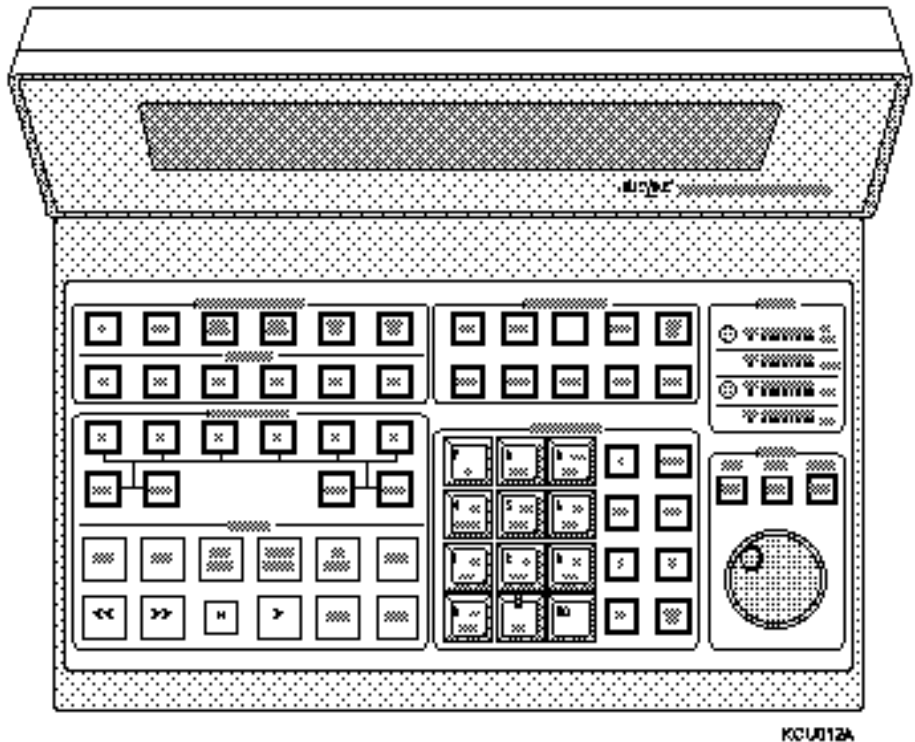# Chapter 4 Getting Started

This chapter describes the basic operating procedures to use the Keyboard Control Unit (KCU).

Figure Chapter 4 -1. Keyboard Control Unit

This chapter presents the following topics:

- Initializing and configuring the KCU (to be performed after installation is complete)

- Using KCU memory

- Using time code registers

- Grouping machines with the KCU

- Using offsets

- Editing with the KCU

- KCU messages and errors

- KCU options menu

Initializing and Configuring the KCU

Perform the procedures in this section after the installation is complete, but before you begin using the KCU.

Turning on the KCU

The KCU has a battery backed-up memory system. Each time the KCU is turned on, it powers up in exactly the same condition in which it was powered down. All the setup and transport information previously entered is immediately operational.

When first turned on, the KCU does a quick lamp test and displays the software version(s) installed. The power-on sequence also indicates if the System Supervisor Unit (SSU) is enabled, and the amount of memory locations available (0-9 or 00-99).

At this point, the KCU has finished its sign-on and displays *Press the Poll Key to Establish Communication.* Turn on the Lynx-2 modules and put them on line with the [TRAN MODE] key. Press the yellow status key ([POLL] key) on the KCU to establish RS422 communication.

If the Lynx-2 modules are powered on and placed online prior to the KCU being turned on, the KCU automatically polls the Lynx-2 modules and displays *Hold the GRP Key and add Groups in Order of Priority.*

Resetting the KCU

If it becomes necessary to clear or reset the KCU, use the calculator [CLR] key and the [POLL] key to re-initialize the KCU. All KCU parameters are set to their default settings and the group is erased, with a prompt displayed to re-establish the group at the end of the reset.

To reset the KCU, press and hold the [CLR] key while pressing the [POLL] key. Continue to hold the [CLR] key momentarily after releasing the [POLL] key. The prompt *Lamp Test, Clearing Memory* is displayed while the KCU initializes a lamp and LED test. When the initialization is complete, the KCU prompts you to re-establish the group.

Setting the System Reference

Before using the KCU, determine the system speed reference your machines will be locked to. When a system reference is selected, the KCU synchronizes all Lynx-2 modules, including the master, as slaves to this timing reference. This provides fast and stable locking because each machine is independently controlled and locked.

When a system reference is selected at the KCU, verify that the selected reference is properly connected to every Lynx-2 module in the chain.

There are four reference selections available:

Int Xtal   Lynx-2 Module internal crystal

Ext Vid   External composite or black burst video sync signal

Mains   AC mains frequency

VSO   Variable speed, determined by varispeeding the master transport

The KCU reference defaults to External Video. The system speed or rate is determined by the video source applied to the Lynx-2 modules, either 29.97 Hz for NTSC or 25 Hz for PAL/SECAM. Unless you use a different frame rate, for example 30 Hz, use this reference to get started.

System reference parameters may be changed in the SYS options menu. See *KCU Options Menus* in this chapter for details.

