5

SERIAL COMMAND SET

This section discusses the QuadView serial control commands. The command set provides access to all of the unit's functions.

An optional software control program, called the Virtual Control Panel, is also available from RGB Spectrum. See "Control Software For Windows" on page 26 for more information on this program.

GENERAL

The command set is made up of ASCII characters. Commands are case insensitive and each has both a long and a short form. The short form is indicated by the capitalized letters in the long form of the command.

> *Example*—the command "**BAUDrate**" can be entered in the following ways:
>
> `>baudrate` `>baud`
>
> `>BAUDRATE` `>BAUD`

Most commands may be used to set a variable (called an "argument"), or to get the value of a variable. The format <command> <value> sets "command" to a "value", whereas <command> alone returns the command's value. Arguments appearing in square brackets "[ ]" are optional.

> *Example*—set BRIghtness to 125 and then check the current value for CONTrast:
>
> `>bri 125` *sets the value*
>
> `>cont` *checks the value*
>
> would return:
>
> `>contrast 95` *system reports the value*

Illegal commands or arguments generate error messages and correct usage instructions.

To execute serial instructions, each command line must be followed by a carriage return <CR>.

CONTROL SOFTWARE FOR WINDOWS

RGB Spectrum offers an optional software control program which runs under Microsoft Windows 95, 98, 2000, XP, and NT. The QuadView Virtual Control Panel (VCP) is a graphical user interface to RS-232 serial control.

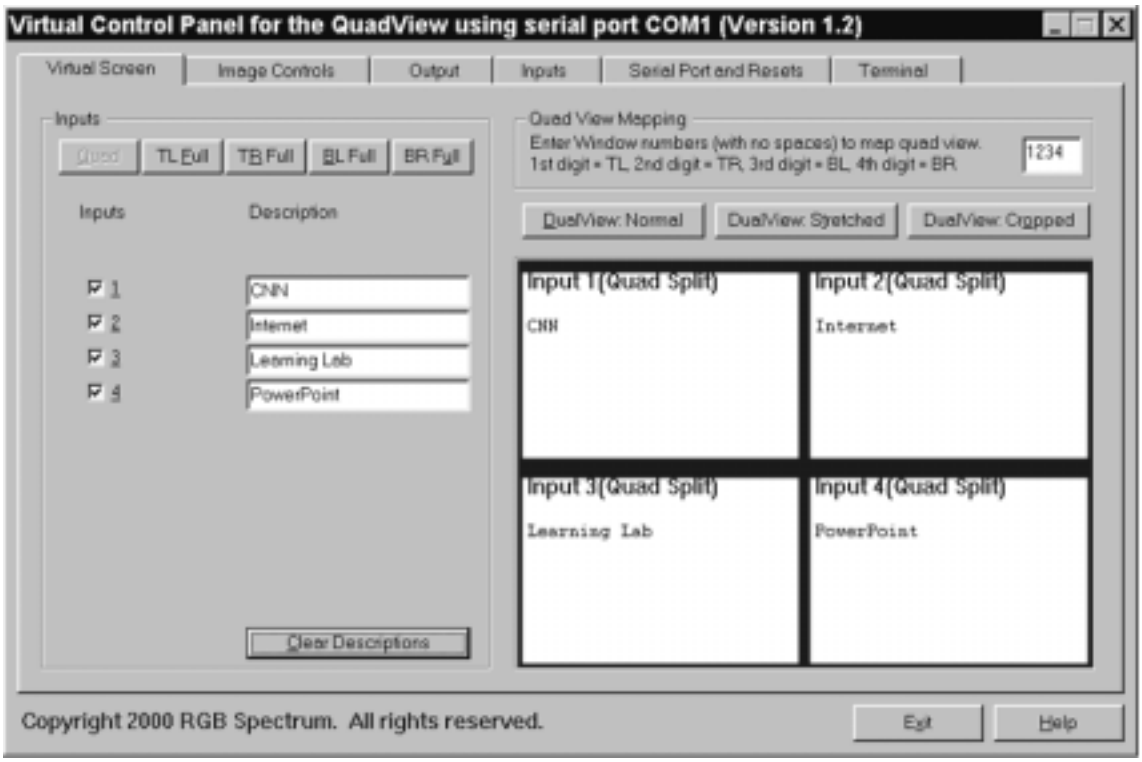

FIGURE 9. **VCP Software for the QuadView**

With the VCP, you have push button control over all functions of the QuadView. The VCP requires the same serial connections as described in *Appendix A*.

