

Features and Controls

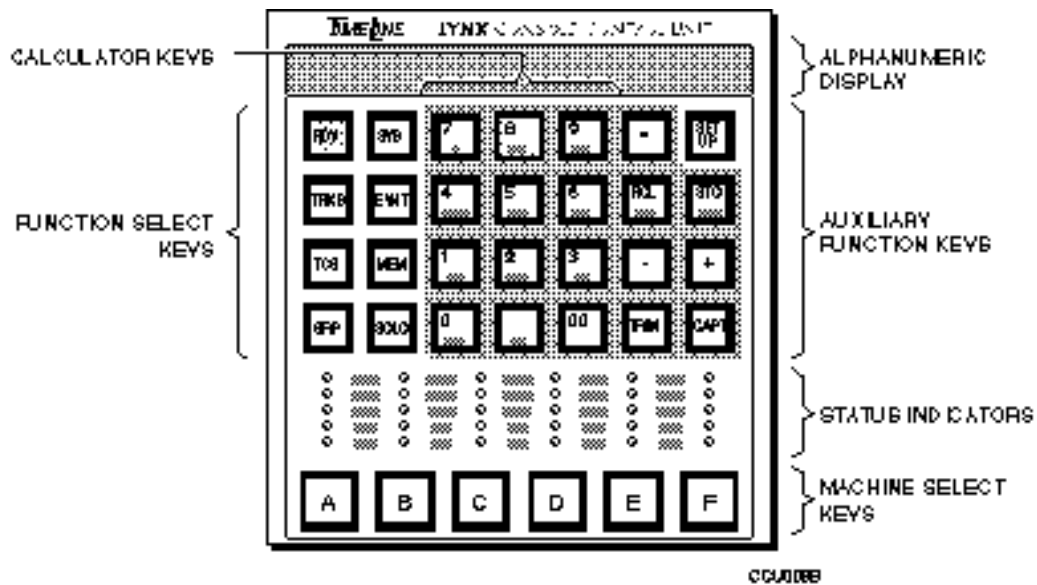


Figure 6-1. Front Panel

Introduction

This chapter identifies the six functional blocks for the Console Control Unit (CCU). These blocks are:

- Display
- Function Select
- Calculator
- Auxiliary Function Keys
- Status Indicators
- Machine Select

The function of each key and indicator is described in detail. Additionally, in the back of the chapter is a brief description of the motion control push buttons and optional jog wheel controls that are located on or in your console.

Display

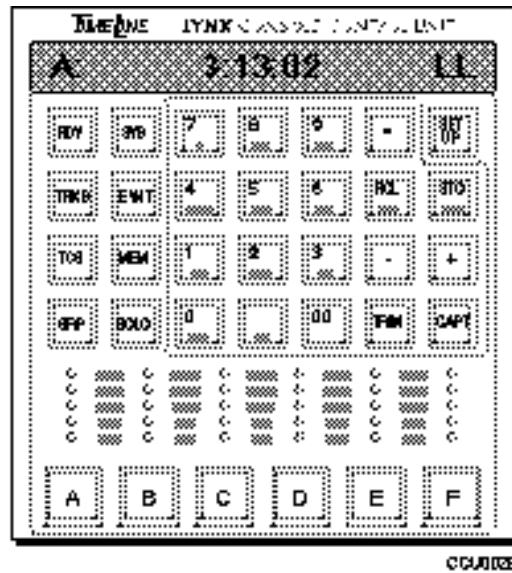


Figure 6-2. Display

The CCU uses a 16-character alphanumeric, dot-matrix display. Four categories of information are displayed:

1. Normal Operating Display
2. Calculator Display
3. Register Contents
4. Error Messages

Leading zeros are not displayed. For example, 3 minutes, 13 seconds, and 2 frames is written as:

00:03:13:02

The CCU displays it as:

3:13:02

Drop frame code is indicated by separating the minutes and seconds digits with a comma rather than a colon. For example, if the time code above is drop frame it would be written as:

3:13,02

Normal Operating Display

The normal CCU operating display is displayed when the CCU is initially turned on. For example;

A* 11:27:06:03 LL

A* Indicates which machine is selected (A-F). Status information is displayed for that machine.

A capital letter (A) indicates that the machine selected is the master.

A lower case letter (a) indicates that the machine selected is a slave.

An asterisk (*) indicates that the machine is the reference.

Remember, any machine (A-F) can be the master.

11:27:06:03 Time code for machine A, the selected machine.

LL Indicates whether the machine and group are in or out of lock. In this example, LL is used; however, any of the letters listed below may be used.

- I Internal Fix
- i Internal Variable
- L External Video
- M Mains
- P Pilot
- T External Time Code
- V VSO
- A Aux

The first letter indicates that the Master machine is locked to the reference. The second letter indicates that all other machines in the synchronized group are locked to the reference.

Calculator Display

When any of the calculator keys (00-9) are pressed, the normal operating display is replaced by the digit that was pressed. If you are performing an addition, the following example would represent a possible sequence. The example is calculated in 30 fps code.

You Press	You See	Description
1.	A 11:27:06:03 LL	Normal operating display
2. 55	55	You automatically enter the calculator display mode.
3. +	+	The CCU is ready for the next entry.
4. 21	21	The original number entered is replaced by the new entry
5. =	2:16	The answer is displayed. (NB 30 frame calculation)

Register Content

The calculator keys also provide access to register contents. Press **RCL** or **STO** in the Auxiliary Function Key section for access to these registers. When **RCL** or **STO** is selected, the respective key will flash. Select the required calculator register key to display the register value. For example, to examine the Inpoint, press **RCL** followed by **7 IN**. [IN] 11:27:06:03 will be displayed.

Error Display

When a system error occurs, the **SYS** key will flash. Refer to the Error Messages section in the Appendix for a complete list of error messages.

Press **SYS** to enter the "error mode". The **SYS** LED will turn on and the first error message will be displayed until you press **SYS** again. Pressing **SYS** again will display the next error message. After the last error is displayed, you will automatically exit the error mode. Pressing **CLR** will also exit the error mode.

