LANCe DESIGN

REMOTE TBC SYSTEM
OPERATION MANUAL

Firmware Version 4.1 (CP-160B)

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WARRANTY STATEMENT

This equipment is warranted to be free of defects in materials and workmanship for a period of two years from date of delivery.   Any necessary repairs resulting from defects in materials or in manufacture will be made free of charge provided that the equipment has not been subjected to mechanical or electrical abuse, or modification, as determined by Lance Design, and also that the equipment is returned to Lance Design with prior authorization.

No liability whatsoever is assumed for consequential damages resulting from the use or failure of this equipment. This warranty is in lieu of all other warranties, expressed or implied, including any implied warranty of fitness for purpose.

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CAUTION! HAZARDOUS VOLTAGES ARE EXPOSED WHEN THE COVER OF THIS UNIT IS REMOVED.   USE EXTREME CAUTION WHEN MAKING ADJUSTMENTS OR SETTING DIPSWITCHES IN ORDER TO AVOID ELECTRIC SHOCK.

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CP-160B Front Panel

SECTION 1.1 - USE AND CAPABILITIES

The Lance Design TBC Remote system is designed to provide full remote control of the TBC adjustments of up to 32 broadcast or post-production videotape machines, or other devices such as frame syncronizers, from up to eight locations.

The functions controlled are: SETUP (BLACK LEVEL)
        VIDEO LEVEL
        CHROMA LEVEL
        CHROMA PHASE (HUE)

        *HORIZ PHASE (or SYNC PHASE)
        *SUBCARRIER PHASE (or FINE PHASE)
        *BETA Y/C DELAY (or AUX TIMING 1)
        *COLOR FRAME (or AUX TIMING 2)

        *FREEZE AND FREEZE MODE

(* these functions depend on the capabilities of the device being controlled)

A memory system is provided so that each control panel may independently save up to fifty setups per vtr. It is therefore very easy to recall previous setups when reels are changed, for example. A reel number may also be stored with each memory's data for easy reference. The last 10 registers (for each vtr) may be protected so that they may be used to store default or standard setups.

The control system is designed around a coax party line, so that control of every vtr is available to every control panel without any delegation or repatching. There is a simple VTR lock function to prevent the accidental adjustment of a vtr which may be in use elsewhere.

Typically a control location represents an edit suite, a quality-control or transmission area, or a vtr operating area. Each vtr, or other device, to be controlled is equipped with an appropriate interface, which converts the party line data to match the vtr's specific control requirements.

Some other features are:

Editor Port allows connection to most popular edit controllers, and will allow storage of the setup data in the edit decision list (EDL). In some cases the control of the tbc's may be accessed directly from the edit console.

RS-232 Port allows the connection of a terminal (or PC running a communications program). Through this terminal it is possible to enter custom device names so that each device is displayed as a familiar name. The terminal also provides access to other functions, such as panel status, firmware version, memory clear, and diagnostics.

SECTION 1.2 - PHYSICAL DESCRIPTION OF SYSTEM

The system consists of three components: Control Panels (1 to 8)
                                                 VTR Interfaces (1 to 32)
                                                 Coax Party Line

The CONTROL PANELS are single-rack-unit devices which contain 8 pushbuttons for function selection, and a single high-resolution optical encoder, used for making all adjustments. Each control panel has a PANEL ID number which is set via an internal DIPSWITCH. One panel MUST be set to ID=0. This panel becomes the bus controller, and must be on for the system to operate. Any other panels may be set for ID=1 to 7, and are not required for operation. Each panel must have a unique number.

All adjustment data is placed on the party line and recognized by the appropriate vtr interface. The party line data also updates all other control panels, so that every panel always contains matching current data. Adjustment data, both current and in memory, is stored in battery-backed RAM in each panel. The battery will maintain adjustment data for several weeks, and are recharged when power is applied to the panel.

The display for the CP-160B panel consists of a 2 x 24 VFD display module.

