

QS-440
Quad Split

Operation Manual

FEDAL

QS-440 Quad Split

Multiple Input Display and Image Resizing Device

*JGA Operation Manual 1-QS440-1-OM
Change 1, December 1998*

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Feral Industries

A Division of James Grunder & Associates

14563 W. 96th Terrace

Lenexa, Kansas 66215

For Service, Call 1-800-331-2019

Voice: 913-492-4666 Fax: 913-895-7496

www.grunder.com email: grunder@grunder.com

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I. Introduction

The QS-440 Quad Split is a multiple input display and resizing device that combines four video inputs into one video output. Each input is independently scalable, allowing each image to be resized horizontally and vertically. Each input can be independently positioned, and each also has complete aspect ratio control. Each input can be independently frozen without degradation in the other input channels. Image resizing and transitions can be manually performed and stored in memory for quick and easy recall.

The Quad Split offers composite (CV) and Y/C (SV) inputs and outputs. It accepts up to four inputs simultaneously and can transcode between video formats. Each channel is a frame buffer, allowing the inputs to be asynchronous for hassle free timing. The unit operates in both the NTSC and PAL video standards. A genlock input, and key output, allow for easy integration with other equipment.

All Quad Split features can be controlled either on the integrated front panel, or by RS-232 ASCII code commands (Protocol is located in the back of this manual, see appendix a).

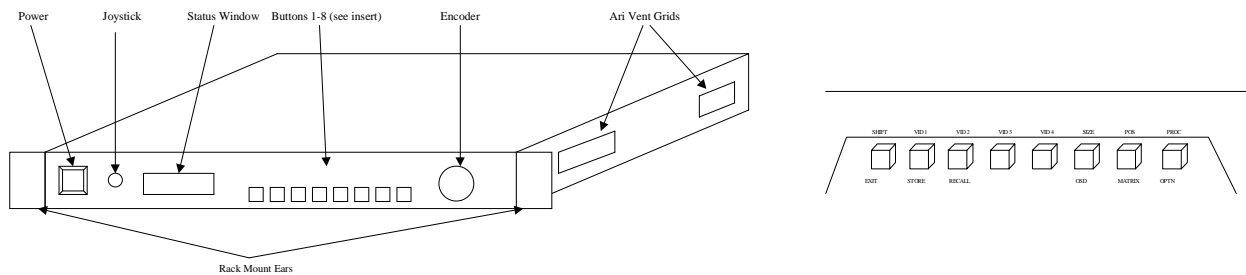


Figure 1a—Front View/Button Insert View

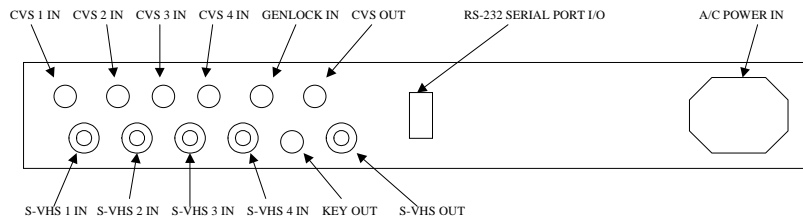


Figure 1b—I/O Connector View

II. Installation

Step 1—Mount the QS-440 in a 19” rack. (see instructions below)

Step 2—If operating the unit via serial control, make the necessary cable connections. (see fig. 1b, 2a, 2b for serial port connections)

Step 3—Connect your video equipment to the QS-440 input and output connectors existing in the rear chassis. (See fig. 1b for I/O connector locations)

A. Mounting

The QS-440 conforms to standard 19”, 1U, rack specifications. The unit should always be mounted by four rack ear bolts (*not included*) to provide sufficient support for the chassis.

CAUTION

When the unit is rack mounted, do not place additional weight on the unit without adding support beneath the unit.

The QS-440 should be operated in a relatively dust-free environment, with relatively stable ambient temperatures and humidity levels. Ensure the air intake vents are not obstructed in any way. These vents are located on the sides of the unit. Stacking rack mount configurations are acceptable because of the side air intake vents—however, stacked units must not emit excessive heat, which would deteriorate the heat removal capabilities of the QS-440. A forced air ventilated equipment rack system is recommended for regular usage.

B. Serial Support

To operate the unit via serial port control, locate the 9-pin serial port connector on the back. Connect one end of a 9-pin cable to this connector, and the other end to the applicable serial port connector on your computer. The port should be available, and set up to communicate at 9600 baud, 8 data bits, 1 stop bit, and no parity. This specification is the default setting of the QS-440.

