



# CP-50 / CP-50RM UNIVERSAL CONTROLLER

Installation and Operation Manual  
Software Version 3.1

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CP-50 Desktop Controller

## QUICK OPERATION GUIDE

- **To Enable Local Panel Control**, press 'Local' button on panel (CP-50) or toggle off 'External Control' on the CP-50RM.
- **To Enable an External Controller**, press 'External Control' button on panel (upper right). This mode allows control from an external device such as an Avid system to pass through the CP-50 and on to the VTR. The CP-50 will look for status and time data coming back from the VTR, and display it if available, but will not affect the external controller operation in any way.
- **To Clear All Cues**, Press and hold both the CUE # and MARK IN buttons. The display will say 'CLR to Clear All Cues'. While still holding the CUE # and MARK IN buttons, press the CLR button in the keypad. All cue marks will be erased.
- **To Select a Cue Register**, press CUE #, then enter two digits on the keypad (00-50). You can also press and hold the CUE # key, and use the '+' and '-' keys to scroll through the registers. Note that if menu item 05 is set to 'Cues Recall w/Cueup', the vtr will be immediately cued to the time in the recalled cue register.
- **To Mark a Cue**, press MARK IN. The current vtr time will be stored in the current cue register.
- **To Cue to a Register Time**, select the desired register (as above), then press the CUE button. The vtr will be instructed to go to the register time, minus any PREROLL value set in the CP-50 menu.
- **To Enter a Cue Time From The Keypad**, key in the time, press SET, and press MARK IN. Alternatively, you may key in the time, press SET, press CUE #, and enter two digits. The keypad time will be entered into the cue register specified.
- **To Recall a Cue Time To The Display**, press FCN, then MARK IN. The corresponding time value will be recalled to the display and the scratchpad register, so you can do arithmetic with it if desired (add and subtract), or store it in another register. Alternatively you can 'double-click' the CUE # button. This does the same thing as FCN, MARK IN. If there is no value stored in the register, the display will be all asterisks, indicating no value.
- **To Trim a Cue Time**, recall time to display as above (FCN, MARK IN), press '+' or '-', enter the trim value on the keypad, press SET, and press MARK IN to resave it.

## Quick Operation Guide – continued

- **To Cue Directly to a Keyed-In Time Value** enter the time value on the keypad, press 'SET', and press 'CUE'. The vtr will cue to the entered time. The time value will not be stored anywhere. Remember that you must press 'SET' before pressing 'CUE'. This validates the keypad entry before attempting to send the machine to that position.
- **To Calculate Duration** or running time from the current Mark In time, press the 'TM' button in the keypad. This will subtract the Mark In time from the current tape position, and display the result on line 2 of the display.
- **To Adjust Video Levels**, press the VIDEO ADJUST button. This allows adjustment of BLACK LEVEL, VIDEO LEVEL, and SATURATION. Repeated presses of the VIDEO ADJUST button will cycle through these functions. You may also use the up and down scroll buttons (plus and minus buttons) to select the functions. Adjustments are made by turning the jog/shuttle knob. Pressing the UNITY button sets the selected parameter to the zero or unity value.

If the vtr or ddr to which the controller is connected doesn't support control of the selected parameter, there will be no number displayed after the function name.

- **To Adjust Timing Parameters**, press the TIMING ADJUST button. This allows adjustment of HORIZONTAL (SYNC) PHASE, FINE (SUBCARRIER) PHASE, PICTURE HUE, and PICTURE POSITION. Functions are selected as above.
- **To Adjust Audio Output Levels**, press the AUDIO ADJUST button. This allows adjustment of audio output (playback) levels for channels 1-4. Channels are selected as above. The adjustment range is typically from -infinity (off) to +6db. Pressing UNITY sets the channel to the unity or normal setting.
- **To Cancel Any Adjustment Mode**, press the CLR button.
- **To Save Level and Timing Settings**, press the STORE button, then a number key on the keypad (0 through 9). There are 10 TBC files in the CP-50, each of which can store all video and audio level adjustments, and all timing adjustments.