The interfaces are small self-contained units which are located near the vtrs, and connected to the vtr's remote connector by a supplied ribbon cable. Each interface contains a DIPSWITCH which is used to set the interface ID number. This is the control panel VTR number to which that interface will respond. The other dipswitch sections control some diagnostics, and options that vary from interface to interface.

The system is interconnected via a single coax party line. Each device is inserted into this party line using a BNC 'T' connector. Small, inexpensive coax may be used, keeping the installation costs low.

NOTE: The coax party line should <u>NOT</u> be terminated.

SECTION 1.3 - TECHNICAL SPECIFICATIONS

 FUNCTIONAL:

Maximum Number of Panels (Controlling Locations):   8
Maximum Number of Interfaces (VTRs) Controlled: 32
Interconnection Method: Serial data, single coax party
                                                      line

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Control Panel Display (CP-160B):   Vaccuum Florescent , 24 characters X 2 rows

*Functions Controlled: Setup, Video Level, Chroma Level, Hue
                                    Horiz. Phase, Subc. Phase, Y/C Delay
                                    Picture H phase, Freeze, Freeze Mode
                                    Color Frame

*Depends on device capabilities

Control Resolution: System is10 bit (1024 steps). Resolution limited
                                    by some VTRs with serial interface

Memory Registers: Fifty per VTR per panel. All functions stored.
                                    Battery back-up.

Reel Numbers: May be assigned for reference (000 - 999)

Adjustment Method: Optical Encoder (Single front-panel knob)

REAR PANEL CONNECTORS:

Data: BNC Female. Data party line connection.

Editor: 9-pin D Female. RS-422 for editor interface.
                                    SMPTE-standard pinout.

RS-232 (terminal):   9-pin D Female. RS-232, 9600 baud, 8-N-1
                                        Connection for optional setup terminal used for
                                    entering nmemonics and other functions. Use
                                    pin-for-pin cable to connect to PC serial port.

Power: Standard 3-pin IEC power connector.

ELECTRICAL/MECHANICAL:

Power Requirements: 115vac, 50-60 Hz, 10 Watts

Fuse: 250v 1/4 amp SLO-BLO

Size (control panels):   1.75" H x 19" W x 9.75" D
                           (one standard rack unit)

Weight: Approx. 6 lbs net

SECTION 2 – INSTALLATION

SECTION 2.1 - SETTING DIPSWITCHES

Each control panel contains configuration dipswitches inside the unit, on the rear of the circuit board.   The switch functions listed below apply to DIPSWITCH 1. Dipswitch 2 in the CP-160 has no function at this time. The top cover must be removed to gain access to the switches.

To remove the top cover, remove the six screws, lift the rear of the cover slightly and pull the cover backwards (away from the front panel). Be especially careful in the case of the CP-160, since the fit at the front edge of the top cover is quite tight. The functions of the various sections of this switch are as follows.

SW 1 - Panel ID number LSB   SW 1-3 establish the binary
SW 2 - Panel ID number Bit 2   panel ID number.
SW 3 - Panel ID number MSB   (SW ON = Logic 1)

The control panels must all have different ID numbers. If you are using multiple panels, you must change the ID number of all but one of them. They can be any numbers from 0 to 7, as long as they are all different. Note that the panel set for ID=0 serves as the controller for the party line, and must exist (and be powered) for the system to operate. If there is no panel 0, a "party-line fault" message will be displayed.

SW 4 - Exclusive Unlock Disable   SW=ON allows this panel to
                                       unlock locks set by any panel.

SW 5 - Expanded Timing Disable   SW=ON disables expanded timing
                                      functions PIX-Y/C PHS, and COLOR
                                      FRAME. User preference, normally off.

SW 6-7 Editor Protocol   Selects the serial (editor) protocol of the
                               RS-422 editor port.

Both OFF = GVG ESP-1 (expanded) for use with Grass Valley and many other editors.

SW 6 on, SW 7 off = CMX "Auto Note" for use with older (CMX 3400-3600) editors to provide text note entry of data.

SW 6 off, SW 7 on = CMX Omni mode. Similar to ESP-1, but provides slight adjustment for CMX OMNI editors.

Both ON = Undefined at this time. Do not use.