C. RS-232 Cable Wiring

Your computer's serial port may have one of two types of external connectors—9-way or 25-way. See fig. 2 for the necessary connections for both types.

QS440	Computer (9 pin)	QS440	Computer (25 pin)
3-----TX Data	←--3	3-----TX Data	←--3
2-----RX Data	→--2	2-----RX Data	→--2
5-----Ground	-----5	5-----Ground	-----7
	DTR-----4		RTS-----4
Link{	DSR-----6	Link{	CTS-----6
	RTS-----7		DSR-----7
Link{	CTS-----8	Link{	DTR-----8
	N/C-----9		

Figure 2—RS-232 Wiring Diagram (9 pin & 25 pin)

NOTE: Refer to the RS-232 wiring diagram to insure your cable has the required handshake jumpers as indicated

III. Video Input Connections

The QS-440 has nine inputs. They consist of four CV inputs (on BNC connectors, labeled CVS), four SV inputs (on four pin DIN connectors, labeled S-VHS), and a Genlock input (BNC connector).

A. Composite Video Input

The inputs that are labeled CVS 1-4 (see fig. 3 below) are used to input composite video. Composite video is a video signal that travels on one conductor, and contains all information necessary to reproduce an image (luma, chroma, sync, etc...). It is normally an output of common video playback units, cameras, and other video processing devices. You may connect up to four separate composite sources, one per each CV connector on the QS-440.

NOTE: Do Not connect an SV signal and a CV signal to a single input channel simultaneously. You may mix and match CV and SV on different channels (example: channel 1 and 3 may have CV connections, while 2 and 4 may have SV connections. Any combination is allowable)

B. S-VHS Video Input

The inputs labeled S-VHS 1-4 (see fig. 3 below) are used to input SV video. SV video is a signal that uses two lines to travel on. Y (luma) and C (chroma) components are separate. Typical S-VHS sources include S-VHS or Hi8 videotape playback unit, BetaCam, M-II, and other video processing devices. You may connect up to four separate SV sources, one per each S-VHS connector on the QS-440.

NOTE: Do Not connect an SV signal and a CV signal to a single input channel simultaneously. You may mix and match CV and SV on different channels (example: channel 1 and 3 may have CV connections, while 2 and 4 may have SV connections. Any combination is allowable)

C. Genlock

The Genlock input (see fig. 1b) is used to lock the output to a stable external reference, such as a black burst generator, a color bar generator, a camera, or an output from a master time base correction unit. The QS-440 has automatic genlock, which is turned on when no genlock source is connected, and off when an external genlock source is connected.

NOTE: A stable reference must be connected to the QS-440 to activate the external genlock circuitry.

IV. Video Output Connections

A. Composite Video Output

The output labeled OUT CVS is capable of producing a composite video output consisting of up to four separate inputs (CV or SV inputs). This output can be connected to any device capable of receiving a composite input video source.

B. S-VHS Video Output

The output labeled OUT S-VHS is capable of producing an SV video output consisting of up to four separate inputs (CV or SV inputs). This output can be connected to any device capable of receiving an SV input video source.

C. Key Output

The BNC connector labeled KEY (see fig 1b) allows the QS-440 to be integrated with an existing system through a production switcher. Routing this signal through a switcher enables the operator to key the QS-440 output over other video sources.

V. Front Panel Control Operation

A. Video Input Selection/Freeze

Once all your connections are made, the front panel may be used to easily switch between inputs, and manipulate the output display. (see fig. 3)

1. Video Channels 1,2,3 and 4.

To access the video channels, press the appropriate Vid button on the front panel, making the selected channel the “active” channel (active means that the selected channel is set for manipulation through proc amp, scaling, positioning, and all other options). For example, to set channel 1 active, press the Vid 1 button. Channel 1 information will be displayed in the status window (see fig. 3). To select channel 2, press Vid 2. Repeat this process respectively for channels 3 and 4 as necessary.

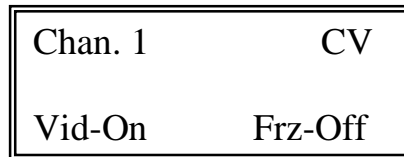


Figure 3—Status Window

You may now control the active channel. Use the joystick or the encoder to enable and disable the active channel. Press the joystick left, or turn the encoder left, to disable the channel. Press the joystick right, or turn the encoder right to enable the channel.

