Kramer VP-701/3/4XL

Manual

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1 DISCLAIMER

This product is intended for professional and/or home use. This product is not intended for use in a medical environment and does not have the required certifications for such use. Similarly, use aboard any aircraft or spacecraft while in flight or as an adjunct to any surface, airborne or marine navigation system or any offshore marine activity, including control of any watercraft, or any use similar to those specifically herein mentioned is prohibited. Use in the aforementioned circumstances would require additional testing and certification.

You have not become the owner of any software - you have merely purchased the right to use the software. You may make one copy of the software for your own use. Other copies will be deemed a breach of copyright.

No warranty is made either expressed or implied including but not limited to any implied warranties of merchantability or fitness for a particular purpose. In no event shall the supplier or manufacturer of this product be liable for errors found within, or be liable for any direct, indirect or consequential damages or loss in connection with the purchase or use of this hardware software or manual. The sole and exclusive liability to the supplier and manufacturer regardless of the form of action shall not exceed the replacement cost of the materials described herein.

By using this equipment you have indicated that you have agreed to the terms listed above. If you do not wish to agree or the above terms are contrary to your conditions of purchase you may return the equipment, unused, to your supplier. All trademarks and copyrights are acknowledged. E&OE.

See also the 'Limited Warranty ' and 'Exclusion of damages' at the back of this manual.

1.1   Regulatory Agency Acceptance

European 'CE' Mark Statement

Emissions: BS EN 61000-6-3:2001 (Generic Immunity Standard for Residential, Commercial and Light Industrial)
Immunity: BS EN 61000-6-1:2001 (Generic Immunity Standard for Residential, Commercial and Light Industrial)

1.2   FCC Statement

Class A Device: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide a reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and

used in accordance with the Instruction 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.

Caution: This equipment is intended for use in the manner prescribed in the Instruction Manual. Any user changes or modifications not expressly approved by Kramer Electronics could void the user's authority to operate the equipment. Connecting this equipment to external devices requires no specially shielded cabling for FCC compliance. The Instruction Manual shows or describes the proper connection of this equipment for operation that insures FCC compliance.

Direct all inquiries regarding FCC compliance to: **KRAMER ELECTRONICS, LTD.**

1.3 Manual Copyright Notice

This Operation Manual is the intellectual property of Kramer Electronics ©2007. No portion of this manual may be copied or reproduced in any manner or by any means, including, but not limited to electronic and electro-mechanical, without its express written permission.

2   IMPORTANT SAFETY INSTRUCTIONS

To insure the best from this product, please read this manual carefully. Keep it in a safe place for future reference.

To reduce the risk of electric shock, do not remove the cover from the unit.
No user serviceable parts inside. Refer servicing to qualified personnel.

2.1 Power and connections

This unit must be connected to a mains socket outlet with a protective earth connection.

This unit is not disconnected from the AC power source as long as it is connected to the wall outlet. The off state for this unit is called standby mode. In standby mode the unit is designed to consume a reduced quantity of power compared to normal operating modes.

When not using the unit for a long period of time, insure that the AC power cord is disconnected from the wall outlet.

The AC wall outlet should be installed near to the unit and be easily accessible.

Do not plug in or attempt to operate an obviously damaged unit.

2.2 Water and moisture

To reduce the risk of fire and personal injury, operation of this device outdoors and/or exposure to rain, water or excessive moisture is expressly prohibited.

The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

2.3 General care

Do not force switches or external connections.

When moving the unit, disconnect the serial port connections first then the power cable and finally the interconnecting cables to other devices.

Do not attempt to clean the unit with chemical solvents or aerosol cleaners, as this may damage the unit. Use a clean dry cloth.

2.4 Location

Installation of this unit should be in a cool dry place, away from sources of excessive heat, vibration, dust, moisture and cold.

2.5 Ventilation

Slots and openings in the sides of the unit are provided for ventilation. To ensure reliable operation, avoid obstruction of these openings and ensure the unit is installed in a well-ventilated area.

2.6 Intellectual property

Some IC chips in this product include confidential and/or trade secret property. Therefore you may not copy, modify, adapt, translate, distribute, reverse engineer, reverse assemble or decompile the contents thereof.

2 IMPORTANT: CONSIGNES DE SECURITE

Afin de tirer le meilleur de ce produit, merci de lire attentivement ce manuel. Gardez-le dans un endroit sûr pour pouvoir le consulter à nouveau.

Afin de réduire le risque de choc électrique, ne retirez pas l'unité de sa protection.

Aucune pièce réparable par l'utilisateur à l'intérieur. Référez-vous à des personnes qualifiées.

2.1 Alimentation électrique et connexions

Il faut brancher l'appareil sur une prise du secteur disposant d'une mise à la terre.

Cette unité n'est pas déconnectée de la source de courant électrique tant qu'elle est connectée à la prise murale. Le mode éteint de cette unité est appelé mode de veille. En mode de veille, cette unité est conçue pour consommer une quantité réduite de courant par rapport aux modes normaux d'utilisation.

Lorsque vous n'utilisez pas l'unité pendant une longue période, assurez-vous que le câble d'alimentation électrique est déconnecté de la prise murale.

La prise murale de courant doit être installée près de l'unité et aisément accessible.

Ne branchez pas et n'essayez pas d'utiliser une unité visiblement endommagée.

2.2 Eau et humidité

Pour réduire les risques d'incendie et de dommages corporels, l'utilisation de cet appareil à l'extérieur et/ou son exposition à la pluie, l'eau ou une humidité excessive est expressément interdite.

L'appareil ne doit pas être exposé aux gouttes ou aux éclaboussures et aucun objet contenant de l'eau, comme par exemple un vase, ne doit être posé sur l'appareil.

2.3 Entretien général

Ne forcez pas les boutons ou connexions externes.

Lorsque vous déplacez l'unité, déconnectez d'abord les connexions de ports en série puis le câble d'alimentation et enfin les câbles de connexion avec d'autres appareils.
N'essayez pas de nettoyer l'unité avec des dissolvants chimiques ou des produits nettoyants en aérosol, car cela peut endommager l'unité. Utilisez un chiffon propre et sec.

2.4 Emplacement

L'installation de cette unité doit se faire dans un endroit frais et sec, éloigné de sources excessives de chaleur, de vibrations, de poussière, d'humidité et de froid.

2.5 Aération

Les rainures et les ouvertures sur les cotés de l'unité servent à l'aérer. Pour permettre une utilisation sûre, évitez d'obstruer ces ouvertures et assurez-vous que l'unité est installée dans un endroit bien aéré.

2.6 Propriété intellectuelle

Certaines puces IC dans ce produit contiennent des éléments propriétaires confidentiels et/ou des secrets commerciaux. Vous ne devez donc pas copier, modifier, adapter, traduire, distribuer, démonter, désassembler, ou décomposer leur contenu.

2 INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Para sacar el mejor provecho de este producto, léase este manual con detenimiento. Guárdelo en un lugar seguro para poder hacerle referencia en el futuro.

Para reducir el riesgo de calambre, no quite la cubierta del aparato.

No hay piezas utilizables dentro. Remítase todo mantenimiento a personal cualificado.

2.1 Corriente y conexiones

Esta unidad debe estar conectada a una toma de corriente eléctrica con una conexión a tierra de protección.

Mientras esté conectada a una toma de electricidad, el aparato seguirá conectado a la fuente de corriente CA. A la posición de «off» de este aparato se le denomina posición de espera. En la posición de espera, el aparato está diseñado a consumir una cantidad reducida de electricidad en comparación con los modos de operación normales.

Asegúrese de desconectar el cable de corriente CA de la toma de la pared cuando no va a utilizar el aparato por un periodo largo de tiempo.

La toma CA de la pared ha de estar instalada cerca del aparato y debe ser fácilmente accesible.

No enchufe ni intente operar un aparato que esté evidentemente dañado.

2.2 Agua y humedad

Para reducir el riesgo de fuego o de daños personales, se prohíbe la utilización de este aparato en el exterior y/o su exposición a la lluvia, al agua o a atmósferas de excesiva humedad.

El aparato no debe situarse cerca de zonas en las que haya riesgo de goteo o salpicaduras. Tampoco deben colocarse objetos que contengan agua (jarrones, por ejemplo) en el mismo.

2.3 Cuidado general

No forzar interruptores o conexiones externas.

Al mover el aparato, desconecte las conexiones del puerto en serie primero, luego el cable de electricidad y finalmente los cables interconectados a otros aparatos. No intente limpiar el aparato con disolventes químicos o productos de limpieza aerosol, ya que podrían dañar el aparato. Utiliza un paño limpio y seco.

2.4 Ubicación

Este aparato se debe instalar en un lugar seco y fresco, lejos de fuentes de calor excesivas, la vibración, el polvo, la humedad y el frío.

2.5 Ventilación

El aparato viene provisto de ranuras y agujeros en los lados para la ventilación.

Para asegurar una operación eficaz, se debe evitar la obstrucción de estos agujeros y también asegurar que el aparato se instale en una zona con adecuada ventilación.

2.6 Propiedad intelectual

Algunos chips con circuito integrado de este producto incluyen propiedad confidencial y/o propiedad de secreto comercial. Por lo tanto queda prohibido copiar, modificar, adaptar, traducir, distribuir, usar técnicas retroactivas, desmontar, o recopilar los contenidos del mismo.

2 WICHTIGE SICHERHEITSVORSCHRIFTEN

Lesen Sie diese Bedienungsanleitung bitte sorgfältig, um Ihr Produkt optimal nützen zu können, und bewahren Sie sie zum späteren Nachschlagen an einem sicheren Ort auf.

Entfernen Sie bitte keinesfalls die Abdeckung, um der Gefahr eines Stromschlags vorzubeugen.

Im Inneren des Geräts befinden sich keine Teile, die vom Benutzer gewartet werden können. Lassen Sie Wartungsarbeiten nur von Fachpersonal durchführen.

2.1 Stromversorgung und anschlüsse

Das Gerät muss an eine geerdete Netzsteckdose angeschlossen werden.

Solange das Gerät mit einer Steckdose verbunden ist, bleibt die Stromversorgung aufrecht. Der Ausschaltzustand des Geräts wird als Standbymodus bezeichnet. Im Standbymodus verbraucht das Gerät weniger Strom als in den üblichen Betriebsarten.

Wird das Gerät über einen längeren Zeitraum hinweg nicht verwendet, ziehen Sie bitte das Stromkabel aus der Steckdose.

Die Steckdose sollte sich in der Nähe des Geräts befinden und leicht zugänglich sein.

Verbinden Sie ein offensichtlich beschädigtes Gerät keinesfalls mit einer Steckdose und versuchen Sie auch nicht, es zu bedienen.

2.2 Wasser und feuchtigkeit

Um die Gefahr eines Brandes oder einer Körperverletzung zu verringern, ist es ausdrücklich verboten, dieses Gerät im Freien in Betrieb zu nehmen und/oder es Regen, Wasser oder hoher Feuchtigkeit auszusetzen.

Das Gerät darf keinen Tropfen oder Spritzern ausgesetzt werden und es dürfen keine mit Flüssigkeiten gefüllte Behälter, wie Vasen, auf das Gerät gestellt werden.

2.3 Allgemeine pflege

Wenden Sie bei der Handhabung von Schaltern und Anschlüssen keine Gewalt an.

Beim Umstellen des Geräts entfernen Sie zuerst die seriellen Anschlüsse, dann das Stromkabel und zum Schluss die Verbindungskabel zu anderen Geräten.