The VCP comes with an on-line help feature, so the application is not covered in this User Manual. If you have purchased the VCP control software, please refer to the on-line help, accessible on each section of the software via the "Help" button located in the bottom right corner of the screen.

COMMAND SET SUMMARY

The serial command set can be used to control QuadView. The uppercase letters in the command name can be used to abbreviate the command on the prompt line. For example, **INputTYPE**, you can use **INTYPE**, and for **CONTrast**, you can use **CONT**. A space is required between a command and its argument.

The following tables list all of the commands for controlling the QuadView.

INPUT COMMANDS

These commands allow you to make adjustments for your inputs and then save these settings into the unit's internal memory.

Command	Arguments	Description
INput	<input # | ALL> [AUTO | LOCK | DEBUG]	Sets the input mode for the specified input. *Auto* engages the autosync circuitry. *Lock* turn the autosync circuitry off. *Debug* provides information on input status and reports changes to measured parameters.
INputDELete	<1…50>	Deletes the specified saved input from the *Input List*.
INputFormat	<input #>	*InputFormat* is a read-only command for checking the video format of the current video input selection. The command is only valid when *Input Type* is set to either Composite, Component, or S-Video. The response to the command will be NTSC or PAL. The input argument can only be "1" or "3" since these are the only input channels which support the optional video board.
INputInteractive	<input#>	Enters input interactive mode to visually adjust timing parameters of the specified input. A white box frame and crosshair appear over the full screen input. Starting with the upper-left corner of the image, use these keyboard controls to position the image within the white frame: **i** = move up **m** = move down **j** = move left **l** = move right With the upper-left corner properly adjusted, address the lower-right corner next by using these keyboard controls: **I** = move up **M** = move down **J** = move left **L** = move right With the image properly adjusted, quit the utility: **q** = quit After you have adjusted the input to your satisfaction, use the *Input Name* command to name your input source, and the *Input Save* command to store the *Input List*.
INputLIST	[<1…50>] [<1…50>] [<active>]	Displays the entire *Input List* of saved input timings. If arguments are supplied, displays on the portion of the list requested. The *Active* argument displays all saved list entries.
INputLOAD	<input #> <1…50>	Loads the indicated entry from the *Input List* to the specified input channel. The entry is loaded only if it matches the measured parameters of the signal—sync format and polarity, interlace state, vertical total, and horizontal frequency.

INPUT COMMANDS

These commands allow you to make adjustments for your inputs and then save these settings into the unit's internal memory.

Command	Arguments	Description
INputName	<input #> <name>	Assigns a name to the specified input. The argument can be up to 17 alphanumeric characters with no spaces (underscore is acceptable). Factory default: Auto_1
INputSave	<input#> <1…50>	Saves the specified input to the selected entry in the *Input List*. These settings are recalled whenever the signal is reapplied to the QuadView.
INputTiming	<input #> <hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact>	Sets the timing of the selected input. **Note:** The vertical total cannot be changed from the measured value; that is, the total of <vfp> + <vs> + <vbp> + <vact> must remain constant. See Table 5 for ranges and factory defaults.
INputTYPE	<input#> <COMPOSITE | SVIDEO | COMPONENT | RGB>	This command is used for channels with video input option boards. The command selects between the four possible inputs types of such a channel. One input per channel can be used at a time. The input argument can only be "1" or "3" since these are the only input channels which support the optional video board. Factory default: RGB
LoadInputList	<1...50> <name> <hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact> <hfreq> <sync> <hpol> <vpol> <il>	The *LoadInputList* command lets you define input timing strings without requiring the input signal to be present. For example, if one QuadView system had an Input List which must be copied to a second unit, the LoadInputList command could be used to enter in the list entries one by one. The first argument, <1…50>, indicates the Input List entry number to which to store the timing string. The second argument, <name>, gives a customized name to the signal. The next eight arguments, <hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact>, define the signal's timing. The next five, <hfreq> <sync> <hpol> <vpol> <il>, define the horizontal frequency, sync format and polarity, and interlace status. All 15 arguments must be supplied for the command to be successful.