Initializing Lynx Communication

Turn on the Lynx-2 modules and put the modules on line with the [TRAN MODE] key. Make sure each Lynx-2 module is set to a unique address, and has the correct external video sync signal connected (if needed).

1. Press the KCU [POLL] key and confirm that the 422 LED illuminates on each Lynx-2 module. The corresponding STATUS LEDs on the KCU should also illuminate.

2. Press the [SOLO] key

   The [SOLO] key will light.

3. Press the [A] key.

   The [A] key will light
   This solos the corresponding A machine. The current time code position of the A machine is shown in the display. "SOLO:A" appears in the display with the "." indicating the machine is stopped. Other soloed machine indicators are ">" for play, ">>" for fast forward, "<<" for rewind, REC for record, and REH for rehearse.

   The "Err: 0.–" display shows the offset error, in frames and subframes, to lock. When the machine is played, the offset error value is counted down to .00 to indicate that the machine has been properly synchronized.

4. Press the [>] (Play) key.

   The [>] key lights. Time code display updates.
   "SOLO : A > L" indicates the soloed machine is in play and locked.

5. Press the [■] (Stop) key.

   The [■] key lights and the time code display stops.

6. Repeat steps 3 through 5 for each Lynx-2 module.

Using KCU Memory

This section describes the use of KCU memory functions.

The KCU can capture and store in memory up to 100 time code values. Time code values can be retrieved and used as auto-locate positions or for other time code operations.

Capturing a Time Code Value

Capture and locate a time code value in either solo or group mode. The machine in this example is in solo mode.

1. Press the [A] key.
   This solos the corresponding A transport.

2. Press [>].
   Play to the time code that you want to capture and save.

3. Press the [CAPT] key.

   [CAPT] key flashes, [STO] key flashes
   The KCU has captured a time code and is ready to store the value.

4. Press the [MEM] key.

   [MEM] key flashes
   "Store Memory" is displayed, prompting you to choose a
   memory location.

5. Press [1].
   The KCU stores the data into memory location 1.

6. Press [CLR].
   Clears the display.

Retrieving a Time Code Value

1. Press the [MEM] key.

   [MEM] key flashes
   The KCU is ready to recall a time code value stored in a
   memory location.

2. Press [1].

   Mem1   xx:xx:xx is displayed
   The value stored in memory 1 is retrieved.

3. Press [LOC] to locate using the value in the Calculator Entry
   register (lower right of display) as the locate point.

   The [LOC] key lights, "SOLO : A Loc xx:xx:xx" is displayed.
   The transport locates to the time code value retrieved from
   memory location 1, displayed in the Calculator register
   plus the preroll amount.

Changing Memory Size

Memory size determines the number of memory spaces that will
be available for storing values. Press [SETUP], then [MEM], to
change memory size.

See *Using KCU Memory* in this chapter for more information.

Using Time Code Registers

Values may be stored to or recalled from any of the time code registers.

The calculator keys provide access to the time code register values. The registers correspond to the numbered (00-9) calculator keys:

- 00/ZERO for the Local Zero register
- 0/TIME for the Time register
- 1/PRE for the Preroll register
- 2/POST for the Postroll register
- 3/REF for the Reference Sync Point register
- 4/SYNCP for the Source Sync Point register
- 5/OFST for the Offset register
- 6/ERR for the Error register
- 7/IN for the In Point register
- 8/OUT for the Out Point register
- 9/DUR for the Duration register

The following special function keys provide additional access to registers:

- IN for the In Point register
- OUT for the Out Point register
- REF SYNC for the Reference Sync Point register
- SRC SYNC for the Source Sync Point register
- CUE PT for the Cue Point register

Local Zero Register

The calculator [00/ZERO] key provides access to the Local Zero register, which is used to store an offset value that will be subtracted from values stored to memory registers. This function is used mainly for film applications.

The Local Zero register is available with KCU 600 and KCU 300 series software.

Time Register

The calculator [TIME] key provides access to the Time register. The Time register is used to store a time code value to the Lynx-2 or Lynx-2 Film Module.

Press [STO], then [TIME], to store a new value in the Time register. The current time code of the selected machine is displayed.

Press [RCL], then [TIME], to recall the current in the Time register. The current time code of the selected machine is displayed.

To display the current time code of a different machine, press the appropriate machine select key, then [RCL], then [TIME].

Preroll Register

The calculator [PRE] key provides access to the Preroll register. The preroll position is the time code location that the KCU uses to cue the master machine during locate and edit functions.

The value in the Preroll register is used to calculate the preroll position using the following equation:

Preroll position = In Point – Preroll value

The default value for the Preroll register is 5 seconds.

The Preroll register may be accessed during store, recall, and trim operations.

Postroll Register

The calculator [POST] key provides access to the Postroll register. The value in the Postroll register is used by the KCU to calculate the postroll time code position at the end of an edit sequence.

The postroll position is the time code location to which the KCU rolls the transports at the end of an edit. The postroll position is calculated using the following equation:

Postroll position = Out Point + Postroll value

The default value for the Postroll register is 5 seconds.

The Postroll register may be accessed during store, recall, and trim operations.