Versuchen Sie keinesfalls, das Gerät mit chemischen Lösungsmitteln oder Sprayreinigern zu reinigen, da dies das Gerät beschädigen könnte. Verwenden Sie ein sauberes, trockenes Tuch.

2.4 Aufstellung

Das Gerät sollte an einem kühlen, trockenen Ort aufgestellt werden, fern von übermäßiger Wärme, Vibrationen, Staub, Feuchtigkeit und Kälte.

2.5 Belüftung

Seitliche Schlitze und Öffnungen sorgen für die Belüftung des Geräts. Um die ordnungsgemäße Belüftung zu gewährleisten, dürfen diese Öffnungen nicht verdeckt werden. Sorgen Sie außerdem dafür, dass das Gerät an einem gut belüfteten Ort aufgestellt wird.

2.6 Gewerbliches eigentum

Einige integrierte Schaltkreise in diesem Produkt enthalten vertrauliche

Informationen und/oder Betriebsgeheimnisse. Sie dürfen daher diese Inhalte nicht kopieren, modifizieren, adaptieren, übersetzen, verteilen, rückentwickeln, rückassemblieren oder dekompilieren.

2 BELANGRIJKE VEILIGHEIDSINSTRUCTIES

Lees deze handleiding zorgvuldig door om het beste uit uw product te halen. Bewaar het op een veilige plek voor raadpleging in de toekomst.

Haal nooit het omhulsel van de eenheid af, dit om de kans op een elektrische schok te verminderen. Maak het apparaat nooit open: er bevinden zich geen door de gebruiker in te stellen onderdelen in het apparaat. Laat service en onderhoud over aan een gekwalificeerde technicus.

2.1 Elektriciteit en aansluiting

Dit toestel moet worden aangesloten op een netcontactdoos met een aardsluitingsbeveiliging.

Deze eenheid is niet van de wisselstroom voedingsbron gescheiden wanneer de stekker nog in het stopcontact zit. Wanneer de eenheid uitstaat, staat deze nog in de stand-by modus. In de stand-by modus vergt de eenheid minder stroom dan in de normale "aan" modus.

Wanneer u de eenheid voor langere tijd niet gebruikt, zorg er dan voor dat de stekker van het wisselstroomsnoer uit het stopcontact is getrokken.

Het wisselstroom stopcontact moet dichtbij de eenheid geïnstalleerd worden en makkelijk toegankelijk zijn.

Als de eenheid duidelijk beschadigd is moet u deze nooit op het lichtnet aansluiten of bedienen.

2.2 Water en vocht

Om het risiko op brand en persoonlijk letsel te beperken is het gebruik van dit apparaat buiten en/of blootstelling aan regen, water of overdadige hoeveelheden vocht uitdrukkelijk verboden.

Het apparaat mag niet worden blootgesteld aan druppels of bespatting en er mogen geen objecten die gevuld zijn met vloeistoffen, zoals vazen, op het apparaat geplaatst worden.

2.3 Algemeen onderhoud

Forceer schakelaars of externe aansluitingen nooit.

Bij verplaatsing van de eenheid, de seriële poortaansluitingen eerst loskoppelen, dan de voedingskabel en als laatste de snoeren naar andere apparaten. Probeer de eenheid nooit met chemische oplosmiddelen of schoonmaakmiddelen in een spuitbus schoon te maken, omdat dit de eenheid kan beschadigen. Gebruik een schone droge doek.

2.4 Plaatsing

Deze eenheid moet geïnstalleerd worden op een koele droge plaats, uit de buurt van bronnen van extreme hitte, vibraties, stof, vocht en kou.

2.5 Ventilatie

De sleuven en openingen aan de zijkant van de eenheid zijn voor ventilatie. Zorg er voor dat de eenheid op een goed geventileerde plek geïnstalleerd wordt zodat deze betrouwbaar werkt.

2.6 Intellectueel eigendom

Sommige IC chips in dit product bevatten vertrouwelijke informatie en/of fabrieksgeheimen. U mag daarom de inhoud hiervan niet kopiëren, wijzigen, aanpassen, vertalen, verspreiden, nabouwen, of decompileren

3   DEVICE SUMMARY

3.1   Device Capabilities

All units are PC to video down-converters and feature a single video processing and scaling engine, with the VP-704XL also featuring video mixing, keying, Genlock source and fader capabilities.

These functions allow the flexibility for handling a wide range of inputs and outputs (both PAL and NTSC), depending on the unit used.

All units are at one in the home and broadcast & display environments. They offer a range of high-level image processing functions – with each model designed to fulfill a particular need.

The following is a summary of the main types of product available as marked on the front of each unit:

VP-701XL & VP-703XL Down Converters
Down converting an image is when a computer PC or HD input is inputted to the unit. The input signal is then converted into a suitable signal which can then be displayed for use on a video screen or television, such as composite video. Both of these units are identical in operation, except that the VP-703XL is in a 1U rack-mount case with a built-in power supply, and can be controlled via the RS232 port.

VP-704XL Down Converter with Overlay
This unit has all the features of a Down Converter, but it also has the added facility to superimpose the inputted computer image on top of an existing video signal. This is achieved with the unit's inbuilt facilities such as Keying, Picture in Picture (PIP), and Fading. This unit is also in a rack-mount case with built-in power supply.

3.2   Device Features

Simple Control
The unit can be controlled from the front panel using the transparent (soft) keys on the front of the unit or from an infra-red remote control

Upgradeability
All units benefit from firmware upgradeability, thus reducing product obsolescence by allowing the installation of the latest version of firmware.

3.3 VP-701XL

3.4 VP-703XL

3.5 VP-704XL

4   FRONT PANEL CONTROLS

The range of buttons on the front of the unit provides the user with quick access for selecting a variety of features.

The 5 main control buttons, with a 'MENU' button at the centre and left/right/up/down buttons surrounding it, provide the user with a way of navigating the on-screen-display (OSD) menu system.

Several other buttons on the front panel provide quick access to certain features of the unit.

4.1   VP-701XL & VP-703XL front panel
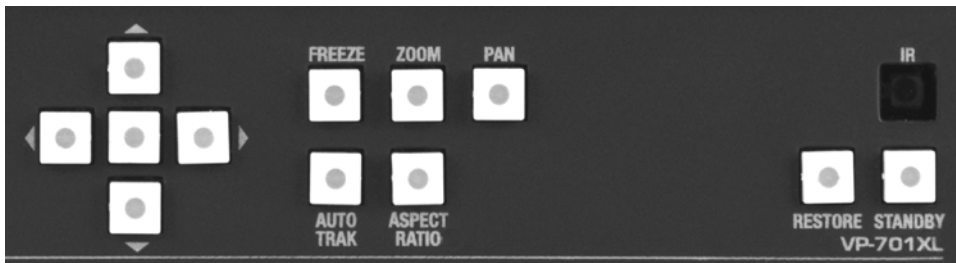
4.2   VP-704XL front panel
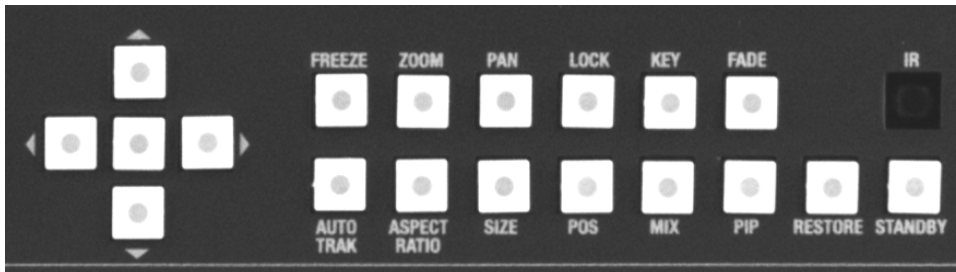
4.3   Button controls

A sub-set of the following buttons will be available on the front of the unit, depending on the model in use:

Button	Button Function
MENU (at the center of the arrow buttons)	Press once to show the on-screen display (OSD). Hold in to cancel the OSD. Hold in for longer to store the current settings.
FREEZE	Freezes the current image (does not affect any background image)
ZOOM	Jumps to the 'Zoom' menu item (also steps Zoom between 100%, 150%, 200% and 300% if OSD is not active)

PAN	Jumps to the Zoom pan menu item and allows immediate panning of a zoomed image using multi-directional switch.
AUTO TRAK	Activates Auto Track for the analog RGB input
ASPECT RATIO	Changes the aspect ratio of the output, by cycling between 3 different settings.
*SIZE	Jumps to the 'Shrink' menu item and allows immediate adjustment of PIP size.
*POS	Jumps to the Shrink pos % menu item and allows immediate adjustment of PIP position.
*LOCK	Sets Lock mode to Genlock. This locks the unit's output to the current Lock source. See 'Adjust outputs' menu details.
*KEY	Enables keying – see 'Adjust keyers' menu. (Key color defaults to black, so black foreground will disappear.)
*MIX	Sets Lock mode to Lock & Mix, to overlay onto the current Lock source. Use with the KEY and FADE buttons for more flexibility. A 2nd press will swap foreground and background. See 'Adjust outputs' menu details.
*FADE	Fades out the current image – fades back in on next press.
*PIP	Activate picture-in-picture mode. (Activates and deactivates the Shrink value in the 'Adjust windows' menu in the OSD)
RESTORE	Hold in briefly to restore to last-saved (power-on) defaults – this is useful to 'escape' from non-displayable configurations. Hold in for longer (two beeps) to perform a Factory reset of user settings.
STANDBY	Hold in to put the unit into Standby (power-save) mode. Hold in briefly to come out of Standby mode.

These buttons are included on VP-704XL only

4.4 Special button combinations and functions

Various button combinations are available to perform certain functions:

Info: *These buttons combinations only work when the unit is switched on and active i.e. with the STANDBY/ON LED off.*

4.4.1 Storing the current settings

Press and hold the centre 'MENU' button for a few seconds. This will store all settings in non-volatile memory so that they will be used as the default settings when next powered on.

4.4.2 Locking front panel buttons & IR remote control

This can be performed by pressing STANDBY/ON and FREEZE at the same time. All front panel buttons and IR remote commands will be disabled, with the exception of repeating the above combination to unlock the unit and for storing the current locked buttons setting (thus letting you make sure the unit always starts up with the buttons locked). The IR remote's LOCK and STORE buttons will always be active, giving another way to turn button/IR remote locking off.

The STANDBY/ON button will flash when the unit's buttons are locked.

4.4.3 Forcing NTSC output resolution

Press and hold the AUTOTRAK and FREEZE buttons together, then release.

4.4.4 Forcing PAL output resolution

Press and hold the AUTOTRAK and ZOOM buttons together, then release.

5   INPUTS AND OUTPUTS

The units have different video inputs and outputs depending on your model.

5.1   VP-701XL & VP-703XL rear panel
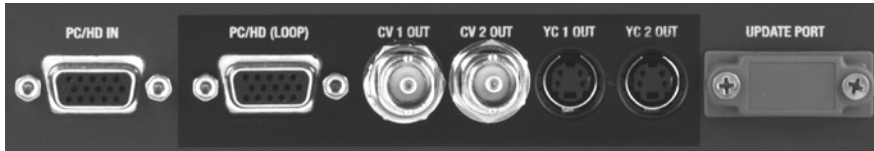
(Not shown is the VP-701XL's 12v DC input, nor the VP-703XL's AC mains input.)

