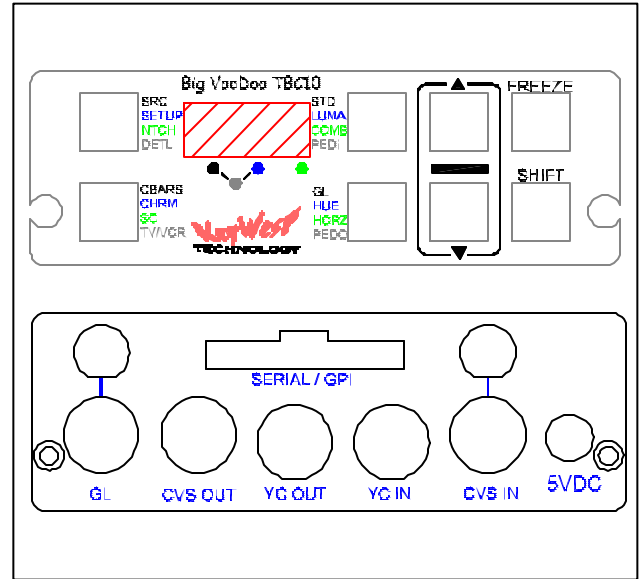


## Big VooDoo 8-Bit or 10-Bit Time Base Corrector

The Big VooDoo Time Base Corrector (BVTBC8/10) is a broadcast quality full frame synchronizer and time-base corrector that features two versions—8-bit and 10-bit. Inputs and outputs include composite in and out (with loop), Y/C in and out, and genlock input (with loop) on professional BNC and 4-pin mini-DIN connectors. Optional SDI input or output also available upon request. The unit features complete processor amplifier control, genlock, freeze (frame & fields), and operates in NTSC or PAL-B. The BVTBC8/10 is also RS-232, RS-422, or GPI controllable. Low cost and convenient quarter-rack size ensure high-quality, affordable days at the beach.



### FEATURES

- Composite, Y/C, and optional SMPTE-259M Serial Digital input and output
- Genlock Input—Composite and Genlock Loops
- NTSC & PAL-B analog video input (output standard same as input)
- Adaptive 3- 5 Line digital comb filter
- Professional 75 ohm BNC and 4-pin mini-DIN input/output connectors
- 5.8 MHz typical NTSC luma bandwidth (to 3dB)
- 58dB SNR (10-bit, 42dB 8-bit)
- Freeze frame & field capability (with automatic freeze on loss of input sync)
- Luma, Chroma, Setup, and Hue proc amp controls
- Horizontal and Sub-Carrier Phase controls
- Auto-saves settings after time-out period
- Triple Eight-Segment LEDs indicate status
- RS-232/422 controllable (Windows? compatible Graphical User Interface (GUI) available)
- Low-heat and low-power consumption, locking plug, 5VDC source (wall transformer included)

### ORDERING INFORMATION

Part #	Options
BVTBC10	Rack Kit, Rack Kit Blanks, Universal PSU
BVTBC8	Rack Kit, Rack Kit Blanks, Universal PSU
SDI Input	SMPTE-259M Serial Digital Input (10-bit Only)
SDI Out	SMPTE-259M Serial Digital Output (10-bit Only)

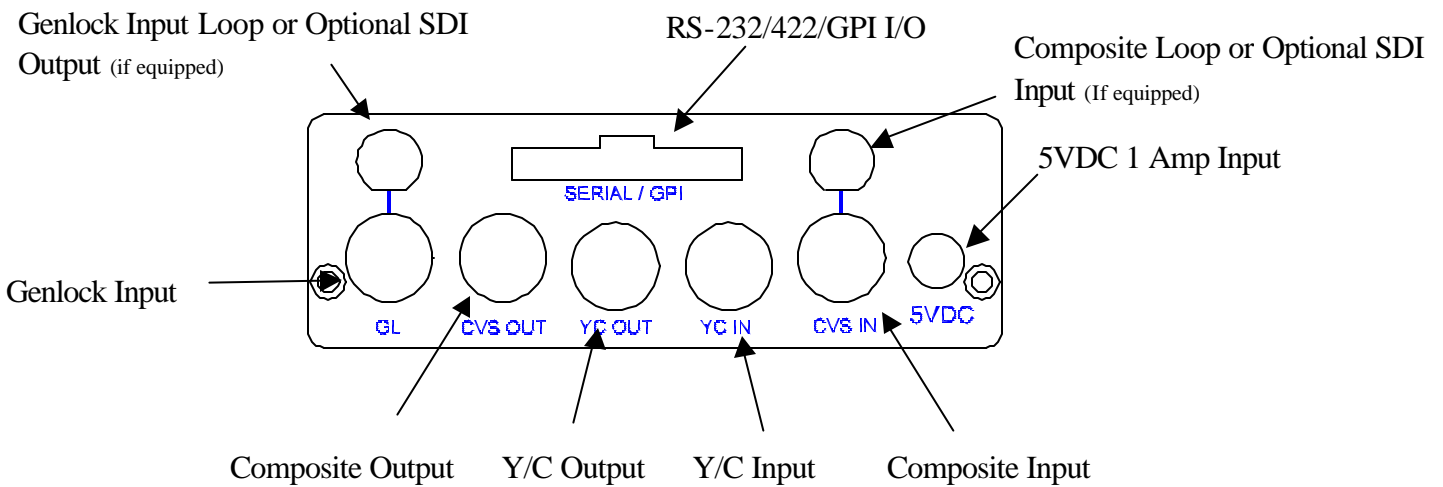
### APPLICATIONS

- Broadcast & Cable applications requiring stabilized video sources
- Post-Production for stabilized video
- Any application requiring color correction
- Any application requiring genlocked video sources
- As a genlock source
- “Tool-box” device for field testing and low-cost correction of video sync problems in the field
- Truck/Van installations
- Anywhere analog video is used

**\*\*\*CAUTION\*\*\***

Use only 5VDC Regulated power input. Minimum current rating should be 1 Amp. Keywest Technology supplies a specified wall transformer with each unit. Use of non-specified power inputs will result in damage to the unit. Use of a Keywest Technology rack-mount multi-outlet 5VDC power supply is authorized.

**CONNECTIONS**

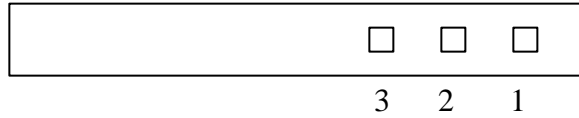


**Operational Note**

Output formats are always active. No special mode selections required—for example, an SDI output equipped unit will produce SDI out, Composite out, and Y/C out simultaneously without user intervention