Press the joystick up to accept CV input for that channel. Press the joystick down to accept SV input for that channel.

Press the encoder in alternately to freeze and unfreeze the active channel display.

Repeat these processes as necessary for each channel as required. Remember to set the active channel first by pressing that channels Vid select button.

<u>Joystick</u>	<u>Encoder</u>	<u>Result</u>
Up	-----	CV Select
Down	-----	SV Select
Left	Left	Active Channel Off
Right	Right	Active Channel On
----	Press In	Freeze On/Off Toggle

B. Size and Position

1. Position

The POS button allows you to place a video image anywhere on the display screen. To activate this function, first select the channel desired (make it active) and then press the POS button. The status window will display the active channel position information. The digits on the lower line of information are numerical representations of current horizontal and vertical positions of the active channel. The values range from 001 to 255 (see fig. 4). Use the joystick to position the active channel.

Up:	Press the Joystick Up
Down:	Press the Joystick Down
Left:	Press the Joystick Left
Right:	Press the Joystick Right

Chan. 1	Position
H-001	V-001

Figure 4—Status Window

Pressing and holding the joystick in a specific direction will continue movement in that direction. The joystick may be actuated a “single click” for fine position adjustment.

2. Size

The SIZE button serves a dual purpose. Pressing the Size button once will activate the Zoom function for the active channel. Pressing the button again will activate the Aspect function for the active channel.

a. Zoom

The Zoom function allows a video input to be sized (scaled) in horizontal and vertical proportion. When Zoom is selected through the Size button, the status window will display the active channel zoom status (see fig. 5). The lower line on the display will show the horizontal and vertical zoom values numerically from 001 (smallest) to 255 (largest or full screen).

Chan. 1	ZOOM
H-001	V-001

Figure 5—Status Window

Use the joystick to manipulate the zoom values of the active channel.

Up/Left	Decrease Size
Down/Right	Increase Size

Pressing the encoder will drive the active channel to full screen display.

b. Aspect

The Aspect function allows a video input to be sized in horizontal and vertical scales independently. That is, you have the ability to change the aspect ratio to any variable desired (normal standard examples of aspect ratio are 4:3 and 16:9). To access the Aspect function, press the Size button twice (or once if already in the Zoom menu) to cycle through Zoom to Aspect. The status window will display the active channel aspect status (see fig. 6). The values on the lower line of the status window are representations of the horizontal and vertical aspect situation on a scale from 001 to 255 for each axis.

Use the joystick to manipulate the aspect values of the active channel:

Up:	Decrease the vertical picture size
Down:	Increase the vertical picture size
Left:	Decrease the horizontal picture size
Right	Increase the horizontal picture size

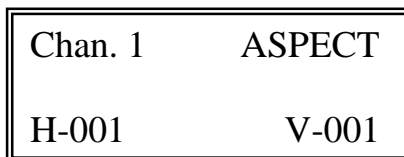


Figure 6—Status Window

Press the encoder to drive the active channel to full screen display.

C. PROC

The Proc button activates proc amp controls. Proc works in conjunction with each of the four video channels and cycles contrast, brightness, color, hue, and detail settings for the active channel.

Press the Proc button alternately to cycle through the available options (Contrast, Brightness, Color, Hue, and Detail). Cycle through the options until the status window displays the proc control you wish to manipulate on the active channel (see fig. 7). The value will be displayed as a numeric value between 001 and 255

for Contrast, Brightness, Color, and Hue. Detail value will be displayed as a numeric value between 000 and 003 only.

Use the joystick or encoder to control the selected proc amp values:

<u>Joystick</u>	<u>Encoder</u>	<u>Value</u>
Left	Left	Decrease Value
Right	Right	Increase Value
Up/Down	Press	Factory Default (All128 except Detail 001)

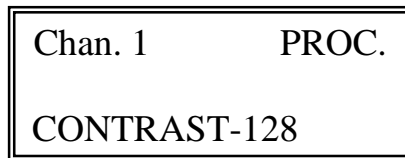


Figure 7—Status Window

D. Option Menu

To access the second level of button functions, press the Shift button. An asterisk (*) will be displayed in the lower right corner of the status window, indicating the unit is now in 2nd function mode. When in 2nd function mode, press the OPTN button (same button as PROC). By alternately pressing the OPTN button, the user will cycle through the options of Horizontal Phase, Sub Carrier, Background Color, Standard, and Board Version.