5.2   VP-704XL rear panel
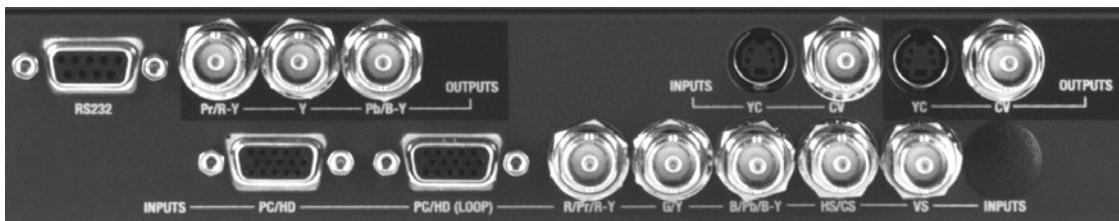
(The VP-704XL's AC mains input is not shown)

5.3   Computer inputs/outputs

The PC/HD input can accept:

> Analog RGBHV
> RGsB (sync on green)
> YUV/YPbPr (including tri-level)

In most cases, the particular input being used will be auto-detected. See 'Adjust sources' for more information on manually selecting an input type.

The VP-704XL unit has a second 5 x BNC input and also CV and YC Genlock inputs.

The PD/HD (LOOP) connection is directly connected to the PC/HD input internally so that a PC monitor may still be attached. No scaling or image alteration is performed on the PC/HD (LOOP) output.

5.4   Video Genlock inputs (VP-704XL only)

CV and YC inputs can accept either standard NTSC or PAL inputs – for example, from a video camera, VCR, DVD player, gaming device, etc. PAL and NTSC detection is automatic.

5.5   Video outputs

The CV and YC outputs always function simultaneously and can be set to either standard NTSC or PAL – see 'Adjust outputs' for more information.

The VP-701XL and VP-703XL both have dual CV/YC outputs – all four connections are active simultaneously, showing identical images.

The VP-704XL also has a YPbPr output (that can also be switched to RGsB) on 3 BNC connectors.

5.6   RS232 control

All units have an RS232 connector, however the VP-701XL does not support control over this port – it is purely there for updating firmware.

The VP-703XL and VP-704XL can both be controlled using a serial protocol as detailed later in this manual (currently, no application control is available).

6   INFRA-RED REMOTE CONTROL

Your unit is compatible with infra-red remote controls as shown below:

Resets back to
power-on defaults

Stores current
settings

Selects input:
1/2/3=RGB/CV/YC

Enables Keyer

Enables
Lock & Mix mode

Fades in/out

Starts AutoSet

Locks the
IR & panel buttons

(Not used.)

Selects flicker
reduction level

Sets Shrink/PIP
size & position

Navigates through
the menu structure
& changes values.

Adjusts current
menu values.
Left/right alter
current value and
up/down alter the
next value

Toggles between
zoom & pan mode

Toggles freeze
on and off

Selects the next
zoom level and
zoom menu

Activates PIP /
Shrink mode

The transmit range of the remote control depends on many factors, but is designed to be fairly directional. Therefore you should always aim it directly towards your unit.

The IR remote control can be disabled in the System menu. This can be used in situations where multiple units respond to the same remote control or are located close to one another.

7 MENU LAYOUT AND SETTINGS ADJUSTMENT

From here on, we'll be looking at the menu structure employed in the series and, more importantly, the individual menu items that allow you to take advantage of the power of the unit.

You'll be using the MENU ↓ and ↑ buttons and the on-screen display (OSD) to view the options and settings available to you. The OSD can be activated by pressing the MENU button once. Holding the MENU button in for a short while will then close the OSD.

Whilst the OSD is active, use the ↓ and ↑ buttons to change where you are in the menu. Go into a sub menu by pressing the MENU button once. To exit a sub menu, scroll using the ↓ or ↑ button to the end of the sub-menu to reveal Exit. Push in the MENU button to exit the sub menu.

You can edit a value in brackets '[ ]' by pressing the MENU button once (you'll note that the brackets surrounding a particular parameter's value will begin to flash). Change the value by using the ↓ and ↑ buttons to decrease and increase the value respectively. Then finalize your adjustment by pressing the MENU button once more.

A few menu items have multiple parameters within an individual menu selection. In those cases, you can adjust one item, and then move to the next, etc.

Info:	*Holding the MENU button in for a few seconds stores all changes in memory. Unless you intentionally change it again later, the adjustment will remain even after power is removed from the unit.*

7.1 The High Level Menu Structure

Menus are arranged so that a particular general function has a menu name on the top line and beneath that either a sub-menu or one or more related individual settings are displayed.

In some cases the functionality is global – meaning it has an effect on the unit as a whole (such as changing the output resolution). In the majority of cases, the function is related to a specific operational area of the unit, detailed by the text in the top line.

There are two screens that appear before the Group Menus (sub-menus) are accessed.

```
(Model number)
Kramer Electronics
```

The first is the 'welcome' display shown above indicating the model of the unit.

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kramerelectronics.com
SW: 65. PT: 12, BT: 13
```

Moving to the next menu item displays the firmware information screen (the numbers on your unit will be different to those shown). The SW number refers to the version of firmware loaded into the unit, this can be upgraded from our website.

The PT and BT numbers refer to Hardware version information and are of interest to the Technical Support Group should you ever need assistance.

At the end of all Group Menus will be an 'Exit' item. Simply select this to exit the existing menu structure and return to the previous one in the hierarchy.

7.2   Group Names and Descriptions

Menu Group Name	Group Description
Adjust outputs	Controls output parameters
Adjust windows	Controls characteristics of the scaled window
Adjust keyers*	Controls the keying ability of the unit
Adjust sources	Controls signal source input parameters
Adjust resolutions	Controls unit's input/output resolution table (hidden by default - only visible when advanced menus are switched on)
System	Controls global system parameters for the unit

Applies only to the VP-704XL

7.3   Items Associated with the Adjust outputs group (Applies to VP-704XL only)

This menu group allows adjustments to be made that specifically affect the output of the unit, including output resolution and locking/overlaying onto a computer or video source.

```
800 x 600 60Hz
Lock mode              [Off] [RGB1]
```

This menu item allows the lock mode to be selected and the lock source to be defined. The top line of the display shows the current detected resolution of the selected lock source (RGB1 in this example). RGB1 can be PAL or NTSC. The lock

mode can be either Off, Genlock or Lock & Mix, with the operation of these shown in the following table:

Lock mode	Description
Off	The output resolution of the Output is defined by the setting for Output Resolution and there will be no background source visible.
Genlock	The output video will be "Genlocked" to the selected lock source. The output signal will be synchronous to the input sync and adjustable but there will still be no lock source visible.
Lock & Mix	The output video will be locked to the selected source, the syncs will be locked (but with an additional internal video processing delay) and the background for the output will be that of the Lock source (unless foreground and background are swapped).

In both Genlock and Lock & Mix modes the source selected for the lock input determines the resolution of the Output image. The output resolution for the entire image can be no different than the resolution of the lock source. All synchronization signals are re-generated within the unit so they may look slightly different when compared on an oscilloscope to the original source.

Info: *Before turning the Lock feature on, you first must select a valid Lock source. Some units may not have all Lock sources available, depending on hardware limitations – see Specifications for details of limitations on your unit.*

*Not applicable for these units

```
1024 x 768  60Hz
Output res.                    [28]
```

Your unit can handle a very wide array of inputs and convert them all to a single output signal with defined characteristics. This output resolution will remain in place until changed or it may be overridden by the lock mode and source.

The top line of the display will show the current output resolution selected. Some units will have a limited number of output resolutions depending on their function (e.g. Down Converters are more limited than Video Scalers).

*Not applicable for these units

```
Adjust outputs
Output type                    [RGBHV]
```

This menu item allows you to select the type of signal output your unit will provide. Types of output vary depending on the resolution selected and include various types of component signals Y/R-Y/B-Y or YPbPr, the full range of RGB type signals RGBHV and RGsB (Sync on green).

*Not applicable for these units

```
Adjust outputs
Optimize for SDI          [On]
```

This menu item is only available on certain units with an SDI output and when locking to a CV or YC input. An internal de-jitter circuit ensures that the SDI output has a low jitter over the full 10Hz to 100kHz range, even though the CV or YC input may have a high jitter. However, this is not always compatible with a CV/YC output where the colour sub-carrier should not be de-jittered and needs to follow a Lock source's input – hence it should be turned Off it the CV/YC outputs are going to be used.

```
Adjust outputs
Out std              [NTSC / PAL]
```

This menu item is only available when the Output resolution is set to PAL or NTSC. With this you can change the output type to the PAL or NTSC standard with the further option of changing the output to the additional PAL & NSTC standards such as PAL-M or PAL-N. SECAM is also available as an output, provided the 'Output res' is set to PAL / 50Hz.

```
Adjust outputs
Back Y/U/V      [ 16] [128] [128]
```

Sets the value of the fixed background color, which is present when PIP is used with no Lock source background displayed. This menu item is only available for units with overlay, keying and fading abilities.

7.4   Items Associated with the Adjust windows group

This menu group allows adjustment to be made to window specific parameters such as the window source, its position, size and zoom level.

```
NTSC / 60Hz
Source                [  YC1]
```

The source display screen allows the input source for the currently selected window to be changed.   The top line of the display shows the detected characteristics of the signal. Valid Input sources match those available on the front of the unit

Certain units do not have full flexibility of Window source and Lock source when Genlock or Lock & Mix are active (in the Adjust outputs menu group). See the Specifications for your unit to see if any limitations are present.

```
Adjust windows
Zoom level %                [ 100]
```

Changing this option, sets the amount of picture magnification you wish to use for the window Source. You are provided with the options to zoom the image from 100% to 1000% (10x zoom).

```
Adjust windows
H/V zoom %       [100] [100]1.333
```

When the parameter 'Aspect Adjust' later in this sub-menu is set to 'Advanced', this display is made accessible. It allows the independent setting of the horizontal and vertical zoom values. The third number (1.333 in the example) is the Aspect Ratio resulting from the adjustments, which is automatically calculated for you based on the incoming resolution and the H & V Zoom values.

Most resolutions are 4:3 ratio, thus the third number will be 1.333 (4 divided by 3). Another common aspect ratio is 16:9 (16 divided by 9 = 1.777). PAL and NTSC inputs are physically 4:3 on your video monitor, but their actual pixel/line ratios are different and so will not display as 1.333.

```
Adjust windows
H/V zoom pan %     [ 50] [ 50]
```

Once an image has been 'zoomed', this control allows the image to be positioned within the window so that any portion can be seen, not just the middle.

```
Adjust windows
Image freeze                [Off]
```

This menu item allows the image to be frozen or unfrozen – thus keeping a single image on screen indefinitely. Note that images are not stored when power is removed from the unit.

```
Adjust windows
H/V out shift           [  0] [  0]
```

This positions the selected Window horizontally and vertically on the monitor. This should only be used for 'fine tuning' and should not normally require adjustment – use the Shrink H/V adjustment when your image is less than 100% Shrink value.

```
Adjust windows
Shrink level%          [ 50] [On]
```

Shrink Level determines the percentage of the monitor's total available screen space that the selected Window image occupies. Adjustment is provided for a reduction down to 10% of the overall output size. In most cases, this feature is used for picture-in-picture (PIP) when a background image is being used (for units with overlay abilities).

Note that some units do not have the [On] entry – this is only for units with a PIP button on the front, with turns this entry On and Off. On these units, this feature is 'Off' by default, so that the full image size of 100% is used. Shrink level will need to be turned On before any change to this value has an effect.