HOST COMMANDS

The Host commands control the output of the QuadView. They define the output or "host" timing and sync format, and save, load, and delete timings to the Host List.

Command	Arguments	Description
ClearHostList	(none)	Clears the *Host List* of all user-defined hosts.
HOST	(none)	A query command which returns information on the selected host timing.
HostDELete	<1..10>	Deletes the specified user-defined host.

HOST COMMANDS

The Host commands control the output of the QuadView. They define the output or "host" timing and sync format, and save, load, and delete timings to the Host List.

Command	Arguments	Description
HostInteractive	(none)	Enters the host interactive mode. This is an adjustment mode for changing the Host Timing values to better suit your display device. Once in the interactive mode, a white box and crosshair appear on the output display. Starting with the upper-left corner of the image, use these keyboard controls to position the image within the white frame: **i** = move up **m** = move down **j** = move left **l** = move right With the upper-left corner properly adjusted, address the lower-right corner next by using these keyboard controls: **I** = move up **M** = move down **J** = move left **L** = move right With the image properly adjusted, quit the utility: **q** = quit After you have adjusted the input to your satisfaction, use the *Host Name* command to name your input source, and the *Host Save* command to store the *Host List.*
HostLIST	[<1…63>] [<1…63>]	Displays the entries in the Host List (Figure 10). Without arguments, the command returns the entire list. With one argument, it returns information on the specified Host List entry. With both arguments, it returns the portion of the Host List specified by the arguments. The first 10 entries are user-defined. That is, these slots are reserved for host timing strings the user defines with the HostTiming and/or HostInteractive commands, and saves with the HostSave <1…10> command. Entries 11 through 54 include both progressive (non-interlaced) and interlaced hosts with a standard 4:3 or 5:4 aspect ratio. They are listed in order of decreasing resolution and frequency. Entries 55 through 63 are 16:9 wide screen hosts. Factory default: Host #11
HostLOAD	<1…63>	Loads the indicated host from the *Host List.*
HostName	<name>	Assigns a name to the current host. The argument can be up to 17 alphanumeric characters with no spaces (underscore is acceptable). Factory default: Auto_1
HostSave	<1…10>	Saves the current host settings into the *Host List.* The argument specifies which *Host List* position is used.
HostTiming	<input #> <hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact>	Sets the timing for the current host. Factory default: Host #11, 1280x1024, 75 Hz See Figure 10 for a description of Host List.
OPTimize	<ON | OFF>	Improves the horizontal resolution. This command is useful when the display device is a CRT and the output resolution (host) is less than 1280x1024 pixels. If the display is a discrete (sampled) device, such as an LCD or DLP, and you turn Optimize ON, you may get a modulus mismatch, creating vertical banding. Factory default: OFF

IMAGE POSITIONING/VISIBILITY

This section contains commands for controlling the display configuration, zoom and pan operations, and freezing inputs.

Command	Arguments	Description
DoubleBuffer	<input#> <ON | OFF>	The double buffering feature eliminates pointer crossover. This is a visual artifact which can be visible in imagery containing horizontal motion—for example, a camera panning from left to right—or scene changes. It appears as a brief, horizontal break in the picture. Your eye may not discern it, but what you are seeing is a portion of one frame of video and a portion of another. With DoubleBuffer ON, pointer crossover is eliminated. The trade off is that horizontal motion may appear a little jerkier. DoubleBuffer is applicable to both RGB and video inputs. When setting DoubleBuffer for input 1, first select the specific input type with the INputType command. DoubleBuffer is only valid if the output host is progressive (non-interlaced), and if the input is an RGB signal, it must also be progressive. DoubleBuffer is also valid for all video inputs on the video input option board. Factory default: ON
DualView	<NORMAL | STRETCH | CROP>	The *DualView* command sets the display mode to a two window configuration. It uses quadrants one and two (top left and top right), placing the inputs assigned to those quadrants side-by-side on the output. The input assignment is made with the QuadViewMap command. The argument used determines the aspect ratio of the windows (see Figure 11). With NORMAL, the windows are automatically set to the correct aspect ratio based on the host timing. With STRETCH, the windows are stretched vertically. With a 16:9 output host, the windows fill the screen in STRETCH mode. With a 4:3 host, the windows are stretched vertically but take up only a 16:9 portion of the 4:3 output display. With CROP, the windows are stretched vertically as with STRETCH, but in order to maintain the correct aspect ratio, the input is cropped by 20% on the left and right.
FreeZe	<input# | ALL> <ON | OFF>	Turns freeze status of selected input on or off. If *Freeze* is on, it delays action of *Brightness*, *Contrast*, and *Gamma* commands until *Freeze* is turned off. The freeze status is maintained through switches between display configurations (e.g., full screen to quad split), as it is the input that is frozen, not the output. Any change to the host timing resets the freeze status to off. Factory default: OFF
FullScreen	<input# | BLACK>	The FullScreen command sets the selected input to a full screen display. With the black argument, the screen is set to black. FullScreen is an alternative display configuration command to QuadView and DualView.
MULlions	<OFF | THIN | MEDIUM | THICK>	Sets the thickness of the border under *Quad* mode. *Thin* is two pixels wide, *Medium* is four pixels wide, and *Thick* is eight pixels wide. Factory default: OFF