NOTE: To return to the 1st Function of the panel buttons, simple press Shift again, which will extinguish the asterisk on the window and return the unit to 1st functions

The Option Menu gives the user access to 5 separate controls. The controls are:

1. Horizontal Phase Set
2. Sub Carrier Phase Set
3. Background Color Set
4. Standard Set
5. Board Version Informational Display

Cycle the OPTN button until the status window displays the menu control desired.

1. HORIZONTAL PHASE SET

Horizontal phase works in conjunction with Genlock, and will only be effectual when Genlock is “On”. Horizontal phase allows adjustment of the horizontal picture position so that it is timed with the Genlock reference signal.

Use the joystick or the encoder to set the Horizontal Phase value.

<u>Joystick</u>	<u>Encoder</u>	<u>Result</u>
Left	Left	Value Decrease
Right	Right	Value Increase

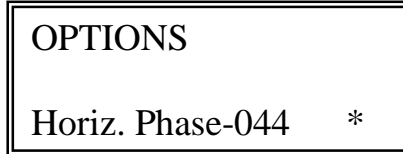


Figure 8—Status Window

2. Sub-Carrier Phase

Like Horizontal Phase, the Sub-Carrier (SC) Phase works in conjunction with Genlock. SC phase enables flesh-tones to be adjusted for color matching.

Use the joystick or the encoder to set the Sub-Carrier Phase.

<u>Joystick</u>	<u>Encoder</u>	<u>Result</u>
Left	Left	Value Decrease
Right	Right	Value Increase

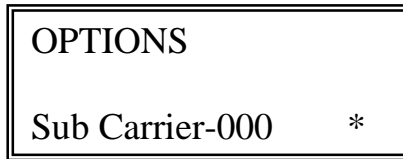


Figure 9—Status Window

3. Background Color

You may set the background color to black or white through this control. This is setting is toggled by pressing the encoder.

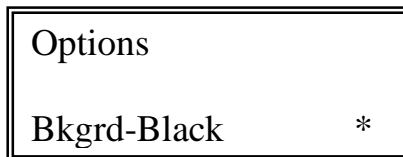


Figure 10—Status Window

4. Standard Select

This allows you to select the standard the unit is running in. The options are NTSC and PAL. To toggle this setting, press the encoder.

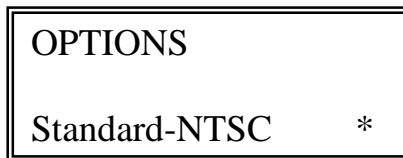


Figure 11—Status Window

5. Board Version

This option is a purely informational option. When Board Version is displayed in the status window, pressing the encoder will display the software version and date of the running board. No user selections are available through this option.

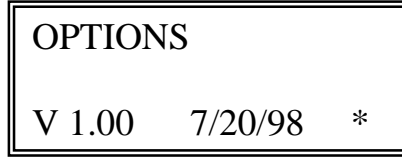


Figure 12—Status Window

E. MATRIX MENU

The Matrix Menu gives you access to the 4 x 4 matrix router built into the unit. It allows each input channel to be assigned to any of the 4 input sources. For example, through this control, it is possible to have channels 1-4 all display the video input source 1. Or, it is possible to have channels 1-4 display sources 1-4 respectively. Any combination the user requires is possible through manipulation of the Matrix Menu.

One item to become familiar with first is layering. The unit doesn't have the ability to change the layer priorities of the channels. The following layer assignments are built in to the unit:

Layer 1	Channel 1
Layer 2	Channel 2
Layer 3	Channel 3
Layer 4	Channel 4

Why is this important? Without a matrix router, you would be forced to change cabling whenever you decided to wanted to overlay source 4 over source 2, for example, because channel four is permanently set at layer four. Now, with a matrix router, you can change the layer of a source by changing its channel setting.

To access the Matrix Menu, press the shift key, so that the asterisk (*) is displayed on the status window, lower right corner. Then press the Matrix button. The Status window will now display the active channel matrix status. The lower line of the status window will read "Source-x", where x is the current input source for that channel.

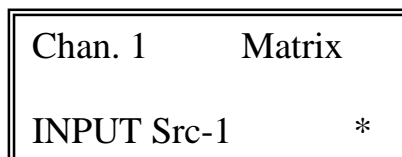


Figure 13—Status Window

To change the input source for the active channel, rotate the encoder. The status window will display the changing source number, and the image displayed on the monitor or display device will simultaneously change to the new settings.