```
Adjust windows
Shrink  H/V %   [100] [100] 1.333
```

When parameter 'Aspect Adjust' in the System Menu structure is set to 'Advanced', this display is made accessible. It allows the setting of different Horizontal and Vertical 'shrink' sizes. The third number (1.333 in the example) is the Aspect Ratio resulting from the adjustments, which is automatically calculated for you based on the output resolution (the actual pixels & lines, not your physical screen size) and the H & V Shrink values.

Most resolutions are 4:3 ratio, thus the third number will be 1.333 (4 divided by 3). Another common aspect ratio is 16:9 (16 divided by 9 = 1.777). Therefore, to convert your 4:3 output into a 16:9 output, reduce the vertical (V) Shrink value to 75% and this will simulate a 16:9 output. PAL and NTSC inputs are physically 4:3 on your video monitor, but their actual pixel/line ratios are different and so will not display as 1.333.

```
Adjust windows
H/V position %         [100] [ 50]
```

This menu option determines the position of the shrunken image on the monitor screen. This will move an image that is less than the full screen size left/right or up/down within the monitor's available screen space. It will not let you move the image off the screen, so certain values will appear to have no effect (unless you use a very low Shrink value like 10%).

```
Adjust windows
Aspect adjust          [Simple]
```

This parameter is used in conjunction with the Zoom and Shrink functions. When set to "Advanced", it allows the horizontal (H) and vertical (V) components of the Zoom and Shrink functions to be adjusted independently, thus allowing custom aspect ratios to be created, or to convert from one aspect ratio to another. When

left as "Simple", the H/V components of Zoom and Shrink are adjusted equally i.e. H is equal to V.

```
Adjust windows
Flicker Reduction            [Low]
```

The Flicker Reduction menu item will only appear if you have selected a low resolution interlaced output such as PAL or NTSC. If you are using CV or YC outputs, this adjustment may be of interest, particularly when you have line drawings or similar fine detail. You can choose from four possible Flicker Reduction settings. You should use as little Flicker Reduction as possible because the Vertical detail will be softened at the highest setting.

Flicker mode	Function
Off	Disables flicker reduction (sharpest mode).
Low	Suitable for most input sources.
Med.	Enough for most situations such as thin line drawings
High	Highest amount of flicker reduction. Will cause loss of vertical detail in some images.

```
Adjust windows
Image smoothing              [Auto]
```

Image smoothing reduces the jagged-edges sometimes seen within an output image by softening it. It typically improves the quality of a scaled image greatly. There are four possible settings for this adjustment: "Off", "Med.", "High", and "Auto". The "Auto" setting is generally thought to be most desirable and will vary the smoothing process according to the amount of zoom taking place.

```
Adjust windows
Image flip   [Off]
```

Occasionally, it's necessary to cause the output image to be flipped Vertically, Horizontally or both – most commonly when a video projector is ceiling-mounted, or for special effects.

.

### 7.5 Items Associated with the Adjust keyers group (Applies only to the VP-704XL)

Please note that not all units have this sub-menu – it is only present on units with overlaying abilities.

Towards the end of this manual you will find a section titled 'COMMON OPERATIONS' – this gives a step-by-step guide to keying out a particular color.

```
Adjust keyers
Keyer enable              [Off]
```
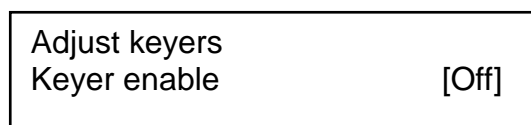
This menu item turns keying On or Off for the current foreground. A keyed image is in essence one image superimposed over another – such that portions of the top image are made transparent (keyed out), so that the background image can show through. The following settings allow you to vary the colour(s) that are keyed out.

```
Adjust keyers
Swap fore/backgrnd        [Off]
```
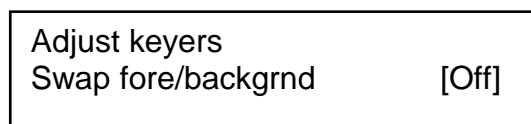
This menu item allows you to swap the foreground and background images when Lock mode is set to Lock & Mix (Under Adjust output). It will have no effect in any other mode (since no background is present).

Normally, your foreground is the input (window) source and your background is the lock source. This then allows you to superimpose any graphics or video input on top of the lock source by keying out a certain color or range of colors in the input source. Swapping them means that the input source moves to the background and the lock source is now in front of it. Thus you are now keying out the lock source colors to reveal the input source behind it.

```
Adjust keyers
Y Key min/max         [  0] [ 32]
```
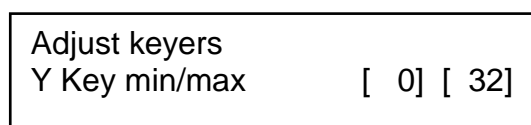
The Min/Max parameters are used to select what range of Y (luminance/grey-scale) values are made transparent within the selected window/lock source. In order to key out part of an image, start with the max value and increase it until the required lighter parts within the window/lock source disappear. Then adjust the min level to bring back any darker parts of the image.

```
Adjust keyers
Y Key softness            [  0]
```
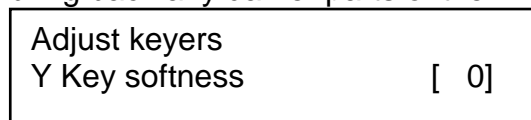
The Y Key softness option removes noise from the keyed image, generally at the edges. Adjust as required to make the edges of the key as sharp or as soft as desired. The noise is where the analog to digital process (A/D conversion) may not sample a 50% brightness as being exactly 50% i.e. sometimes 49% and

sometimes 51%. Increasing the softness value will broaden the range of keyed colors so that the keying of images varies depending on how close a color is to the keyed-out range.

```
Adjust keyers
Y Key invert                [Off]
```
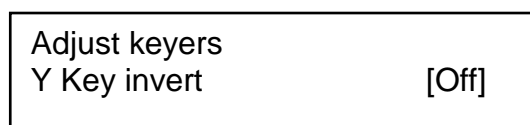
The Y Key invert changes the keying characteristics with respect to what colors of the foreground image you wish to 'key out'.

Setting it to Off will cause the colour range that's defined to be removed - remove the desired colours. Setting it to On will cause the colour range that's defined to be kept - key out all other colours.

The descriptions above behave identically on the remaining U Key Invert & V Key Invert component versions. However they are directed at the U/B-Y (blue) colour component and V/R-Y (red) colour components respectively. Adjustment and effects are the same as explained above for Y Key Invert (brightness/grey-scale).

7.6   Items Associated with the <u>Adjust sources group</u>

The 'Adjust Sources' menu group accesses the parameters associated with the processing amplifiers used for each input (RGB, CV, YC, etc.). They allow you to fine-tune an incoming signal to optimize its color, brightness or even sharpness.

Not all settings are available for all input types, and not all input types listed here may be available on your unit.

It is recommended that you Store your settings once you're happy with them in readiness for future use.

```
Source: RGB1
Source to adjust            [RGB1]
```
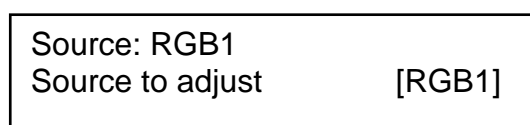
This menu item selects the input connection for which you want to make adjustments to. As in the image above, changes will only be made to the source connected to RGB1. Once the selection has been made, all changes made using the following operating parameters will only apply to the selected input.

Info: *Selection of a CV/YC source will reveal different menu items that allow adjustments beyond those used for RGB sources. The menu discussions that follow relate first to RGB sources, then to CV / YC type sources.*

7.6.1 RGB Source Menu Items

```
Source: RGB1
Auto Track          [Inactive]
```

Once the Autoset sense setting has been made, this menu item is accessed and activated. The Autoset sense utility will then correct the pixel phase and then position the Top Left portion of the image and the Bottom Right portion of the image. Once complete it then resume inactive status.

```
Source: RGB1
TL pos. adj.            [  0] [  0]
```

This menu item allows manual positioning of the Top and Left portion of the image. It is used to ensure that the input signal is captured correctly, eliminating any black borders. These settings are often used to correct the position of a PC signal on an input, or to eliminate any undesired noise at the top or bottom of a PAL or NTSC video source.

```
Source: RGB1
BR size adj.            [  0] [  0]
```

This menu item allows manual positioning of the Bottom and Right portion of the image. These settings are often used to correct the position of a PC signal on an input, or to eliminate any undesired noise at the top or bottom of a PAL or NTSC video source.

```
Source: RGB1
On Source Loss          [  1]
```

The following options are available:
Show
Freeze
Blue
Black
Remove

```
Source: RGB1
Input pixel phase       [  16]
```

Since an image pixel is a very small element of the total image, it's possible for your unit's Analog to Digital converters to wrongly sample the picture on the edge of each pixel thereby losing image resolution and creating image noise. The Input pixel phase adjustment allows you to change the position (from 0 to 31) where the pixels are sampled, relative to the horizontal sync signal.

To make this adjustment, select an RGB source and then provide an image from that source with fine detail, preferably with very sharp vertical lines. Adjust this value until you see the sharpest image. Alternately, adjust this value to give the worst (noisiest/softest) image, and then add or subtract 16 to get the optimum value.

Note that the AUTOSET function (for RGB inputs only) will attempt to automatically work out the best value for this setting.

```
Source: RGB1
RGB input type          [RGBHV]
```

There are several types of signals that are called RGB signals as a generic term. Each has slightly different characteristics that set it apart from similar RGB signals – such as how the synchronization signal is sent. This menu item lets you set the input type to use.

Available options let you select whether the input is standard RGB or YUV (including YPbPr signals with a tri-level sync).

```
Source: RGB1
RGB contr.      [100] [100] [100]
```

This menu item lets you adjust the individual RGB or YUV/YPbPr signals, in case one component is at a different contrast to other, or if they all need to be boosted or lowered.

```
Source : RGB1
De-int              [M.comp med]
```

An interlaced input consists of two fields separated in time. Both fields are required in order to make up the full resolution input image, but since they are sent one after the other, a moving image will have "motion artifacts" if the two fields are simply combined together. The most common artifact is a blurring at the point of maximum movement within an image. Your unit provides some tools to minimize the effects of de-interlacing of an image.

The following options are available for this menu item:

Mode	Function
Normal	The two interlaced fields are simply combined together. This will often show artifacts on moving images, but can be used when the input is known to be still.
Auto	Automatically selects Film 3:2 or Medium Range Motion Compensation (M. Comp Med.) depending on whether Film Mode is detected or not. For 1080i sources, a special de-interlacing mode is selected to eliminate combing effects.
Film 3:2	Enables 3:2 pull down conversion of the incoming NTSC video. (This option should not be used if the source is not NTSC video).
M. Comp Low M. Comp Med. M. Comp High	Enables Pixel Adaptive Motion Compensation. Three levels are available with 'Low' providing the least compensation for Motion and 'High' providing the most compensation.

7.6.2   CV & YC Source Menu Items (Applies only to VP-704XL)

Of the above Source Menu items, the Autoset sense and Autoset status functions, RGB type and Pixel phase are specific to RGB signals only. The rest of the Source menu items function with RGB, CV or YC type signals. In addition, there are four additional Menu items that are only used with CV or YC type signals and these are explained below:

```
Source: YC1
Bright [100]          Contrast [100]
```

Adjust the Brightness and Contrast of the image to your requirement.