(continued)

Dipswitch Settings – continued

SW 8 - Interface ACK Bypass   SW = ON causes panel to not look for
                                    interface data acknowledgement. Test
                                    mode only, should be OFF.

Control panels are shipped with all switches off.

LOCK AUTHORITY

SW 4 is optional. If SW 4 is off, only the panel that "locked" a particular VTR may
release the lock; all other panels are restricted from adjusting that VTR until it is
released. If SW 4 is on, that panel will be allowed to release a lock set by any panel,
and the lock message serves only as a reminder that a particular VTR may be in use
elsewhere. Note that this option operates on a panel-by-panel basis. One panel may
be given the ability to unlock any lock, while other panels may be allowed to unlock only
their own locks. (see section 3.5)

SECTION 2.1 - SETTING DIPSWITCHES   (INTERFACES)

Each VTR interface contains an 8-position dipswitch, accessible through a cutout in the
end panel. The function of the first five sections is to set the device (vtr) number to
which the interface responds (see the binary table on the following page.) The functions
of the other 3 switches vary somewhat between the various interface types. Consult the
application notes in the back of this manual for further information regarding specific
interface types.

SECTION 2.1 - SETTING DIPSWITCHES   -   BINARY VALUE TABLE

VALUE	SW1	SW2	SW3	SW4	SW5
01	**ON**	**OFF**	**OFF**	**OFF**	**OFF**
02	**OFF**	**ON**	**OFF**	**OFF**	**OFF**
03	**ON**	**ON**	**OFF**	**OFF**	**OFF**
04	**OFF**	**OFF**	**ON**	**OFF**	**OFF**
05	ON	OFF	ON	OFF	OFF
06	OFF	ON	ON	OFF	OFF
07	ON	ON	ON	OFF	OFF
08	OFF	OFF	OFF	ON	OFF
09	**ON**	**OFF**	**OFF**	**ON**	**OFF**
10	**OFF**	**ON**	**OFF**	**ON**	**OFF**
11	**ON**	**ON**	**OFF**	**ON**	**OFF**
12	**OFF**	**OFF**	**ON**	**ON**	**OFF**
13	ON	OFF	ON	ON	OFF
14	OFF	ON	ON	ON	OFF
15	ON	ON	ON	ON	OFF
16	OFF	OFF	OFF	OFF	ON
17	**ON**	**OFF**	**OFF**	**OFF**	**ON**
18	**OFF**	**ON**	**OFF**	**OFF**	**ON**
19	**ON**	**ON**	**OFF**	**OFF**	**ON**
20	**OFF**	**OFF**	**ON**	**OFF**	**ON**
21	ON	OFF	ON	OFF	ON
22	OFF	ON	ON	OFF	ON
23	ON	ON	ON	OFF	ON
24	OFF	OFF	OFF	ON	ON
25	**ON**	**OFF**	**OFF**	**ON**	**ON**
26	**OFF**	**ON**	**OFF**	**ON**	**ON**
27	**ON**	**ON**	**OFF**	**ON**	**ON**
28	**OFF**	**OFF**	**ON**	**ON**	**ON**
29	ON	OFF	ON	ON	ON
30	OFF	ON	ON	ON	ON
31	ON	ON	ON	ON	ON
32*	OFF	OFF	OFF	OFF	OFF

 * This is of course really binary 0, but it results in the interface responding as VTR 32.

SECTION 2.2 - PHYSICAL INSTALLATION

Set DIPSWITCHES as required- see previous section. The control panels should be rack-mounted just below or adjacent to the setup monitor and scopes. No special ventilation is required, but the unit does generate some small amount of heat, and reliability will increase if the ambient temperature is kept reasonable.

The interface units are designed to be mounted on the back of the VTR they are controlling, or screwed to a rear rack rail. The mounting holes are on 3.0" centers and will align with a standard rack rail spacing. The units are very light and two screws through one side should be adequate. For a more secure installation, a 2-unit blank rack panel can be drilled to mount one to four interfaces.