*Figure 1*

RS-232 Connection



Viewing Rear Panel

- Pin 1 – Transmit
- Pin 2 – Receive
- Pin 3 – Ground

Figure 2

PCB Important Landmarks

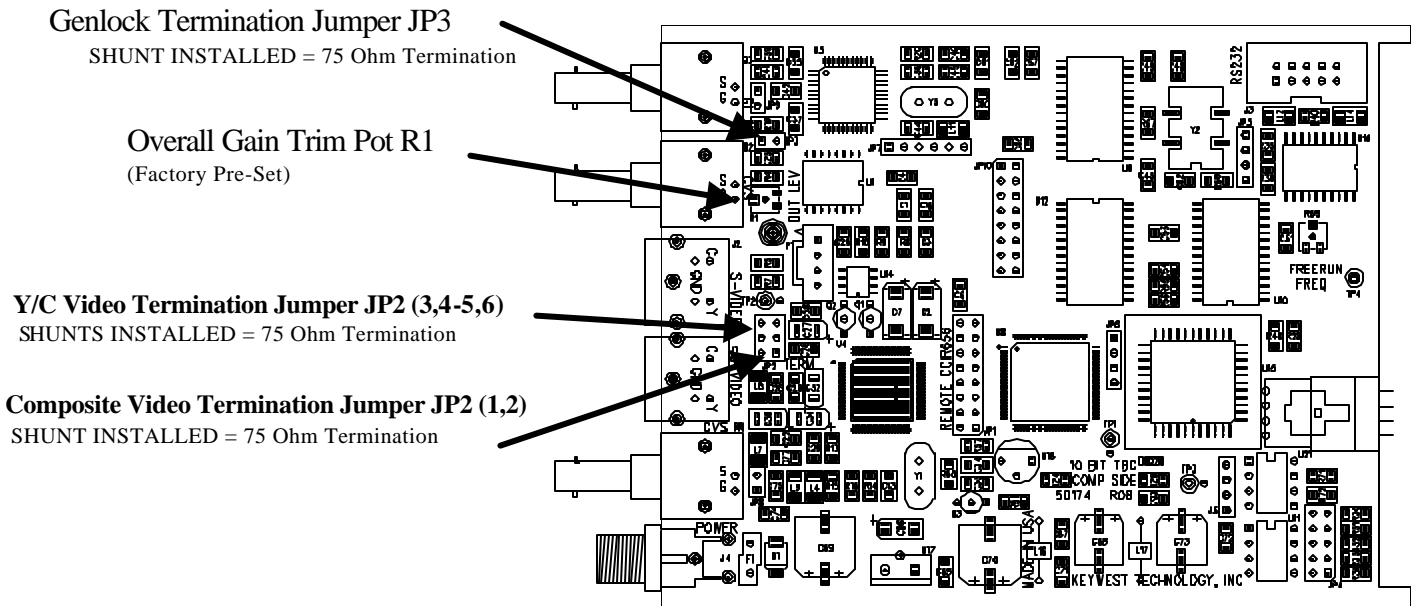


Figure 3

NOTE 1  
Y1 AND Y3 CRYSTALS  
USE LOW-PROFILE CRYSTALS  
WMD HC-49/U/S TYPE

## OPERATIONS

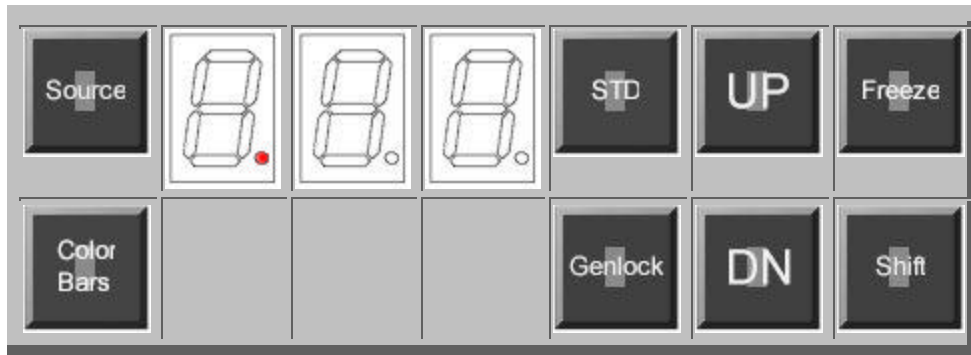
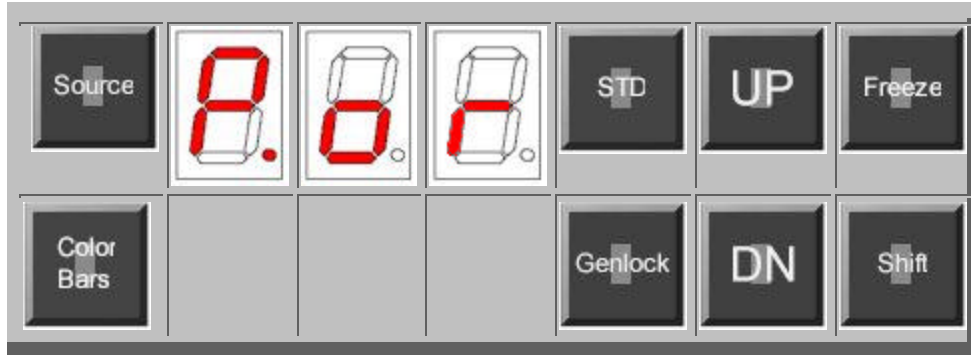
### BVTBC Menu Level 1

The BVTBC at turn-on looks like the first picture below... **Por** in the display indicates that the DSP based BVTBC is loading the DSP. After about 5 seconds the display will look like the second picture below. Take note of the **●** decimal point inside the LED's. These little dots indicate the Menu Level. Below, the **first** LED has the decimal point lit, indicating that we are at Menu Level ONE. The SHIFT button is used to advance through the Menu Levels.

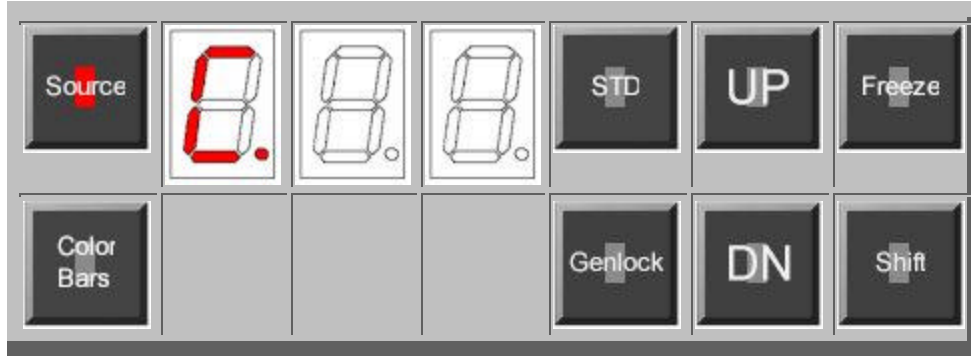


?? NOTES...

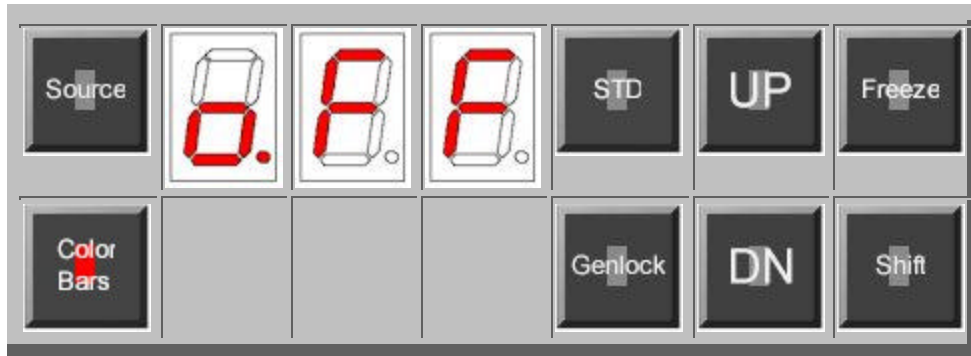
- The BVTBC **always** returns to menu level 1 state, regardless of what menu level was last used, or after there is no user input for approximately 15 seconds.
- Any changes made are **AUTO-STORED** when the unit returns to this default state.
- Menu Level 5 is currently not used.
- Changes made to levels can be returned to factory defaults by returning to that adjustment and pushing both the UP and DN buttons simultaneously.
- Changes made which are not levels, such as, Source, do not have factory default recalls.
- IF you require the BVTBC10 to be initialized to factory delivered values you must contact factory for detail instructions which involve removal from the case and temporary internal jumper settings.
- Using a terminal program set to 9600 baud, N81, and connected to the serial port of the BVTBC, upon power-up, the product name, PCB number, the version of software and its released date will be shown in the terminal window. Example: BVTBC K174 V1.00 08/27/01



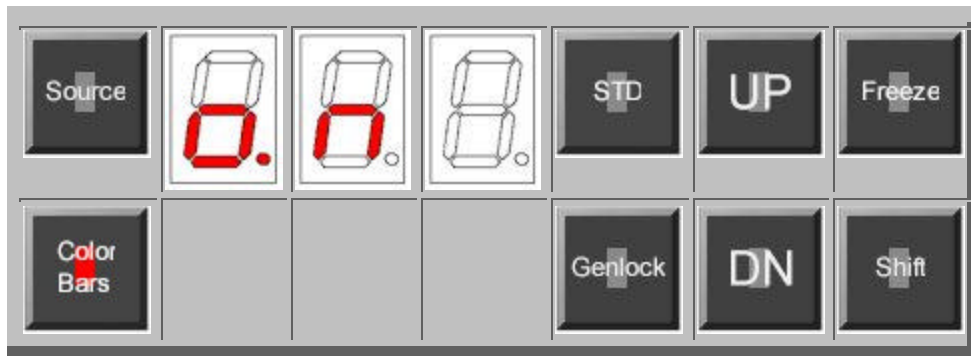
The First Button has the function of **Source** select. There are three possibilities for sources to the BVTBC, **C**omposite, **S**-Video, or **S**Di (optional SMPTE-259M input). The composite source selection is shown below. The source selection is made using the **UP** and **DN** buttons, the selection toggles.