```
Source: YC1
Satur [100]                Hue [0]
```

Saturation is the amount of color present in the image. Hue is the color "tint" parameter and the adjustment range is +90 degrees through to -90 degrees with 0 being the default.

```
Source: YC1
Sharpness                    [0]
```

Within limits, you can enhance or soften the appearance of detail within an image. The Sharpness values go both negative and positive, with 0 being the default. Note that over-enhancing an image has the side effect of making it appear to be noisy and under-enhancing an image gives the appearance of poor video quality.

```
Source: YC1
Luma delay                    [    0]
```

On occasion, a video source will have the color portion of the signal offset from the luminance portion. If you've ever seen a poor quality comic book that has the outline of the cartoon character's head in one place on the page but the flesh tones for the head offset slightly, you are seeing the print equivalent of Luminance to Chrominance Phase Delay.

Fortunately, your unit provides a way for you to make the two signals occur at the same time on the selected image. The adjustment range provides both positive and negative levels of delay with 0 being the default.

7.7   Items associated with the <u>Adjust resolutions group</u>

Info: *The Adjust Resolutions Menu Group only appears when the Advanced Menus function is turned on within the System Menu Group. To turn it on, go to the System Menu Group and then proceed to the item that says "Advanced Menus". Turn the function 'On", exit the Systems menu and return to this menu structure.*

The Resolution Database is used by your unit to identify any incoming video signal and is also used to create an output resolution. It is therefore a very important part of the unit's infrastructure.

Important Cautionary Information

DO NOT ADJUST THESE ITEMS UNLESS YOU'RE CERTAIN YOU KNOW WHAT YOU'RE DOING! THE ONLY METHOD TO UNDO CERTAIN CHANGES IS TO UPDATE THE FIRMWARE.

TRY USING THE AUTOSET, SHRINK, SHRINK POS, TL & BR ADJUSTMENTS <u>FIRST</u>.

Making adjustments here risks creating a non-standard resolution that is not displayable on a monitor. The resolutions and values within the database are industry standards and should not normally be altered by the user. That said, there might be times when it is necessary to create a custom resolution with specific parameters. If circumstances require you to make such a change, please read the following specific notes:

1. *Any changes made to this database take effect instantly and are also stored immediately in non-volatile memory.*
2. *Since this database is used for both input and output image processing, altering a resolution that is used for both (e.g. 1024x768 input and 1024x768 output) may give undesired effects.*

```
800 x 600 60 Hz
Image to adjust            [ 17]
```

Change the value to select resolution you want to alter.

Typically, the image number currently being used for input or output would be already be selected otherwise immediate feedback to your changes will not be available via your monitor.

```
800 x 600 60 Hz
Interlaced                 [ Off]
```

This adjustment specifies whether the image is interlaced or progressive scan. It toggles simply On or Off, so there are no flashing brackets.

```
800 x 600 60 Hz
H.freq.crse            [37.879] kHz
```

Course Frequency Adjust
The H freq.crse (Horizontal Sync Frequency - Course) adjustment provides the option for changing the Horizontal Sync timing Frequency in 100 Hz steps.

```
800 x 600 60 Hz
H.freq.fine            [37.879] kHz
```

Fine Frequency Adjust
The H.freq.fine (Horizontal Sync Frequency) adjustment provides the option for changing the Horizontal Sync timing Frequency in 1 Hz steps. Use this option to fine tune after using the course adjust.

Please note that the internal sync generator may be unable to generate the exact frequency you want.

```
800 x 600 60 Hz
Clks/l [1056] =            40.000MHz
```

This option changes the total number of image pixels on one line of monitor video including the Horizontal sync pulse and blanking time. This is normally in a multiple of 8. It is very important to get this value correct, or many digital display devices, such as TFT monitors, will display an image with an odd moiré effect – such as soft vertical bands spread evenly across the image.

```
800 x 600 60 Hz
Lines/f [ 628] =              60.317 Hz
```

This menu controls the total number of lines of video present in the image which includes the vertical Sync pulse, the blanking period and the active video. Changing this option affects the final vertical sync frequency.

```
800 x 600 60 Hz
H/V active              [ 800] x  600
```

A video frame includes both the active area, the portion of the image normally containing useful visual information, and a resolution value for a given display standard which only expresses the number of pixels visible in an image.
The well-known 800 x 600 computer resolution standard simply means that there are 800 pixels/line visible horizontally and there are 600 lines visible vertically.

This item provides a way to change the number of active pixels and lines.

```
800 x 600 60 Hz
H/V Start              [ 88] x  23
```

There is a period of time between the end of the Horizontal Sync pulse and the start of Active Video. This portion of the waveform signal is called the "Back Porch", a term originating with the television broadcasting industry and its RS-170A specification. In practice, this will control where the video image starts on the left side of the monitor without changing the width of the sync pulse itself (another way to control where the image area starts). The two parameters control where the back porch is positioned and they interact to a degree.

Info: *By adjusting these parameters, you control the start of the back porch (with respect to the trailing edge of Horizontal Sync) and also its width. The place where the Back Porch begins with respect to the Horizontal Sync pulse and the width of the Back Porch have a direct bearing on where the active (visible) portion of the image begins. Do not attempt this adjustment without monitoring the results with an oscilloscope.*

```
800 x 600 60 Hz
H/V Sync              [ 128] x  4
```

There are standards for all current computer and broadcast resolutions that specify the correct width of both Vertical and Horizontal synchronizing pulses.
If you are creating a special, non-standard resolution, you may wish to adjust the pulse width to fit your new requirements. The H/V Sync screen is where that is accomplished.

Like the H/V Start adjustment, you must use an oscilloscope when making these adjustments so that you know exactly how many milliseconds or microseconds of pulse width you have created. The numbers shown are relative numbers and not an actual time measurement.

```
800 x 600 60 Hz
Sync polarity                    [+H+V]
```

Sync can be either negative polarity or positive polarity. To further complicate things, it is possible that you may want to make the Horizontal Sync polarity different from the Vertical Polarity. This control allows you to make that change. You have four possible selections:

+H+V
-H+V
+H-V
-H-V

7.8   Items Associated with the System group

The final Sub Menu is for adjustments of System parameters. The "System" in this case means the unit's functions that are generally unrelated to individual inputs, outputs or any of the various production features.

```
System
SW: 16,     PT:  12,        BT:   13
```

This screen is an informational screen. Should you require technical assistance with your unit, the technical support personnel may request that you read the contents of this screen to them during the support call.

The first section, "SW", is the version of the software that is installed on your unit. You can update software via the User Support web site (procedure to be described later in this manual) and the updates are currently free of charge. "PT" refers to Product Type and "BT" means Board Type. Both of these are hardware designators and cannot be changed by the user however both designators are important to support personnel.

```
System
SW date:                    2006-7-11
```

This is an information page showing when the currently installed software was released. The information is useful to the user as he or she compares the date to the website information describing the current software release.

```
System
TAC#          27-56-12-93-28-33
```

The TAC number is a unique identifier for the unit and is for future use.

```
System
Push to store
```

This screen provides a quick and easy way to store all current operating parameters. The unit will remember the set up you are currently using at the time of data storage and also when you next apply power. To store the current settings, press and release the control button.

```
System
Autoset sense              [Medium]
```

In order for Autoset to work properly, it needs a sufficiently bright full-screen image to examine. The sense level lets you change the brightness threshold for detection of the screen edge between Low, Medium, High and V.high. Medium is the default level, which is recommended for normal use (Windows-type images, etc.)

```
System
OSD on power up            [On]
```

This parameter controls whether the 'welcome' screen is displayed or not on power up for units with an on-screen display – it can be disabled as required. This is useful when a unit is installed as part of an overall system.

```
System
Advanced Menus             [Off]
```

When turned on, the previously explained Adjust resolutions menu structure is exposed. The default condition is 'Off', to prevent accidental changes.

```
System
RS232 baud rate            [57600]
```

This menu item allows the adjustment of the serial baud rate used for RS-232 communications. The rate can be adjusted to 9600, 19200, 28800, 33600, 38800,

57600 and 115200. (This adjustment is provided for those instances where you wish to use the RS-232 control system for your own purposes.) The default baud rate is 57600.

```
System
Buzzer                           [ On]
```

The screen labeled 'Buzzer' is actually the control for turning the "Beep" "On" or "Off". Normally this is left in the "On" position to provide positive feedback that your data entries and parameter changes have been accepted.

```
System
Resolutions                        88
```

This screen is an informational screen showing the total number of the defined resolutions in the resolution database. Future firmware releases may increase the total number of resolutions defined in the database.

```
System
Power cycles                       41
```

Power Cycles refers to how many times the unit has been powered since it left the factory. This is an informational screen. No action is taken regardless of the value shown here, however some users have an equipment cleaning or specification audit procedure and this information may be useful to those users.

```
System
Firmware updates                   11
```

Indicates the total number of times the firmware has been changed over the life of the unit. It is quite possible for this to be more than 1, as a unit undergoes numerous tests during production.