IMAGE POSITIONING/VISIBILITY

This section contains commands for controlling the display configuration, zoom and pan operations, and freezing inputs.

Command	Arguments	Description
OVERSCAN	<input#> <ON | OFF>	*Overscan* performs an automatic 2% enlargement on video inputs only. It has no effect on WSR values, and it applies to all video inputs for the specified channel. *Overscan* is useful in trimming out excess blanking in video signals or head switching for VTR sources. Unlike WSR, when *Overscan* is turned on, the enlargement is automatic and constant even when switching between the various video input types. Factory default: OFF
PAN	<input#>	Activates the pan utility for the selected input. Only a zoomed input can be panned. The controls for the utility are as follows: **i** = pan up **m** = pan down **j** = pan left **l** = pan right **q** = quit
QuadView	(none)	The *QuadView* command switches the output display to a quadrant configuration, using the quadrant/input arrangement specified in the *QuadViewMap* command. There are no arguments for this command. *QuadView* is an alternative display configuration command to *FullScreen* and *DualView.*
QuadViewMap	<1…4> <1…4> <1…4> <1…4>	This command sets up the input/quadrant mapping assignment. All four quadrant assignments are required, and no input can be repeated more than once. The arguments are in quadrant order of top left to bottom right (TL, TR, BL, BR), and refer to the inputs. For example, if the command "QVM 4 3 2 1" is issued, input #4 appears in the TL quadrant, input #3 in the TR, input #2 in the BL, and input #1 in the BR. The *QuadViewMap* assignment is saved in NVRAM. Factory default: 1 2 3 4
RSR	<input#>	Resets the source rectangle (WSR) to default value, that is equal to the HACT and VACT measurements of the specified input signal. RSR "unzooms" a zoomed image. RSR also resets bright, contrast, gamma, hue, saturation, and sharpness values to defaults.
SPLIT	<PRIMARY input#> [<TR input #> <MR input #>]	This command takes your available input numbers (1, 2, 3, 4) and maps them to the four windows. If you enter only one argument, that input is mapped to the primary window and the other windows are mapped sequentially- top right, middle right, bottom right- starting with the smallest remaining input number. For example, if you type SPLIT 3, then input 3 will be in your primary window, input 1 is in the top right window, inputs 2 is in the middle right window, and input 4 is in the bottom right window. **Note**: This command only works for non-interlaced 16:9 output hosts. Factory default: 1 2 3
SplitMAP	(none)	This command displays the input mapping created by the *Split* command. This mapping is different from the QuadViewMapping.

IMAGE POSITIONING/VISIBILITY

This section contains commands for controlling the display configuration, zoom and pan operations, and freezing inputs.