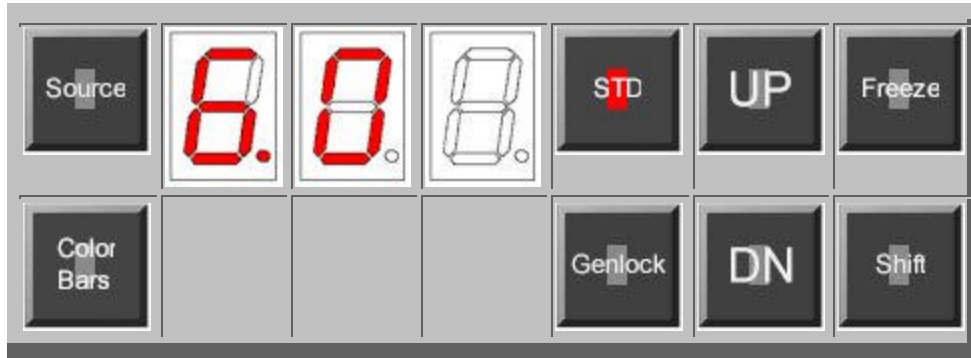
The next button down forces the output of the BVTBC to be composite **C**olor Bars, and the display shows the current status of that function. **o**FF means that **C**olor Bars are not being output, and **o**n means that **C**olor Bars are on the Composite and S-Video outputs. These **C**olor Bars are full-field - not SMPTE, and "on" is never stored as a default. Also, if the SDI output option is installed - **C**olor Bars are NOT output on the SDI output. The **UP** button turns **o**n **C**olor Bars and the **DN** turns them **o**FF.



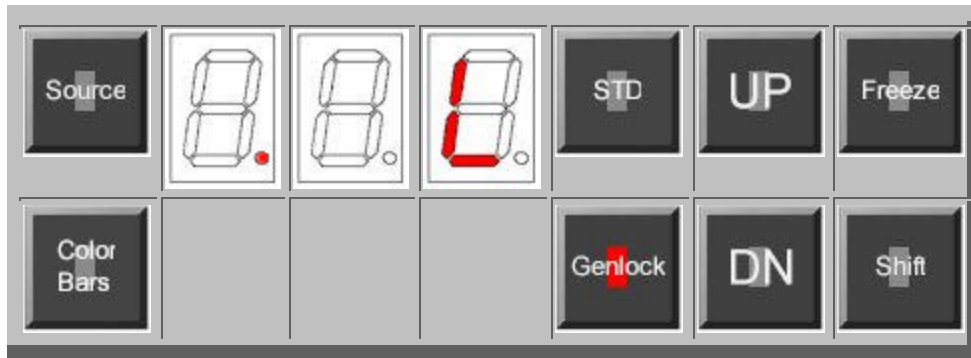
Pushing the **UP** button changes the display to... **C**olor Bars **o**n.



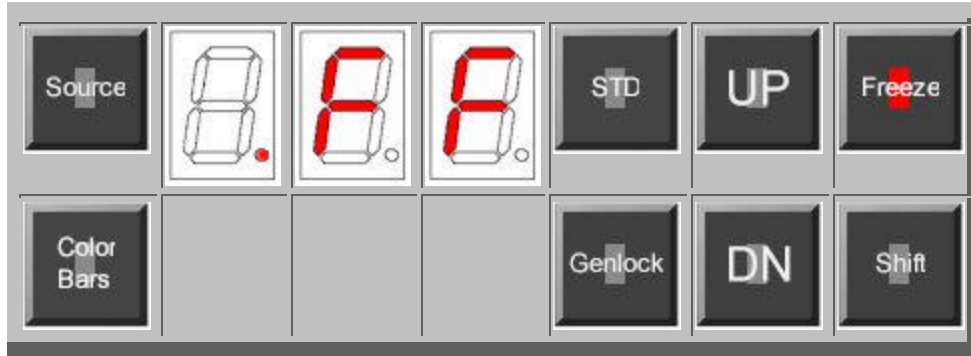
The **STD** button shows the default standard (NTSC - **60**, PAL - **50**) by showing the field frequency. The **UP** button sets the **STanDard** to NTSC, while the **DN** button selects PAL.



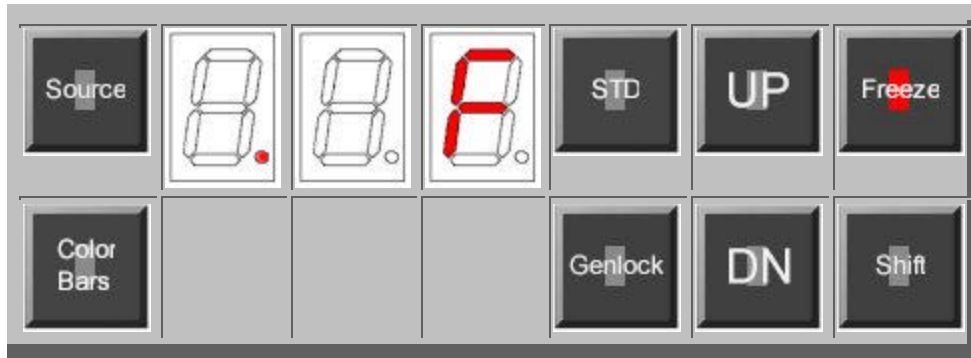
Pushing the **Genlock** button shows the **Genlock** status of the BVTBC. There are not 2, but 3, different displays that relate the status. The **L** displayed below indicates that the **Genlock** mode has been enabled and the output of the BVTBC is Genlocked. If while the **Genlock** is enabled, the video reference connected to the rear fails, then the display will read **-L**, indicating an invalid genlock reference. The third possible display is **oFF**, meaning that the user does not desire to have the output of the BVTBC genlocked to a reference. The BVTBC provides a stable crystal oscillator for non-genlocked applications. The **UP** button enables Genlock, the **DN** button disables **Genlock**. Remember, if you want to **Genlock** the output of the BVTBC - you must have a stable Composite video signal connected to **Genlock** input at the rear of the BVTBC.



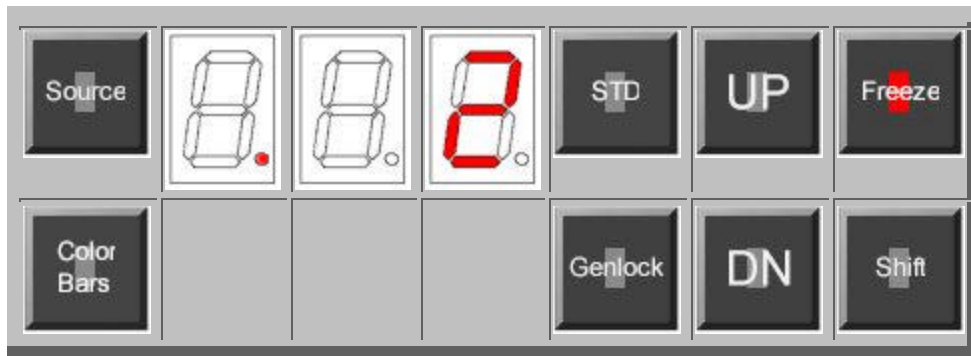
The last item available on Menu level 1 is the **Freeze** button. When **Freeze** is pushed the LED's show that the output video is **F**rame **F**rozen, and this condition will remain until the **Freeze** button is pushed again. Thus the **Freeze** button toggles the **Freeze** function on/off. **Warning:** the picture will **Freeze** as soon as this button is pushed. There are options that modify the **Freeze** function, but they can only be made while in the **Freeze** mode. The first **F** in the picture below indicates that the output is Frozen, the second **F** means that its a **F**rame **F**reeze. Pushing the **Freeze** button again toggles **Freeze** ON/OFF and is denoted by the first **F** going away. While in the **Freeze** mode the **UP** and **DN** buttons cycle through **F**rame, Field **1**, and Field **2** options.