NOTE: Changes MUST be saved prior to powering down the unit, or all settings will revert to factory default. Store the POR and Matrix settings to ensure proper restart of the unit. NOTE: If POR is stored, all current settings will be stored. Storing the Matrix will only store the matrix router settings (ignoring any proc, timing, or OSD changes made)

F. ON-SCREEN DISPLAY (OSD)

The OSD enables you to display labels for each input channel, and each input source. The channel labels are pre-programmed at “Chan. 1, Chan. 2, Chan. 3, and Chan. 4 respectively and can’t be altered. The source labels may be user programmed, as described below. The OSD consists of an 8-character label per each channel and source. The character set contains the English alphabet (upper and lower case), Arabic numbers 0 through 9, and several punctuation symbols.

To access the controls for the OSD, press the shift button, activating the 2nd function buttons, so that the asterisk (*) is displayed in the lower right hand corner of the status window.

Press the OSD button—the status window will display OSD status of the unit, “On or Off”. To toggle the on and off states, press the encoder.

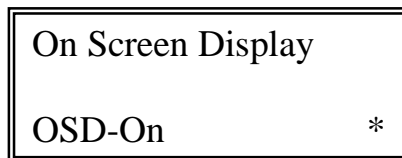


Figure 14—Status Window

The OSD is programmable for each input source. You may assign labels for each input. To program the OSD, access the OSD menu (as stated above) and press the OSD button until the status window displays “Prog OSD Src: x (where x-the source to be programmed). To change which source to program, rotate the encoder, stopping on the desired source (1, 2, 3, or 4).

Once you have selected the desired source to program, press the encoder.

The OSD for that particular source will now be flashing on the screen. The flashing character position is the active character. You may change the character by rotating the encoder.

Once the desired character is displayed, press the encoder. The next character in the string will flash and is now ready to program. Repeat this process until the desired OSD is obtained for the selected input source.

Press the OSD button once again—the “Store OSD Src” option will display in the status window. Press the encoder now to store the programmed source label.

NOTE: It is very easy to confuse the programming. Remember that the sources are being programmed, not the channels, therefore, if the source 2 label is reprogrammed, and source 2 is not being used, it will not be displayed. Also, if the source 2 label is reprogrammed, and all channels are set to source 2, then all channels will display the source 2 label. It is possible to program a source label when that source is not being used. The QS-440 will allow this by displaying the selected (but unused) source in the normal 4 x 4 position, but will revert to the proper label for that position after the OSD programming has been terminated.

G. STORE

The QS-440 has six levels of data storage. These may be accessed by first pressing the shift button, which will place an asterisk (*) in the lower right corner of the status window, and will actuate the 2nd function buttons. The six storage registers are:

- ZAP 1
- ZAP 2
- Proc
- Matrix
- System Timing
- Power On Reset



Figure 15—Status Window

To access each category, press the Store button (after pressing shift and actuating the 2nd functions). Each press of the Store button will toggle through the save options, beginning with ZAP 1 and ending with Power On Reset. Storing each category is accomplished by pressing the encoder. The status window will display “Done!” when the selected data has been successfully stored. A description and use for each Store category follows:



Figure 16—Status Window

1. ZAP 1 & ZAP 2
ZAP is an acronym for Zoom, Aspect, and Position. Storing a ZAP 1 or ZAP 2 register stores the current zoom, aspect, and position of the output display.
2. Proc
Proc. stores the current value for all the proc. amps in the QS-440. This function stores the values for each channel, as they are currently set.
3. Matrix
Matrix stores the current settings of the 4 x 4 matrix router. This function stores the current settings of the input sources for all 4 channels
4. System Timing
System Timing stores the Horizontal Phase and Sub-Carrier Phase current settings.
5. Power On Reset
Power On Reset stores all the current values of all controls. It will store the processor levels, the matrix setup, the timing, and the current position of the 4 channels. This function is used to set the unit default (power-up) condition.

H. RECALL

The Recall function gives you access to the 6 categories of memory storage registers. To access this function, press the Shift key, which will actuate the 2nd function buttons, and display an asterisk (*) in the lower right corner of the status window. Next, press the Recall button.

You may then toggle through the recall categories of ZAP 1, ZAP 2, Proc., Matrix, System Timing, and Factory Preset (which replaces Power On Reset in the Recall Menu).

