

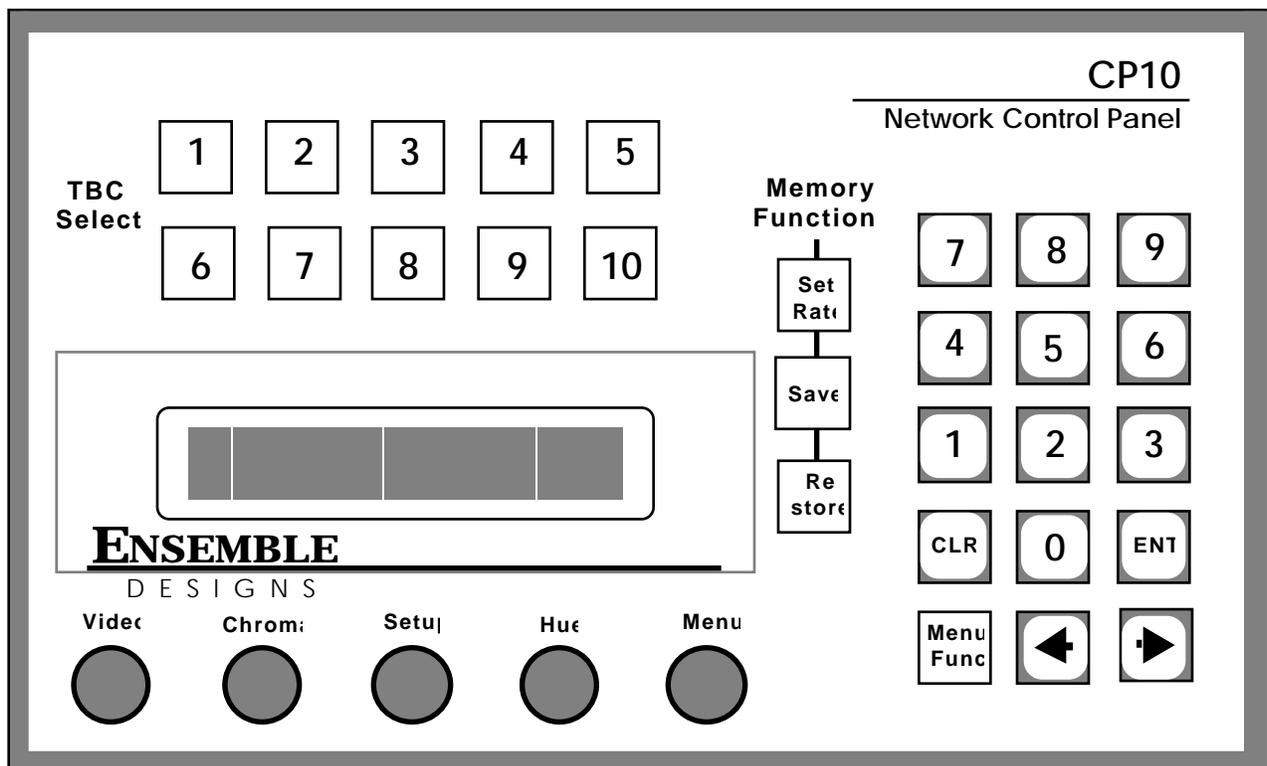
**CP10  
Network Control  
Panel for the  
TC400D  
  
Operator's Manual**

Version 2.4 or later  
Revised September 2003

## CP10 Network Control Panel for the TC400D Operational Description

### Overview

The CP10 is a networkable control panel for use with TC400D TBC Controllers. The built-in Local Area Network (LAN) capability of the TC400D allows multiple units to be connected to form larger systems.