Reference Sync Point Register

The KCU uses the time code value in the Reference Sync Point register to calculate offsets for any source machines with source sync points. Offsets are calculated using the following equation:

Offset = Source Sync Point - Reference Sync Point

If you change the reference sync point value (either in Trim mode or by entering a new value), the KCU recalculates and stores the correct offset for all source machines with active source sync point values.

Accessing the Reference Sync Point Register

The calculator [REF] key provides access to the Reference Sync Point register during store, recall, and trim operations.

The special function [REF SYNC] key provides access to the Reference Sync Point register.

Clearing the Reference Sync Point Register

Press [CLR] and [REF] simultaneously to clear the Reference Sync Point register.

Press and hold [CLR] and press special function [REF SYNC] key to deactivate the value in the Reference Sync Point register without actually clearing the value. The [REF SYNC] key is no longer lighted.

Source Sync Point Register

The [SYNCP] key provides access to the Source Sync Point register for a specified machine. The KCU uses the time code value in the Source Sync Point register of each machine to calculate an offset for a source machine relative to the reference sync point. Each source machine in the system has a separate sync point register. The reference machine can not have a Source Sync Point register.

The offset is displayed as a positive or negative number with an absolute value of 12:00:00:00 (12 hours) or less. The offset is calculated using the following equation:

Offset = Source Sync Point - Reference Sync Point.

If the source sync point has a higher time code value than the source sync point, the keyboard displays the offset as a small negative number. For example, -1:10:00:00 is displayed rather than the equivalent large positive number 22:50:00:00.

If you change the source sync point value (either in Trim mode or by entering a new source sync point value), the KCU recalculates and stores the correct offset for that machine.

Accessing the Source Sync Point Register

The calculator [SYNCP] key provides access to the Source Sync Point register during store, recall, and trim operations.

The special function [REF SYNC] key provides access to the Reference Sync Point register.

Clearing the Source Sync Point Register

Solo a machine, then press [CLR] and [SYNCP] simultaneously to clear the Source Sync Point register.

Press and hold [CLR] and press the special function [SRC SYNC] key to deactivate the value in the Source Sync Point register without actually clearing the value. The [SRC SYNC] key is no longer lighted.

Offset Register

The [OFST] key provides access to the Offset register for a specified machine. This register may be accessed during store, recall, and trim operations. Each slave machine in the system has a separate Offset register. The reference machine cannot have an offset.

Offsets are discussed in detail in the *Using Offsets* section of this chapter.

Error Register

The [ERR] key provides access to the machine offset Error register. The Error register does not store any values, but provides a display of the positional error of a machine.

Press [RCL], then [ERR], to display the Error register for a selected machine. The error is displayed in status mode.

In Point Register

The In Point register stores the time code value of the current programmed edit. The value is expressed in terms of the master machine time code. The edit in point is used to calculate source machine offsets if no reference sync point is entered.

The special function [IN] key is illuminated whenever there is an active value in the In Point register.

If no in point is set, it will be calculated automatically when you enter an out point and a duration. The equation for calculating an in point is:

In Point = Out Point – Duration

The KCU calculates an in point value based on the current position of the source machine and the source machine offset value. This occurs if a source or slave transport is soloed when you press the special function [IN] key (the reference machine time code is not running at the time). The in point value is calculated in the reference time code type.

If there is no active value in the In Point register when you select an edit mode, the error message *Set an "in" point* is displayed and the edit command is canceled.

The value in the In Point register is also used as the Reference Sync Point in any automatic offset calculations if there is no value in the Reference Sync Point register.

Accessing the In Point Register

The calculator [IN] key provides access to the In Point register during store, recall, and trim operations.

Press the special function [IN] key at any time to store the current reference machine time code value into the In Point register.

Clearing the In Point Register

Press [CLR] and calculator [IN] simultaneously to clear the In Point register.

Press and hold [CLR], then press special function [IN], to deactivate the value in the In Point register without actually clearing the value. The [IN] key is no longer lighted.

Out Point Register

The value stored in the Out Point register is the record out point of the current programmed edit. The value is expressed in terms of the master machine time code.

The out point is calculated and stored automatically when you enter an in point and a duration. The equation for calculating an out point is

Out Point = In Point + Duration

The special function [OUT] key is illuminated whenever there is an active value in the Out Point register.

If there is no active value in the Out Point register when you select an edit mode, the message *Warning: open end* is displayed and the KCU performs an open-ended edit. In an open-ended edit, the duration shows as open during the preroll, and is incremented a single frame at a time during the actual edit period.

If a source or slave transport is soloed when you press the special function [OUT] key (the reference machine time code is not running at the time), the KCU calculates an Out Point value in the reference machine's time code based on the current position of the source, or slave, machine and its offset value.

Altering the value of the duration also causes the out point to be recalculated. Altering the out point causes the duration to be recalculated.

Accessing the Out Point Register

The calculator [OUT] key provides access to the Out Point register during store, recall, and trim operations.

Press the special function [OUT] key to store the current reference machine time code value in the Out Point register.

Clearing the Out Point Register

Press the [CLR] and calculator [OUT] keys simultaneously to clear the Out Point register.