Press the encoder once that category is displayed on the status window. The QS-440 will revert to saved values. Factory Preset replaces Power On Reset so that you may have a fallback safe setting if programming has gone awry. This control will restore the QS-440 values to factory set defaults. To recall Power On Reset levels, power down, and power up the unit.

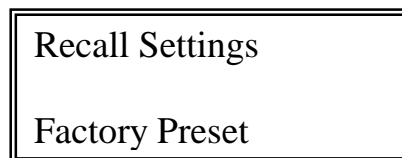


Figure 18—Status Window

I. Priority Commands

The Priority Command set allows you to select any one of the four channels for full screen display, while de-activating the remaining three channels. This feature is useful for any application in which you may want to view four sources, and cut immediately to any of those four images for unimpeded, full-screen display. The priority mode also allows instant access to zap #1 and zap #2 settings.

To access through the front panel controls:

- Press shift then VID 3, LCD will now display “Priority Mode”
- Vid 1 selects Channel 1 Priority
- Vid 2 selects Channel 2 Priority
- Vid 3 selects Channel 3 Priority
- Vid 4 selects Channel 4 Priority
- SIZE selects ZAP 1
- POS selects ZAP 2

Press SHIFT twice to exit priority mode, and return to ZAP 1 settings.

Appendix a—RS-232 Command Set

1. Routine Commands

RMT_A	Ask Routine
RMT_B	Set Background Black/White
RMT_C	Set Chroma value
RMT_D	unused
RMT_E	Set Freeze mode
RMT_F	unused
RMT_G	unused
RMT_H	Set Hue value
RMT_I	unused
RMT_J	unused
RMT_K	unused
RMT_L	Set Luminance value
RMT_M	unused
RMT_N	Set NTSC/PAL mode
RMT_P	Priority Commands
RMT_Q	unused
RMT_R	Recall Proc from register
RMT_S	Set Setup value
RMT_T	Store Proc to register
RMT_U	unused
RMT_V	Set Video mode On/Off, Composite, Component
RMT_W	"Who are you ?" Return serial/board address.
RMT_X	Return Serial #, version #, and Date.
RMT_Y	unused
RMT_Z	Set System timing
RMT_LP	Set Position value
RMT_LQ	unused
RMT_LR	unused
RMT_LS	Size routine
RMT_LT	unused
RMT_LU	unused
RMT_LV	Select active controlled channel.
RMT_LW	unused
RMT_LX	Select/Set crosspoint of MAX456.
RMT_LY	unused
RMT_LZ	Store Size and Position for All channels

2. Routine Specifics:

Note: Proceed all commands with an address bit (a, b, c, or d) with the exception of the “W” command (“W” returns the appropriate serial address (a, b, c, or d))

a. RMT_A **Ask for current channel settings**

Format is: A N cr
 A n cr

Where A is an upper case A
N is an upper case N for Normal
n is an ASCII number 0-4
cr is a carriage return

b. RMT_B **Set Background Black/White**

Format is: B n cr

Where n - + for Background White
 n - - for Background Black

Format is: B ? cr

 returns B cr lf ACK for Black
 W cr lf ACK for White

c. RMT_C **Set Chroma value routine**

Format is: C 1 + cr Increment Chroma level
 C 1 - cr Decrement Chroma level
 C 1 @ cr Normalize Chroma level
 C 2 xx cr Set Chroma level to xx

Where C is an upper case C
 + is a plus sign
 - is a minus sign
 xx is a Hex number

d. RMT_E Set Freeze routine.

Format is: E n + cr Freeze On
 E n - cr Freeze Off

Where E is an upper case E
 + is a plus sign
 - is a minus sign
 n is an ASCII 1 - 4 for specified individual channel (upper case A
 for all four channels, @ sign for current ;active individual
 channel))

e. RMT_H Set Hue value routine

Format is: H 1 + cr Increment Hue level
 H 1 - cr Decrement Hue level
 H 1 @ cr Normalize Hue level
 H 2 xx cr Set Hue level to xx

Where H is an upper case H
 + is a plus sign
 - is a minus sign
 xx is a Hex number

f. RMT_L Set Luminance value routine

Format is: L 1 + cr Increment Lum level
 L 1 - cr Decrement Lum level
 L 1 @ cr Normalize Lum level
 L 2 xx cr Set Lum level to xx