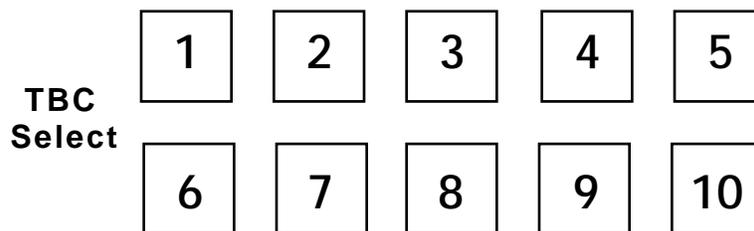


The CP10 control panel is designed to be used in edit suites and tape QC positions. It can access any of the machines connected to TC400D controllers in the system. CP10s and TC400Ds are connected in daisy chain fashion using ordinary modular telephone cable and connectors. At the beginning of a session machines are assigned to the ten TBC Select buttons using the alpha-numeric display.

The CP10 features the same easy user interface of the TC400D. A full serial interface allows storage of TBC settings into the EDL of selected edit controllers.

The CP10 is 8.5" wide and 5.25" tall. It mounts in a standard half-rack waveform monitor rackmount, or it can be mounted flush in a panel or desktop. Depth behind the panel is less than 2.5". The CP10 is powered by a small, modular transformer.

The CP10 connects to TC400D TBC controllers over a Local Area Network (LAN). This LAN must run from one device to the next in daisy-chain fashion. The LAN port of the CP10 is a dual modular phone connector on the rear pc board. At each end of the network, a 100 ohm termination should be installed. A termination is a RJ-11 modular phone connector with a 100 ohm resistor crimped across the outer two contacts (which correspond to the yellow/black pair in a phone cable).

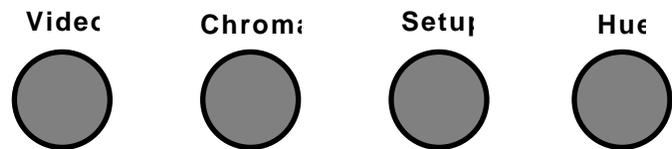


## Assigning TBCs

Different TBCs which are connected to TC400Ds can be assigned to the ten TBC Selects on the front panel. This assignment function is described later in this manual in the **Network Access** Menu Function. Once a machine is assigned to a TBC Select button on the CP10, then operation is identical with the TC400D.

## Simple TBC Control

The four parameters of Video Level, Setup, Chroma and Hue have dedicated front panel controls which are delegated between the ten different TBC's. TBC's are selected by pressing one of the ten delegation switches above the control knobs.



An indication of the currently selected TBC is provided by illumination (by a green LED) of the selection button.

When the control delegation is changed the control knobs are re-directed to the newly selected TBC, leaving the values for the previously selected TBC unchanged. The knobs have no endstops and are able to rotate continuously, thus allowing the knob to

properly control the TBC, regardless of the value of the function at the time the control was delegated to it. The knobs are scaled so that it takes approximately four complete revolutions of the knob to take the control from one limit of its range to the other. This provides extremely fine control, making it easy to adjust to the desired value. For each of the four proc values and the Set Rate value, there is a nominal, or default value which which can be programmed through the **Set Default** menu. Pressing and holding a TBC Select button for at least one second will reset all four of the control values for that machine to those default values.

### Memory Functions

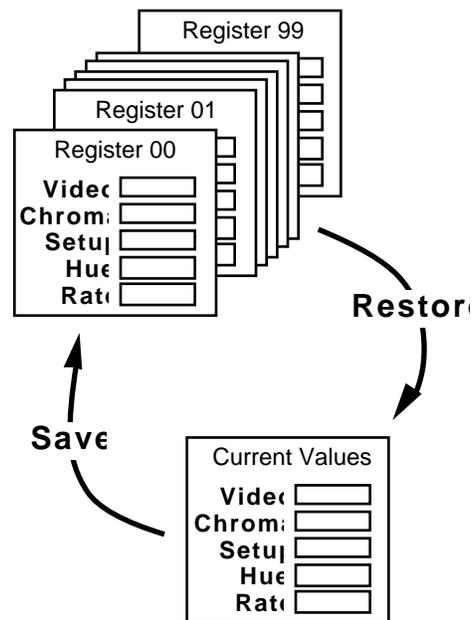
Each TBC control channel has its own set of 100 memory registers. Each register contains the values for Video, Setup, Chroma, and Hue which are to be sent to the TBC. The values which are currently being sent to the TBC are stored into a register when a Save command is issued. A Restore command will bring the values back from the register and they will once again be sent to the TBC.