Pushing the **Freeze** button again changes the display to... and this means the output is not Frozen and that the Freeze mode is Frame output.



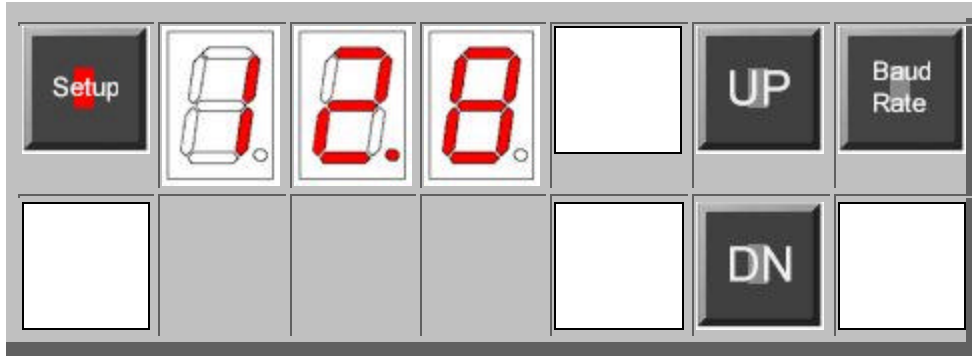
Pushing the **DN** button changes the display to... and this means that the output is not Frozen and the **Freeze** mode is Field **2** only.



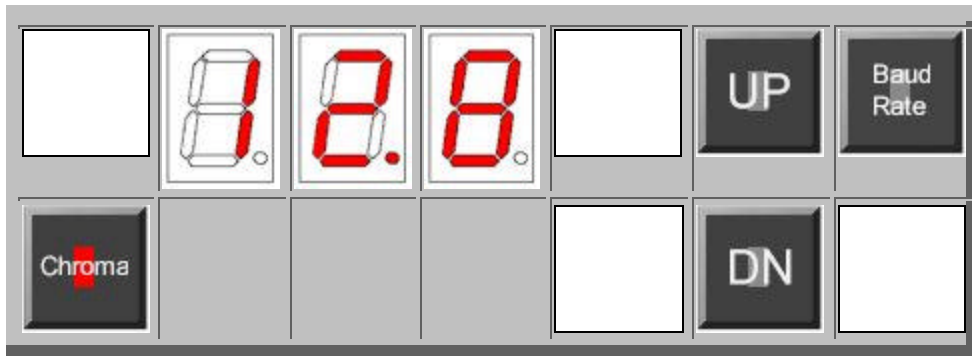
## BVTBC Menu Level 2

The Proc Amp adjustments for the BVTBC are on Menu Level 2 as shown below.

The picture below shows the effect of pushing the **Setup** button. The displays range is 0-255 steps and the **UP** button increases the Setup level and **DN** decreases the level. Pushing both **UP** and **DN** simultaneously resets to the factory default level shown below.

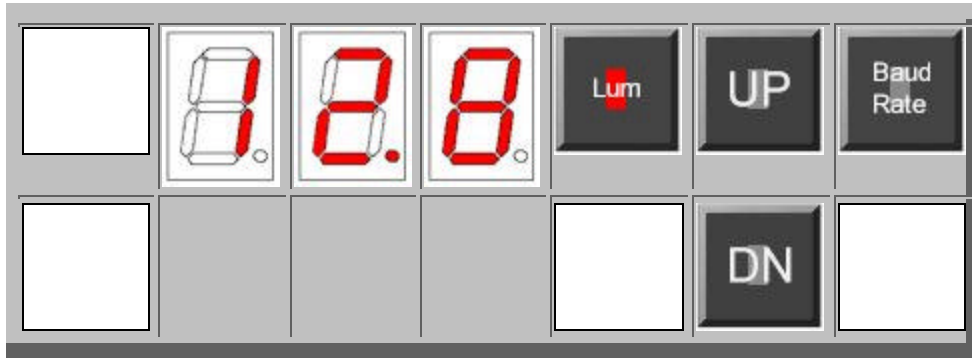


The **Chroma** button recall the stored value for the Chroma level. The range is 0-255 steps with the **UP** button increasing the level and the **DN** button decreasing the Chroma level. Pushing both **UP** and **DN** simultaneously resets to the factory default level shown below.

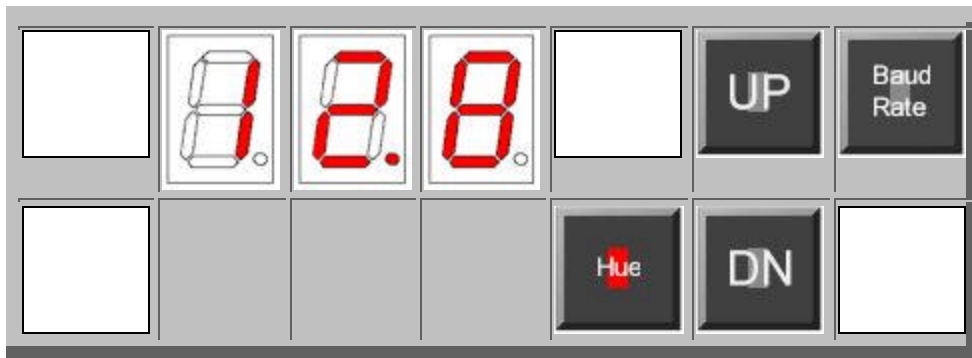


The next button, **Lum**, changes the Luminance (aka Contrast) value of the output video. Its range is 0-255 steps. The **UP** button increases the Luminance while the **DN** button decreases the output level. Pushing both **UP** and **DN** simultaneously resets to the factory default level shown below.

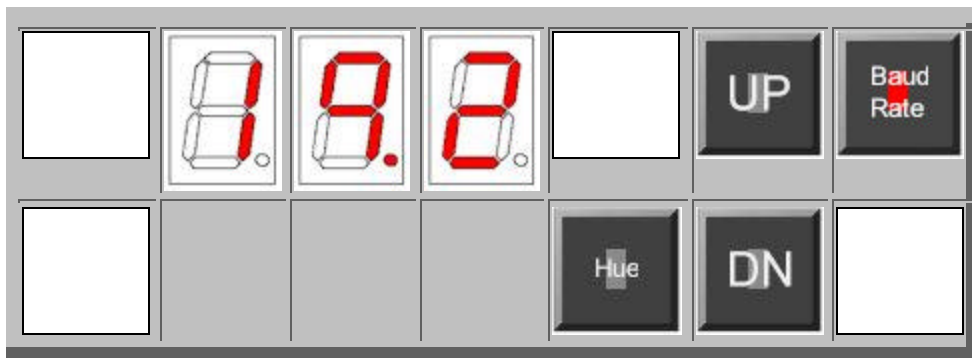




Pushing the **Hue** button displays the Hue value stored in memory. The displayed value *does not indicate* the actual phase of anything. The range is 0-255, which covers 360°, meaning that each increment is about 1.4°. This control is circular and the **UP** button moves through the values clockwise - the **DN** button counter-clockwise. The factory default value can be chosen by pushing the **UP** and **DN** buttons simultaneously. The default value for Hue is 128.