Where L is an upper case L
 + is a plus sign
 - is a minus sign
 xx is a Hex number

g. RMT_P Priority Commands

Format is: P @ n cr Select Channel as Priority Channel

Where n is 0 through 5
0=ZAP 1
1=Channel 1 Priority
2=Channel 2 Priority
3=Channel 3 Priority
4=Channel 4 Priority
5=ZAP 2

g. RMT_R Recall from EEPROM routine

Format is: R @ C cr Recall current channel settings
R @ A cr Recall settings for all channels
R @ I cr Recall initial settings
R @ N cr Recall normal settings
R @ P cr Recall power-on reset settings

h. RMT_S Set Setup value routine

Format is: S 1 + cr Increment Setup level
S 1 - cr Decrement Setup level
S 1 @ cr Normalize Setup level
S 2 xx cr Set Setup level to xx

Where S is an upper case S
+ is a plus sign
- is a minus sign
xx is a Hex number

i. RMT_T Store to EEPROM routine

Format is: T @ C cr
T @ I cr
T @ P cr
T @ N cr
T @ A cr

j. RMT_U Unlock/Auto Genlock

Format is: U + cr
 U - cr

Where U is a upper case U
 + - Auto Genlock mode
 - - Alone mode

Auto genlock mode is dependent on LOS signal. LOS present - Genlock
LOS missing - Alone mode; Genlock mode is stand alone, LOS signal
not used.

k. RMT_V Video control routine.

Format is: V n cr

Where V is a upper case V
 n is a plus (+) or minus (-) sign and
 + - Video On
 - - Video Off
 ? - Video status query, 1 On, 0, Off
 C - Video composite
 S - Video component
 cr is a carriage return (hex char 0x0D)

l. RMT_W "Who are you ?" routine.

Returns serial address (lower case a through d).

Format is: W @ cr

Where W is a upper case W
 @ is the ASCII at sign (hex char 0x40)
 cr is a carriage return (hex char 0x0D)

m. RMT_X Routine to return SER. #, VER. #, and DATE.

Format is: X @ cr

Where X is a upper case X
 @ is the ASCII at sign (hex char 0x40)
 cr is a carriage return (hex char 0x0D)

n. RMT_Z Set/Store System timing (Horz and SC)

Set Horizontal timing:

Format is: Z 1 + cr Increment Horz value
 Z 1 - cr Decrement Horz value
 Z 1 x cr Set Horz value to x

Where Z is an upper case Z
 + is a plus sign
 - is a minus sign
 x is an Hex number 00-7F

Set Sub Carrier timing:

Format is: Z 2 + cr Increment SC value
 Z 2 - cr Decrement SC value
 Z 2 x cr Set SC value to x

Where Z is an upper case Z
 + is a plus sign
 - is a minus sign
 x is an Hex number 00-7F

o. Z @ ? cr Requests System timing

Replies x y cr lf ACK
 x - Horz. Timing in hex
 y - Horz SC Timing in hex

p. RMT_LP Position change routine.

Format; p x y cr

Where x is horizontal position (Hex)
 y is vertical position (Hex)

q. RMT_LS Size change routine

Format; s x y cr

Where x is horizontal size
 y is vertical size

r. RMT_LV (lower case V) Active Channel Select

This stays in effect until next select.

Format is: v n cr

Where v is a lower case v
n is the Channel number (1-6 ASCII)
cr is a carriage return (hex char 0x0D)

n - 0 Matrix OCF
n - 1 Scaler channel 1
n - 2 Scaler channel 2
n - 3 Scaler channel 3
n - 4 Scaler channel 4

s. RMT_LX (lower case X) To select and update crosspoint for MAX456

Format is: x i o cr

Where x is a lower case X
i is the input number (1-4 ASCII)
o is the output number (1-4 ASCII)
cr is a carriage return (hex char 0x0D)

Format is: x @ ? cr Returns the current crosspoint settings
x @ s cr Store xpoints to EEPROM
x @ r cr Recall xpoints from EEPROM

Where ? is a question mark
s is a lower case S
r is a lower case R

t. RMT_LZ (lower case Z) Store/Recall Scaler channels Size and Position

Format is: z n s cr Store Size and Position to EEPROM
 z n r cr Recall Size and Position from the EEPROM
 z @ ? cr Returns Size and Position of channels

Where z is a lower case Z
 s is a lower case S
 r is a lower case R
 n is the reg #, 1 or 2
 or channel #, 1 through 4
 cr is a carriage return (hex char 0x0D)
 ? is a question mark