This memory organization is illustrated at left. This same organization is repeated ten times over for each of the ten TBC channels.

Each register also contains a transition rate (set rate) value which determines the speed at which the control values in that register will be brought to bear on the TBC. A zero frame transition will produce an immediate, hard cut to the restored values. If the transition value in the register is 30 frames then restoring that register to air will cause a 1 second smooth transition between the current control values and the values in the register. Transitions can be as long as 999 frames.

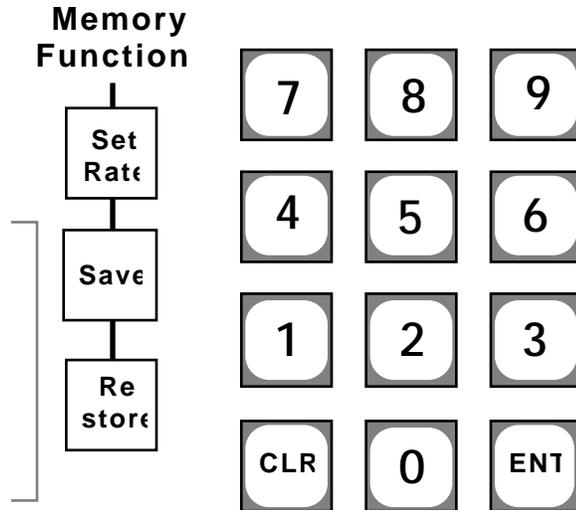
Note that Register 0 is a special register which contains the current values. It can be used in conjunction with some editors to transfer current values, but cannot be used like the other 99 registers as a storage location.

Memory functions are accomplished using the Save, Restore, and Set Rate buttons. Pressing one of these three function keys causes it to illuminate (in Red), indicating that the numeric keypad is now directed toward that particular function. The keypad is then used to provide the desired numeric value, either a register number or a transition rate. During numeric entry the LCD display on the righthand side of the panel shows the numbers as they are pressed. Once the number has been keyed in the value is confirmed by pressing ENT (Enter). This terminates the operation and the function lamp then goes off. During numeric entry CLR (Clear) is used to backspace unwanted keystrokes. A Memory operation can be cancelled by pressing the function button a second time. This will extinguish the lamp and no operation will take place.



A Save to register 62, for example, is obtained by pressing Save, 6, 2, ENT. During this operation a message will appear on the LCD display. This Save operation will copy the current TBC control values and the current transition rate into register 62. Save operations have no effect on the values being sent to the TBC and hence no effect on the on screen video.

If a transition rate different than the current value is desired it must be entered before performing the Save. A transition rate of 120 frames (4 seconds) would be programmed by pressing Set Rate, 1, 2, 0, ENT. Save operations performed subsequently would then place this 120 frame transition rate in the affected registers.



Bringing the contents of a memory register back into current values is a Restore operation. To bring back register 37, for example, you would press Restore, 3, 7, ENT. If register 37 had been saved with a non-zero transition rate then the control values being sent to the TBC will smoothly transition from the current value to the value stored in the memory register. These transitions will be proportional. If, for example, the difference between the current Video value and the restored Video value is large, whereas the difference between the Hue values is small, then the Video control to the TBC will change more rapidly than the Hue control since it has more distance to cover. However, the transition in both cases will take the same amount of time.

The simple memory operations described above will be directed toward a single TBC, the TBC which is currently delegated (and illuminated in green). This allows different registers to be restored to different TBC's, even restored with different transition rates. The TBC delegation can be changed at any time during one of the three memory operations, Save, Restore, or Set Rate. The function will be directed toward the delegation that is in effect when Ent is pressed.

The actual numeric values of the TBC control settings can be displayed in place of the register number and transition rate. Press either the Left or Right Arrow buttons to alternate between these two displays.

## Menu Functions

TBC control and memory operations are the most commonly used functions of the CP10. The functions that are less frequently used are accessed through a function menu which is displayed on the alpha-numeric display at the right of the control panel.