Pushing the **BAUD RATE** button displays the Baud value stored in memory. The two modes are 19200 and 9600. The display shown below indicates Baud Rate of 19200. Baud Rate of 9600 is indicated simply by "96" on the LED display. Pushing the UP and DOWN buttons toggle between the two possible settings.

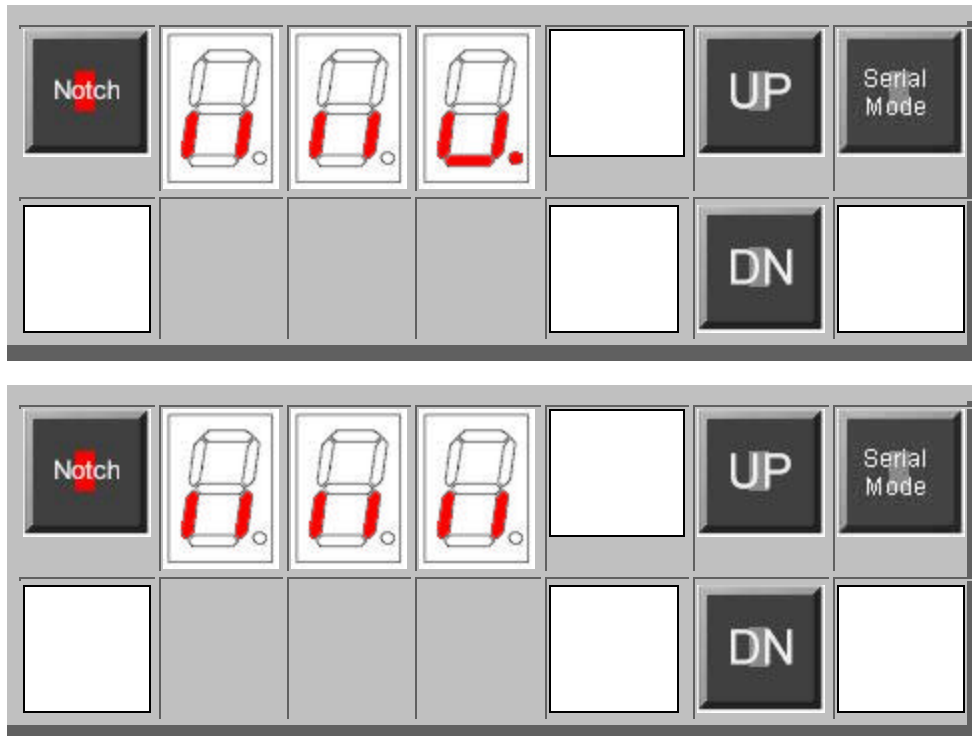


## BVTBC Menu Level 3

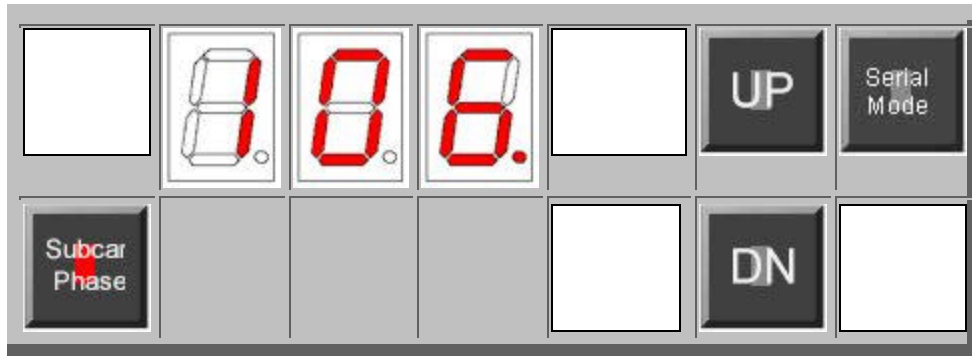
The functions for Menu Level 3 are auxiliary, seldom used functions made available to the user and are shown below.

Pushing the **Notch** button shows the decoder filter status of the BVTBC. There are two basic filter schemes used in decoders. The one used with stable and coherent subcarrier is the comb filter. This filter provides the best separation of chroma from composite video because it is able to maintain the luminance bandwidth. The second common filter is the Notch filter, which as the name implies, separates the chroma from the luminance based solely on frequency domain. The Notch mode is used when the subcarrier is not coherent with video, such as a consumer based VCRs. The BVTBC provides the ability to switch between these filters using the Notch button to select the filter status. In the display directly below, the third LED displays a small **u** - meaning that the selected filter is the Notch filter. The second picture shows the "teeth" of a comb - and indicates a Comb filter selection. The control is simply, the **UP** button selects Notch filter ON, and displays **|||u**, and the **DN** button selects Comb filter ON and displays **|||**

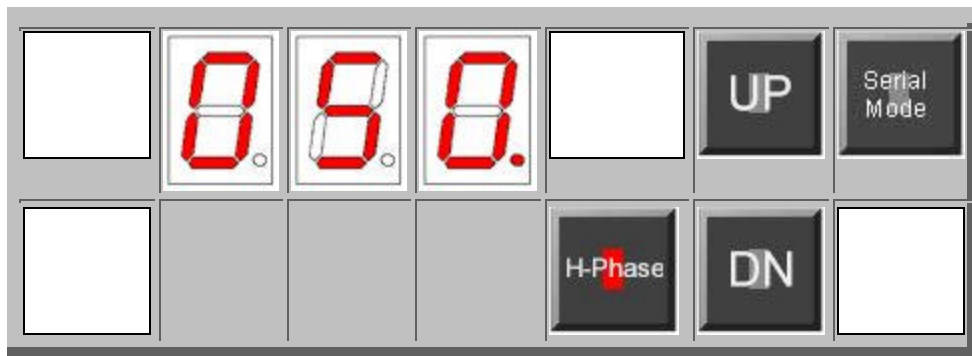
The **Comb Filter** button is redundant and is not used in this product. The Notch and Comb filters are mutually exclusive.



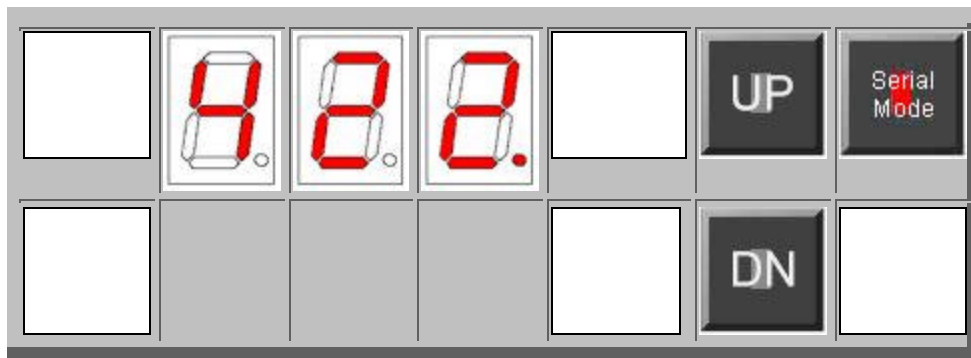
When the BVTBC is Genlocked - it is necessary to adjust the phase of the output to match that of the Genlock video feed, some other house reference. This means adjustments for the **H-Phase** and **Subcarrier Phase**. The adjustment of **Subcarrier Phase** is best done with the use of a vectorscope to monitor the BVTBC output. When the **Subcarrier Phase** button is pushed, the stored relative phase is displayed. This number does NOT indicate any true phase difference between the input and output, it is only a number relative to its range of 0 -255. Each increment will change the output phase approximately 1.4° at 3.58MHz. Again, we use the **UP** and **DN** buttons to change the subcarrier phase. If you are using the **Mixed** output, make sure that the inserted video subcarrier phase matches the color phase of the Background video. Don't confuse the **Subcarrier Phase** adjustment with the HUE adjustment - the HUE changes the chroma phase with respect to the burst - the **Subcarrier Phase** changes both burst and chroma phase together relative to the Genlock input.