The **SYS** LED will flash until all of the errors have been cleared. Clear the error register by pressing **CLR + SYS**, either in or out of error mode.

Function Select Keys

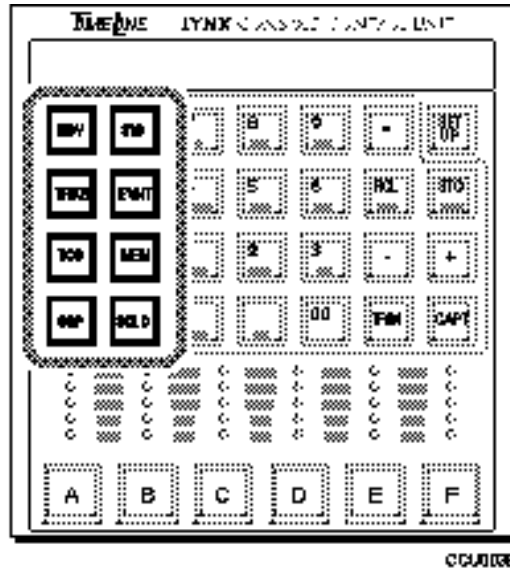


Figure 6-3. Function Select Keys

The CCU Function Select keys are used to determine system operating mode, set track and transport record enables, control events and other system activities.

REC

REC or the record key is a dual function key. It can be used in either record or tracks mode. When either function is enabled, the **REC** status LED will flash. If the Aux Status LED is set to Record Ready, it will turn on and the Record Status LED will not flash. See Setup and AUX LED for additional information.

REC is used in combination with the tape machine select key to record enable a tape machine. You press **REC** + Machine Select Key (A-F) to record enable a transport. The associated **REC** status LED will flash to indicate record ready status (Aux status - rec ready). Press **CLR** + **REC** to clear.

In **TRKS** mode, you may record enable a track (see **TRKS** description for details).

SYS The **SYS** key flashes when a system error occurs. Refer to the Error Messages section in the Appendix for a complete list of error messages.

Press **SYS** to enter the "error mode". The **SYS** LED will turn on and the first error message will be displayed. Pressing **SYS** again will display the next error message. After the last error is displayed, the CCU automatically exits the error mode. Pressing **CLR** will also exit the error mode.

The **SYS** LED will flash until all of the errors have been cleared. Clear the error register by pressing **CLR + SYS** together.

TRKS Use **TRKS**, the **Tracks** key to record enable different tracks on a tape or video machine. This feature *sometimes requires* the installation of the Serial Card option in the Lynx module. When one or more tracks are enabled, the **TRKS** light flashes and the **REC** key lights. To accommodate the numerous types of tape machines, the CCU has three 'pages' of setups that may be used individually or in combination.

Page	Display	Description
1	V 1 2 3 4 Syn TC V 1 2 3 4 Cue TC	Video or audio machine with less than 5 audio tracks
2	1 2 3 4 5 6 7 8	Multi-track up to 8 audio channels
3	"Track #01 :Safe"	Multi-track with more than 8 audio channels. Safe and Ready are assigned in the Set up menu, item 9.

Press **CLR + REC** to reset (or safe) all of the tracks. Immediately upon record enabling a track, the REC key will light.

Page 1 -
Video Machines

Select tracks to record enable from the calculator keyboard.

<u>Key</u>	<u>Track</u>	<u>Key</u>	<u>Track</u>
1	A1	0	V
2	A2	5	Syn/Cue
3	A3	6	Time code
4	A4	9	Assemble

Page 2 -
Audio Machines

Select tracks to record enable from the calculator keyboard.

<u>Key</u>	<u>Track</u>	<u>Key</u>	<u>Track</u>
1	A1	5	A5
2	A2	6	A6
3	A3	7	A7
4	A4	8	A8

**Page 3 -
Multitrack Machines**

Use the **LAST** and **NEXT** keys or the Jog wheel to scroll to the track that you would like to record enable (these keys will auto-repeat). Press **+** to enable or **-** to safe each track. If a track is safe, it may not be recorded on; the status will be displayed as

Track #xx :SAFE.

A track that is record enabled will be displayed as

Track #xx = Rdy.

Time Code + Multiple Audio Tracks

Procedure

You Press	You See	Description
1.		The serial interface card must be installed into the Lynx module
2. A	A flashing	Select the machine A-F that you would like to record enable specific tracks on.
3. TRKS	TRKS light on ----- TC	The selected machine will blink or flash. You may change machine simply by pressing a different machine select key.
4. 6	REC light on	Press 6 to record enable the time code track.
5. A	Track #xx :Safe	Press the machine key to display page 3 of the track selection menu.
6. 1	Track 1 = Rdy	Track 1 can be enabled (if safe is displayed, the channel is locked and may not be recorded on. Go to the Set up menu, item 9 to change from safe to ready mode)
7. +	Track 1 = Rdy	Track 1 is enabled and will accept record operations.
8. NEXT	Track 2 = Safe	Track 2 is ready for selection.
9. 2	Track 2 = Rdy	Track 2 is enabled and will accept record operations. Repeat steps 7 - 9 for each track that you wish to enable. NEXT increments the track numbers and LAST decrements the track numbers.

EVNT This function is not currently implemented.

MEM The **MEM** or Memory Register key is used with the Calculator keypad. You can use **STO** to write numbers to a memory register or use **RCL** to read numbers from it.

Up to 100 memory registers are available in the CCU. The default is 0-9. Use the setup menu to select either 0-9 or 00-99 memory.

Remember, if you select up to 100 registers (00-99), you must always enter two digits to store or recall a number.

To recall a memory, press the **MEM** key. The **MEM** and **RCL** LEDs will flash followed by the memory number.