Press and hold [CLR], then press the special function [OUT] key to deactivate the value in the Out Point register without clearing the value.

Duration Register

The [DUR] key provides access to the Duration register. Whenever there are active values in the In Point and Out Point registers, there is a calculated time code value in the Duration register.

The value in the Duration register is the length of the current programmed edit. If either the in point or out point are changed, the duration is automatically recalculated. The equation for calculating the duration is

Duration = Out Point - In Point

The Duration register may be accessed during store, recall, and trim operations.

Press [CLR] and [DUR] simultaneously to clear the Out Point register. Clearing the duration register automatically cancels the out point register, leaving the in point register as is.

Cue Point Register

The special function [CUE PT] key provides access to the Cue Point register.

Grouping Machines with the KCU

The KCU can simultaneously control up to six tape machines. When the transport control keys are pressed, all machines assigned to the group will chase and synchronize.

Machine Modes

When the KCU is first initialized, no machines have been placed in the group.

Using Solo Mode

Press [SOLO] and the appropriate machine select key (A-F). The transport control keys control only the selected machine. All other machines remain in their current state of motion. To select a different machine, press the appropriate machine select key (A-F).

The [GEN] key is also available with KCU 300 series software. [SOLO GEN] is normally used only to generate time code, but it can be used to control a time code-only chase device.

Assigning a Machine to a Group

All machines assigned to the group will be controlled together by the transport control keys (synchronously in play). In group mode, the display shows the status of the master machine. Individual machine status can be viewed by pressing the corresponding machine select key.

To assign a machine to a group,

1. Press the [GRP] key.

   [GRP] key lights, "Hold the "GRP" key, and add groups in order of priority" is displayed.
      This is the machine selection prompt.

2. Press and hold the [GRP] key, while pressing the machine select (A-F) keys.

   The machine keys light as they are added to the group.
      The master machine is displayed as an uppercase letter and the slave machines as lowercase letters. The first machine put into the group is always the master reference machine.

3. If you need to change the group assignments, press the amber [POLL] key, which repolls the Lynx-2 modules on the 422 bus and erases any previous group designation.

4. Press [B] to put the B machine into group status mode.

   The [B] key flashes and the Group display changes to STAT.
      In status mode, you can check the current running time code value and error for that machine.

5. Press [GRP] or [B] to return to the Group display mode.

   STAT display changes to group display and the [B] key is solid.

Removing a Machine from the Group

1. Press [GRP] and the machine select key to remove a machine from the group.

   The [B] key lamp is turned off.

2. Press [GRP] + [B].

   The [B] key lights.

   The slave machine B is placed back into the group.

Locking in a Group

Before locking machines in a group, it is good practice to let each machine resolve and lock by itself. By doing this, each Lynx-2 module remembers its transport type and subsequently locks the transport considerably faster.

The KCU display indicates whether the machine and group are in lock. To lock machines in a group,

1. Press the [GRP] key.

   [GRP] key lights, "Hold the "GRP" key, and add groups in order of priority" is displayed.
   This is the machine selection prompt.

2. Press and hold the [GRP] key, while pressing the machine select (A-F) keys.

   The machine keys light as they are added to the group.
   The master machine is displayed as a capitol letter and the slave machines as lower case letters. The first machine that is put into the group is always the master reference machine.

3. Press the [SOLO] key.

   The [SOLO] key lights as well as the [A] key.
   When the [SOLO] key is pressed, it addresses a single machine in the group. Press any machine select key when the [SOLO] key is lighted to address that machine. The display identifies the soloed machine as "SOLO: A" in the display. The machine's current time code position "A : xx:xx:xx:xx", and the offset error position of the machine to lock "Err:0.-" are displayed

4. Press the [>] key.

   The [>] key lights and the transport is put into play..
   As the tape machine plays, the running time code value is displayed. The machine automatically resolves and locks. "SOLO: A > L" is displayed, indicating that the machine is in play and is locked.

5. Press the [■] key when the machine has achieved lock.

   The [■] key lights and the machine is stopped.

6. Solo the next machine by pressing the next machine select key (A-F). Repeat steps 4-5 for each machine.

7. Press the [GRP] key.

   The [GRP] key lights along with any Machine Select keys that have been put into the group.
   The display changes to the group status mode, showing machine status and the current time code position of the master machine.

8. Press [ALL STOP], then the [■] key.

   The slave machines chase to the correct park ahead position of the master machine.

9. Press [PLAY].

   The group plays and locks. Lock status is indicated by the LL at the right of the time code. The first L indicates that the master machine is locked, and the second L indicates that all the slave machines have resolved and locked.

Changing the Master Machine

The KCU allows any machine to be the group master. The master machine can be changed at any time with all positional relationships maintained. Any offsets are transferred to the slave machines. The reference machine cannot have an offset.

The following example assumes a group of A and B, with A the master machine.

1. Press the [GRP] key.

2. Press and hold [SETUP], then press [B].

   The master machine is reselected to the B machine. The master machine now has an offset if B has an offset.

Separating the Master and Reference Machines

The reference machine is <u>always</u> the first machine placed into the group after the KCU has polled, making it the master machine.