To adjust the **H-Phase** requires the use of a scope to monitor the BVTBC output. When the **H-Phase** button is selected- the stored relative phase is displayed. This number does NOT indicate any true phase reference, it is only a number relative to its range of 0 -255. Each increment will change **H-Phase** approximately 78ns. The total range is from -5us to +15us relative to the Genlock input. Use the **UP** and **DN** buttons to change the Horizontal phase value. If you are using the **Mixed** output, make sure that the Effect video leading edge of sync matches that of the Background video leading edge of sync.



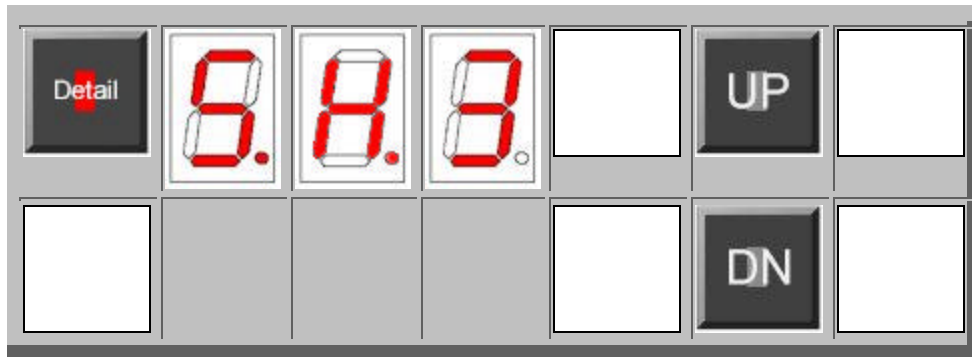
The BVTBC offers two **Serial Modes** for communications - RS-422 and RS-232. The serial protocol is N81. The **DN** button selects and displays **422** - meaning RS-422 baud. The **UP** button selects and displays **232** - meaning RS-232.



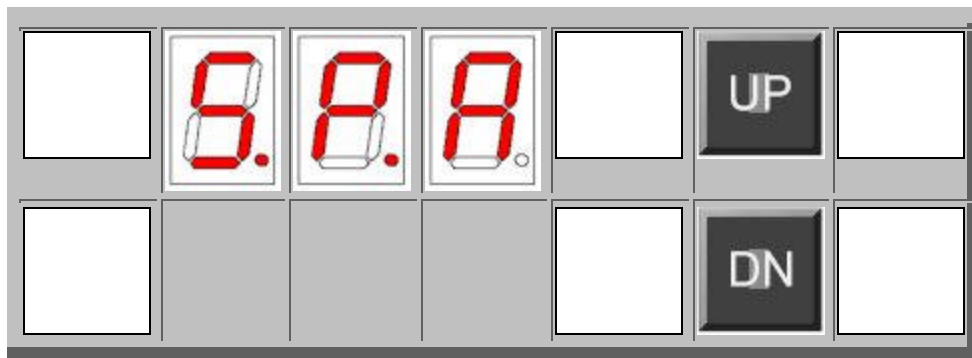
## BVTBC Menu Level 4

Level 4 changes the way the BVTBC handles various videos. These functions for the BVTBC at Menu Level 4 are shown below.

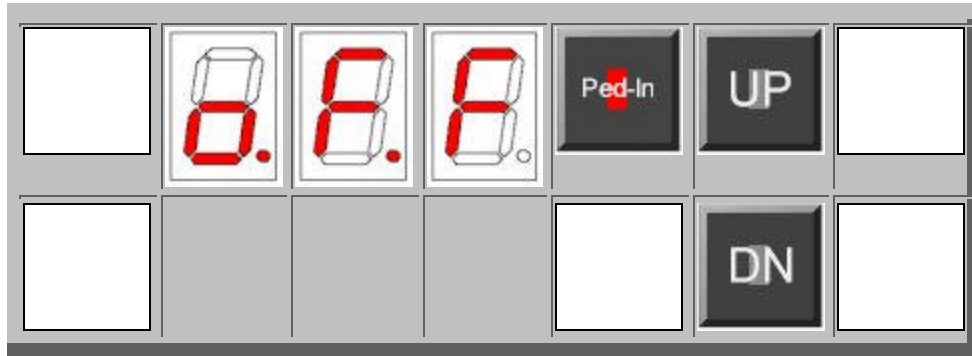
The **Detail** (Sharpness) button below allows soften or sharpening the processed video which has the effect of decreasing or increasing the frequency response of the BVTBC around 2.4mHz (NTSC) and 2.9mHz (PAL). This may need to be done to compensate for noisy signals, or sharpen the edges of soft images. There are four levels of Detail; 0 - which is no compensation; 1 - increases by 3dB; 2 - increases by 6dB; 3 - increases by 12 dB. The **UP** and **DN** buttons increment/decrement the values. The display shows the level of Detail selected from **SH0..3**, level 3 is shown below.



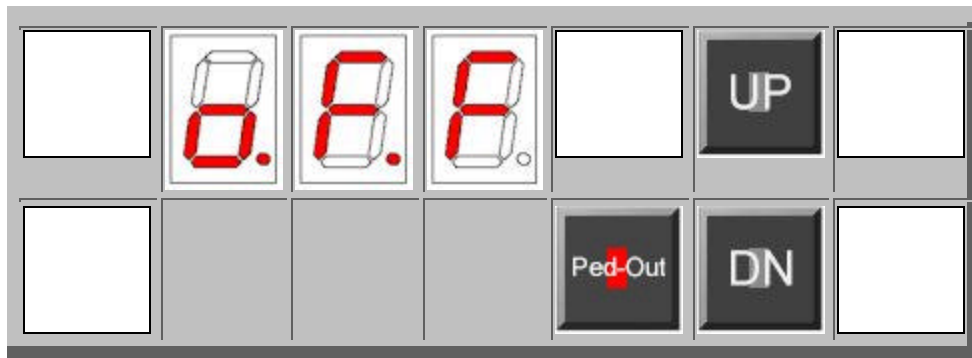
The BVTBC offers two different time constants for the phase locked loops within its decoder section. When the input video is known to be stable and the chroma coherent with the video, then **TV** time constant is recommended. When the source video is from an unstable (timebase wise) or noisy or the chroma is incoherent, then chose the **VCR** time constants. The BVTBC also offers an **Automatic** selection feature where the input jitter is monitored and the decision is made automatically without user input. NOTE: when **Auto** is selected the BVTBC not only selects the proper time constant, but also automatically controls the Notch/Comb filter selection. When **Auto** selects **VCR** time constants the Notch filter is also selected. The **UP** and **DN** button selects the **VCR, TV or Auto** modes. The display shows **SP**eed of the filter - **SPA** - Auto mode, **SP1** - TV mode, and **SP2** - VCR mode.



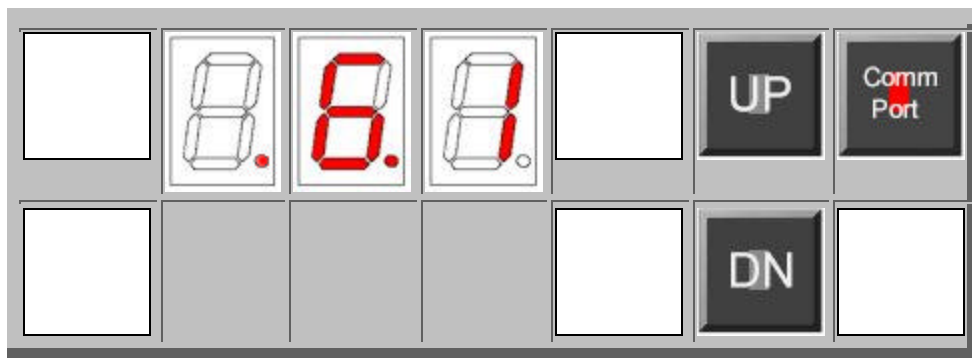
NTSC video may or may not have setup or may or may not need setup added to the output. We allow all cases by offering the ability to compensate for these non-standard situations. The PAL world, having never had setup on their video, avoids these problems. The need exist for both Pedestal (setup) compensation for the input and output. Shown below is **Ped-In** button selected and the display indicates that Pedestal is **On** input signal and the TBC is to allow it to remain. If the Pedestal is removed then the display shows **oFF**. The **UP** button selects **oFF** (no compensation), the **DN** button selects **On** (pedestal is subtracted from incoming video).