Procedure

You Press	You See	Description
Select the number of Memory Registers that will be available		
1. SETUP		Enter Setup mode.
2. MEM	REg: 0-9	This is the default number of memory register available.
3. 1	REg: 00-99	Registers 00 through 99 may be selected by pressing 1.
4. SETUP	XX:XX:XX:XX	Press SETUP again to exit Setup mode.
Store a number to a Memory Register		
5.	02:23:42:07	Assume this time code is displayed and you want to save it to a register to use it later.
6. STO MEM	STO flashes MEM flashes	Store the number into a Memory Register. Enter the register number and if registers 00-99 are selected you must always use 2 digits to enter the register number.
09	XX:XX:XX:XX	
Recall a number from a Memory Register		
7. RCL MEM 09	RCL flashes MEM flashes CAPT flashes STO flashes 02:23:42:07	Recall or read a number from a particular Memory Register. If you only press the MEM key, the CCU assumes that you want to recall a value stored in the register number entered.
Capture a number and place it into a Memory Register		
8.	02:23:42:07	Instead of storing a number, you may capture it.
9. CAPT MEM 09	02:23:42:07	CAPT captures the value. MEM stores it in Memory Register 09.
Park a transport at a captured time code location		
10. SOLO + A MEM 09	A: XX:XX:XX:XX 02:23:42:07	Put one of the transports into solo mode. If you only press the MEM key, the CCU assumes that you want to recall a value stored in the register.
11. LOC (motion control keys)	SCM: 02:23:42:07	Initiates a locate operation to the value stored in the selected memory.

GRP Press **GRP** to operate selected tape machines as a synchronous group. When group is active, the **GRP** key and the selected machine keys (**A-F**) will be lit.

To assign a tape machine to a group:

While holding down the **GRP** key, press the appropriate Machine Select key (**A-F**).

To remove a tape machine from a group:

While holding down the **GRP** key, press the appropriate Machine Select key again.

STATUS **GRP** is also used to access status mode. Status mode displays information that is specific to each machine in the group. In status mode, the group key is lit and the current Machine Select key flashes, indicating that status mode is active.

The status displayed is controlled by the Status Register setting entered through the **SETUP** key (refer to Auxiliary Function Keys). Machines designated as master are an exception. You will not see the time code, and the error will always be '0' when you press **SETUP**. To display the machine status, perform the following:

1. Press **GRP**.
2. Press the appropriate Machine Select key (**A-F**).
3. The status (time code, error, or both) will be displayed. Refer to **SETUP** to select the display.
4. To see the status of a different tape machine, simply press the appropriate Machine Select key.
5. Press the flashing Machine Select key again to return to normal group operating display.

SOLO The Tape Machine is automatically assigned to a Machine Select key (**A-F**) by the CCU. The assignment is based on the address set up in the Lynx modules.

Press **SOLO** and the appropriate machine select key (**A-F**) to place the Tape Machine in solo.

The transport motion control buttons will only control the selected transport. All other transports will remain in their previous state.

Press the **SOLO** key twice to switch to **GRP** (group) mode.

Calculator Keys

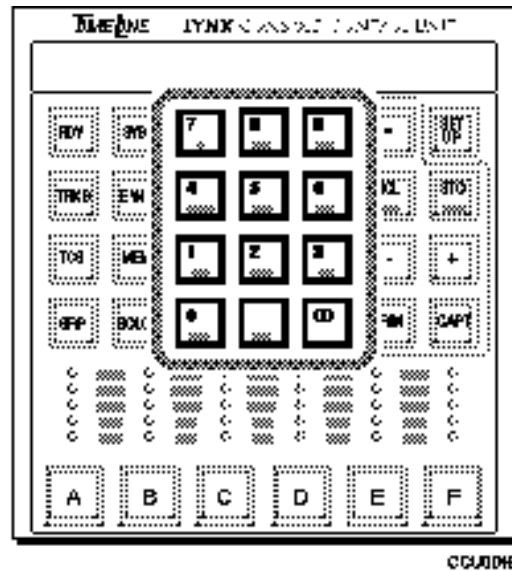


Figure 6-4. Calculator Keys

Most of the CCU Calculator keys perform dual functions. When you first press a numbered key, the calculator is active. Calculator numbers are entered left-to-right with the most significant digit first, leading zeros are ignored. Auxiliary function keys + , - , and = are used with the calculator.

When you press one of the numbered keys, after one of four auxiliary function keys (**TRIM**, **CAPT**, **RCL**, or **STORE**), the alternate function of the numbered key becomes active.

- 00** This key is similar to the double '0' key on a calculator; it inserts two zeros into the display.
- CLR** This is a multiple mode clear key. It clears the data entry area of the display window. Press **CLR** to perform the following:
1. Exit calculator mode and return to the normal operating display.
 2. Clear incorrect entries for any key or function.
 3. Clear the display buffer. If you have entered a number but have not yet stored it to a register, the original register value will be retained.
 4. Clear registers. To clear a specific register, simultaneously press the **CLR** key and the calculator key for the register that you wish to clear.

For example, hold down the **CLR** key and press **OFST** to clear the offset register for a slave machine.

0 TIME When not used as a '0' in calculator mode, press **RCL** or **STO**, then **TIME** to recall the current stored value or store a new value into the Time register. The current time code of the machine selected will be displayed. To display the current time code of a different machine, press the appropriate machine select key followed by **RCL** or **STO** then **TIME**.

1 PRE When not used as a '1' in calculator mode, **PRE** provides access to the Preroll register. This register may be accessed during Store, Recall, or Trim operations. The value in the Preroll register is used to calculate the preroll position.

$$\text{Preroll position} = \text{In Point} - \text{Preroll amount}$$

The preroll position is the location that the CCU will cue the reference transport during Cue and Edit functions. The default value for preroll is five seconds.

2 POST When not used as a '2' in calculator mode, **POST** provides access to the Post roll register. This register may be accessed during Store, Recall, or Trim operations. The value in the Postroll register is used by the CCU to calculate the time code of the end of an edit sequence, relative to the OutPoint. The default value for post roll is five seconds.