To separate the master and reference machines,

1. Press the [POLL] key to re-poll the KCU.

2. Press and hold [GRP] + [A-F] to make a group with the A machine the reference master.

   [GRP] key lights, A-F keys light (according to addresses assigned)

3. Press [SETUP] + [B].

   The A machine remains the reference machine (designated by an asterisk), and the B machine becomes the master (designated by a capital letter).

Using Offsets

Offsets are used if the time code on two or more tapes does not match. For example, if tape A starts at 00:00:00:00 and tape B starts at 02:00:00:00, a record in point of 00:30:00:00 cannot be correct for both machines. Use the KCU to enter offsets to compensate automatically for the time code difference between the tapes.

The offset is the difference in the number of frames between the reference and slave or master tape at the point where they are to be synchronized. For example:

> 02:00:00:00 (Slave time code)
> -<u>01:00:00:00</u> (Reference time code)
> =+1 hour offset (number of frames)

A positive offset indicates that the source machine time code position is in advance of the reference machine time code position. If the machine selected is the reference tape machine, the offset register value will be zero since offsets are only applied to slave machines.

When a machine has an offset, the corresponding machine AUX LED in the STATUS display will light.

Setting an Offset

Offsets cannot be set for the reference machine.

The KCU always calculates a machine offset from the reference machine. The KCU indicates the reference machine with an *, the master machine with a capital letter and slave machines with lower case letters. By default, the first machine selected into the group is the reference master machine, indicated by "A*".

To change the reference machine, repoll the KCU. Press and hold the [GRP] key, and reselect the machines. If required, the reference machine can be different from the master machine, allowing the master machine to have an offset from the reference machine. (See *Changing the Master Machine* section.)

In the following example, A is the master reference machine and B is the slave machine. A and B are grouped together.

1. Press [SOLO] + [A] to solo the master A machine.

    The SOLO LED and A LED come on.

2. Press [PLAY].

    The A machine goes into play.

3. Press [STOP] to locate the machine to a point and stop.

4. Press the [B] key.

5. Press [PLAY].

   The B machine goes into play.

6. Press [STOP] to locate the machine to a point and stop.

7. Press the [CAPT] key.

   The CAPT and STO LEDs flash.
   The slave time code position is captured and the KCU prompts for a register to store it in. In this case, the value is stored to the offset register.

8. Press Calculator key [5] (Offset).

   The slave offset is automatically calculated and stored.

9. Press the [GRP] key to return machines to group mode.

   A LED on, B LED on, GRP LED on.
   The B transport is marked with an AUX LED in the Status display to show that an offset is present.

10. Press [PLAY].

    The machines go into play and lock with the offset.

11. Press [STOP].

Calculating Offsets Using Sync Points

The special function keys may be used to shortcut certain keystrokes on the KCU. In this example, the [REF SYNC] and [SRC SYNC] keys will automatically capture and store sync points to the individual machines.

1. Press [SOLO], then [A] to Solo the master machine.

   SOLO LED on, A LED on.

2. Press [CAPT], then the [REF] (3) calculator key.

   This captures the current time code value for the master machine, then stores that value as the reference sync point. A reference point for the master machine is a position on the master tape to which slave tape sync points position.

3. Press [B] to Solo the slave machine.

4. Press [CAPT], then the [SYNCP] (4) calculator key.

   This captures the current time code value of the slave (B) machine and stores it into the sync point register. The offset is calculated automatically and stored in the Offset register.

5. Press the [RCL] key, then [OFST] (5), to verify the correct offset. Use the [RCL] key if desired.

6. Press [SOLO], [A], then [>], to Solo the A machine in play mode.

7. Press the [REF SYNC] key.

   This captures and stores a reference sync point to the master machine Sync Point register.

8. Press [STOP].

9. Press [SOLO], [B], then [>], to Solo the B machine in play mode.

10. Press the [SRC SYNC] key.

    This captures and stores a source sync point to the slave machine Sync Point register.

11. Press [STOP].

12. Press the [GRP] key.

    A LED on, B LED on, GRP LED on.

13. Press [ALLSTOP], then [STOP].

    The B machine chases and parks to the master machine position.

14. Press [PLAY].

    The machines go into play with the offset.

Trimming an Offset

An offset can be trimmed by increasing or decreasing the frame or subframe amount in any register. Default trim values are 1 frame and 1 subframe.

Trim Frame:	The value can be adjusted between 1 and 10 frames.
Trim Subframe	The value can be adjusted between 1 and 25 subframes.

In the following example, assume that the A and B machines are grouped. Although the tape machines are in stop in this example, an offset can be trimmed dynamically with the tape machines in play.

1. Press [GRP] + [STOP].

2. Press the [B] key.

   This changes the Group display to Status display for the B machine.
   From Group display mode, press a machine key to enter the status display for that machine. From the status mode, memory registers can be addressed directly for that machine.

3. Press the [TRIM] key.

   Trim key flashes, + LED on, — LED on.
      The frame trim increment is displayed and the Offset register is called.

4. To change the offset dynamically,

   • Use the [+] key to increase the offset. Press and hold the [+] key to make the key auto-repeat.