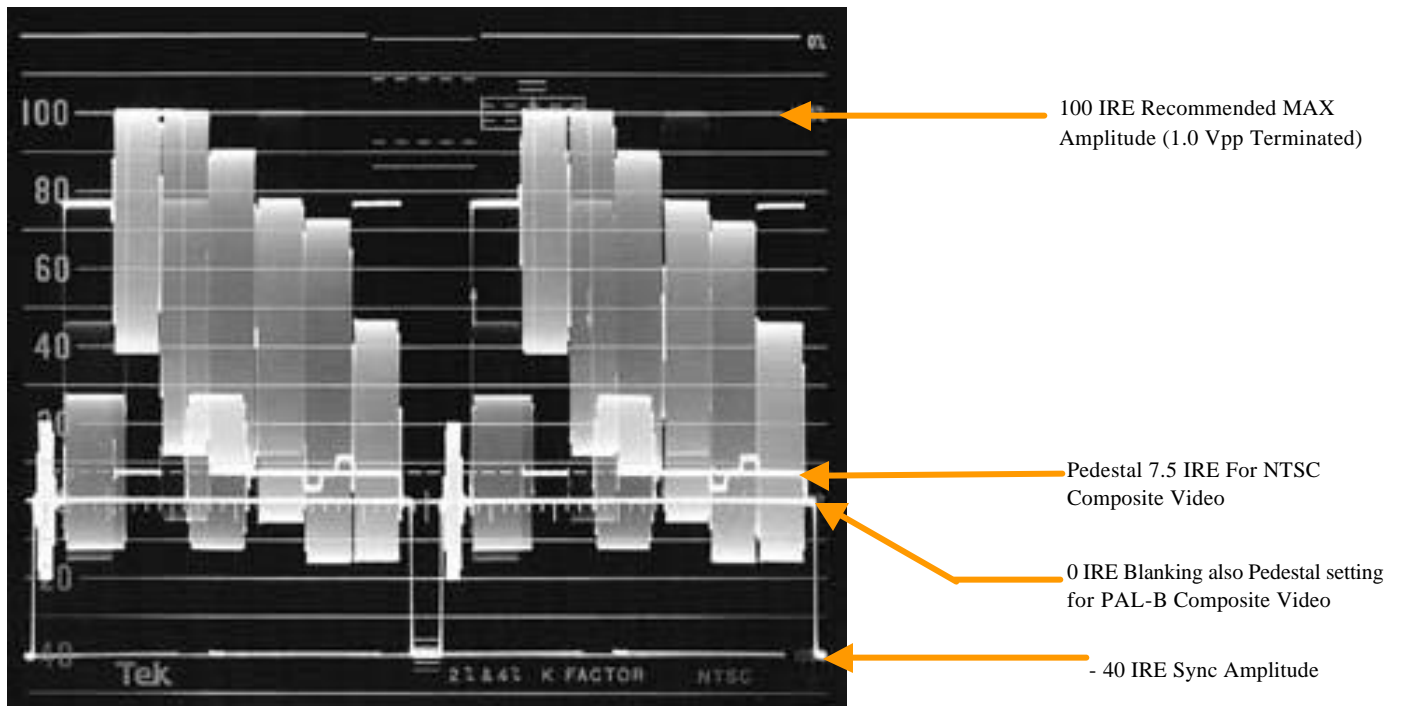


Pushing the **Ped-Out** button displays the status of the Pedestal on the output of the BVTBC. The **UP** button selects and displays **on** - meaning that Pedestal is added to the processed video at the output. The **DN** button selects and displays **oFF** - does not add Pedestal



The BVTBC provides the selection between addresses for the **Comm Port**. The possible addresses are HEX 61 through 68, or ASCII a through h. The **UP** and **DN** button toggle through the possible settings.





Sample NTSC Video Waveform

SMPTE Color Bars

Figure 4

## BVTBC8/10 COMMANDS

Filename: K174CMD.doc -- Preliminary  
 Date: 08/28/01  
 Author: BM

-----  
 BVTBC10 (K174) Serial Remote Command Format  
 -----

Format:

SOM ADDR CMD1 CMD2 (DATA1 ... DATAn) CS EOM  
 ie: < a 20 10 @ > select CV video source

Where:

SOM	Start-of-message byte	3C hex	"<"
ADDR	Address byte	61 to 68 hex	"a" to "h"
CMD1	Command 1 byte	20 to 7E hex	
CMD2	Command 2 byte	00,01,10 to 13, 20 to 2F, 30 to 3F hex	
DATA1	Data byte 1 (optional)	00 to FF hex	
DATA2	Data byte 2 (optional)	00 to FF hex	
CS	Future Checksum byte	@ (ASCII 'at' sign)	
EOM	End-of-message byte	3E hex	">"

-----  
 BVTBC10 (K174) Serial Remote Response Format  
 -----

Format:

SOM ADDR CMD1 CMD2 (DATA1 ... DATAn) CS EOM  
 ie: ( a 20 10 @ ) CV video source is selected

Where:

SOM	Start-of-message byte	28 hex	"("
ADDR	Address byte	61 to 68 hex	"a" to "h"
CMD1	Command 1 byte	20 to 7E hex	
CMD2	Command 2 byte	00,01,10 to 13, 20 to 2F, 31 to 3F hex	
DATA1	Data byte 1 (optional)	00 to FF hex	
DATA2	Data byte 2 (optional)	00 to FF hex	
CS	Future Checksum byte	@ (ASCII 'at' sign)	
EOM	End-of-message byte	29 hex	")"

NOTE: For ease of use, all Query commands CMD2 00 respond to 01 also (CMD2 01).



## BVTBC10 COMMANDS

---

### 20 Video Source Select

```
CMD2 00 Query
      01 Query (note above)

      10 CV Composite
      11 SV S-Video
      13 SDI Serial Digital (future)
```

```
example < a 20 00 @ >      Query Source setting.
response ( a 20 10 @ )
```

```
example < a 20 11 @ >      Select SV
response ( a 20 11 @ )
```

---

### 21 Video Standard

```
CMD2 00 Query

      10 NTSC
      11 PALB
```

```
example < a 21 00 @ >      Query Standard setting.
response ( a 21 10 @ )
```

```
example < a 21 10 @ >      Select NTSC
response ( a 21 10 @ )
```

## BVTBC10 COMMANDS

2C      Tracking  
           CMD2 00            Query

          10            Track Auto  
           11            Track TV  
           12            Track VCR

example < a 2C 00 @ >            Tracking Query  
 response ( a 2C 10 @ )            Tracking is AUTO

example < a 2C 12 @ >            Tracking set to VCR  
 response ( a 2C 12 @ )            Tracking is VCR

2D      Pedestal IN  
           CMD2 00            Query

          10            Ped IN Off  
           11            Ped IN ON

example < a 2D 00 @ >            Ped IN Query  
 response ( a 2D 10 @ )            Ped IN is Off

example < a 2D 11 @ >            Turn Ped IN On  
 response ( a 2D 11 @ )            Ped IN is On

2E      Pedestal OUT  
           CMD2 00            Query

          10            Ped OUT Off  
           11            Ped OUT ON

example < a 2E 00 @ >            Ped OUT Query  
 response ( a 2E 10 @ )            Ped OUT is Off

example < a 2E 11 @ >            Turn Ped OUT On  
 response ( a 2E 11 @ )            Ped OUT is On

2F      Color Bars  
           CMD2 00            Query

          10            Color Bars Off  
           11            Color Bars On

example < a 2F 00 @ >            Color Bars Query  
 response ( a 2F 10 @ )            Color Bars are Off

example < a 2F 11 @ >            Turn Color Bars On  
 response ( a 2F 11 @ )            Color Bars are On