3 REF When not used as a '3' in calculator mode, the **REF** register provides access to the Reference SyncPoint register. This register may be accessed during Store, Recall, or Trim Operations. Press **CLR** and **REF** simultaneously to clear the Reference SyncPoint register. The time code number in the Reference SyncPoint register is used by the CCU to automatically calculate offsets for any source transports with Source SyncPoints entered. The offsets are calculated as follows:

$$\text{Offset} = \text{Source SyncPoint} - \text{Reference SyncPoint.}$$

If you change the Reference SyncPoint number using Trim mode, or by entering a new Reference SyncPoint, the CCU automatically recalculates and stores the correct offset for all source transports with active Source SyncPoint Values.

4 SYNC When not used as a '4' in calculator mode, **SYNCP** provides access to the Source SyncPoint register for a specified transport. This register may be accessed in Store, Recall, and Trim operations. Each source transport in the system has a separate Offset register, which is accessed by selecting the transport using the Machine Select keys.

Press **CLR** and **SYNCP** simultaneously to clear a Source machine SyncPoint register.

The time code number in each transport's Source SyncPoint register is used, by the CCU, to automatically calculate an offset for a source machine relative to the reference transport. The offset is calculated as follows:

$$\text{Offset} = \text{Source SyncPoint} - \text{Reference SyncPoint}$$

The result of this calculation is displayed as a positive or negative number with an absolute value of 12:00:00:00 (12 hours) or less. If the Reference SyncPoint has a higher time code number than the Source SyncPoint, the keyboard displays the offset as a small negative number (for example: -1:10:00:00 rather than the equivalent large positive number, which would be 22:50:00:00).

If you change a Source SyncPoint number in the Trim mode, or enter a new Source SyncPoint value, the CCU automatically recalculates the offset for that transport.

5 OFST

When not used as a '5' in calculator mode, the **OFST** key provides access to the Offset register for the source transport currently selected in Solo or Status mode. This register may be accessed in Store, Recall, and Trim operations. Each source transport in the system has a separate Offset register, accessed by selecting the transport using the Machine Select keys. The reference transport cannot have an offset.

The Offset is a numerical expression of the relationship between the source and reference transport time code positions. It is always applied to the slave modules. Offset is determined as follows:

Slave/Source time code	-	Master/Reference time code	=	Offset
02:10:20:00	-	03:20:40:00	=	1 hr 10 min 20 sec offset

A positive offset indicates that the source machine time code numbers are higher than the reference time code numbers.

If the machine selected is the master tape machine, the offset register value will be zero, since offsets are always applied to slave machines.

Master Offset

Press **RCL** or **STO** to recall the currently stored value, or to store a new value into the Offset register. Each transport may have a different value stored.

There are three ways to calculate an offset: sync point, manually, or using capture and then offset.

Features and Controls

Procedure

You Press	You See	Description
Sync Point		
1. SOLO		Solo the machine that must be offset from the master.
2. CLR + SYNCP		Clear the Sync Point register for the selected machine.
3.	02:23:42:07	A time code number for the selected machine is displayed.
4. SYNC	02:23:42:07	This time code is established as the sync point between the solo machine and the master.
5. STO OFST		The offset between the solo machine and the master is automatically calculated and stored in the Offset register.
Manually		
1. SOLO B	B* 01:03:02:07 LL	Solo a machine. Select any machine but the master.
2. 0 2 2 3 4 2 0 7	02:23:42:07	Use the Calculator keys to enter an offset.
3. STO OFST		Store the offset to the offset register.
Capture + Offset		
1. SOLO B	B* 02:23:42:07 LL	Solo a machine. Select any machine but the master.
2. CAPT		Capture the time code displayed.
3. OFFSET		The offset is automatically calculated and stored by the CCU for the solo machine with respect to the master machine.
Clear the Offset Register		
1. CLR + OFST		Press simultaneously to clear the Offset register.

5 OFST (cont)

Subframe

You may adjust the offset by selecting **RCL**, **OFST**, and **TRIM**. Press the **+** and **-** keys to increase or decrease the offset. Although you can trim to subframes, the CCU will not display the subframe number.

Offset is correctly handled in either drop frame or non-drop frame time code, as well as mixed code situations. Offsets are always stored and displayed in the code format of the reference transport's time code, regardless of the type of code that each source machine has. For example, if the reference time code is drop frame, all offsets will be handled and displayed by the keyboard as drop frame; even if a particular offset refers to a machine with non-drop frame code.

Remember, drop frame code is displayed on the keyboard with the frames digits separated from the seconds digits by a comma, rather than a colon.

In mixed code situations, the actual offset value necessary to achieve the desired synchronization, the sum of three components:

1. The intuitive, "clock" difference between the two time code numbers.
2. A correction to this "clock" offset based on the difference in frame counts between the two time code formats.
3. A correction for the accumulated frame count difference since 00:00:00:00 (time code 'midnight').

For example, if you want to synchronize 1:00:00:00 (non-drop frame) with 1:00:00,00 (drop frame), it actually requires an offset of 3 seconds and 18 frames, to account for the difference in running frame count since 'midnight'.

As shown in this example, the simplest solution is to let the CCU calculate the correct offset value.

6 ERR

When not used as a '6' in calculator mode, ERR provides access to the transport Error register. This register does not store any numbers, it provides a display of the positional error of any transport. This is the offset error of a transport, as reported to the CCU by the Lynx module.

Group Mode

When the CCU is in group mode, you can select Status and recall the ERR register. Press **RCL + ERR** to recall the current value of the Error register. The Error register contains the error between the master and slave tape position in frames (see the GRP key description under Function Select Keys for more information).

Solo Mode

There are occasions when the offset error has no meaning. The ERR register display has been programmed to show the most relevant information.

<u>Display Mode</u>	<u>STOP</u>	<u>PLAY</u>	<u>Rewind/FWD</u>
Solo	0.--	Resolve error in subframes	0.--
Group	0.--	Resolve error (ref machine)	0.--
Status slave	Distance from ref (park-ahead)	Resolve error (in subframes)	Distance from ref (Offset err)
Status master	0.--	Lock error (Offset error)	0.--

The CCU automatically displays subframe error when the error is less than one frame. When the displayed error is greater than one frame, the subframe component is suppressed and shows only as '.--'.