Menu Functions are enabled by pressing the **Menu Func** button. It will illuminate (in Red) to indicate that a menu function is active. These functions can be turned off by pressing **Menu Func** a second time.

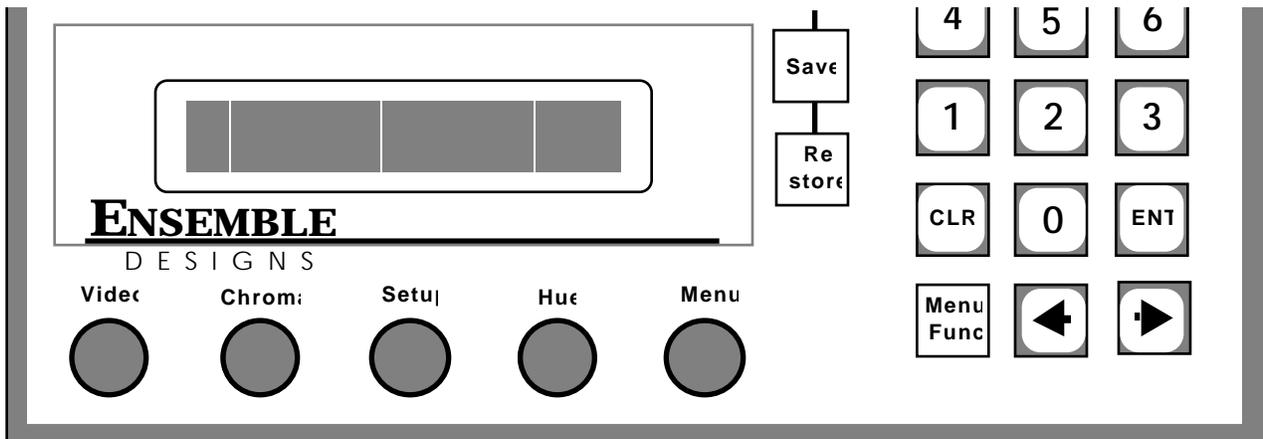
In a menu function, data or information is entered by using the numeric keypad or the control knob to the immediate left of the display window.

### Adjusting Contrast of the Menu Display

Prior to operating the CP10 it may be necessary to adjust the contrast of the Liquid Crystal Display (LCD). This contrast adjustment sets the optimum angle for viewing the display. This is done with a small screw-type adjustment on the rear side of the pc board which has the pushbutton switches on it. It is located on the righthand side of the panel.

The Left and Right Arrow buttons are used to step through the individual portions of functions which involve more than one data element. Not all functions require multiple entries. A left pointing arrow appears on the lefthand side of the display whenever the Left Arrow button can be used to step left through the selections, a right pointing arrow on the righthand side of the display indicates that the Right Arrow button is useful.

When the **Menu Func** button is first pressed, the name of the first function (Special function) will be displayed. The **Menu Knob** is then used to move forward and backward through the list of functions. When the desired function is displayed, press **ENT** to select the function.



The firstset of functions: Adj Sync, Adj Subcarrier, Adj ColorFrame, Adj Y/C Delay, and Periph Enables, will be directed toward the TBC which is currently delegated on the TBC Select button group. Pgm Edit Port, Panel Name, Capture Enable, and AppleTalk are not affected by the TBC Select.

Menu Functions are:

**Spec Functions**  
**Network Access**  
**Adj Sync**  
**Adj Subcarrier**  
**Adj ColorFrame**  
**Adj Y/C Delay (or Vid Phase)**  
**Register Copy**  
**Set Default**  
**Program GPIs**  
**Panel Name**  
**Capture Enable**  
**AppleTalk**

Once selected by pressing ENT, the functions are used as follows:

**Spec Functions**

Special machine specific functions are accessed through this menu. These functions are available only as allowed by the VTR or TBC. The functions are:

**Frz Frame Cntl:** The Freeze Frame (if available) feature is turned on and off by pressing ENT.

**Frz Field Cntl:** Freeze Field (if available) is turned on and off by pressing ENT.

**Bypass Cntl:** The Bypass/Normal control (if available) is controlled by pressing ENT.

**Note:** These special functions are all turned off when the TBC Select button is held down for more than one second.

**Network Access**

Control of machines connected to TC400Ds is obtained through this menu. Different machines can be assigned to any or all of the ten TBC Select buttons. See Appletalk Menu to set Node Addresses.