   • Use the [–] key to decrease the offset. Press and hold the [–] key down to make the key auto-repeat.

   • Use the jog wheel to trim the offset up or down instead of using the [+] and [–] keys.

5. To exit trim mode and save the new offset, do one of the following:

   • Press [TRIM] to return to status mode, or

   • Press [B] to return to group mode.

Storing an Offset

The following is an example of the procedure for storing an offset to the In Point register.

1. Type 20min:15frames:12sec into the calculator display.

   00:20:15:12
      Enters (or recall) a time code value.

2. Press [STO]

   STO LED flashes.

3. Press a calculator key to select a register. Or, press [MEM] and a calculator key to select a memory.

4. Press [7 / IN]

   STO LED turns off.
      The time code value is stored to the In Point register.

Offsets in Differing Time Codes

The KCU handles offsets correctly in either drop frame or non-drop frame time code as well as in mixed time code situations. Offsets are always stored and displayed in the code format of the reference transport time code, regardless of the type of code that is present on each source machine. For example, if the reference time code is drop frame, all offsets are handled and displayed by the KCU as drop frame time code values, even if a particular offset is related to a machine with non-drop frame code.

Drop frame code is displayed on the KCU with the frames digits separated from the seconds digits by a semi-colon rather than a colon, as in *03:20:40;00.*

In mixed code situations, the actual offset value necessary to achieve the desired synchronization in the KCU system is the sum of the following three components:

- The actual (clock) difference between the two time code values.

- A correction to the clock offset based on the difference in frame counts between the two time code formats.

- A correction for the accumulated frame count difference since 00:00:00:00 (time code 'midnight'). This applies to drop frame/non-drop frame time code only.

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

The simplest method of calculating offsets is to use sync points or capture the frame count and let the KCU calculate the correct time code offset value.

Editing with the KCU

The KCU has comprehensive Rehearse, Record and Replay edit routines. In and out points can be quickly marked with the special function keys. The KCU cues all transports in the group to the preroll point, executes an automated record at the in point, and drops out of record at the out point.

Editing Example

For this example, A is the master reference machine and B is the slave machine. Other machines may be added if desired.

1. Press the [>] PLAY key.

   The group goes into play and locks.

2. Press the [IN] key.

   The [IN] key lights and the display shows the captured record In point in the lower right hand portion of the display.
   The [IN] key can be pressed during any group mode, solo mode, or status mode operation for direct storage to the record In Point register. Once pressed, it updates the In Point register to the current time code value addressed in the display. If group mode is selected, the in point always reflects the master machine time code.

3. With the group still in play, press the [OUT] key.

   The [OUT] key lights and the display shows the captured record Out point in the lower right hand portion of the display. The record out point is marked and stored into the Out Point register.

4. Press the [EDIT] key.

   [EDIT] key lights, [CUE] key flashes, [REPLAY] key flashes, [REC] key flashes, [REH] key flashes. Edit mode selection keys flash to prompt for a selection.

5. Press the [REC] key.

   [EDIT] lamp on, [CUE] lamp on, [REC] lamp flashes.

   The Edit/Record mode has been selected. The group cues to the cue point that equals the in point minus the preroll time, which defaults to 5 seconds.

6. After the last machine in the group goes into play and locks, the prompt *WARNING: No Active Transports Enabled* is displayed, describing the machine record status. Press and hold the round red [REC STATUS] key and press machine keys [A-F] as required to record enable each machine.

   The preroll time counts down and the group goes into record at the in point. The group drops out of record at the out point and rolls through the postroll. The postroll default time is 5 seconds.

7. Press the [LOOP] key.

   [LOOP] key lights.
   If LOOP is selected before the edit is complete, the group rescues to the preroll point and repeats the sequence indefinitely.

Setting a Sync Point

1. Press [SOLO], [B] to Solo a slave machine.

2. Press [CAPT].

   STO LED flashes and the current time code value for the B transport is captured into the calculator display.

3. Enter or capture a time code value and select a register to store the value.

4. Press [4/SYNCP].

    *Display shows the captured time code value stored to the Sync
        Point register.*
    The value is stored in the Sync Point register. If a reference
    sync point exists, a new offset is calculated and stored for
    the slave machine.

Clearing a Sync Point

1. Press [SOLO] + [B] to Solo a slave machine.

2. Press [CLR] + [4] to clear the value in the Sync Point register.

3. Press [RCL] + [4]

    You can verify that the clear operation occurred by recalling
    the Sync Point register contents.

KCU Messages and Errors

The KCU automatically displays non-system messages to prompt
an action or to provide a description, suggestions, or status
information. System errors are not displayed automatically.

Refer to the Troubleshooting chapter for a list of error messages.

Displaying System Error Messages

System error messages are available only with KCU 330 series
software.

System errors are not displayed automatically. The SYS LED
flashes when a system error occurs.

To display system error messages,

1. Press [SYS] to enter error mode.

    The SYS LED lights.
    The first error message is displayed.

2. Press [SYS] again to display the next error message.

    The SYS LED flashes until all of the errors have been cleared.
    After the last error is displayed, all messages are cleared
    and the KCU automatically exits the error mode.