Subframes are only displayed if the error is less than one frame. For example, 0.25 would be displayed since it is less than one frame. However, if the error is between 17 and 18 frames, only '17.--' is displayed.

7 IN When not used as a '7' in calculator mode, it provides access to the InPoint register. The InPoint register may be accessed in Store, Recall, and Trim operations. Press **CLR** and **IN** simultaneously, to clear the InPoint Register.

The number in the InPoint register is the Record InPoint of the currently programmed edit, in terms of the reference transport's time code.

Note

The InPoint is used to calculate source machine offsets if no Reference SyncPoint is entered.

8 OUT When not used as an '8' in calculator mode, **OUT** provides access to the OutPoint register. This register may be accessed during Store, Recall, or Trim operations. Press **CLR** and **OUT** simultaneously to clear the OutPoint Register.

The number stored in the OutPoint register is the Record Out point of the currently programmed edit in terms of the reference transport's time code. The Outpoint is automatically calculated and stored if you enter an InPoint and a Duration. Altering the value of the Duration will cause the OutPoint to automatically be recalculated and stored.

9 DUR When not used as a '9' in calculator mode, **DUR** provides access to the Duration register. This register may be accessed in Store, Recall, and Trim operations. Whenever there are active values in the InPoint and OutPoint registers, there is an active number in the Duration register.

Press **CLR** and **DUR** simultaneously to clear the Duration register. Clearing it cancels the OutPoint Register.

The number in the Duration register is the length of the current programmed edit. This value is automatically calculated by the CCU from the InPoint and OutPoints.

$$\text{Duration} = \text{OutPoint} - \text{Inpoint}$$

If either the InPoint or OutPoint are changed, the duration is automatically recalculated. The correct OutPoint can also be calculated from an InPoint and Duration.

$$\text{OutPoint} = \text{InPoint} + \text{Duration}$$

For example,

1. Enter an InPoint by pressing the **IN** key at a desired point, or using the Calculator keys to specify an In Point.
2. Enter a Duration from the keypad using the **STO** and **DUR** keys.
3. You will see the **OUT** key light up indicating that the OutPoint register now contains an active value, which was calculated from the data that you just entered.

Auxiliary Function Keys

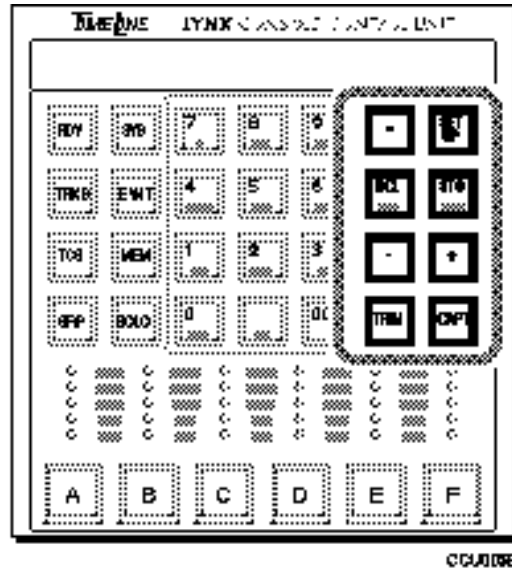


Figure 6-5. Auxiliary Function Keys

The Auxiliary Function Keys are used to perform arithmetic operations with the calculator keys and to setup CCU operations.

- = The equal key is used in conjunction with the + and – keys to perform time calculations. It indicates the completion of a calculation sequence and when pressed, the sum or difference will be displayed. The answer is reformatted into time code, if there is no other arithmetic operation in progress.

Procedure

You Press	You See	Description
1. RCL TIME (0)	3:13:02	The time code stored in the Time Register.
2. +	0	The CCU is ready for the next entry.
3. 23 the	21	The original number entered is replaced by new entry
4. = begin	3:13:23	The answer is displayed in time code. Note that this represents 3 minutes, 13 seconds, and 23 frames. You must press CLR to a new calculation or return to the normal operating display.

SETUP The **SETUP** key provides access to the user preference option menus to customize CCU operation. To access individual menus, press **SETUP**, then the appropriate menu selection. On the CCU, you can select **SYS**, **GRP**, **TRKS**, **MEM** or **TRIM**. On the motion control key bank, you may select **REC** or **ROLLBACK**.

Once you have selected an operation to customize, select the number from the calculator keypad corresponding to the feature. For example, to adjust the display brightness you would select **SYS** then '1' from the calculator keypad.

You may also press the **LAST (RCL)** or **Next (STO)**, to move between the menus. Press the **+** and **-** keys to move through the selections in each submenu. Press **SETUP** again to exit this mode.

SETUP + SYS

- | | |
|---------------------|--|
| 0 Aux LED | Designate a function for the AUX LED CCU Status Indicators. |
| 1 Brightness | Adjust the brightness of the CCU display. |
| 2 CTRL via | Selecting direct means that all of the motion control switches are enabled, selecting Neve disables Stop, Rewind, Fast Forward, and Play. |
| 3 Jog Speed | Adjust the sensitivity of the jog wheel; '1' is the fastest and 10 is the slowest. |
| 4 IntRef Fps | Set the system reference frame rate. |
| 5 IntRef % | Adjust the internal reference to a value between 85 and 115. This is like varispeed, in 100ths. Use the + and - keys to adjust. |
| 6 Ref SRC | Select the system frame rate reference source. |
| 7 Stat Reg | Select the registers that will be displayed in group status mode. TC is for time code only, Err is for error only, and TC, Err will make both available. |

This is a real time status display and can be called while the machines are in play.

SETUP + GRP

0 Search When in group, search will wait for all of the transports to search to the correct location then the tape machines will play. In chase mode the slaves will chase the master.

SETUP + TRKS

0 Video Trk Safe is the equivalent of write protect, you will not be able to write to the video track. Rdy (ready) indicates that you can record on the tape.