Upon entering Network Access menu, the current machine selection will be displayed on the top line of the display. If it shows **Local Cntl**, then the current TBC Select button has local control of the TBC or VTR that is physically connected to the corresponding TBC

**Network Access (con't)**

control output. If the display shows **Rem Cntl**, the TBC Select is already assigned to a machine connected to a TC400D.

To change from Local to Remote control, select **Network Access** and press ENT. The CP10 will search the network and, if there are other TC400s on the net, the display will be similar to the one below:

Lcl Cntl; VTR 1  
ENT = Local Cntl.

Use the menu knob to scroll through an alphabetical list of all available machines. The First entry is always **Release Cntl**, which will release control of the remote machine.

The list of machine names is sorted alpha- numerically. To help search for a machine whose name contains a number, you can press one of the number buttons. This will forward the selected entry in the list to the next one of whose name contains the digit that was pressed. This number button, or any other, may be repeatedly pressed to search for all occurrences of names containing the desired digit. If no machine name on the network contains the selected digit, nothing will happen. At any time, turning the knob will scroll through the list from the current position.

Once the desired machine is selected, press the ENT button to acquire it. If the machine isn't in use by another panel, the message **Remote Acquisition Successful** will be displayed. However if the machine is in use, you will see the message Channel In Use by <Panel Name> where <Panel Name> is the name of the panel that currently has access of this TBC Channel. At this point, the display will either return back to the machine list or go on to ask whether you want to capture this channel. If the **Capture Enable** for your panel is Enabled, then you are given the opportunity to capture the TBC channel away from the other panel that currently has control. Pressing **ENT** will release control from the other panel and capture control for this panel. However, this option is not available if **Capture Enable** for your panel is **disabled**.

To release Control on the CP10, select **Release Cntl** in the **Network Access** menu.

### **Adj Sync**

The Sync Timing (sometimes referred to as Horizontal Phase) of the selected VTR output is adjusted using this function. The adjustment is made with the Menu Knob. The relative position of the control within the total range of adjustment is displayed by a vertical bar on the lower line of the menu display. The actual range of horizontal adjustment that is available is dependent upon the type of machine being used.

Extremely fine adjustment of Sync Timing can be made with the Right and Left Arrow Buttons. They will move Sync Timing in the smallest possible increment. (See note below).

Once the Sync Timing of the machine has been set it can be stored in non-volatile memory in the **Default Setting** menu.

**Note:** There are differences between different TBCs and VTRs in the way the sync timing adjustment will appear. With some machines the control will be smoothly adjustable, allowing you to set the horizontal phase to any value you wish. On other machines the sync timing will change in small increments. This is perfectly normal and in all cases the TC400D will provide the same type of adjustment that is found on the machine's own control panel. However, the continuous rotation controls on the TC400D may provide a smoother, or more exact feel to the control.

### **Adj Subcarrier**

This function is used to adjust the Subcarrier Phase or system timing of the selected TBC or VTR. The adjustment is made with the menu knob. It is used, in conjunction with the Sync Timing adjustment, to properly time the VTR into a production switcher. The relative value of the Subcarrier Phase adjustment will be displayed on the lower row of the menu display.

Extremely fine adjustment of Subcarrier Phase can be made with the Right and Left Arrow Buttons, just as with Sync Timing.

Subcarrier Phase is stored in non-volatile memory in the **Default Setting** menu.

### **Adj Subcarrier (con't)**

**Note:** Like Sync Timing, the Subcarrier timing adjustment is dependent on the method in which this adjustment is made on the machine itself. On some VTRs and TBCs, subcarrier timing is adjusted by a combination of a switch, which determines a coarse setting of the parameter, and a rotary control which provides a fine adjustment. The TC400D combines these two adjustments into a single rotary control which will appear to have several overlapping ranges. It may be possible to find two settings of the control which both produce the desired subcarrier phase. In this case the adjustment which is farthest from a discontinuity should be used.