```
System
Hours in Use                      877
```

This is another informational display for usage audit purposes.

8   RS232 PORT

8.1   Connection

Your unit is fitted with a standard 'D9' socket allowing it to be controlled from a computer or other type of terminal or console with a similar interface.
A 'null-modem' is not required. See the Specifications section for a detailed pin connection list.

The default baud rate is 57600 with 8 data bits, 1 stop bit and no parity. This baud rate can be changed in the System menu to suit other programs if need be.

8.2   Communications protocol

The standard communications protocol for your unit is text-based and is detailed on section 9.1
The protocol is also bi-directional (unit and computer both send messages to each other), so that you can send changes to the unit, and it will also respond with any changes made via alternate methods (front panel buttons, menu changes and infra-red control). This enables any attached computer to be aware of any changes made to the unit from an alternative source rather than itself.

Note: Any command you send to the unit will be replied to either with an error code or with the actual changed value. This may be different to the one you sent; for example, if trying to set a value too high or too low.

9 RS232 / IP CONTROL SPECIFICATION

PLEASE NOTE: that the VP-701XL RS232 port is used only for FW upgrading. It can't be used for RS232 control.

This section outlines how to control a unit via an RS232 using ASCII-based commands. It details how to send and receive serial data to perform many of the functions that a user has access to on the unit.

9.1 Communication protocol basics

Packets of ASCII data containing hexadecimal numbers are exchanged between the unit and controller via an RS232 or IP link (you cannot use both at the same time).

The RS232 standard is 57600 baud, 8 bits, no parity and 1 stop bit, although this can be changed by the user (see 'System' menu).

No flow control is used - however all control packets start with an ASCII 'F', end with carriage-return (13 decimal, 0x0D hexadecimal) and all such packets sent to the unit will be acknowledged (thereby provided software handshaking). Note that a line-feed (LF) should not be sent.

It may take around 30ms (0.03 seconds) for an RS232 command to be actioned and acknowledged – this will vary between different models.

ASCII-hex data is used where a number is encoded into its hexadecimal equivalent with leading zeros – e.g. Where '00' is decimal value 0, '80' is decimal 128 and 'FF' is decimal 255. In other words, two characters are sent for each byte encoded.

Any gap of more than 1 second between the characters of a control command sent will cause a time-out - and previous characters sent will be lost.

Write packets (sending command functions to the unit) are always 20 characters long (including a carriage return at the end). The unit will respond with a full 20 character message indicating what has changed. This returned payload will reflect the actual value of the parameter changed. If the user requests a value out of bounds then the limit value is used, and the payload will then reflect the limited value used.

Read packets (sent to request information from the unit) are always 14 characters long (including a carriage return at the end), the response from the unit will be a 20 byte message with the Write flag (since it is 'writing' the value back to the host) and the ACK flag set.

The ACK flag will be returned as 0 if the command is invalid for some reason – for example a bad FUNCTION, WINDOW, OUTPUT or PAYLOAD value. An ACK=0 message will be otherwise identical to the one you sent, so you know exactly which message has the error.

Any changes made to the unit using the front panel controls will also cause the full 20 byte message to be sent indicating the change that has occurred, thus enabling a program to stay 'in-sync' with the unit. In some cases (such as the execution of a macro) multiple 20 bytes messages will be sent indicating all the parameters that have been changed.

Only one message should be sent to the unit, another message can't be sent until a specific response is received from the unit (the user should look for a message with the same WINDOW, OUTPUT and FUNCTION values as they sent). If no message is received back within 1 second, there is likely to be a hardware communication problem (or wrong baud rate, etc.).

If absolutely required, to simplify programming the user may send packets one after the other with around 100ms (100 milliseconds) between each one. However, this will not work for all packets (such as Zooming into Testcards or changing Logos) since this will cause the unit's micro-controller to be busy, so the users must experiment and satisfy themselves that this is possible.

9.2 Packet format

Below is a representation of data bytes in a single packet for a 'Write' to the unit to set a value:

SOP	CMD	CHA	WINDOW	OUTPUT / FUNCTION	FUNCTION	PAYLOAD x 3	CS	EOP

Below is a representation of data bytes in a single packet for a 'Read' to the unit to get a value:

SOP	CMD	CHA	WINDOW / FUNCTION	OUTPUT	FUNCTION	CS	EOP

The table below details the function of each part of the packet:

Packet part	Function
SOP (Start of packet)	This is always the ASCII letter 'F' to indicate the packet start.
CMD (Command)	ASCII-hex byte to indicate the type of command being sent. Each bit in the byte has a different function. Currently only the following bits are defined: Bit 7 = Write (0) or Read (1) request. Messages from the unit are always Writes.

	Bit 6 = ACK bit. Should be set to 0 for messages to the unit. ACK=1 returned means message was okay. ACK=0 returned means an error was present in the message. Bit 5 = 0 Reserved for future use. Bit 4 = 0 Reserved for future use. Bit 3 = 0 Reserved for future use. Bit 2 = 1 This bit *must* be set. Bit 1 = 0 Reserved for future use. Bit 0 = 0 Reserved for future use.
CHA (Channel) SOURCE or MACRO NUMBER	This byte has multiple uses, and defaults to 0 unless used for:. CHA When a channel number is used in the Adjust Sources section (see later). SOURCE Byte to indicate the source channel to be altered (if appropriate). 0x10 = RGB1, 0x11 = RGB2, 0x12 = RGB3, etc. 0x30 = CV1, 0x31 = CV2, 0x32 = CV3, etc. 0x40 = YC1, 0x41 = YC2, 0x42 = YC3, etc. 0x50 = SDI1, 0x51 = SDI2, etc. 0xD0 = OUT1, 0xD1 = OUT2, etc. 0xF0 = TC1, 0xF1 = TC2, etc. MACRO Or – for Macro related commands: Bit 7..4 = 0 Reserved Bit 3..0 = Macro number
WINDOW / LOGO / BORDER	Bit 7 = 0 (Reserved). Bit 6..0 = Represents the window to be adjusted (for multi-channel units only). E.g. Window 'A' (the default for single-channel units) is sent as '41' since 0x41 is ASCII for 'A'. 0x61 is ASCII for 'a' (a Logo) and is sent as '61'.
OUTPUT & FUNCTION HIGH	Bit 7..4 = Number representing the output to adjust 0 = Output 1, 1 = Output 2 (for multi-channel units). Bit 3..2 = Reserved (set to 0). Bit 1..0 = Bits 9 & 8 of the function code. (Remainder of bits [7..0] are in FUNC LOW.) E.g. If the function code is 0x234, and we want to adjust Output 2, then this byte is 0x12
FUNCTION LOW	ASCII-hex byte to indicate the lowest 8 bits of the actual function to set or receive (e.g. change Zoom value). A later table details all the functions available.
PAYLOAD x 3 bytes	A series of ASCII-hex bytes carrying the data to send. Read requests have no payload - the payload is in the data sent back. Write packets require a payload, and this is always in 'triple-bytes' - i.e. 3 bytes are required, MSB first.

	e.g. '000001' is 1 in decimal, '010000' is 65536 in decimal, and 'FFFFF0' is -16 in decimal.
CS	ASCII-hex byte that is the (check) sum of all previous bytes (excluding the SOP 'F' character). E.g. The command F0400410082000001C8 has the checksum of 04+00+41+00+82+00+00+01=C8, so the complete command to send is F0400410082000001C8. A short-cut for debugging allows the checksum to be replaced by 2 question marks, so in the previous example you could send F0400410082000001?? Instead. This is purely for test and debugging - you should normally use a checksum to ensure data validity.
EOP	This is a carriage return (no line-feed) - ASCII code 13 (decimal).

9.3   Function list

These are grouped together into their associated on-screen menus.

Your unit and this manual should be used to determine the actual function of each of the following, as only the menu text is listed here. Where an equivalent menu item does not exist on your unit, then that feature is not supported on.

Function codes are given in hexadecimal and adjustment range is in decimal (but always sent as hexadecimal!).

For dual-channel units the mode of operation also restricts what Window and Output can be used the following table shows the allowed combinations:

Mode	Allowed Window and Output combinations
Switcher	Output 1 (0x00) and Window A (0x41) / Z (0x5A) / Logo a (0x61)
Independent	Output 1 (0x00) and Window A (0x41) / Z (0x5A) / Logo a (0x61) OR Output 2 (0x01) and Window B (0x42) / Z (0x5A) / Logo b (0x62)
Dual PIP	Any combination of Output and Window

The following table is a list of all menu functions, their related function number and valid range of adjustment.

<u>Please note that not all items will be available on all units.</u>

Menu text	CHA	FUNC (Hex)	Range of adjustment (decimal)
Top level			
Mode (Dual-channel units only)		109	0 = Switcher 1 = Independent 2 = Dual PIP

Adjust outputs			
Lock source (connector)		149	0x10 = RGB1, 0x11 = RGB2, 0x12 = RGB3 0x30 = CV1, 0x31 = CV2, 0x32 = CV3 0x40 = YC1, 0x41 = YC2, 0x42 = YC3 0x50 = SDI1, 0x51 = SDI2 0xD0 = OUT1, 0xD1 = OUT2 0xF0 = TC1, 0xF1 = TC2
Lock method		10A	0..2 = Off, Genlock, Lock & Mix
Lock H Shift		14A	-4096..4096
Lock V Shift		14B	-4096..4096
Output resolution		083	1..1000
Output Enable		170	0..1 = Off, On
Output image type analogue		0E2	0 = RGBHV 2 = RGsB 3 = YUV 4 = tlYUV 7 = tlRGB
Output image type digital		16C	0 = RGBHV 3 = YUV 9 = Not available
Background Y		13B	16..235
Background U		13C	16..240
Background V		13D	16..240
CCIR Output Standard		101	0 = NTSC/PAL, 1 = PAL-M/PAL-N, 2 = SECAM
Output CV/YC Hue (degrees)		139	-22..22
Output SC/H Phase		085	-180..180
Output Luma Bandwidth		134	0,1,2 = Low, Medium, High
Output Chroma Bandwidth		135	0,1,2 = Low, Medium, High
Output Chroma delay		137	-4..3
PAL WSS		130	0 = Off 1 = 4:3 Full format 2 = 14:9 Letterbox centre 3 = 14:9 Letterbox top 4 = 16:9 Letterbox centre 5 = 16:9 Letterbox top 6 = >16:9 Letterbox centre 7 = 14:9 Full format 8 = 16:9 Full format
Take		11E	0->1 = Perform a Preview -> Program transition

Adjust Windows			
Program source / Window source (connector)		082	0x10 = RGB1, 0x11 = RGB2, 0x12 = RGB3 0x30 = CV1, 0x31 = CV2, 0x32 = CV3 0x40 = YC1, 0x41 = YC2, 0x42 = YC3 0x50 = SDI1, 0x51 = SDI2 0xD0 = OUT1, 0xD1 = OUT2 0xF0 = TC1, 0xF1 = TC2
Window Enable		12B	0..1 = Off, On
Zoom level %		086	100..1000
Zoom level H %		103	100..1000 (only used in Advanced A/R mode)
Zoom level V %		105	100..1000 (only used in Advanced A/R mode)
Aspect ratio in		107	0.1:1..9.99:1