SECTION 2.3 - ELECTRICAL CONNECTIONS

COAX PARTY LINE

For both the CP-150 and the CP-160 control panels, the DATA connector on the control panel should be connected to the DATA connectors of any other control panels and the BNC connectors of all interfaces. Use BNC "T" connectors where devices (panels of interfaces) need to be connected. No particular order or structure need be followed. It is not necessary to terminate the party line in any way. Total length of the party line has been tested to over 500 feet, but considerably longer lengths should present no problem. Note that the party line is DC referenced, and that there should be no ground potential differences over about 500 millivolts. Since this amount of ground potential is disastrous to video anyway, this restriction should not be of great concern. If the video works, the party line should work. If higher-level ground potential is anticipated, Lance Design can provide an opto-isolator, p/n 50-125-0. This should not be required in any but the most extreme cases.

EDITOR INTERFACE

If you're using the editor/EDL interface capability of the CP-150/160 control panels, you will need an additional cable between the 'EDITOR' connector on the control panel to a peripheral port on the edit system controller. With all editors except the older CMX systems (3400/3600), this cable is a standard SMPTE-type 9-pin (see drawings section of this manual). For the older CMX's, a special cable is required. Contact Lance Design for more information.

Editor Port Pinout

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

RS-232 PORT

Each control panel has an RS-232 port for connecting to a terminal (or PC running a terminal program such as 'PROCOMM'.) The use of this terminal allows for entry of six-character device names ('show' names), and access to other functions such as diagnostics. If device names are to be the same for all panels on a party line, only one panel needs to be connected to the terminal, since the names, once entered, may be copied over the party line to all other panels.   The RS-232 connector on the CP-150/160 is wired to connect to a PC serial port with a pin-to-pin cable; no null modem is required.

CP-160 RS-232 Port Pinout

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

VTR INTERFACES

VTR interface modules are specific to particular VTR types. You can't use a Beta interface on a D2, for example. Consult the device chart for further information, or contact Lance Design. Check the applications notes in the rear of this manual for information regarding particular vtrs and interfaces.

In general, the interfaces should be connected to the party line as described above, and connected to the vtr or syncronizer with the supplied cable. The connector used on the vtr varies depending on machine type, but it is usually labled 'TBC REMOTE', 'V/A REMOTE', or something similar. Again, check the applications notes.

Some vtr types do not supply power on the connector, and so an external power supply is required to power the interface. This is a small wall-mount transformer, which connects to the interface via a 1/8" phone jack on one end of the interface. If the interface you're using has this jack, then it needs the external power supply.

SECTION 2.4 - FIRST TIME OPERATION

Once the unit has been installed as described in the previous section, apply power to all control panels and VTRs. The display should appear and there should be no "PARTY LINE FAULT" message. If this message does appear, check to make sure that the party line coax is connected properly and is not shorted. Also check to make sure that one and only one panel is set for ID=0.

Once the system is running, the green LED on each interface should flash about once every five seconds. This indicates that the refresh cycle is running properly and that the interfaces are working properly. If an interface fails to flash, check the ribbon cable connections and the interface dip switch. Also make sure that the VTR is turned on.

Make sure that the VTRs are set for remote TBC control. This may be a panel switch (BVW) or a menu selection (BVH-3000). Note that for DVR-series VTRs, the remote control is always active.

The system should now be operational. Try adjusting the functions of the VTRs and confirm proper operation. When panels are first installed, it is a good idea to store valid adjustment data in a few memories. The upper 10 memories (41-50) may be protected and are intended to store standard or default setups (see operation section). Storing good setups in a couple of these registers provides a good way of quickly returning a vtr to a known setup state.