### **Adj ColorFrame**

The playback color framing of certain 1" Type C VTRs can be adjusted using the Adj ColorFrame menu. This also corresponds to the 'Edit Ready Cal' adjustment on Ampex VTRs. The adjustment of the selected machine is made using the Menu Knob.

While adjusting color framing the top line of the menu display will show 'OK' when the VTR is returning an indication of proper color frame to the TC400D. This indication corresponds to the PB Colorframe OK indicator on Sony VTRs and the Edit Ready indicator on Ampex VTRs. In addition, the display will show 'INV' when the Invert condition exists on Ampex VTRs.

This adjustment is saved to non-volatile memory with the **Default Setting** function.

Please refer to the documentation for your VTR for more specific information on this adjustment.

### **Adj Y/C Delay**

The Luminance/Chrominance Delay (Y/C Delay) can be adjusted on certain Sony Betacam models. The adjustment of the selected machine is made using the Menu Knob.

This adjustment is saved to non-volatile memory with the **Default Setting** function.

## Register Copy

The **Register Copy** feature allows an individual register or range of register to be copied from a source channel to the currently selected (destination) channel. In addition, by selecting the special Register 0, the current settings may also be copied.

To copy registers, first select the channel you wish to copy register to. The current TBC Channel is always the destination for **Register Copy**. Then, choose the **Register Copy** menu and press ENT. Assuming channel 1 is the selected channel, you will see the following display:

Copy to Ch 1 Reg ??

Using either the menu knob or the number buttons, select the first destination register you wish to copy to. Valid registers range from 1 to 99. A special register number, 0, may also be used, which will copy data to the current channel settings. Press ENT to continue. At any time, you can quit the Register Copy selection menu by either pressing the MENU FUNC button or selecting another channel or function. In this example, we've entered register 62 to be the first register to copy to. After pressing ENT, the display goes on to the next step:

Copy to Ch 1 Reg 62 from Ch?

Now enter the source channel, from 1 to 9. Channel 10 is not available for a source channel on the CP10. Press ENT to continue and the display will then look like below, ( here we are using channel 2 afor the source channel):

Copy to Ch 1 Reg 62 from Ch 2 Reg ??

Then we enter the first source register number. Once again, register 0 can be used to use the current settings of the source channel. For this example, use register 50 and, after pressing ENT, we see the next display:

Copy to Ch1 Reg 62 from Ch 2 Reg 50-??

### **Register Copy (con't)**

Finally we select the ending source register. Note that this register must be larger than, or the same as the first source register. In addition, a range of only 38 registers can be copied in this example because the destination starts at 62, so the highest number that can be entered in this case is 87, as a larger number would exceed the 99th register of the destination channel. For this example, we want to copy 10 registers, so we enter 59 and then press ENT.

ENT=Copy Ch 1 Reg 62 from Ch 2 Reg 50-59

This displays a final confirmation before the registers are copied. Pressing ENT at this point will start the register copy, which can take up to a few seconds if copying all registers to or from a remote channel. When the Register Copy is done, the menu function is dropped and the display returns to normal. If there is a problem, such as loss of the network connection, an error message will be displayed.

All destination registers (62 to 71 in the example above) will be copied with the registers from the source (50 to 59), even if the source register is empty. If the range of destination registers included register 0, then the current setting will be updated immediately with whatever source register was chosen as the first register.

### **Set Default**

There are five default settings for each TBC channel in the TC400D. The current default settings are automatically recalled when the unit is turned on and can also be recalled when any of the four TBC Select buttons are pressed and held for 2 seconds. The default settings affect Video, Chroma, Setup, Hue, Transition Rate, and all the timing adjustments.

Set Default allows for changing the current default setting number and saving new setting values. Selecting the Set Default menu results in the display as shown below:

Default Settings = 1  
ENT = Setting 1 >

### Set Default (con't)

There are five **Default Settings** to choose from. To change to a different setting, either push button 1 through 5 or turn the Menu Func knob, then push ENT to activate the new setting, which will also recall that setting.