Command	Arguments	Description
WINdow	<input# | ALL> <ON| OFF>	The *Window* command is used to turn off one or all inputs. If *Window* is Off and the input to that channel is removed and reapplied within two seconds then the status remains off. If *Window* is On and signal is removed for more than two seconds and then reapplied, the window status reverts to on. This allows for the use of a switcher and maintaining the desired on/off status. It also means that when a previously unused channel is used, the window automatically turns on allowing the new input to be displayed. The WIN ALL command is used to turn all windows on or off simultaneously. Factory default: ALL ON
WSR	<input#> <x> <y> <width> <height>	Sets the source rectangle for the selected input. The source rectangle is the portion of the original input that is displayed on screen. By default, WSR is set to show the entire image. That is, the default value for RGB inputs is equal to the HACT and VACT measurements of the specified input signal. For video, WSR defaults to 720x480 for NTSC and 720x574 for PAL. The source rectangle is used to zoom in or out on an image. The <x> and <y> coordinates represent coordinate screen starting point from which to draw the supplied values of <width> and <height>. Example—To zoom in on the upper left quadrant of an 800x600 input, the WSR values are: wsr <input#> 0 0 400 300 To display only the bottom right quadrant, the WSR values are: wsr <input#> 400 300 400 300 The full, default source rectangle for this 800x600 input is: wsr <input#> 0 0 800 600 WSR resets to defaults whenever the signal is acquired or reacquired. That is, if you remove or replace the input signal, or if you change the input type selection on a single channel with the INputTYPE command, then WSR resets to the default values for the newly acquired signal.
ZooM	<input#>	Activates the zoom utility. *Zoom* affects the WSR value for the input. The zoom utility controls are: **i** = zoom in **o** = zoom out **q** = quit The maximum zoom is limited in all cases to no more than two times the original image. Not all inputs generate a 2x zoom ratio, however. The amount of available zoom range is dependent on the pixel rate of the input signal. *Zoom* resets to an unzoomed state whenever the signal is acquired or reacquired. That is, if you remove or replace the input signal, or if you change the input type selection on a single channel with the *InputType* command, then *Zoom* resets to the default values for the new signal.

IMAGE CONTROLS

After you have made your adjustments with the *Input Commands*, you can then adjust the image controls for each input.

Command	Arguments	Description
BRIght	<input# | ALL> <-500…500>	Sets *brightness* value of the selected input. The ALL argument sets brightness for all four inputs. Factory default: 0
CONTrast	<input# | ALL> <0…200>	Sets *contrast* value of the selected input. The ALL argument sets contrast for all four inputs. Factory default: 100
GAMma	<input# | ALL | QUAD> <0.5…2.0>	Sets a unique gamma value of the selected input when displayed full screen. The ALL argument recalls or sets gamma for all four inputs. For RGB inputs, the value is automatically saved with *InputSave* command. When the QUAD argument is used, a separate gamma value is created explicitly for Quad Split or DualView display modes. This is to ensure an even gamma setting for the multiple input display. Factory default: 1.0
HUE	<input#> <-180…180>	Sets *hue* value of the selected input. Hue is only valid for video option board inputs. Factory default: 0
SATuration	<input#> <0…200>	Sets *saturation* value of the selected input. Saturation is only valid for video option board inputs. Factory default: 100
SHARPness	<input#> <0 | 1 | 2 | 3>	Sets *sharpness* value of the selected input. Factory default: 2

MISCELLANEOUS

These commands control a variety of general QuadView functions.

Command	Arguments	Description
AUTOSAVE	<ON | OFF>	The *AutoSave* feature automatically stores the system configuration approximately every ten seconds. The process stores configuration information such as *HostList*, *InputList*, *Host* settings, and display parameters. *AutoSave* allows you to turn the NVRAM automatic update mode on or off. **Note:** The *AutoSave* feature can cause sluggish response to some QuadView controls. While the *Auto Save* feature is useful during setup of the system, it is best set to Off during live presentations. Factory default: OFF
DEMO	(none)	*Demo* runs the built-in demo sequence. Type “q” to quit demo. The demo is a looping display script which alternates between Full Screen and Quad Split display modes.
FrontPanel	<ON | OFF>	Enables and disables the front panel. Factory default: ON

MISCELLANEOUS

These commands control a variety of general QuadView functions.