## Quick Operation Guide – continued

- **To Recall Level and Timing Settings**, press the RECALL button, then the number key corresponding to the file you wish to recall. The values previously stored in that file will be recalled, and immediately sent to the vtr.
- **To View or Change Menu Settings**, press the MENU button. A menu item will be displayed on the bottom line of the display. Turning the knob or using the plus/minus keys will scroll through the menu items. Pressing the MENU SET button will cycle through the options for the displayed menu item. Also, you may change the menu setting by turning the jog/shuttle knob while holding down the MENU SET button. This is useful for items such as PREROLL which have a large number of possible settings.
- **To Enable GPI Inputs and Outputs [CP-50RM Only]**, select the menu items 11 GPI 1 Fctn, and 12 GPI 2 Fctn. The function selected will be triggered by the corresponding GPI input, and the corresponding GPI output will reflect the status of the selected function.

## GENERAL DESCRIPTION

The Lance Design CP-50 and CP-50RM are compact controllers designed to provide both transport control and 'TBC' control of vtrs or ddrs via the standard Sony protocol/RS-422 connection. The CP-50 is a desktop unit, and the CP-50RM is a 2RU rack-mount unit. These units provides 51 Cue registers, 10 TBC settings files, full transport controls, and control of video levels and timing, and audio playback levels.

The cue points and menu settings are stored in static RAM, maintained by a high-value 'Gold Cap' capacitor. This storage will retain values for a week or more without power applied to the unit. The TBC files are stored in flash memory, and will be retained indefinitely without power.

There is a full numeric keypad which provides timecode entry, cue number entry, and TBC file selection. This keypad also allows timecode arithmetic (adds and subtracts) to be performed.

In addition, there is an external control port which may be connected to the vtr via a 'pass-through' mode, by selecting the EXTERNAL CONTROL mode from the CP-50 front panel. On the CP-50 this port is either an RS-422 connection or an RS-232 connection, selectable by moving jumpers inside the unit. On the CP-50RM, both formats are provided on the rear panel, with a rear-panel switch selecting which will be active.

The CP-50RM additionally provides two optically-isolated GPI inputs, and three open-collector GPI outputs. The functions of the first two GPI inputs and outputs are assignable from the menu. The function third GPI output is fixed and provides 'VTR CUED' status. These connections are available on a separate D9-F connector on the rear panel.

The units are housed in heavy-duty aluminum enclosures, and use the highest-quality switches and controls to provide reliable operation and long life.

## CONTROL PANEL DESCRIPTION

The CP-50 / CP-50RM control panel provides the following controls:

- **Numeric Keypad** - for entry of numeric data, register numbers, timecodes, etc.
- **Plus and Minus Keys** - for timecode arithmetic, and for use as up/down keys for scrolling through the menu items or TBC parameters.
- **FCN Key** - for selecting alternate functions of some keys (like a shift key), and for recalling in times from the register to the display
- **SET Key** - operates like an 'equals' or 'enter' key. To enter a timecode number from the keypad, for example, you would key in the time, press SET, and press MARK IN. The SET key tells the controller to use the keypad time instead of marking from the current vtr position
- **TM Key** -. This key is used to enter time values into the timer or timecode generator of the controlled device, if this capability is supported. It also will display the duration of the a segment by subtracting the time in the Mark In register from the current VTR position, and displaying it on line 2 of the display.
- **CLR Key** - Clear function. Clears numeric entry and other modes. Functions somewhat like a 'cancel' or 'escape' key.
- **CUE#** - used to select the active register from the 51 available registers. Press this key (it lights), and enter a 2-digit register number on the keypad (00-50). You may also hold this button down and use the plus/minus keys to scroll through the 51 registers.
- **MARK IN** - pressing this key will put the current vtr timecode into the IN register. Pressing this key after pressing SET will put the keyed-in timecode value into the IN register. Pressing FCN, then MARK IN will recall the current in time to the display. The MARK IN button will be lighted when ever there is an inpoint stored. If the inpoint is cleared, the button will be dark.
- **AUDIO ADJUST** – selects adjustment mode for audio playback levels
- **TIMING ADJUST** – selects adjustment mode for video timing parameters