## BVTBC10 COMMANDS

```

30  Contrast Adjust
      CMD2 00          Query
                        20,28      Normalize
                        21-27      Increment Adjust
                        29-2F      Decrement Adjust

                        31          Set Value (next byte is value)

example < a 30 00 @ >      Query Contrast value
response ( a 30 xx @ )    (xx is value in hex)

example < a 30 21 @ >      Increment Contrast value by 1
response ( a 30 xx @ )    (xx is value in hex)

example < a 30 2A @ >      Decrement Contrast value by 2
response ( a 30 xx @ )    (xx is value in hex)

example < a 30 31 20 @ >   Set Contrast value to 20hex
response ( a 30 xx @ )

example < a 30 20 @ >      Normalize Contrast value
response ( a 30 xx @ )
    
```

---

```

31  Brightness Adjust
      CMD2 00          Query
                        20,28      Normalize
                        21-27      Increment Adjust
                        29-2F      Decrement Adjust

                        31          Set Value

example < a 31 00 @ >      Query Brightness value
response ( a 31 xx @ )    (xx is value in hex)

example < a 31 23 @ >      Increment Brightness value by 3
response ( a 31 xx @ )    (xx is value in hex)

example < a 31 2C @ >      Decrement Brightness value by 4
response ( a 31 xx @ )    (xx is value in hex)

example < a 31 31 80 @ >   Set Brightness value to 80hex
response ( a 31 80 @ )
    
```

## BVTBC10 COMMANDS

32 Color Adjust  
 CMD2 00 Query

20,28 Normalize  
 21-27 Increment Adjust  
 29-2F Decrement Adjust

31 Set Value

example < a 32 00 @ > Query Color value  
 response ( a 32 xx @ ) (xx is value in hex)

example < a 32 27 @ > Increment Color value by 7  
 response ( a 32 xx @ ) (xx is value in hex)

example < a 32 20 @ > Normalize Color value  
 response ( a 32 xx @ ) (xx is value in hex)

example < a 32 31 40 @ > Set Color value to 40hex  
 response ( a 32 40 @ )

33 Tint Adjust  
 CMD2 00 Query

20,28 Normalize  
 21-27 Increment Adjust  
 29-2F Decrement Adjust

31 Set Value

example < a 33 00 @ > Query Hue value  
 response ( a 33 xx @ ) (xx is value in hex)

example < a 33 2F @ > Decrement Hue value by 7  
 response ( a 33 xx @ ) (xx is value in hex)

example < a 33 28 @ > Normalize Hue value  
 response ( a 33 xx @ ) (xx is value in hex)

example < a 33 31 00 @ > Set Hue value to 00hex  
 response ( a 33 00 @ )

## BVTBC10 COMMANDS

34	Sharpness Adjust	CMD2 00	Query
		20,28	Normalize
		21-27	Increment Adjust
		29-2F	Decrement Adjust
		31	Set Value
	example	< a 34 00 @ >	Query Detail value
	response	( a 34 xx @ )	(xx is value in hex)
to 7)	example	< a 34 2n @ >	Increment Detail value by 1 (n is 1
	response	( a 34 xx @ )	(xx is value in hex)
to F)	example	< a 34 2n @ >	Decrement Detail value by 1 (n is 9
	response	( a 34 xx @ )	(xx is value in hex)
	example	< a 34 31 xx @ >	Set Detail value to xx hex
	response	( a 34 xx @ )	(xx is value in hex from 00 to 04)

## BVTBC10 COMMANDS

```

-----
3D  Filter Adjust
      CMD2 00      Query
          10      Comb On/Notch Off
          11      Notch On/Comb Off
    
```

```

example < a 3D 10 @ >
response ( a 3D 10 @ )
    
```

## BVTBC10 COMMANDS

```

-----
48  Horz Phase Adjust
      CMD2 00      Query
          20,28    Normalize
          21-27    Increment Adjust
          29-2F    Decrement Adjust
          31      Set value
    
```

```

example < a 48 00 @ >      Query HPha value
response ( a 48 xx @ )    (xx is value in hex)
    
```

```

example < a 48 21 @ >      Increment HPha value by 1
response ( a 48 xx @ )    (xx is value in hex)
    
```

```

example < a 48 29 @ >      Decrement HPha value by 1
response ( a 48 xx @ )    (xx is value in hex)
    
```

```

example < a 48 31 xx @ >   Set HPha value to xx hex
response ( a 48 xx @ )    (xx is value in hex)
    
```

```

-----
49  SC Phase Adjust
      CMD2 00      Query
          20,28    Normalize
          21-27    Increment Adjust
          29-2F    Decrement Adjust
          31      Set value
    
```

```

example < a 49 00 @ >      Query SCPHa value
response ( a 49 xx @ )    (xx is value in hex)
    
```

```

example < a 49 20 @ >      Normalize SCPHa value
response ( a 49 xx @ )    (xx is value in hex)
    
```

```

example < a 49 2A @ >      Decrement SCPHa value by 2
response ( a 49 xx @ )    (xx is value in hex)
    
```

```
example < a 49 31 xx @ > Set SCPHa value to xx hex
response ( a 49 xx @ )   (xx is value in hex)
```

## BVTBC10 COMMANDS

---

```
4A  Genlock
      CMD2 00      Query
                10      Off
                11      Auto
```

```
example < a 4A 00 @ > Query Genlock Status
response ( a 4A 11 @ ) (Genlock is Auto-Along)
```

```
example < a 4A 11 @ > Set Genlock to Auto
response ( a 4A 12 @ ) (Genlock is Auto-Locked)
```

## BVTBC10 COMMANDS

---

```
50  Freeze
      CMD2 00      Query
                10      Off
                11      Field 1 (future)
                12      Field 2 (future)
                13      Frame (default)
```

```
example < a 50 00 @ > Query Freeze value
response ( a 50 10 @ ) Freeze Off
```

```
example < a 50 13 @ > Freeze On
response ( a 50 13 @ ) Freeze Frame
```

## BVTBC10 COMMANDS

---

71 Version  
          CMD2 00           Version Query

example   < a 71 00 @ >           Version Query  
response  ( a 71 BVTBC10 K174 V1.00 08/28/01 @ )

---

72 Current Settings  
          CMD2 00           Current Settings Query

example   < a 72 00 @ >           Current Settings Query  
response  ( a 72 BC D ... D+n @ )

where    BC is byte count (typically 0x0B)  
          D  is data

( a 0B video mode cont brit colr tint shar hPha scPha sys status @ )

---

78 Auto Status  
          CMD2 00           Query

          10           Auto Status On  
          11           Auto Status Off

example   < a 78 00 @ >           Auto Status  
response  ( a 78 10 @ )           Auto Status is On  
response  ( a 78 11 @ )           Auto Status is Off

example   < a 78 11 @ >           Auto Status  
response  ( a 78 11 @ )           Auto Status is Off



**KEYWEST TECHNOLOGY  
LIMITED WARRANTY**

KEYWEST TECHNOLOGY does hereby declare that the said product be covered under limited warranty for defective materials and workmanship. This warranty is extended to the original purchaser only, for the amount of time indicated below, effective from the original purchase date and subject to the following:

**\*\*\*\*THIS WARRANTY DOES NOT COVER\*\*\*\***

- A. Products that have been subjected to abuse, accident, alteration, modification, tampering, negligence, misuse, or if repaired or attempted repair performed by anyone other than a service facility authorized to render such service, or if the model or serial number has been altered, tampered with, defaced, or removed
  
- B. Operational adjustments covered in this manual

WARRANTY PERIOD: 2 Years Parts & Labor

Cut and return the following page to register your product.

**PRODUCT WARRANTY REGISTRATION**

Complete and mail within 10 days of purchase

Purchaser's Name \_\_\_\_\_  
Title: \_\_\_\_\_ Phone: \_\_\_\_\_  
Company Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Purchased From: \_\_\_\_\_  
Comments: \_\_\_\_\_

**PURCHASE DATE:**

**MO.**

**YR.**

**MODEL #**

**SERIAL #**

**PARTS**

**LABOR**

		<b>2 YRS.</b>	<b>2 YRS.</b>
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