SECTION 2.5 - MAINTENANCE AND DIAGNOSTICS

The system requires no periodic maintenance once installed.

section 2.5 - Maintenance and Diagnostics (continued)

Possible error messages displayed by the CP-160 are:

PARTY LINE FAULT - This error message is displayed if the normal party line polling sequence is not received. This polling sequence is generated by the panel assigned as panel 0. If this message is displayed, some possible causes are:

      a) No panel is assigned as panel 0
      b) More than one panel is assigned as panel 0
      c) Panel 0 is not powered
      d) Coax party line is disconnected or shorted
      e) Hardware fault

PL DATA ERROR - This message is displayed if a party line checksum error is detected. Some possible causes are:

      a) More than one panel assigned as panel 0
      b) More than one interface with the same address
      c) Intermittent or noisy party line

There are a couple of diagnostic routines in the CP-160 which may be accessed via the setup (ASCII RS-232) terminal. Connect and start the terminal as described in section 3.8. When the main menu is displayed, type 7, and enter. This will run a RAM test, which checks all RAM locations in the CP-160 (it will not corrupt any setup data). If all locations check good, the terminal will display "OK". The next test run is an EPROM checksum, which checks the integrity of the system EPROM (U18).   The checksum displayed should match that printed on the label of U18.

SECTION 3 - OPERATION

SECTION 3.1 - ENABLING THE DISPLAY

The CP-160B VFD display is always active. The panel reverts to the "VTR SELECTED" mode after about 45 seconds of inactivity, so that the knob won't change a level adjustment if it is accidentaly moved.

There are two display modes possible. The CP-160 may be toggled between the NORMAL DISPLAY MODE (which is the usual VTR 1-32), and the MNEMONIC DISPLAY MODE (which is the list entered via the terminal) by first pressing and releasing SHIFT, and then pressing DISPLAY five times in succession. This sequence is to prevent accidental switching of display modes. The display will indicate the mode when this switch is made.

SECTION 3.2 - SELECTING THE VTR

The first step in adjusting a VTR is to select the desired machine from the (up to) 32 available. This is done by pressing the VTR button on the front panel. The display will be turned on and the VTR section of the display will be highlighted (CP-150). You may then select the desired VTR either by stepping through the VTRs with the VTR button, or by turning the knob. The knob is generally the easier way. The VTR number selected corresponds with the dipswitch ID assignment in the interface.

If VTR 15 is selected, for example, the interface on the party line which has binary 15 selected on its dipswitch will be affected.

SECTION 3.3 - ADJUSTING LEVELS

Once the proper VTR has be selected, press the LEVELS pushbutton to enter the level adjustment mode. One of the level parameters will be displayed, along with its current value.

The LEVELS pushbutton will step through the four level parameters, which are SETUP, VIDEO LEVEL, CHROMA LEVEL, and CHROMA PHASE (hue). This sequence is the usual order in which the parameters would be adjusted. Once the desired parameter is selected, simply turn the KNOB to adjust.

The displayed current value will update, representing the current value for that parameter. The range for all parameters is -511 to +511. These numbers are relative only, and have no particular relationship to video levels.   The "unity" or "preset" value is +000. This may be entered by using the PRESET function. This is invoked by first pressing and releasing the SHIFT button, which will flash, and then pressing the LEVELS/PRESET button. The shift mode will automatically cancel.

SECTION 3.4 - ADJUSTING TIMING

Adjustment of timing is very similar to the adjustment of levels described in the previous section. The available timing parameters are HORIZ PHASE, SUBC PHASE, PIX-Y/C PHS, and COLOR FRAME.

Press the TIMING button to enter the timing adjustment mode. One of the timing parameters will be highlighted. Use the knob to adjust, and use the TIMING button to step through the parameters.   The PIX-Y/C PHS control adjusts picture phase on machines which allow that adjustment, or Y/C Delay on Betas. The preset function does operate, but is somewhat meaningless in the case of the system timing adjustments, except to center the control in its range.

When adjusting COLOR FRAME, the CF STATUS indicator is displayed on the lower line of the display. On machines which support this feature (e.g. BVH-3000) the indicator will duplicate the state of the LED on the VTR.

If COLOR FRAME and Y/C DELAY functions are not required they may be disabled (on a panel-by-panel basis) by turning on dipswitch #5.

Note that timing information is saved and recalled by the memory system, and that timing data present when a particular set of level parameters are saved will be recalled when those levels are recalled.   This can be very useful if, for example, VTRs are shared between multiple edit suites with different timing requirements.   By simply recalling a previously saved memory, a VTR may be instantly retimed.