## Control Panel Description – continued

- **VIDEO ADJUST** – selects adjustment mode for black level, video level, and chroma level
- **STORE** – stores level and timing adjustment data in one of ten TBC files
- **RECALL** – recalls level and timing adjustment data from one of ten TBC files
- **UNITY** – sets selected parameter to unity/default value. Button is lit when selected parameter is at unity value.
- **MENU ON** - turns on and off the menu mode. Menu items are displayed on the lower line of the display. Use the knob or the +/- keys to scroll through the items. Also selects the TBC Adjust function if pressed after the "FCN" key. In this mode, the menu button light will blink.
- **MENU SET** - used to change the menu items. Pressing this key will toggle the menu choices if there are only two. If there are more than two, it will step through them. If you hold this key down, you can use the knob to adjust the menu setting.
- **LOCAL CONTROL** – assigns control of the vtr to the CP-50. Button is lighted when in this mode. (Note: this button does not exist on the CP-50RM. In this case, the EXTERNAL CONTROL button toggles ext. control on and off)
- **EXTERNAL CONTROL** – assigns control of the vtr to the EXTERNAL CONTROL connector on the CP-50 rear panel. Note that when in this mode, the CP-50 will listen to communications from the vtr to the external controller, and will attempt to display time and status information if possible, but will in no way affect the operation of the vtr and external controller. VTR controls on the CP-50 will be inhibited.
- **PLAY, RECORD, STOP, CUE, SHTL, JOG, VAR** - standard transport controls. When in variable mode, the speed is displayed in the upper right corner of the display. When pressed by itself, the REC button will put the device into EE mode. Pressing REC again, or pressing STOP will cancel EE mode. The REC button flashes to indicate that the device is in EE mode.

## MENU ITEMS

### **Item 01 Time Code Type [Timer/LTC/VITC/Auto]**

This selection determines what type of timecode the CP-50 requests from the VTR. The legend in the upper left corner of the display reflects what is actually being returned from the VTR.

### **Item 02 Preroll Value [00-30 Seconds]**

When the CUE button is pressed, the VTR will be asked to go the time in the cue register minus the Preroll Value. This value may be set by holding down the MENU SET button and turning the knob.

### **Item 03 Panel Record Lock [Off/On]**

When this is set to ON, the CP-50 will be inhibited from sending a record or EE command. Setting this item on does NOT prevent the external controller from sending a record command to the VTR.

### **Item 04 Variable Range [0<1X / -1>3X]**

This item selects the range of speed control when in Variable mode.

### **Item 05 Cues Recall [Only/With Cueup]**

When set to 'Cues Recall Only', recalling a cue register will only put the time in the active register, and display it. It will not cue the VTR; this must be done by pressing the CUE button. Setting this item to 'Recall w/Cueup' will cause a cueup command to immediately be sent to the vtr automatically when a cue register is recalled.

### **Item 06 Cues Auto-Step [Off/On]**

When this is turned on, pressing the MARK IN button will cause the current cue register number to advance before marking, allowing you to mark a number of cue points by repeatedly pressing the MARK IN button. The CUE # button will flash when this occurs to remind you that the cue numbers are incrementing. When this item is off, repeatedly pressing the MARK IN button will keep entering times into the same cue register.

### **Item 07 Auto Jog Select [Off/On]**

Turning this item on allows jog mode to be entered by just turning the jog/shuttle knob, if the VTR is in stop mode, and not parked on a cue point. Turning the item off means that jog mode is entered only by pressing the JOG button.

### **Item 08 Panel Buzzer [Off/Error Only/On]**

Controls operation of the panel buzzer. 'Off' turns the buzzer completely off. 'Error Only' enables it for warning beeps only, and 'On' enables it for warning beeps and confirmation beeps when marking or setting registers, etc.

menu items – continued

**Item 09 User [None/Still/Standby/Eject/Freeze/Timer Reset]**

Assigns function to the user button on the panel. The button tally reflects the status of the function selected. Note that 'Freeze' will only operate if the controlled device supports this function.

**Item 10 Video Frame Rate [30/25]**

Configures the CP-50 for the video standard in use. The main purpose of this in this controller is to tell it how many frames are in 1 second, for all of the arithmetic and time conversion to work properly. It will function if the wrong standard is selected, but keypad arithmetic, prerolls, and other things will be wrong.