SETUP + TRIM

0 Trim Frame Trim between one and 10 frames. Use the + and – keys to change the trim number.

1 Trim Subfr One to 25 subframes may be trimmed. Use the + and – keys to change the trim number.

SETUP + MEM

0 0-9 Selects memory registers 0-9

1 00-00 Selects memory registers 00-99

RCL LAST This is a dual function key. Use it for recall mode or when you are in a mode to move backwards through the menu or register.

Press **RCL** (recall) and one of the calculator keys to display the contents of the corresponding register. When you press the **RCL** key, it will flash and you will see a "recall reg" message in the display. Select the register by pressing the associated calculator key. Press **RCL** a second time while it is flashing, to cancel the command.

There are separate Sync Point and Offset registers for each slave transport. The information displayed will be for the solo machine or the machine selected (**A-F**), by the **GRP** Status procedure (see **GRP** key description).

When you are in **SETUP** mode, press **LAST** to move backwards through the menu.

You Press	You See	Description
1. RCL	RCL flashes	You would like to recall or display the time code in the InPoint register.
2. IN (IN)	3:13:02:23 RCL turns off	The time code is displayed and RCL automatically turns off.

STO **NEXT** This is a dual function key. Use it to store a value to a register, or when you are in a mode, to move forward through the menu or register.

The **STO** key is used with the numeric keypad to store numerical data into a selected register. Use this key to store a value to any of the registers:

- Time
- InPoint
- OutPoint
- Duration - (also designate a transport by pressing a Machine Select Key, **A-F**)
- SyncPoint - (also designate a transport by pressing a Machine Select Key, **A-F**)
- SyncPoint Offset - (also designate a transport by pressing a Machine Select Key, **A-F**)
- Preroll
- Post roll
- Reference
- Trim

You will not be able to store an offset or syncpoint value if the currently selected transport is the master. The following error message will be displayed: Solo a src first

Press a machine select key (**A-F**) and change the currently selected machine to one of the slave transports.

Remember, if you are in solo mode, the selected machine is the master by default.

Capt Key The store function is automatically invoked when the **CAPT** key is used to capture a time code value (see **CAPT** key description).

You Press	You See	Description
1. CALC Keys	3:13:02:23	Enter or recall a time code value.or RCL
2. STO	STO flashes	You would like to store or save the time code to the InPoint register.
3. IN (7)	3:13:02:23 STO turns off	The time code is stored into the InPoint register. Store automatically turns off.

- (minus) The - or subtraction key is used with the = key, to subtract two time code values. It indicates that the next number entered will be subtracted from the first number entered. Subtraction is performed in terms of frames. Only one calculation at a time may be performed. After performing the calculation, it may be stored to a register. Press **CLR** to begin a new calculation or return to the normal operating display.

The minus key is also used with the **TRIM** key to bump or decrease the numerical value stored in a selected register, by the value of the TRIM register (see Trim).

If you subtract a large number from a smaller one, the result will be displayed in the correct negative time code number format.

You Press	You See	Description
1. CALC keys or RCL	3:23:25	Enter the first number. Press RCL to select the contents of a register as the minuend.
2. -	0	The subtraction operation is selected.
3. RCL In (7)	RCL flashes 2:17:12	You subtract a value previously stored in a register (InPoint register in this example).
4. =	3:10:45:11	The answer is displayed in time code.
5.		At this point you may decide to save this time code to another register.
6. STO	STO flashes	The store function is active, select a register, for example Offset.
7. OFST	STO turns off	The value is stored in the Offset Register.
8. CLR	A 11:27:06:03 LL	The display returns to the normal operating display.

+ (plus)

The + or addition key is used with the = key to add two time code values together.

Addition is performed in terms of frames. Only one calculation at a time may be performed. The correct arithmetic is performed even if the numbers entered are incorrectly formatted. For example, if you enter 1:65:43, it will be translated to 2:06:13 (30-frame calculation) during the calculation.

The + (plus) key is also used with the TRIM key to bump or increase the numerical value stored in a selected register, by the value of the Trim register (see Trim).

You Press	You See	Description
1. CALC keys or RCL	3:13:02:23	Enter the first number or press RCL and use the contents of a register.
2. +	0	The addition operation is selected.
3. RCL IN (7)	2:17:12	Add a value previously stored in a register (InPoint register in this example).
4. =	3:13:20:05	The answer is displayed in time code (30 frame calculation).
5.		At this point you may decide to save this time code in another register.
6. STO	STO flashes	The store function is active. Select a register (for example, Offset).
7. OFST (5)	STO turns off	The sum is stored in the Offset register.
8. CLR	A 11:27:06:03 LL	The display returns to the normal operating display.

TRIM The **TRIM** key selects the Trim mode for the Jog Wheel and the + and - keys. You may adjust the values in most registers. After selecting trim, select a register, then press + or - to increase or decrease the register value by one. Holding + or - down will cause the value to increment or decrement multiple times. Press **TRIM** a second time to enter subframes, and a third time to store the trimmed value and exit the operation.

The next time that you select **TRIM**, the CCU selects the last register that you trimmed. Press a different register key in the Calculator keypad to change registers.

The following keys are active with **TRIM**:

CLR Clears any number from the data entry area of the display and exits Trim mode.

STO Initiates a Store command and prompts you in the display to designate a register

CAPT The **CAPT** (capture) key captures the current time code number for manual storage in any of the CCU memory registers.

When you press the **CAPT** key the value of the time code shown in the display is instantly captured. The **CAPT** and **STO** (Store) keys flash when you press **CAPT**, until a register is selected to store the captured value in. If you do not want to store or save the value in a register, press **CAPT** a second time.

You Press	You See	Description
1.	03:13:02:23	You would like to store a time code in the InPoint register.
2. CAPT	CAPT flashes STO flashes	Both buttons flash. Display shows captured time code.
3. IN (7)		The time code is stored in the InPoint Register.
4. CAPT	STO turns off CAPT turns off	Pressing CAPT again cancels the store operation. The display returns to the reference time code.

Motion Control Keybank

REC 1 Record key Record is initiated by Record (**Rec**) alone, or in combination with play (**Comb**).