Note for HDW/SRW vtrs: When a vtr using the SIF-7 interface is selected, different timing parameters appear. They are:

> **SYNC PHASE**
> **FINE PHASE**
> **AUX TIMING 1**
> **AUX TIMING 2**

SYNC PHASE and FINE phase normally control the HD output timing, and AUX TIMING 1 and 2 control the Standard Def SDI and Composite outputs. These functions may be swapped by turning on dipswitch section 7 on the SIF-7 interface.

SECTION 3.5 - OPERATION OF THE LOCK FUNCTION

There is a lock function included in the control panel software. The purpose of the lock function is to allow a control panel to lock a VTR, thus prohibiting any adjustment by any other panel until the lock is released. The lock can be released only by the panel that established it, or by another panel with dipswitch #4 turned on (exclusive unlock disable; see section 2.1).

The lock is established for the current VTR by first pressing and releasing the SHIFT button, then pressing the LOCK (VTR) button. On the panel which set the lock, an astrisk character (*) will appear to the left of the VTR number (or mnemonic) indicating that this vtr is locked by this panel. All adjustments are still possible from this panel.

On all other panels, the message "*LOCKED* PANEL _" will appear. All adjustments to this vtr will be inhibited from these other panels. (Note that this operation of the lock function differs somewhat from earlier firmware versions.) To unlock, follow the same procedure. Press and release the SHIFT button, then press the LOCK (VTR) button.

SECTION 3.6 - FREEZE OPERATION

The CP-160 allows control of FREEZE operation on certain devices. This allows freeze/unfreeze control, as well as selection of the freeze mode, i.e. FIELD, FRAME, or 4-FIELD.

To operate the freeze control, the display must be enabled, and the desired device selected, and the CP-160 must NOT be in memory mode. Any other mode is ok.

Under these conditions, the STORE button acts as the FREEZE control, and the RECALL button acts as the UNFREEZE.   Once the device is in the freeze mode, additional presses of the STORE button will cycle through the modes FIELD, FRAME, 4-FIELD, if the controlled device permits this selection.

The freeze status will be displayed on all panels on which a frozen device is selected. All panels have control of this function, unless a LOCK is set by a particular panel (see section 3.5, lock operation).   Once a device is frozen, any other operations may be performed on the CP-160 without disturbing the freeze. Memory recalls, etc. have no effect on the freeze status.

INTERFACE CAPABILITY

Currently only a few interfaces support the freeze function. If the selected interface does not support the freeze function, pressing the STORE button will have no effect (except in memory mode, of course).

INTERFACE FREEZE DISABLE SWITCH

If it is desired that an interface (which supports the freeze function) not be allowed to freeze, dipswitch #8 on that interface may be turned ON. This will prevent the device that that interface controls from being frozen by any panel (see section 2.1, setting dipswitches).

section 3 continued

SECTION 3.7 - USE OF THE MEMORY STORAGE SYSTEM

Each control panel contains fifty memory storage registers for each VTR. (50 times 32 VTRs = 1600 registers per panel) These are in addition to the displayed, current values. Each memory stores the data for all parameters, both levels and timing, as well as a reel number. It is thus possible to quickly store setups for separate reels, for example, and change reels quickly without the need to re-setup the machine each time.

The memory registers are designated 1-50. Select the memory function by pressing the MEMORY button. The selected memory number will be displayed, along with the reel number saved in that memory register. Once in the memory mode, select a different memory by pressing the memory button, or by using the knob.

SAVING VALUES TO MEMORY

Once the desired register is selected, the current values may be copied into that register by pressing the STORE button. The display will indicate that the data has been stored. The current values have not been changed.

RECALLING VALUES FROM MEMORY

Select the desired register as above. Press the RECALL button. This will cause the values stored in the selected memory register to be copied into the current values (and therefore placed on the party line to the VTR). The data in the memory register will not be affected.