**Item 11 GPI 1 Function (CP-50RM Only)  
[None/Stop/Play/Record/Var/Still/Cue/Freeze/Mark In/Ext Ctl]**

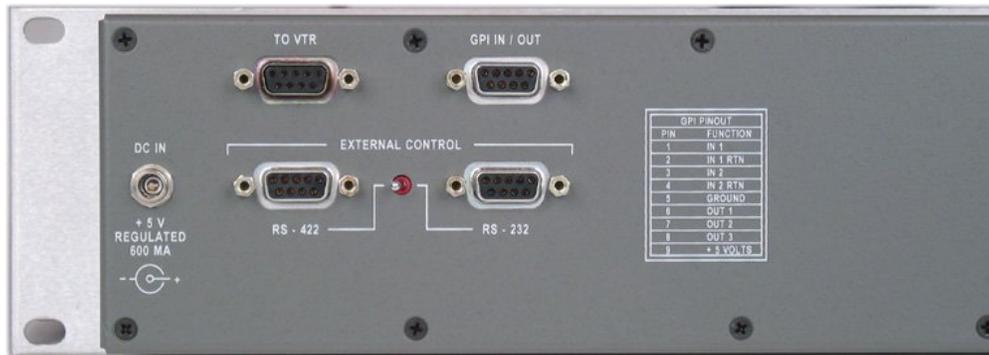
Selects the function of the GPI 1 input, and the status of the GPI 1 output. The function assigned to the GPI will operate just as if the corresponding front panel button were pressed, and the GPI output will reflect the status of the corresponding button light.

**Item 12 GPI 2 Function (CP-50RM Only)  
[None/Stop/Play/Record/Var/Still/Cue/Freeze/Mark In/Ext Ctl]**

Same as above for GPI 2 (input and output).



CP-50 REAR PANEL



CP-50RM REAR PANEL CONNECTORS

## CONNECTOR PIN-OUTS; INTERCONNECT INFORMATION

### **Power Connection**

The CP-50 requires +5 volts DC regulated (5%), approximately 600 ma. It is strongly suggested that you use the furnished power supply. Never connect an unregulated power supply, or damage may result.

### **VTR Port (RS-422)**

Pin #	Function
1	Ground
2	-RX Data (from device)
3	+TX Data (to device)
4	Ground
5	(no connection)
6	Ground
7	+RX Data (from device)
8	-TX Data (to device)
9	Ground

Connection to the VTR is a standard SMPTE RS-422 link, using a pin-to-pin cable

On the CP-50 desktop controller, the **External Controller** connection can be either RS-422 or RS-232, and is determined by the location of an internal cable connection, and the position of an internal jumper. The controller is shipped configured for RS-422. ***Make sure the controller is configured properly for the type of signals applied, or hardware damage can result.***

**External Controller (RS-422)**

Pin #	Function
1	Ground
2	-TX Data (to ext controller)
3	+RX Data (from ext controller)
4	Ground
5	(no connection)
6	Ground
7	+TX Data (to ext controller)
8	-RX Data (from ext controller)
9	Ground

(Use pin-to-pin cable to connect another RS-422 controller. The CP-50 External Control port looks like a VTR in terms of pinout.)

**External Controller (RS-232)**

Pin #	Function
1	(no connection)
2	CP-50 TX to Ext Controller
3	CP-50 RX from Ext Controller
4	(no connection)
5	Ground
6	(no connection)
7	(no connection)
8	(no connection)
9	(no connection)

(Use pin-to-pin cable to connect to PC Com Port.)

The purpose of the RS-232 configuration is to allow PC-based edit systems, such as Avids, etc., to be used as the external controller without having to use an outboard RS-232/RS-422 converter. Any data input as RS-232 is converted to RS-422 within the CP-50 before it is sent to the VTR.

### **GPI Inputs/Outputs (CP-50RM Only)**

Pin #	Function
1	GPI 1 In (opto-iso)
2	GPI 1 In (opto-iso)
3	GPI 2 In (opto-iso)
4	GPI 2 In (opto-iso)
5	Ground
6	GPI 1 Out (open collector)
7	GPI 2 Out (open collector)
8	GPI 3 Out (open collector)
9	+5 Volts Out (100 ma max)

The GPI inputs are optically isolated. The inputs are isolated back-to-back (AC) LEDs in series with a 1K resistor. They may be activated by any voltage from 5 to 24 volts of either polarity (or AC). If it is desired to activate these inputs from a switch or relay closure, the CP-50RM provides power on pin 9 with a ground connection on pin 5. This power is internally limited to a maximum current of 100 ma by an internal poly fuse.

The GPI outputs are open collector transistors, with the emitters grounded, and are active low (transistor on). They are rated at 35 volts, 50 ma maximum.

END