H/V zoom pan % (H)		09F	0..100
H/V zoom pan % (V)		0A0	0..100
Freeze		09C	0..1 = Off, On
H/V out shift (H)		0AD	-4096..4096
H/V out shift (V)		0AE	-4096..4096
Lock pixel offset		14A	-2047..2047
Lock line offset		14B	-2047..2047
Shrink level %		087	10..100
Shrink level H %		104	10..100 (only used in Advanced A/R mode)
Shrink level V %		106	10..100 (only used in Advanced A/R mode)
Shrink enable		18E	0..1 = Off, On
H/V shr. pos.% (H)		0DA	0..100
H/V shr. pos.% (V)		0DB	0..100
Aspect Adjust		102	0..1 = Simple, Advanced
Aspect ratio		190	0..2 = Normal, Letter-box, Narrow
Flicker reduction		092	0..3 = Off, Low, Med, High
Image smoothing		0A1	0..2 = Off, Med, High
Image flip		095	0..3 = Off, Horiz., Vertical, H & V
De-glitch		0A3	0..1 = Off, On
Max fade level		10F	0..100 = Fade level %
Fade out / in		193	-1, 1 = Fade out, Fade in
Layer priority		144	0..5 = Layer priority
Headphone volume		0FD	-16..15 (-16=Mute)
Adjust keyers (on certain models only)			
Keyer enable		127	0.. 1 = Off, On
Y key min/max (min)		0AF	0..255
Y key min/max (max)		0B2	0..255
Y key Softness		121	0..255
Y key Invert		122	0..1 = Off, On
U key min/max (min)		0B0	0..255
U key min/max (max)		0B3	0..255

U key Softness		123	0..255
U key Invert		124	0..1 = Off, On
V key min/max (min)		0B1	0..255
V key min/max (max)		0B4	0..255
V key Softness		125	0..255
V key Invert		156	0..1 = Off, On
Swap fore / background		144	0..1 = Off, On
Edge Blend		180	Bit 0 = Left edge active Bit 1 = Right edge active Bit 2 = Top edge active Bit 3 = Bottom edge active
E.blnd guides		18F	0..2 = Off, Auto, On
E.blnd size H		18B	0.. limited by H width
E.blnd size V		18C	0.. limited by V height
E.blnd gamma H		188	1..15 1=0.1, 15=1.5
E.blnd gamma V		18D	1..15 1=0.1, 15=1.5
E.blnd compensation		198	0..99

Logos (on certain models only)

Logo enable		12B	0..1 = Off, On
Logo number		143	0..9 Logo selection
H/V out shift (H)		0AD	0..100 %
H/V out shift (V)		0AE	0..100 %
Max fade level		10F	0..100%
Layer priority		144	0..5

Borders (on certain models only)

Border enable		150	0..1 = Off, On
Border H size		152	0..99
Border V size		151	0..99
Border H offset		153	0..99
Border V offset		154	0..99
Border Opacity		158	0 (fully transparent) ..100 (solid)
Border Y		155	16..235
Border U		156	16..240
Border V		157	16..240

Adjust sources

Source to adjust		116	0x10 = RGB1, 0x11 = RGB2, 0x12 = RGB3 0x30 = CV1, 0x31 = CV2, 0x32 = CV3 0x40 = YC1, 0x41 = YC2, 0x42 = YC3 0x50 = SDI1, 0x51 = SDI2 0xD0 = OUT1, 0xD1 = OUT2 0xF0 = TC1, 0xF1 = TC2
Autoset	10..1F	FE	1= Start Autoset procedure
Autoset Sense	10..FF	FF	0..3 = Low, medium, high, v.high

Field swap	10..FF	C9	0..1 = Off, On (swaps odd/even fields)
Field Offset	10..FF	196	0..7 = -4..+3 (defaults to 4 = 0)
Testcard	F0..F1	0DC	0..10
TL pos. adj. (left)	10..FF	0B6	-100..100
TL pos. adj. (top)	10..FF	0B7	-100..100
BR size adj. (right)	10..5F	0DE	-100..100
BR size adj. (bottom)	10..5F	0DF	-100..100
Audio input	10..FF	0D0	0..9 = Channels 1 .. 10 on A2-2000
Audio vol	10..FF	0CF	-16..15 (-16=Mute)
Bal	10..FF	0D1	-15..15
Input pixel phase	10..5F	091	0..31
RGB input type	10..1F	0C1	0 = Auto 1 = D-RGB 2 = D-YUV 3 = A-RGB 4 = A-YUV
RGB contr. (red)	10..1F	0C5	75..150
RGB contr. (green)	10..1F	0C6	75..150
RGB contr. (blue)	10..1F	0C7	75..150
De-int.	10..FF	0B8	0..5 = Normal, Auto, Film 3:2, M.comp.low, M.comp.med., M.comp.high
(Film mode detected)	10..FF	0E3	0..1 = Not detected, Detected
Bright	30..5F	0BB	0..180
Contrast	30..5F	0BC	0..180
Saturation	30..5F	0B9	0..180
Hue	30..5F	0BA	-180..180
Sharpness	30..5F	080	-7..+7
Luma delay	30..5F	0BD	-4..3

Adjust transitions (on certain models only)

Transition type		112	0..2 = Cut, fade, wipe
Switching fade time		0F5	0 (off) to 50 (5.0 seconds)
Wipe type		145	0 = Left -> Right 1 = Right -> Left 2 = Up -> Down 3 = Down -> Up 4 = Diagonal 5 = Diamond
Wipe Size		146	10..2000

Audio Control (S2-106AD Only)

Sample frequency		191	0..4 = Bypass, 32, 44.1, 48, 96kHz
Audio delay		192	0..999 = delay in ms (restricted depending on Sample frequency)

Adjust resolutions

Note: You MUST set the 'Image to adjust' value to the correct value first, and only then change the other values - otherwise you may be adjusting the wrong entry. The user should not adjust the 'Image to adjust' entry using the front panel whilst also accessing it via RS232			
Image to adjust		081	1..1000
Interlaced		0CA	0..1 = Off, On
H.freq.crse		0BE	10000..200000
H.freq.fine		0BF	10000..200000
H/V active (H)		096	64..2047
H/V active (V)		097	64..2047
H/V start (H)		08B	0..1023
H/V start (V)		08C	0..1023
Clks/l		08D	64..4095
Lines/f		08E	64..2047
H/V sync (H)		08F	8..1023
H/V sync (V)		090	1..1023
Sync polarity		094	0..3 = ++, +-, -+, --
System			
SW (Software version)		0D2	Read only
PT (Product type)		0C4	Read only
BT (Board type)		0C2	Read only
Advanced menus		11D	0..1, Off, On
OSD on Power up		189	0..1, Off, On
Store		0C8	Set to 1 to store
Buzzer		0CB	0..1 = Off, On
Power cycles		0D6	Read only
Firmware updates		0DD	Read only
Hours in use		0D7	Read only
Resolutions		0D8	Read only
Number of Testcards		0D9	Read only
Number of logos		14F	Read only
Board temp. (deg.C)		0CD	Read only
Air temp. (deg.C)		148	Read only
Regulators temp.(deg.C)		147	Read only
PLD temp. (deg.C)		111	Read only
Fan speed (rpm)		0CE	Read only
Led brightness		12C	0..100
RS232 Baud rate		0AB	0..6 = 9600, 19200, 28800, 33600, 38400, 57600, 115200
TAC number 0		15D	Read only
TAC number 1		15E	Read only
TAC number 2		15F	Read only
TAC number 3		160	Read only
TAC number 4		161	Read only
TAC number 5		162	Read only

Not part of menu system			
Front panel lock		0FC	0 = unlocked, 1 = locked

9.4 Examples

Each example shows the packet sent to the unit and its response. When a byte is not required to be sent it is indicated by a '- 'in the table below (since a Read is 6 bytes shorter than a Write). Each character shown below is sent as a ASCII character so F0400 is sent as 'F' '0' '4' '0' '0'.

Packet sent

Packet returned

SOP	CMD	CHA	WIN	OUT	FUN	PAY	CS	EOP	SOP	CMD	CHA	WIN	OUT	FUN	PAY	CS	EOP

Set output 1 window B Source to RGB2

F	04	00	42	00	82	000011	D9	CR	F	44	00	42	00	82	000011	19	CR

Set output 1 window A to Enable advanced aspect
control
Note checksum is ?? for debugging

F	04	00	41	01	02	000001	??	CR	F	44	00	42	01	02	000001	8A	CR

Set 1A Shrink to 110 – invalid max for shrink is 100

F	04	00	41	00	87	00006E	??	CR	F	44	00	41	00	87	000064	70	CR

Read 1C Zoom level – invalid as window C does not
exist

F	84	00	43	00	86	-	??	CR	F	04	00	43	00	86	000000	CD	CR

Read 1B Zoom level   Zoom = 100

F	84	00	42	00	86	-	??	CR	F	44	00	42	00	86	000064	70	CR

Set baud to 9600   Reply is at 9600 baud

F	04	00	42	00	AB	000000	F0	CR	F	44	00	42	00	AB	000000	30	CR

Set 1A Zoom = 300

F	04	00	42	00	86	00012C	F7	CR	F	44	00	42	00	86	00012C	37	CR

Set 1A Shrink to 50

F	04	00	42	00	87	000032	FE	CR	F	44	00	42	00	87	000032	3E	CR

Set 1A Shrink H Posn to 0

F	04	00	42	00	DA	000000	1F	CR	F	44	00	42	00	DA	000000	5F	CR

Set 1A Shrink V Posn to 100

F	04	00	42	00	DB	000064	84	CR	F	44	00	42	00	DB	000064	C4	CR

9.5 Reading and writing macros

Depending on the unit connected there can be up to 7 macros stored in the unit. These macros can be programmed to perform a specific task, for example enable PIP mode, Position pip window at H=0, V=0, Zoom in to 120%.

The WIN and OUT bytes are not used for macro reading or writing and should be set to WIN=1A and OUT = 0

The CHA byte indicates the macro we are programming / reading / running. Macro 1 to 5 are CHA 0..4, CHA=5 is restore, CHA 6..7 are Macros 6..7.

Macro Restore (CHA=5) is read only, the units restore state is set by sending the Store command (0C8).

Menu text	CHA	FUNC (Hex)	Range of adjustment (decimal)
Macro			
Run macro	0..7	F1	0..1 = Run, Erase macro
Number of items within macro	0..7	F4	Read Only
Function to adjust	0..7	F2	0..4095
Value	0..7	F3	Value for Function

9.5.1 Reading a previously stored Macro

In order to read a macro the following commands must be sent in this specific order – no other commands should be sent between these messages. The CHA in these cases relate not to the source but to the macro we are reading.

Packet sent   **Packet returned**

SOP	CMD	CHA	WIN	OUT	FUN	PAY	CS	EOP	SOP	CMD	CHA	WIN	OUT	FUN	PAY	CS	EOP

Read number of items currently stored in Preset 2 read   Returned packet indicates 4 items available to

F	84	01	42	00	F4	-	BB	CR	F	44	01	42	00	F4	00002	FC	CR

Read the Function for the first item in the preset / macro   Payload is the Function stored – 86 = Zoom

F	84	01	42	00	F3	-	BA	CR	F	44	01	42	00	F3	000086	?80	CR

Read the Data for the first item in the preset / macro   Payload is the data for the function – 100%

F	84	01	42	00	F2	-	B9	CR	F	44	01	42	00	F2	000064	5D	CR

Read the Function for the second item in the preset / macro   Payload is the Function stored – 87 = Shrink

F	84	01	42	00	F3	-	BA	CR	F	44	01	42	00	F3	000087	81	CR

Read the Data for the second item in the preset / macro   Payload is the data for the function – 100%

F	84	01	42	00	F2	-	B9	CR	F	44	01	42	00	F2	000064	5D	CR

The above example shows the read for all the items within macro 0. The first command reads the number of items available in the macro and resets the read address. Then the following items read the function and then the data for each of the items in the preset/macro. Following a read of the data for a macro internally

the next item in the macro is selected for reading so it is not possible to read the same item twice without first re-reading the number of items in the macro.

9.5.2   Writing to a macro

In order to read a preset / macro the following commands must be sent in this specific order – no other commands should be sent between these messages.

Packet sent   **Packet returned**

SOP	CMD	CHA	WIN	OUT	FUN	PAY	CS	EOP	SOP	CMD	CHA	WIN	OUT	FUN	PAY	CS	EOP

Clear macro

SOP	CMD	CHA	WIN	OUT	FUN	PAY	CS	EOP	SOP	CMD	CHA	WIN	OUT	FUN	PAY	CS	EOP
F	04	02	42	00	F1	000001	3A	CR	F	44	02	42	00	F1	000001	7A	CR

Write the function for first item in macro 3 = Zoom

F	04	02	42	00	F3	000086	C1	CR	F	44	02	42	00	F3	000011	01	CR

Write data for the first item = 100

F	04	02	42	00	F2	000064	9E	CR	F	44	02	42	00	F2	000011	DE	CR

Write the function for the second = shrink

F	04	02	42	00	F3	000087	C2	CR	F	44	02	42	00	F2	000011	02	CR

Write the data for the second item = 100

F	04	02	42	00	F2	000064	9E	CR	F	44	02	42	00	F3	000011	DE	CR

9.5.3   Run and Restore macros

Macros once programmed can be run by sending one of the following commands. By running macro 5 the unit can be restored to its previously saved state, when used in conjunction with the other macros this allows a default setup or baseline for the unit to be created.

Packet sent   Packet returned

SOP	CMD	CHA	WIN	OUT	FUN	PAY	CS	EOP	SOP	CMD	CHA	WIN	OUT	FUN	PAY	CS	EOP

Restore

SOP	CMD	CHA	WIN	OUT	FUN	PAY	CS	EOP	SOP	CMD	CHA	WIN	OUT	FUN	PAY	CS	EOP
F	04	05	42	00	F1	000000	3C	CR	F	44	05	42	00	F1	000000	7C	CR

Run macro 1

F	04	00	42	00	F1	000000	37	CR	F	44	00	42	00	F1	000000	77	CR

Run macro 2

F	04	01	42	00	F1	000000	38	CR	F	44	01	42	00	F1	000000	78	CR

Run macro 3

F	04	02	42	00	F1	000000	39	CR	F	44	02	42	00	F1	000000	79	CR