Command	Arguments	Description
Help	[<command>]	*Help*, without an argument will display the entire serial command set. *Help*, with a command as an argument will display detailed information about that command.
ID	(none)	Displays the product identification, product name, firmware version number, date, and serial number.
RestoreFactoryDefaults	(none)	Restores all user settings to their factory default values.
SAVECONFIGURATION	(none)	Forces an update and explicit save of the system's NVRAM. This stores configuration information such as *HostList*, *InputList*, *Host* settings and display parameters.
STATus	(none)	Returns the *Status* of the QuadView and its current settings.
TestPattern	<ON | OFF>	This command turns the internal *TestPattern* (color bars) on and off. Factory default: OFF
VERSION	(none)	*Version* returns firmware, hardware, and bootcode revision information.

SERIAL PORT FUNCTIONS

These commands control the baud and echo settings.

Command	Arguments	Description
BAUDrate	<1200 | 2400 | 9600 | 19200 | 38400 | 57600 | 115200>	Sets the serial port *baud* rate. The value is automatically saved in NVRAM. Factory default: 9600
ECHO	<ON | OFF>	Turns the serial *echo* On/Off. The value is saved in the NVRAM. The *echo* is only on commands typed and sent to the unit. **Note:** *Echo* setting has no effect on responses issued by the QuadView; responses are always visible, regardless of the *echo* status. Factory default: ON

TABLE 5. Definitions and Ranges for Timing Parameters

Parameter	Definition	Range (default value)
HFP	Horizontal front porch	0 to 640 pixels (16)
HS	Horizontal sync	16 to 640 pixels (144)
HBP	Horizontal back porch	0 to 640 pixels (248)
HACT	Horizontal active	16 to 1280 pixels (1280)
VFP	Vertical front porch	0 to 512 lines (1)
VS	Vertical sync	2 to 32 lines (3)
VBP	Vertical back porch	0 to 512 lines (38)
VACT	Vertical active	12 to 1024 lines (1024)
HFREQ	Horizontal frequency in Hz	15 to 90 kHz (75)
SYNC	Sync format	3, 4, or 5 wires (5)
HPOL	Horizontal sync polarity	1 or 0 (1)
VPOL	Vertical sync polarity	1 or 0 (1)
IL	Interlaced/Noninterlaced	1 or 0 (0)

#	NAME	HFP	HS	HBP	HACT	VFP	VS	VBP	VACT	HFREQ	SYNC	HPOL	VPOL	IL
1.	(user defined hosts)													
. 10														
11	VESA_1280x1024_75	16	144	248	1280	1	3	38	1024	799805	1	1	0	
12	VESA_1280x1024_60	48	112	248	1280	1	3	38	1024	639835	1	1	0	
13	1280x1024___59.94	48	112	248	1280	1	3	38	1024	638975	1	1	0	
14	1280x1024_____50	52	116	250	1280	1	3	38	1024	532995	1	1	0	
15	VESA_1280x960__60	96	112	312	1280	1	3	36	960	600025	1	1	0	
16	1280x960____59.94	96	112	312	1280	1	3	36	960	599415	1	1	0	
17	1280x960_____50	96	112	312	1280	1	3	36	960	500005	1	1	0	
18	EIA_1260x946___30	44	136	164	1260	8	8	61	473	306925	1	1	1	
19	EIA_1164x874___30	36	112	140	1164	6	6	59	437	283425	1	1	1	
20	SUN_1152x900___66	30	128	194	1152	2	4	31	900	617975	1	1	0	
21	APPLE_1152x870_75	32	128	144	1152	3	3	39	870	686815	1	1	0	