ROLLBACK

0 Key Func Key functions as Rollback (**RIback**) or Reverse Play (**RevPly**).

Table 6-1. CCU Setup Options

Key	Keypad #	Menu	Menu Selections	Valid Range
SYS	0	Aux LED:	RecRdy Ofst Mstr (default) M,Ofst (master offset)	
	1	Brightness	15% 25% 50% (default) 100%	
	2	Ctrl via:	Neve	(if jumper is installed)
	3	Jog Rate	Direct (default)	
	4	Stat Reg:	5 (default) TC Err (default) TC,Err	1-10
	5	Trim Frame	1	1-10
	6	Trim Subfr	1	1-25
TCG Key	0	Sys Ref	IntFix (read from SSU) IntVar ExtVid Mains Pilot ExtTC VSO AUX	
	1	Spd/Code	24/24 25/25 29/DF 29/30 30/DF 30/30	
	2	Varispd %	100.00 (default)	85.00-115.00
	0	Search:	Chase (default) Group	
TRKS	0	Video Trks	Safe (default) Rdy	
	1	Video rst:	Off On	
MEM	0	Mem Size:	0-9 (default) 00-99	

Table 6-2. Motion Key Setup Options

REC	2	Rec Key:	P+Rec (default) Rec
ROLL- BACK	0	Rollback:	RIback (default) RevPly
REH	1	Reh key:	P+Reh Reh
Evnt	0	Mode:	Normal Auto Rec Ex Rec Reh EI Reh Lock
	1	Beep Mode:	Off On
	2	Spacing:	10-30
	3	Last beep:	Muted On
Tran (A-F)	0	Capstan:	Wild Reslvd
Loop	0	> Edit:	Stop Reedit Replay End
	1	> Replay:	Repeat
	2	> End:	Stop Rcv
Edit	0	Edit Q/C	Off Normal
	1	Rolls as:	Mst Slv All Slv
	2	Edit Dspl:	Normal Cntdn
Rdy	0	Rdy Lamp	Off Steady Flash
TCG	3	TCG Mode:	P, Run P, Mute P, Wild
	4	VITC Mode:	Off On

Status Indicators

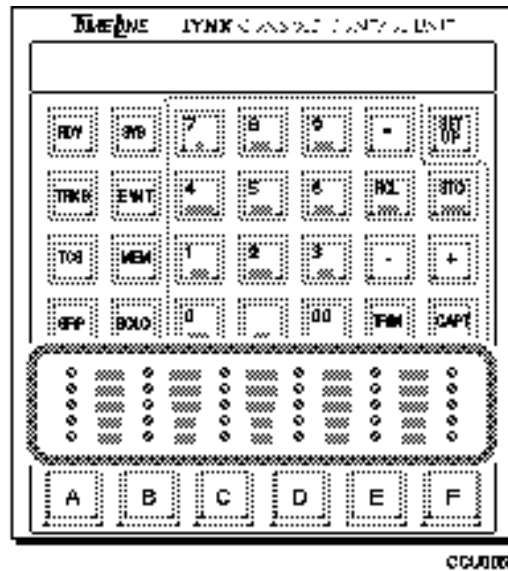


Figure 6-6. Status Indicator

- LOCK** When lit, the corresponding machine is locked to the system reference.

- CODE** When lit, code is present and the corresponding machine is in play. If it is flashing, the corresponding machine is playing, but no time code is present. If it is off, there is no time code and the corresponding machine is not moving.

- BUSY** When lit, the corresponding transport is in motion but not locked. Generally, one of the following operations is in progress:

 - start of play
 - rewind
 - fast forward
 - shuttle/jog

- REC** If selected as the **AUX LED** function and **AUX** is lit, the machine is recording. When flashing, the machine is ready to record.

- AUX** This LED is user assignable in the **SETUP SYS** process. (For additional information, refer to the **SETUP** description in this chapter.) You may assign it as Record Ready, Offset present, Master machine or Master offset. If just a master is selected and there are no offsets only the master light will be lit. If a master and slave(s) are selected with an offset, then the master and the machines with the offset will be lit.

Machine Select Keys

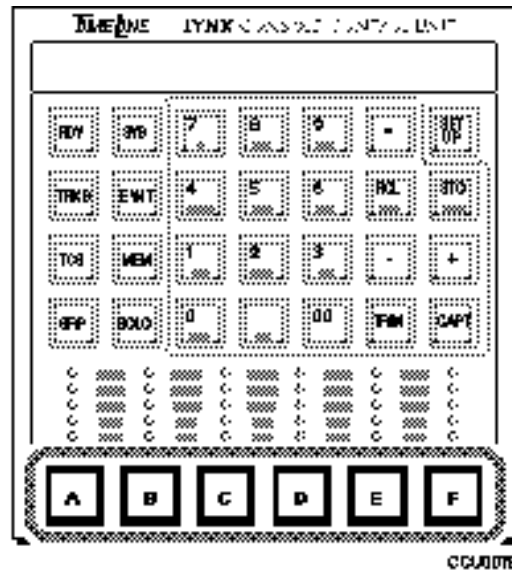


Figure 6-7. Machine Select Keys

A - F You may assign up to six Lynx modules and associated transports to the Machine Select Keys (**A-F**). They will be controlled from the CCU through the System Supervisor (SSU). These machines may be operated individually in Solo mode, or synchronously in Group mode.

Solo Mode Press **SOLO** and the appropriate machine select key (**A-F**). The transport control pushbuttons will control only the selected machine. All other transports will remain in the current state of motion. To select a different transport, press the appropriate machine select key (**A-F**).

Group Mode All machines assigned to the group will be controlled together by the transport control pushbuttons (synchronously in play).

To assign a machine to a group, press and hold the **GRP** key and the appropriate Machine Select key (**A-F**). To remove a machine from a group, press and hold the **GRP** key and the appropriate Machine Select Key (**A-F**).

Motion Control Pushbuttons

Motion Control Pushbuttons may optionally be connected to the CCU. The motion control cable is attached to J6 on the CCU Processor Board. Please refer to Chapter 3, Installation under Motion Control Interface for installation and connection instructions.

