, 640 columns by 480 rows.

I	clears the screen and displays the Image Menu (see below).
C	clears the screen and displays a menu which allows you to select a different color for the menus (press ESC to leave this menu without changing the menu color).
S	clears the VGA screen of image and text.
M	redisplays the menu.
Q	leaves the utility software and returns to DOS.

5.1.3 The Image Menu

PRO AV TEST IMAGES

T	Page of Text
C	Color Bars
H	Chirp
P	Pattern
I	Picture
A	Ramp
K	Chroma Key Chart
M	Menu
S	Clear Screen
R	Return

T	Displays a Page of Text.
C	Displays eight vertical color bars.
H	Displays a Chirp Pattern.
P	Displays a Complex Black and White Pattern.
I	Displays a 16 or 256 color picture (the full picture is seen only in the 1024 x 768 mode; smaller resolutions display the upper left hand corner of the picture).
A	Displays a 16 or 256 grey shades ramp.
K	Displays a 16 or 256 color grid.
M	Redisplays the Image Menu.
S	Clears the screen.
R	Returns to the Main Menu.

5.1.4 Hyperformance Utility Software Error Messages

5.1.4.1 Not a Legal Command in TEXT MODE

The Page of Text is the only Image that can be displayed in Text mode. This error message will be displayed if you try to display any of the other Images in Text mode.

5.1.4.2 Picture8.PCX Not Found!

Picture8.PCX contains the Picture displayed in the 256 color modes. If this error message occurs, make sure the file PICTURE8.PCX is present in the current directory.

5.1.4.3 Picture4.PCX Not Found !

Picture4.PCX contains the Picture displayed in the 16 color modes. If this error message occurs, make sure the file PICTURE4.PCX is present in the current directory.

5.1.4.4 VESA Version n.n VESA CALL FAILED

This error occurs when the VESA driver with the indicated version number has been installed, but a call to the VESA software returns an error code. It indicates an incompatibility between the VESA driver and the VGA card.

5.1.4.5 VESA Driver Not Installed

The utility software uses the VESA TSR in the 1024x768 and 800x600 modes. If your attempt to use these modes results in this error message, make sure you have installed the VESA TSR (see above).

Appendix A - Limited Warranty

FOCUS Enhancements, Inc. warrants this product against defects in materials and workmanship for a period of THREE (3) YEARS from the date of original purchase.

If you discover a defect, FOCUS Enhancements, Inc. will, at its sole option, repair or exchange the product at no charge to you, provided you contact FOCUS Enhancements, Inc. Technical Support to obtain a Return Material Authorization (RMA) Number and instructions on where and how to obtain repair. Note that a copy of the bill of sale bearing the FOCUS Enhancements, Inc. serial numbers as proof of date of original purchase is required for each product returned for warranty service. Before returning product, remove all non-FOCUS Enhancements, Inc. RAM, accessories, and options. FOCUS Enhancements, Inc. cannot be liable for the return or care of any non-FOCUS Enhancements, Inc. products, nor accept responsibility for loss or damage of product in transit.

This warranty does not apply if the product has been damaged by accident, installation or removal of product, abuse, misuse, misapplication, accident, neglect, fire, water, lightening, or other acts of nature, failure to follow supplied instructions; has been modified, repaired or undergone attempted repair by unauthorized personnel without the written consent of FOCUS Enhancements, Inc.; has a serial number that has been removed, modified, or defaced. FOCUS Enhancements, Inc. reserves the right to use re-manufactured, refurbished, or used parts and components in making warranty repairs.

FOCUS Enhancements, Inc. products are designed to work with Windows™ and MacOS™ computers. Certain features of third-party software or hardware designed for the host system may not be available when used with this product. Accordingly, FOCUS Enhancements, Inc. does not warrant or represent that all third-party software or hardware will function error-free when used in conjunction with this FOCUS Enhancements, Inc. product.

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Some states do not allow the inclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may have other rights, which vary, from state to state.

Appendix B - Hyperformance Utility Software License

FOCUS Enhancements Corporation grants the user a 99 year license to use and reproduce the Hyperformance Utility Software. No restrictions in copying or using the software or its reproduced images are implied except that any video taped reproduction of any image developed or displayed by the Hyperformance Utility Software must be reproduced using a FOCUS Enhancements Pro AV product.

Appendix C – Genlock

All versions of the Pro AV can Genlock to a black burst, or active video external reference signal. Our usage of the word Genlock is the usage understood by professional Television Engineers. The Pro AV will lock Vertically, Horizontally and in color phase to the external reference signal. All Overlay, Chroma-Key, mixing functions, etc. must be accomplished by additional devices.

The suggested way to align Genlock is as follows:

Make sure that the Pro AV provides a properly aligned picture with respect to an ordinary television raster. (Since you have control over Horizontal and Vertical Size and Position, all 4 of these parameters must be properly aligned with a television raster before attempting Genlock).

Connect the Genlock reference signal into either one of the Genlock BNC connectors. Connect the other Genlock connector to the next device that you want to provide Genlock reference to. If the TView Pro AV is the last device in the configuration, select the Genlock Termination On from the Front Panel or RS-232/422 Communication. Otherwise, make certain that you select Genlock Termination Off. The 2 Genlock connectors are directly connected with no buffering.

Adjust the Genlock Horizontal Position (from the front panel or RS-232/422) for correct position of the converted video signal at the mixing point.

Adjust the Genlock Color Phase (from the front panel or RS-232/422) for the correct color phase of the converted video signal at the mixing point.

Appendix D - Component output

All versions of the Pro AV support two user selectable forms of component output. The TView Pro AV is factory configured for Betacam component (Y, R-Y, B-Y) and RGB (without 7.5 IRE units of video setup). In addition, component output synchronization may be provide as a separate, composite sync signal (4 wire) or as composite sync signal on the green output (3 wire). Other amplitudes of component output (i. e. M II) are available by special order.

Appendix E - FCC Compliance Statement

Note: This equipment has been tested and found to comply with the limits for a Class B Digital Device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against interference if installed and operated properly in a commercial environment. This equipment generates, uses and can radiate radio frequency energy, and if not properly installed and used in accordance with the instructions in this manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Only peripherals (computer I/O devices, terminals, printers. etc.) tested and complying with Class B limits should be attached to this device with shielded I/O cables.

Finally, any changes or modifications to the equipment by the user not expressly approved by the grantee or manufacturer could void the user's authority to operate such equipment.