22	VESA_1152x864__75	64	128	256	1152	1	3	32	864	675035	1	1	0
23	EIA_1080x809___30	26	96	118	1080	6	6	54	404	262445	1	1	1
24	1024x768_____100	24	136	160	1024	3	6	29	768	806065	1	1	0
25	VESA_1024x768__85	48	96	208	1024	1	3	36	768	686815	1	1	0
26	VESA_1024x768__75	16	96	176	1024	1	3	28	768	600245	1	1	0
27	VESA_1024x768__70	24	136	144	1024	3	6	29	768	564785	0	0	0
28	VESA_1024x768__60	24	136	160	1024	3	6	29	768	483655	0	0	0
29	1024x768____59.94	24	134	158	1024	3	6	29	768	483115	0	0	0
30	1024x768_____50	24	136	160	1024	3	6	29	768	403035	0	0	0
31	VESA_1024x768__43	8	176	56	1024	0	8	41	384	356015	1	1	1
32	EIA_900x674____30	20	64	80	900	5	5	45	337	218705	1	1	1
33	APPLE_832x624__74	32	64	224	832	2	3	38	624	497165	1	1	0
34	EIA_832x624____30	16	56	64	832	5	5	41	312	202535	1	1	1
35	800x600_____100	32	96	128	800	1	2	22	600	625005	1	1	0
36	VESA_800x600___85	32	64	152	800	1	3	27	600	536735	1	1	0
37	VESA_800x600___75	16	80	160	800	1	3	21	600	468755	1	1	0
38	VESA_800x600___72	56	120	64	800	37	6	23	600	480795	1	1	0
39	VESA_800x600___60	40	128	88	800	1	4	23	600	378805	1	1	0
40	800x600_____59.94	40	128	88	800	1	4	23	600	376425	1	1	0
41	VESA_800x600___56	24	72	128	800	1	2	22	600	351565	1	1	0
42	800x600_____50	32	96	128	800	1	2	22	600	312505	1	1	0
43	PAL_768x576____25	22	70	84	768	5	5	39	288	156255	0	0	1
44	640x480_____100	16	96	48	640	10	2	33	480	525015	0	0	0
45	VESA_640x480___85	56	56	80	640	1	3	25	480	432695	0	0	0
46	VESA_640x480___75	16	64	120	640	1	3	16	480	375005	0	0	0
47	VESA_640x480___72	24	40	128	640	9	3	28	480	378605	0	0	0
48	VESA_640x480___60	16	96	48	640	10	2	33	480	314735	0	0	0
49	640x480_____59.94	16	96	48	640	10	2	33	480	314735	0	0	0
50	640x480_____50	16	96	48	640	10	2	33	480	262505	0	0	0
51	NTSC_640x480___30	44	112	104	1280	6	6	29	242	157345	0	0	1
52	VESA_720x400___85	36	72	108	720	1	3	42	400	379275	0	1	0
53	VESA_640x400___85	32	64	96	640	1	3	41	400	378605	0	1	0
54	VESA_640x350___85	32	64	96	640	32	3	60	350	378605	1	0	0
55	1280x768_____56	48	112	248	1280	1	3	30	768	451165	0	0	0
56	1280x720_____100	110	40	220	1280	5	5	20	720	750015	0	0	0
57	1280x720_____60	108	40	214	1280	5	5	20	720	450005	0	0	0
58	1280x720____59.94	112	40	224	1280	5	5	20	720	449555	0	0	0
59	1280x720_____50	110	40	220	1280	5	5	20	720	375005	0	0	0
60	852x480_____60	20	66	52	852	6	6	33	480	314915	0	0	0
61	852x480_____59.94	20	66	52	852	6	6	33	480	314685	0	0	0
62	1360x1024__75.1	32	136	272	1360	3	3	35	1024	80000 5	1	1	0
63	1360x768__60	92	40	276	1360	3	6	18	768	47700 5	1	1	0

FIGURE 10. The Host List

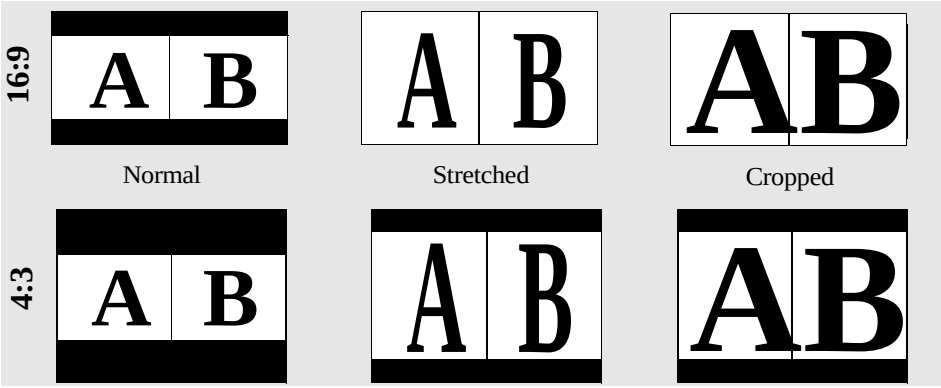

FIGURE 11. **DualView Modes—16:9 and 4:3 Displays**