Appendix b—Front Panel Control Quick Reference Guide

1. VID 1-4

Function: Sets selected channel active; gives access to control video on/off, freeze on/off; CV and SV selector

<u>Joystick</u>	<u>Encoder</u>	<u>Result</u>
Left	Left	Channel Off
Right	Right	Channel On
Up		CV Select
Down		SV Select
	In	Alternate Freeze On/Off

2. SIZE

Function: Activates Zoom and Aspect control of active channel

Zoom Control:

<u>Joystick</u>	<u>Encoder</u>	<u>Result</u>
Up		Decrease Size
Down		Increase Size
Left		Decrease Size
Right		Increase Size
	In	Alternate Full Screen/POR

Aspect Control:

<u>Joystick</u>	<u>Encoder</u>	<u>Result</u>
Left		Decrease Horizontal Size
Right		Increase Horizontal Size
Up		Decrease Vertical Size
Down		Increase Vertical Size
	In	Alternate Full Screen/POR

3. POS

Function: Activate position control of active channel

<u>Joystick</u>	<u>Encoder</u>	<u>Result</u>
Left		Move Channel Left
Right		Move Channel Right
Up		Move Channel Up
Down		Move Channel Down

4. PROC

Function: Activate proc amp controls for active channel

Proc Cycle: Repeatedly press PROC button to cycle through options Contrast, Color, Brightness, Hue, Detail

<u>Joystick</u>	<u>Encoder</u>	<u>Result</u>
Left	Left	Decrease Value
Right	Right	Increase Value
Up		Not Used
Down		Not Used
	In	Restore Value to default

2nd Function Buttons

To Access the Button's 2nd functions, use the shift button. Press Shift and an asterisk will appear in the lower right corner of the status window. This will activate the 2nd functions. To return to 1st functions, press shift again, which will extinguish the asterisk and return to 1st function operation.

5. OPTN

Function: Activate Options Menu

Options Cycle: HPhase, SC Timing, Background Color, Standard, Board Version

HPhase, and SC Timing Control:

<u>Joystick</u>	<u>Encoder</u>	<u>Result</u>
Left	Left	Value Decrease
Right	Right	Value Increase
Up	In	Restore Default Value
Down		Restore Default Value

Background Color, Standard, and Board Version Control:

<u>Joystick</u>	<u>Encoder</u>	<u>Result</u>
	In	Toggle Background Color
	In	Toggle Standards Select (NTSC/PAL)
	In	Display Board Version

6. MATRIX

Function: Activates Matrix Router Control of Active Channel

<u>Joystick</u>	<u>Encoder</u>	<u>Result</u>
	Left	Decrease Source Number
	Right	Increase Source Number

7. OSD

Function: Activate OSD Programming Control

<u>Joystick</u>	<u>Encoder</u>	<u>Result</u>
	In	Select OSD Option
	Left	Change Character
	Right	Change Character
	In	Store

8. STORE

Function: Activate Memory Registers for Data Storage

<u>Joystick</u>	<u>Encoder</u>	<u>Result</u>
	In	Store Value

9. RECALL

Function: Activate Memory Registers for Data Recall

<u>Joystick</u>	<u>Encoder</u>	<u>Result</u>
	In	Store Value

Appendix c--Glossary and Abbreviations

1. **Alpha Key Output**—Alpha Key is a BNC connector referred to as Key. It is used to track the video for resizing and positioning. It operates with an external keyer.
2. **Aspect**—Aspect, controlled under the SIZE button, resizes video vertically and horizontally independently in unequal proportions
3. **BNC**—Standard type connector used in video and RF industries.
4. **Chrominance (Chroma)**—color intensity of a NTSC/PAL video signal
5. **Composite Video**—video waveform consisting of all necessary data to reproduce a video signal; all signals traveling on a single conductor.
6. **Genlock**—signal used to synchronize two or more video sources, enabling sources and signals to be used together.
7. **Key Frame**—frame of video used as a reference for different operations
8. **LCD**—liquid crystal device
9. **NTSC/PAL**—video standards; NTSC used primarily in the United States (also a few other parts of the world); PAL used primarily in Europe, Asia, and South America.
10. **Y/C**—meaning Y-Luminance, C-Chrominance; type of video signal that travels on two separate conductors (Y and C); also known as SV and S-VHS
11. **ZAP**—acronym for zoom, aspect, and position
12. **Zoom**—resizes the video in proportion in accordance with the set aspect ratio