3. To exit to exit error mode at any point without clearing the
    error messages, press [CLR].

Displaying Version Numbers

Version number display is available only with KCU 330 series software.

To display software version numbers, press [RCL], then [SYS]. The version number for each PROM is displayed.

Accessing Status Mode

When the KCU display is in group mode, press a machine key A-F to select status mode and recall the Error register. The Error register contains the error between the master and slave tape position in frames and subframes.

The error register display is programmed to show the most relevant information at all times. There are occasions when the offset error display has no meaning. The following table shows the error register status in each transport mode.

Display Mode	STOP	PLAY	Rewind/FWD
Solo	0.--	Resolve error (in subframes)	0.--
Group	0.--	Resolve error (Mast machine)	0.--
Stat slave	Distance from Mast (park-ahead)	Resolve error (in subframes)	Distance from Mast (Offset err)
Stat master	0.--	Resolve error (Mast machine)	0.--

The KCU automatically displays subframe error when the error is less than 1 frame.

When the displayed error is greater than 1 frame, the subframe component is suppressed and shows only as "x.--".

Setup [SETUP] Options

The KCU allows comprehensive customization of the keyboard for a particular operating mode, transport, or application.

To enter setup mode,

1. Press the [SETUP] key.

   The [SETUP] key flashes.

2. Select the category to modify.

3. Use the following keys to move through the menu:

   - [LAST] or [NEXT] selects the next or previous item in a top-level menu.

   - [+] or [–] selects the next or previous item in the selected menu.

4. After modifying the selected option, exit setup mode by pressing the [SETUP] key a second time.

    The [SETUP] key stops flashing.

Setup Options

Setup options are listed in the following table. All selections and associated numbers are listed.

Table Chapter 4 -1. SETUP Menu Options

KEY	MENU	SUB-MENU	RANGE
EDIT	Editing Options	0 Edit Q/C	Off, *Normal*, Stop
		1 Edits Roll As	Mast/Slave, *All Slaves*
EVENT	Select GPI Options		
	1 Keyboard GPI 1	0 Mode	Normal, *Autoset*, Rec Tally, Edit-Rec, Group Lock
		1 Beep Mode	Off, *On*
		2 Beep Spacing	10-30 (*20*)
		3 Last Beep	*Muted*, On
	2 Keyboard GPI 2	0 Mode	Normal, *Autoset*, Rec Tally, Edit-Rec, Group Lock
FILM	Film Options	0 Ref Code Type	24, 25, DF, *30*
		1 NTSC Default	*29.97*, 30.00
F1-F6	Macros		
LIST	SSU List Menu	0 SSU Capture To	GPI 1-GPI 8 (*GPI 1*)
LOOP	Edit Looping	0 After Edit	*Re-edit*, Replay
		1 After Replay	*End*, Repeat
		2 After End	*Stop*, Recue
MEM	Memory Menu	0 Memory Size	*0-9*, 00-99
ROLLBACK, REH, REC	Key Options	0 Rollback Key	*Rollback*, Play-Rev
		1 REH (Rehearse By)	*Play+Reh*, Reh Only
		2 REC (Record By)	*Play+Rec*, Rec Only
SYS	System Options	0 System Ref SRC	Int Xtal, *Ext Vid*, Mains, VSO
		1 Calc Entry Mode	*Normal*, CMX Style
		2 Flash Rec Lamp	*No*, Yes
		3 Wheel Rate	1-10 (*1*)
		4 Supervisor On	*No*, Yes
TRKS	Track Select	0 Video Tracks	*Safe*, Enabled
		1 Video Auto-Rst	*Off*, On
TRAN	Tran Options		
	A-F Machine Keys	0 Capstan Mode	Wild, *Resolved*
		1 Ser TC Option	*Enable*, Inhibit
		2 Track Select	*KCU*, Transport

Setup Example

1. Press [SETUP].

   [SETUP] key flashes, LAST and NEXT LEDs light, [+] and [–] keys light.

   The system is in setup mode.

2. Press [MEM]. There are two options, + and –.

   Memory key lights.

   - Press [+] to set the memory contents register to hold up to 100 memory locations.

     Display shows Memory size: 00-99.

   - Press [–] to set the memory contents register to hold up to 10 memory locations.

     Display shows Memory size: 0-9.

6. Press [SETUP] to exit setup mode.

   Display exits setup mode.

7. Exit and save the memory key selection.

KCU Options Menus

To access a menu, press [SETUP], then press one of the following menu select keys:

EDIT	Editing options
EVNT	Events (GPI relay closures) options
FILM	Film options
LIST	SSU list options
LOOP	Edit looping options
SYS	System options
TRKS	Track select options
TRAN	Transport options

If power to the KCU is turned off, <u>all</u> settings are saved. The last settings entered will be restored when the KCU is next powered on.

Editing [EDIT] Options Menu

Press [SETUP], then the motion control [EDIT] key, to access the Editing options menu. The Editing options menu offers two choices, EDIT Q/C and EDITS ROLL AS.