Run macro 7

F	04	07	42	00	F1	000000	39	3E	F	44	02	42	00	F1	000000	7E	CR

10   COMMON OPERATIONS

This section provides step by step instructions for some common operations.

10.1   Operation of the Keyer

Some units come equipped with a very powerful Luminance and Chrominance Keyer. The Keyer can take some time to master and below is a breakdown and series of simple steps to help you master the Keyer's operation

When adjusting the values, please bear in the mind the following:

The Y value is the Luminance value, so 0 is black and 255 is very bright (white).

The U value is the B-Y component. This is the difference between the Blue and the Luminance value. If part of an image is black, grey or white, then its value is 128 (being the mid-point).

The V value is the R-Y component. This is the difference between the Red and the Luminance value. If part of an image is black, grey or white, then its value is 128 (being the mid-point).

10.1.1 Preparation:

1. Enter the Adjust windows menu.
2. Select the Source (this will be the foreground).
3. Exit the Adjust windows menu.
4. Enter the Adjust keyers menu.
5. Ensure the Keyer is Off.
6. Set all Y, U and V min/max values to [0] [255].
7. Set all Y, U and V softness values to 0.
8. Set all Y, U and V invert values to Off.
9. Turn the Keyer On.

At this point your source image will have disappeared, since all colors have been keyed out.

10.1.2 Adjustment:

Knowing which color(s) you want to key out from the image, e.g. black to disappear, perform the following set of steps:

1. Increase the Y Key Min from 0 until just before the required color (Key Color) appears.
2. Decrease the Y Key Max from 255 until just before the required color (Key Color) appears.
3. Repeat steps 1 & 2 for the U and V min/max values as well.

Adjust any of the Softness values to improve the key. If your input signal is slightly noisy or if you want to soften the edges within the image, then this may require you to decrease the 'min' values and increase the 'max' values to broaden the range of colors keyed out.

At this point, only the key color should remain transparent.

11   TROUBLESHOOTING AND TECHNICAL SUPPORT

If problems are experienced, please read through the symptom topics below in order to resolve the problem. After doing so, if you still need to, contact Technical Support at ***http://www.kramerelectronics.com***. Please have the following details of the problem handy:

11.1   There is no picture on the Output.

If no LEDs are on, then ensure that the AC power adaptor is connected properly and the power switch is on at the AC outlet.

If the Standby/ON LED on the unit is off but another blue LED is active then check that the monitor output from the computer is connected at both the computer and the unit. Check that the output connector you are using from the unit is also connected at the unit and the display equipment.

Check that the display video equipment is set to the correct line input and format/standard as appropriate.

Check that the device connected to the output is on and can support the resolution set in the Adjust output menu, ensuring that the Sync type e.g. RGBHV, is also set correctly.

11.2   The image is shifted and not fully viewable

There are several ways to correct this, depending on the actual problem, although it's generally best to perform a Factory reset.

Try an AUTOSET if the input is RGB or YUV/YCbCr. Next adjust the TL pos. adj. values in the Setup Program source menu until the incoming video signal is displayed correctly. You may also need to adjust the BR size adj. setting to ensure the incoming video signal is properly displayed.

11.3   The output resolutions no longer appear as expected.

Because any changes made in the Adjust resolutions menu are automatically stored, it may be that the resolution data has become altered or corrupted beyond the ability of a display to show it.

Either manually correct the resolution data, or restore the data to full factory conditions by doing a firmware update. The user should avoid altering the resolution parameter data unless absolutely necessary.

11.4   There is excessive flicker on the Output.

Try using a different Flicker reduction mode. Turning the contrast down and the brightness up on the output device can have a large effect on flicker. Or try

adjusting the brightness and contrast of the source input by selecting the Input adjust menu.

11.5 The Output image is distorted.

This may occur where some of the areas of the image are very dark and others are very bright. The solution is to adjust the contrast and brightness settings on your Output device to rectify the problem.

Alternatively, if the Adjust resolutions menu has been used to the output resolution in question, a firmware update is recommended to perform a FULL factory reset.

11.6 Some colors appear to be incorrect on the CV/YC output

First try altering the color, contrast and brightness settings on your TV or video display. These are usually set up for a very different reason than viewing computer graphics and may need changing to suit. If you cannot achieve exactly what you desire then alter the inputs levels in Adjust sources until the correct colors are restored.

11.7 How can I reduce color smearing on CV connections?

Smearing usually occurs on Composite Video connections and is generally unavoidable - unless you can switch to using S-Video or RGB / YUV connections. It occurs because the brightness and color information is transmitted as one combined (composite) signal and the two parts have to be 'bandwidth-limited' to avoid them interfering with each other – which then reduces the quality.

11.8 The picture on the video display is black and white.

Ensure that all the cables are correctly connected. If you are using a PAL TV to display the output then the unit may be providing resolution set to NTSC mode, or vice versa.

11.9 The picture on the video display is green.

The Output type is probably incorrectly set to YUV mode, whereas you are connecting to an RGB monitor – see Adjust outputs menu.

11.10 The RGB input is selected but the image is rolling or pink.

Check the Adjust sources menu and confirm that the input type and sync method is set correctly. (Having YUV input selected, instead of RGBHV often causes this problem).
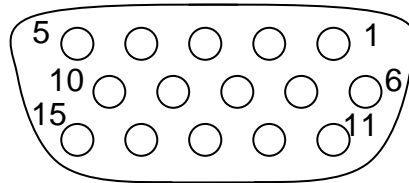
11.11 The video signal from my DVD player does not appear to work.

Some DVD players have a switch at the back that selects between 'Component' and 'S-Video' output, because most will not let you output both at the same time. Make sure it is in the right position for the output you want.

12   CONNECTOR PINOUTS

12.1   HD15 connector

1. Red / Pr / R-Y
2. Green / Y
3. Blue / Pb / B-Y
4. ID2 (input & output linked)
5. GND
6. GND
7. GND
8. GND
9. No connection
10. GND
11. GND on input, pulled high on output (used for auto-termination)
12. SDA (input & output linked)
13. H sync
14. V sync
15. SCL (input & output linked)

12.2   RS232 / D9 socket

1. N/C
2. TX (Transmit data)
3. RX (Receive data)
4. N/C
5. GND (Signal return)
6. N/C
7. CTS (Clear to send)
8. RTS (Request to send)
9. N/C

12.3   4 Pin mini-DIN S-video connector (YC) input

1. Y (Luminance)
2. GND
3. GND
4. C (Chrominance)

13 SPECIFICATIONS

See product front and rear diagrams for details of product I/O. Not all units in the series have all the inputs and outputs listed here.
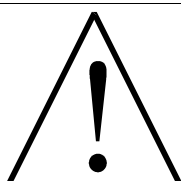
COMPUTER INPUT:	Analog RGB/YPbPr on HD15 connectors into 75Ω, supporting RGBHV, RGsB, YPbPr, auto-terminating into 75Ω Digital sync (in RGBHV mode): TTL Level, 10K termination, pos or negative Analog sync (in RGsB, YPbPr, YUV modes): 0.3V negative. RGB Level Range: 0.5-2.0 Vpp Scan Rate Detection: automatic PC Resolutions: any up to 2048x2048 HDTV Resolutions: any up to 1080p Max horizontal scan rate: 150kHz
VIDEO INPUTS FOR GENLOCK PURPOSES (for **VP-704xl** only):	Composite video on BNC connectors s-Video (YC) on 4-Pin mini-DIN Connectors Input impedance: 75Ω Television standards supported: NTSC and PAL CV/YC sub-carrier lock range: +/- 200Hz (NTSC), +/- 250Hz (PAL)
VIDEO OUTPUTS:	Composite Video 1Vpp on BNC connectors S-Video (YC) 1Vpp on 4-pin mini-DIN connectors CV/YC Video encoder: 8/10-bit Digital Output impedance 75Ω Television standards supported: NTSC and PAL
COMPUTER OUTPUTS:	RGBHV loop For **VP-704xl** only: YPbPr (0.7V RGB / 1.0V sync-tip to white, approx. 0.4V DC offset) HDTV Resolutions: any up to 1080p Vertical Refresh Rate: any to 250Hz
CONTROL METHODS:	The unit can be controlled locally via the front panel buttons and on-screen display (OSD), remotely via the RS-232 interface (not applicable for **VP-701xl**) using a D9 female connector or again remotely via the Infrared remote using the infra-red remote unit.
LOCKING/MIXING (for **VP-704xl** only):	CV/YC SC/H phase adjustments: +/- 180 degrees (for units with CV/YC output only) Keyer: chromakey (YUV) or lumakey (Y) Mixer: PC / Video, foreground/background swappable PIP: variable window size & position – single-button enabling (Not all locking/mixing combinations are available: you cannot overlay one CV or YC source over a different CV or YC source, or one RGB/YUV source over another RGB/YUV source – you are restricted to overlaying CV/YC over RGB/YUV, or RGB/YUV over CV/YC (the exception is where you can overlay one source over itself).

SCALING / SAMPLING / MEMORY / ADJUSTMENTS:	Size and position: automatic via AutoSet or Manual Image size: user-definable presets Image freeze: one video frame Settings memory: non-Volatile CV/YC Video adjustments: contrast, brightness, saturation, hue (NTSC) Zoom range: variable to 10x Zoom (1000%) Shrink range: variable to 10% Image mirroring: Horizontal and/or Vertical Horizontal filtering: full digital Conversion technology: proprietary Color resolution: 24-bit (16.8 Million Colors) Sampling rate: 108MHz maximum Digital sampling: 24-bit, 4:4:4 format Firmware memory: flash, upgradeable via RS-232
REGULATORY COMPLIANCE:	Main unit conforms to FCC, CE, RoHS
ENVIRONMENTAL:	Operating temperature: +4 to +45°C (+40 to +113°F) Operating humidity: 10% to 85%, non-condensing Storage temperature: 0 to +60°C (+32 to +140°F) Storage humidity: 10% to 85%, non-condensing
POWER REQUIREMENTS (for VP-701xl):	External power supply: 12V DC @1A maximum. Actual current consumption varies between units. Internal over-voltage & over-current protection. Full PSU specification: 12V DC regulated 1Amp PSU with a 2.5mm locking center-pin positive DC power connector. A non-locking 2.5mm DC power connector will also fit.
POWER REQUIREMENTS (for VP-703xl and VP-704xl):	100-240V AC, 50-60Hz, 0.3A max.
WEIGHT:	VP-701xl: 1.8kg (3.97lbs) approx. VP-703xl and VP-704xl: 2.4kg (5.3lbs) approx.
DIMENSIONS:	VP-701xl: 21.85cm x 15.0cm x 4.2cm (8.6" x 5.9" x 1.65") W, D, H VP-703xl and VP-704xl: 48.2cm x 17cm x 4.5cm (19" x 6.75" x 1.75") W, D, H

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com, where updates to this user manual may be found. We welcome your questions, comments and feedback.