PROTECTED OR 'DEFAULT' MEMORY AREA

The last ten memory registers (registers 41-50) may be protected or locked, so that the store function is inhibited for those registers. This allows 'defaults' or standard setups to be saved in those registers, and eliminates the possibility of these standard values being changed in normal operation.

The memory protect function is toggled on and off by pressing and releasing the SHIFT button, and then pressing the STORE button five times in succession. The display will say "MEMORY PROTECT ON" or "MEMORY PROTECT OFF" . When a protected memory is selected, an astrisk (*) will be displayed to the left of the MEM XX display, indicating that that register may be recalled only, not stored to.

The control panels are shipped with all memory registers set for +000 for all parameters. It is possible to clear all memory registers to +000 by using the setup terminal (see terminal section.) The memory registers are maintained in battery-backed CMOS RAM. The data retention is good for several weeks without having power applied to the control

panel. When the control panel is on, the battery is being charged, and as long as the unit is on for at least 12 hours every 2 weeks, data retention should be essentially permanent.

SECTION 3.8 - ENTERING REEL NUMBERS

It is possible to enter a Reel Number for reference. The current reel number is displayed in the lower left of the display. This number may be changed by pressing and releasing the SHIFT button, then pressing the MEMORY/REEL button. The current reel number may then be changed by turning the knob. The number may also be set to 000 by using the PRESET function (press and release the SHIFT button, then press LEVELS/PRESET).

When the current setup values are stored in a memory register, the current reel number is also saved. This number will then be displayed with the memory register number to provide a reference for the memory contents. Note that the reel numbers are for operator reference only, and in no way affect the control of the VTR's.

SECTION 3.9 - USE OF THE SETUP TERMINAL AND MNEMONICS

By connecting a suitable ASCII terminal to the RS-232 port on the rear panel of the CP-160B, several additional features may be accessed. There are some diagnostic and informational items in the menu, bu the main use is to enter 6-character alpha-numeric names for controlled devices (other than VTR 1, VTR 2, etc.).

For example, suppose that a user had 4 VTRs connected, which he referred to as PLAY A, PLAY B, PLAY C, and RECORD. These names would be entered along with the appropriate interface numbers via the terminal.   The list may be terminated by entering an astrisk (*) as the first character of the next name. Only the devices prior to this will be displayed.

The terminal may be any standard ASCII terminal (or a PC running a communications program such as "PROCOMM" or "HYPERTERMINAL"). The RS-232 connector on the CP-160B is wired to be connected pin-for-pin to a PC RS-232 (COM) port. No null modem is required. The protocol is 9600 baud 8 data bits, No parity, and 1 stop bit (9600, 8-N-1).

Once the terminal is connected and running, type <CTRL> X to display the CP-160 menu.   SECTION 3.8.1 - SELECTING THE DISPLAY MODE (OR 'NAMESET') The CP-160 may be toggled between the NORMAL DISPLAY MODE (which is the usual VTR 1-32), and the MNEMONIC DISPLAY MODE (which is the list entered via the terminal) by first pressing and releasing SHIFT, and then pressing DISPLAY five times in succession. This sequence is to prevent accidental switching of display modes. The display will indicate the mode when this switch is made.

section 3 continued

SECTION 3.10 - DISPLAY MODE

There are two distinct display modes for the control panels. One (the default) displays
VTR 1 through VTR 32 as the device names, and these numbers correspond to the
actual interface dipswitch numbers. This is called NORMAL mode.

The other mode is called MNEUMONIC mode, and displays device names from the list
entered via the RS-232 terminal port. When the unit is shipped, these are set to display
"NAME1" through "NAME32". In this mode the names may be any six-character
names/numbers, and the list may be shortened by entering an astrisk as the first
character of the name after the last one you want displayed. When the unit encounters
the astrisk, it will jump back to the first name in the list.

Note also in this mode that the interface numbers do not have to go in order. When you
enter the device names, you may also specify an interface number, so you can put the
devices in any order you like without changing the dipswitches on the interfaces.

To switch between these two modes, press and release the "SHIFT" button, and then
press the "DISPLAY" button FIVE times in succession. This awkward method is done to
reduce the chances of the display being changed by accident.