Pressing the right arrow from this menu will bring up the menu as shown below:

Press ENT to save  
< Default Setting 1

To save a new **Default Setting**, select a setting number and press ENT. The current Video, Chorma, Setup, Hue, Transition Rate, and timing parameters will be saved in that Default Setting and that setting number will become current.

All five **Default Settings** and the current setting number for each of the four TBC channels are automatically saved in non-volatile backup memory, no extra steps are required.

### Program GPIs

The CP10 is equipped with 14 GPI inputs. GPIs 1 through 10 are dedicated to providing remote control of the TBC Select function. GPIs 11 through 14 are programmed using this function.

After entering the Program GPI function, the display prompts for the GPI you wish to program.

Next the display prompts for the TBC control channel you wish to control with this GPI. Press that channel select.

The desired function for the selected GPI input is chosen by scrolling through the list of functions with the Left and Right Arrow keys, followed by ENT. The choices are:

**Restore Reg:** This will assign the GPI to perform a Restore Register operation on the chosen TBC. Following selection of this function the display will prompt for the register number. Key in the register number and then press ENT.

**Program GPIs (con't)**

**Frz Frame Tgl:** This will cause the Freeze Frame control of the TBC (if available) to toggle between on and off each time the GPI is activated.

**Frz Frame On:** This will force Freeze Frame on regardless of its current state.

**Frz Frame Off:** This will force Freeze Frame off regardless of its current state.

**Frz Field Tgl, Frz Field On, Frz Field Off:** These are identical to the corresponding freeze frame functions.

When the programming is complete, press Menu Func to return to normal operation.

GPI Programming is saved to non-volatile memory with the **Default Settings** function.

**Panel Name**

Each **CP10** Panel (and TC400D panel) has a name of up to 14 characters. Initially, the name is set to "TC400D Panel" or "CP10 Panel". One use for the name is for identification when acquiring remote channels via **Network Access**. If another panel, or even the same one, attempts to acquire a channel that's already in use, a message is displayed showing the panel that currently controls that channel. Refer to **Network Access** for more information.

To view and set the Panel Name, select the Panel Name menu. The current panel name is shown on the top line and the new name, which is initially the same, is shown on the bottom line. Use the menu knob and the left/right arrow buttons to change the name. The knob selects the letter for the current character as indicated by the cursor and the arrow buttons select the current character by moving the cursor left or right. In addition, the number buttons may be used as a short cut to enter a digit for the current character and the CLR button may be used to enter a space character.

**Panel Name (Cont.)**

Name = TC400D Panel  
ENT = Edit Suite 4

**Panel Name (con't)**

When the new name is set as desired, press the ENT button. The name will be checked for any duplicate panel names on the network and if one is found, a warning message will appear and the name change will not take place. If the new name is unique, then it is saved in non-volatile memory and will be used to identify that panel.

When the panel is turned on, it checks the network for duplicate panel names. If one is found at that time, the name is temporarily cahnged by adding a number after then name to insure its uniqueness. Be sure to name all panels when they're initially installed on the network (after the network connections have been made).

**Capture Enable**

When attempting to acquire a channel in Network Access, a panel may override existing control from another panel by capturing the requested channel. Refer to Network Access for more information.

This ability to capture a channel is set for the panel in the Capture Enable menu. The Capture can be either enabled or disabled by selecting the menu and turning the menu knob to the desired setting( or pressing 0 Disbale or 1 for Enable) and pressing ENT. This setting is saved in non-volatile memory.

**Periph Enables**

The CP10 can be connected as a peripheral device to the E-MEM® system of a GVG Model 200 Production Switcher. This connection is made using the 9pin D-sub Editor port on the rear of the CP10.

Two functions are available. The first is E-MEM Learn on the Model 200 in whcih a TC400D register is learned to the same Model 200 register number. The other function is E-MEM Recall in which a previously learned E-MEM register is Recalled and the TC400D Recalls the same register number.