Table Chapter 4 -2. Edit Options Menu

KEY	MENU	SUB-MENU	RANGE
EDIT	Editing Options	0 Edit Q/C	Off, *Normal*, Stop
		1 Edits Roll As	Mast/Slave, *All Slaves*

When the default setting (ALL SLAVES) is used, all transports in the group are treated as slaves and locked to the KCU timeline. This ensures that all machines lock to the same exact time code position for absolutely accurate edits. If MAST/SLAVE is selected, the master transport resolves and locks to the selected reference, and the slave machines in turn lock to the timeline of the master machine.

Event Select GPI [EVNT] Options Menu

This discussion of the Event Select GPI options menu is applicable to KCU 080 and 600 series software. For information regarding this menu in configurations of KCU with SSU, and of KCU 300 series software (SSU), see the Advanced Features chapter of this manual.

To access the Event Select GPI options menu, press [SETUP], then [EVNT]. Choose KEYBOARD GPI 1 or KEYBOARD GPI 2 from the Event Select GPI options menu.

Table Chapter 4 -3. Event Options Menu

KEY	MENU	SUB-MENU	RANGE
EVENT	Select GPI Options		
	1 Keyboard GPI 1	0 Mode	Normal, *Autoset*, Rec Tally, Edit-Rec, Group Lock
		1 Beep Mode	Off, *On*
		2 Beep Spacing	10-30 (*20*)
		3 Last Beep	*Muted*, On
	2 Keyboard GPI 2	0 Mode	Normal, *Autoset*, Rec Tally, Edit-Rec, Group Lock

Film [FILM] Options Menu

Use the Film options menu to change the reference time code type. This option is available only when using a Lynx-2 Film Module or Film Lynx Gearbox Module. This option is not available with KCU 300 series software.

Press [SETUP], then the device select [FILM] key, to access the Film options menu.

Table Chapter 4 -4. Film Options Menu

KEY	MENU	SUB-MENU	RANGE
FILM	Film Options	0 Ref Code Type	24, 25, DF, *30*
		1 NTSC Default	*29.97*, 30.00

SSU List [LIST] Options Menu

List is available only with KCU 080 series software. Press [SETUP], then the device select [LIST] key, to access the SSU List options menu. The List options menu has the single choice of 0–SSU CAPTURE TO.

Table Chapter 4 -5. List Options Menu

KEY	MENU	SUB-MENU	RANGE
LIST	SSU List Menu	0 SSU Capture To	GPI 1-GPI 8 (*GPI 1*)

Edit Looping [LOOP] Options Menu

Press [SETUP], then [LOOP], to select the loop options. This menu has three choices to define the loop process after edit and replay passes: AFTER EDIT, AFTER REPLAY, and AFTER END.

Table Chapter 4 -6. Loop Options Menu

KEY	MENU	SUB-MENU	RANGE
LOOP	Edit Looping	0 After Edit	*Re-edit*, Replay
		1 After Replay	*End*, Repeat
		2 After End	*Stop*, Recue

System [SYS] Options Menu

To access the System options menu,

1. Press [SETUP].

   [SETUP] key flashes.

2. Press the [SYS] key.

   [SYS] key flashes, the LAST and NEXT LEDs light, and the [+] and [–] keys light.
   The message *System Ref Src: Ext Vid* is displayed.

3. Use the [+] or [–] key to change the reference selection.

4. Press [SETUP] to exit the menu.

The following choices are available from the System options menu:

Table Chapter 4 -7. System Options Menu

KEY	MENU	SUB-MENU	RANGE
SYS	System Options	0 System Ref SRC	Int Xtal, *Ext Vid*, Mains, VSO
		1 Calc Entry Mode	*Normal*, CMX Style
		2 Flash Rec Lamp	*No*, Yes
		3 Wheel Rate	1-10 (*1*)
		4 Supervisor On	*No*, Yes

Track Select [TRKS] Options Menu

Press [SETUP], then [TRKS], to enter the Track Select options menu.

The Track Select options menu offers two choices: VIDEO TRACKS and VIDEO AUTO-RST. These choices relate specifically to video machines. These options are designed to protect the audio facility from inadvertently recording on the video portion of a work tape. However, in some circumstances video track enable may be necessary, such as when a transfer is being done from one machine to another.

The following are the Track Select options menu choices:

Table Chapter 4 -8. Track Select Options Menu

KEY	MENU	SUB-MENU	RANGE
TRKS	Track Select	0 Video Tracks	*Safe*, Enabled
		1 Video Auto-Rst	*Off*, On

Transport [TRAN] Options Menu

Press [SETUP], then [TRAN], to enter the Transport options menu.

Press [SETUP] again to exit and store the transport settings. The transport selections are retained in memory and should only need to be reset if the transport type is changed.

Table Chapter 4 -9. Transport Options Menu

KEY	MENU	SUB-MENU	RANGE
TRAN	Tran Options		
	A-F Machine Keys	0 Capstan Mode	Wild, *Resolved*
		1 Ser TC Option	*Enable*, Inhibit
		2 Track Select	*KCU*, Transport

Resetting a Machine Select Key

Use [CLR] + [TRAN] to reset a machine select key to factory default settings. To solo a transport, press and hold the [CLR] key, and press [TRAN]. *Transport Clearing Now* is displayed as the transport parameters are reset.

This feature is not available in KCU 330 series software.