SECTION 3.11 - USING THE EDITOR INTERFACE

To use the EDITOR port to interface the CP-160 to an edit controller, connect the
EDITOR port on the CP-160 to the PERIPHERAL (or equivilent) port on the edit
controller.

The edit controller should be set to 38.4K baud, 8 data bits, Odd parity, 1 stop bit. This
is the default in many cases.

The primary interface protocol used in the CP-160 is an expanded version on the Grass
Valley Group's ESP-1 protocol. This protocol has become somewhat of a de facto
standard for interfacing TBC remote systems. It is supported by Grass Valley systems,
CMX, and several others. Check with the edit system's manufacurer.   This protocol is
selected in the CP-160 by setting dipswitches 6 and 7 both to the OFF position. (This is
the default).

By turning dipswitch #6 ON, a special editor mode called "CMX Auto-note" is selected.
This is for use with older CMX systems (3400, 3600), and allows TBC setup data to be
entered into the EDL in the form of a text note. This does require a special cable;
please contact Lance Design for more information.

OPERATION WITH GRASS VALLEY "PEGS"

If the AUTO-EMEM mode is turned on on the editor, TBC data can automatically be saved and recalled from the EDL via PEGS commands. Use the "P" or peripheral PEGS function.

The first digit of the PEGS register number is the VTR selection (0-9, see "LEARN-MODE", section 3.10), and the last two digits are the memory register number (00-50), with 00 being the current (active) values.

For example, to save the current B-VTR setup data, following PEGS sequence would be entered:

>   1: Select PEGS. The system prompts; "Function=".

>   2: Enter [P] (for peripheral) and press [enter]. The system prompts; "Command=".

>   3: Enter [200]. The first digit is a 2 for B-VTR (1=A, 2=B, etc.). The last two digits are 00 to select the current values. The system prompts; "Time=".

>   4: Enter a time in the usual manner. This will be the time that the CP-150/160 register will be RECALLED if the edit is re-executed. Note that if the data was stored from the current values (last two digits 00) as in this example, it will take effect as soon as the edit is recalled, and the TIME entry is of no significance.

When an edit with this PEGS Command is first performed (with Auto-Emem on), the edit system will get the current setup data for the B VTR upon the completion of the edit, and save it to the list. When this edit is recalled or auto-assembled, the data will be returned to the CP-160. At the time specified, this CP-160 register is recalled to the current values. (if it's 00, it's already there.)

Any of the 50 memory registers in the CP-160 may be specified in the PEGS command, but the desired setup data would have had to have been saved into the specified register previously. If the register number is not 00, it will be recalled to the current register at the time specified in the PEGS dialogue.

Another feature of the editor interface is "Green Key" selection. As the VTRs are selected on the editor keyboard, the CP-160 will follow the selection by selecting the appropriate device for adjustment.

SECTION 3.12 - THE "LEARN MODE"

Since the CP-160 can control up to 32 VTR's, and the editor interface protocol allows specification of only 10 (0-9), there must be a way to assign VTRs to the editor's green keys. This is done by using the LEARN MODE. This allows any VTR to be assigned to any editor green key. Operation is as follows:

> Select the LEARN MODE by pressing and releasing the SHIFT button, then pressing the TIMING/LEARN button. The display will read: "LEARN VTR MODE; KEY?". The system is now waiting for you to press a green key on the editor.

> Press, for example, the A-VTR key. The display will now read: "LEARN VTR MODE; A-SRC = ". The system is now waiting for the selection of the actual VTR corresponding to the A-VTR key on the editor.

> Select the appropriate VTR (for example, VTR 27) on the CP-160 by using the KNOB (pressing the VTR button will cancel the learn mode), and press the STORE button. The display will now read: "LEARN VTR MODE; A-SRC = VTR 27".

VTR 27 has now been assigned to the A-SRC green key, and will also correspond to a "1" in the first digit of the PEGS command. Press the B-SRC key on the editor, and repeat the sequence as required. The learn mode may be exited at any time by pressing any other button on the CP-160.

End