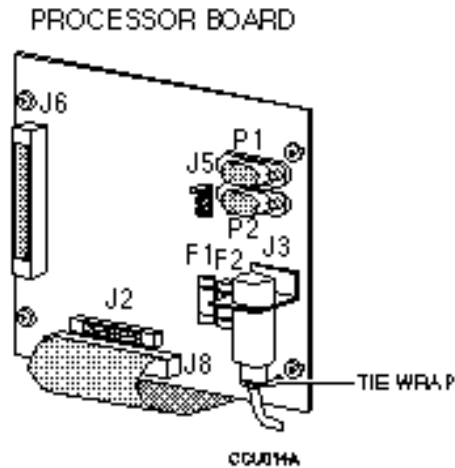


Figure 6-8. Motion Control Pushbutton Connector

<< (Rewind)

In solo mode, the rewind command is issued only to the transport that is soloed. In group mode, the rewind command puts all transports currently assigned to the group into rewind or chase.

>> (Fast Forward)

In solo mode, the fast forward command is issued only to the transport that is soloed. In group mode, the fast forward command puts all transports currently assigned to the group into fast forward or chase.

- **(Stop)**

In solo mode, the stop command is issued only to the transport that is soloed. Pressing stop in group mode initiates an intelligent stop function. The reference or master transport stops immediately, and then parks each source machine at a position that corresponds to the reference or master machine's parked position, taking individual offsets into account. Thus cueing the system to be ready to synchronize.

> (Play) In solo mode, the play command is issued only to the transport that is soloed. In group mode, all of the transports in the group are synchronized.

When the reference or master machine is up to speed and resolved, a letter will appear after the time code in the display. The master machine is identified on the Lynx display by a capital letter and an asterisk; for example **A***. Slave machines are indicated on the CCU display with a lower case letter. The letter also indicates the specific reference being used.

- I Internal Fix
- i Internal Variable
- L External Video
- M Mains
- P Pilot
- T External Time Code
- V VSO
- A Auxiliary

As each transport achieves lock with the reference or master transport, a second letter will be displayed.

A sample sequence might look as follows:

A* 1:16:37:01	The master is selected.
A* 1:16:40:04 I	The master is resolved and locked to the internal variable reference source.
A* 1:16:42:06 II	All machines are resolved and locked.

Rec Pressing **REC** or record issues the record command to any active, record-enabled transport. Look at the status indicators to determine which tape machines are selected.

If the CCU is in either Solo or Group mode, press the **REC** key while holding the Play (>) key on the Console Motion Switches, to issue an immediate Record In command (punch-in) to all active machines, that are in lock or resolve status.

Pressing any transport motion key while in Record mode cancels the Record mode; a rolling punch-out can be performed by pressing the Play (>) key while in Record.

In Solo mode, a Record In command will only be issued to a transport, if it is record enabled and running at resolved speed.

In Group mode, Record In commands are only issued to transports that are assigned to the group, record enabled, and have achieved lock. Verify this status by looking at the right of the time code display, two letters should be visible.

It is possible to put the master machine into Record as soon as it has achieved resolved speed, even if none of the source transports have locked to it. It is not possible to send a Record In command to any source machine, until it has achieved lock with the reference.

If not all of the machines in the group have locked, the CCU will not go into record mode.

Jog/Shuttle Wheel

The CCU supports transport control with a Jog/Shuttle Wheel. The optional Jog/Shuttle Wheel runs forward or backward, or winds at shuttle speeds. The Jog/Shuttle Wheel has three modes: Trim, Jog, and Shuttle. The Jog/Shuttle Wheel cable should be attached to J2 on the CCU Processor Board. Hardware and cabling installation instructions for the Jog/Shuttle option are described in Chapter 3, Installation.

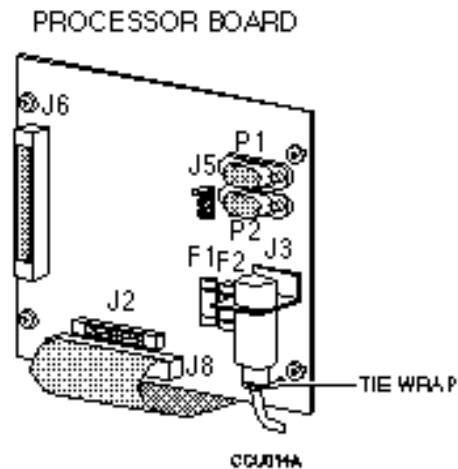


Figure 6-9. Optional Jog Wheel Connection

- Trim** In the trim mode, the wheel is used to adjust the value stored in any of the the CCU's edit or offset registers. For example, you may trim the offset of a source transport in real time to achieve a precise time relationship between the source transport and the reference. Refer to the description of the **TRIM** key in the Auxiliary Function Keys section for complete operating information. In this mode, the Jog Wheel is used instead of the **+** and **-** keys to increment or decrement a value.
- Jog** In the jog mode, the wheel is used to "bump" a transport forward (clockwise) or backward (counter-clockwise) a small amount each time that it is turned. If you turn the wheel continuously, the tape will "scrub" past the heads with a velocity proportional to how fast you turn the wheel.

Shuttle In the Shuttle mode, turning the wheel clockwise causes the active transport(s) to move forward with a velocity proportional to the amount that you rotate the wheel from its starting position. Likewise, turning the wheel counter-clockwise initiates variable-speed backwards motion. The Shuttle speed may be varied from a slow crawl, to several times normal play speed.

Generally speaking, the Shuttle mode is a controlled speed mode only on video transports. Most audio tape transports do not have a variable speed shuttle mode, so the shuttle function is implemented by rapidly toggling between rewind and fast forward. The actual velocity is determined by the ballistics of the particular transport, and the relative tape pack on the reels.

Shuttle is most effectively used in the Solo mode to accurately position a single transport for setting SyncPoints or InPoints and OutPoints. If you use the Shuttle function in Group mode, the wheel controls only the reference transport; all other machines will chase the reference machine and attempt to maintain their correct park-ahead offset.