**Note:** The Editor port must be programmed for GVG 200 Peripheral operation in the Pgm Edit Port function below.

The Periph Enables menu function is used to program the peripheral address and to enable/disable peripheral operation for the selected channel.

**Periph Enables (con't)**

Use the Left and Right Arrow buttons to move between the two selections listed below.

**Periph Address:** This address is used to determine if the peripheral message from the GVG 200 is intended for this channel. There are 24 different addresses, numbered 0 through 23. Use the menu knob to select the desired address.

Peripheral operation of each of the 10 TBC channels in the CP10 is completely independent. Each channel can be given a different address if desired.

**Periph Enable:** In order for the CP10 channel to respond to the peripheral message, it must have peripheral operation enabled. While in this selection, rotate the Menu Knob to display either 'On' or 'Off' as desired.

**Pgm Edit Port**

Operation of the Editor port located on the rear of the CP10 is programmed using this function. This programming consists of three parameters: Edit Port Mode, Edit Port Baud Rate, and Edit Port Parity. Use the Left and Right Arrow keys to move between these parameters.

**Edit Port Mode:** The CP10 can currently be programmed to respond to two protocols: GVG 200 Peripheral and GVG Editor ESP-1, Sony BVE-9100, and LINC Peripheral. The Edit Port can also be set to "off". Selection of the desired protocol is made using the Menu Knob.

The GVG 200 Peripheral protocol is used exclusively with Grass Valley Group Model 200 series production switchers.

The GVG Editor ESP-1 protocol supports operation with Grass Valley Group editing systems which are equipped with Version 5.0 (or later) software. ESP-1 is also used with Axial, Ampex, CMX Omni, Calaway and Paltex. In addition, other editor manufacturers support this protocol which allows the CP10 to work with their editing systems.

**Pgm Edit Port (con't)**

The Sony BVE-9100 protocol supports operation with Sony editors that are equipped with the BKE-9013 color corrector card.

**Edit Port Baud Rate:** Baud rates of 9600, 19,200 and 38,400 are selected using the Menu Knob. The selected baud rate must agree with that of the device connected to the Editor port.

**Edit Port Parity:** Parity can be chosen to be Odd, Even, or None via the Menu Knob. Like Baud rate, the parity must agree with the connected device.

**Note:** Baud rate and parity on the GVG Model 200 Peripheral interface is set using the diagnostic pod. Refer to the documentation with your switcher for details.

**Note:** Baud rate and parity when connected to a GVG editor should be 38,400 baud and odd parity.

**AppleTalk**

When TC400Ds and CP10s are networked together each device must be assigned a unique Node Address. Use the Menu knob to select a Node Address, then press Enter to set it.

When you have finished with a menu function, press Menu Func a second time to return to normal operation. If you select a different TBC while a menu function is active, the menu function will terminate automatically to avoid adjusting a machine by mistake.

For further assistance, contact the factory at (530) 478-1830, FAX (530) 478-1832, [info@endes.com](mailto:info@endes.com).

## Appendix A

### General Purpose Interface Cable Wiring

The GPI Inputs to the CP10 appear on a 15 pin Female connector on the rear of the unit. This connector provides access to 14 independent GPI inputs. The pinout of this connector is as follows:

1	GPI # 1
2	GPI # 2
.	.
.	.
14	GPI # 14
15	Common (internally grounded in the TC400D)

Inputs 1 through 10 are assigned to the TBC Select function and can be used in conjunction with the tally output of a production switcher to automatically delegate the TBC control as a function of the crosspoint selection made on the switcher.

Assuming that your production switcher's tally system provides closure to ground or common (this is the most common type of tally system), connect as follows:

CP10 GPI Common (pin 15)	Switcher Tally Common
CP10 GPI Input #1 (pin 1)	Switcher Tally output for the crosspoint corresponding to the VTR or TBC controlled by the first CP10 Select
CP10 GPI Inputs 2-10	Connect to corresponding crosspoint tally.

GPI inputs 11 through 14 can be programmed to perform a register Restore on a particular TBC channel. In addition, freeze frame features of certain TBCs can be also controlled by GPI.

All GPI inputs are active low.