CNA-200 Automation

CineNet™

Setup and Operation Manual

STRONG
Cinema Products

CNA 200 Automation
Setup and Operation Manual

PR002   Revision 2

This manual covers the setup and operation of CNA-200 automation system.

Optional CineNet and related equipment is covered in the following product reference manuals:

- PR001 CNA Installation Manual
- PR002 CNA-200 Setup and Operation Manual
- PR003 CNA-150 Setup and Operation Manual
- PR004 CNA-100 Setup and Operation Manual
- PR005 QDC-400 Installation and Setup Manual
- PR006 ACP-50 Installation and Setup Manual
- PR007 RVC-5 Installation and Setup Manual
- PR008 PCI-64 Gateway Interface Installation
- PR009 CineNet Host Software
- PR010 RCM-10/RSM-10/RSM-20 Installation and Operation Manual
- PR011 Strong Dimmer Installation, Setup, and Operation Manual
- PR012 eCNA-100 Automation Manual
- PR013 eCNA-150 Automation Manual
- PR014 eCNA-200 Automation Manual
- PR016 Strong FP350 Installation and Operation Manual
- PR017 Eprad FP350 Installation and Operation Manual
- PR018 Paging system Setup and Installation Manual
- PR019 VNC Setup and Operation Manual
- PR020 CineSuite Installation and Operation Manual

Warranty

Table of Contents

Section 1
System Overview

Introduction

The CNA-200® Cinema Network Automation is a CINENET™ compatible automation system specifically designed for the Motion Picture Theatre industry. The system is modular in design, consisting of the operator interface and system I/O devices. The Main Computer and each I/O device is defined by its common functions and locations in the booth and communicate on a serial communications link. Automation systems and remote stations distributed throughout the booth and other areas of the multiplex communicate on a second serial communications link.

To enhance the operation of the CNA-200 and provide a broader level of control, the CINENET™ Gateway PC Card and Host software is available. This product will provide a PC interface to the CNA-200 automations. The Host PC and software will allow management to access programming, real-time data and diagnostic information from all systems connected to the network.

Users and Installers of the CNA-200 are encouraged to read all sections of this operators manual to become familiar with the system and its capabilities. This automation was designed to be easy to set-up and operate. But it is the responsibility of the user to learn how to do so. With a solid understanding of how the CNA-200 operates you can take full advantage of all its capabilities.

If while setting up or operating the CNA-200 automation you find any part of the manual to be unclear or incorrect, please let us know.

The CNA-200 can store up to nine separate programs, each capable of twenty separately cued sequences of all available functions. An internal clock can provide programmed start times, and a "Cue Learn" feature automatically initiates the next sequence in the event of a missed film cue.

The CNA-200 allows two levels of programming: a basic or low level for programming of normal operations and schedules, and a higher level for use by supervisory personnel. Programming of either level is easily accomplished once familiar with the system.

Most of the initial programming should be accomplished as the equipment is installed according to the requirements of the theater, and can be changed only by supervisory personnel with knowledge of the high level password.

A low level password, *Password #1* (set by the Supervisor), allows a level of programming for normal operation. Generally, the daily program operation will require only modification of show times, film format or volume changes that occur with normal changes of feature films. This level of programming is accessed by either password.

An internal DIP switch is provided to enable the high level password requirement, as well as a Host and locally configurable override that enables/ disables the internal switch.

The CNA-200 controls all booth and auditorium functions, including house lights with half-level, stage lights, curtain (with Curtain Call feature), eight sound formats, lens/masking control, special projector operation, and intermission functions such as a slide projector and curtains. Each system is equipped with network and local copy functions, allowing the user to copy programs and set-up data from a remote CNA-200. Interlocked operation is easily accomplished for up to 63 units in any combination. The control panel includes a full set of manual controls.

It is important to note that the CNA-200 functions in a manner similar to current automation technology in that a prescribed sequences of events are performed at a given input, such as pushing the Start button or sensing of a foil film cue. However, the CNA-200 can perform many more functions in a wide variety of ways, all of which are fully programmable.

The CNA-200 is a *single-cue* automation. This means that events, such as lens, masking and sound changes, are initiated by a cue (normally foil placed on the film). These events are stored in the CNA-200's memory and are called *Programs*. The CNA-200 gives you the ability to build and store up to nine different programs. Each program can contain up to ninety-nine *instructions* which are performed sequentially. An *instruction* is a particular function that will be executed during a *program step*. It may have a timed relationship to the step; that is, stage lights may be programmed to dim ten seconds after the instruction is encountered in the program. Each function is identified by an *instruction number*.

The CNA-200 incorporates a unique feature called *Cue Learn* in which cues times for each program are stored in the computer's memory. Cue Learn is activated by the operator before a film is run for the first time. All cue times will then be "Learned" or stored in memory. On all subsequent runs the CNA-200 expects to see the film cues at a particular time. If a cue is not seen, due to a missing or worn cue foil, the computer will automatically "issue" a cue which will advance the program and keep the show running properly. Cue Learn also makes it possible to operate a show without film cue foil at all!

The CNA-200 also provides a configuration or set-up section that allows you to customize the system. This section is called "Supervisory". Supervisory is a set of system functions including relay contact configuration, power up states, maintenance schedules, interlock configurations, along with other system parameters most of which will be set up at system installation and not changed unless there is a hardware change. Most Supervisory functions can only be changed using *password 2* (high level password).

Finally, the CNA-200 provides for storing "Clock Start Times". This can be an extremely useful tool for the projectionist and manager. The CNA-200's internal clock and calendar allows the user to store up to ten clock start times per day for the entire week.

Product Description

The following sections discuss the topology of the CNA-200 automation system. The standard CNA system can be divided into two major parts: the Main Controller and the Termination Panels.

Communications to the termination panels and other remote CNA-200 systems is accomplished via two serial ports on the Main CPU:

The Local I/O Network Port - This is the interface for the Local I/O Network (LIN) that will support the Dual or Single Termination Panels and other auxiliary devices.

The Local Synchronous Network port - This is the interface for the Interlock and copy functions between CNA-200 systems, Remote Monitors and Host computer.

Local I/O Network (LIN)

The standard CNA-200 automation system consists of a control panel and termination panels. The control panel houses the main computer and power supply which controls the termination panels via the LIN (Local I/O Network). The LIN provides the serial data communications as well as power to the termination panels.
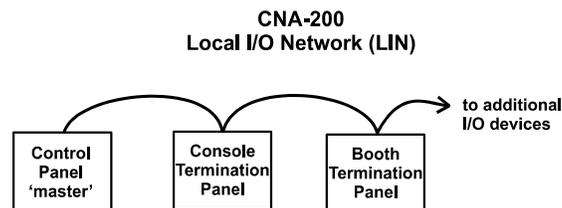
The LIN will also support devices such as dimmers, failsafes, auxiliary control panels and automatic volume control. The LIN is designed to support up to 32 devices. See CNA Installation manual for details on wiring the network.

Local Synchronous Network (LSN)

The LSN (Local Synchronous Network) is an RS-485 data link that will support CNA Automations, remote stations, synchronous communications for interlock, network copy functions and a Host PC. The automation systems are connected together in a daisy-chain configuration.

Each CNA automation on the LSN is identified with a unique Id number. This number should correspond with the "house" number.

Local Synchronous Network (LSN)

Daisy-Chain   **To other CNA Automations**

HOST PC	CNA-200	CNA-200	CNA-200	CNA-200	CNA-200
Managers Office	**House 1**	**House 2**	**House 3**	**House 4**	**House 5**
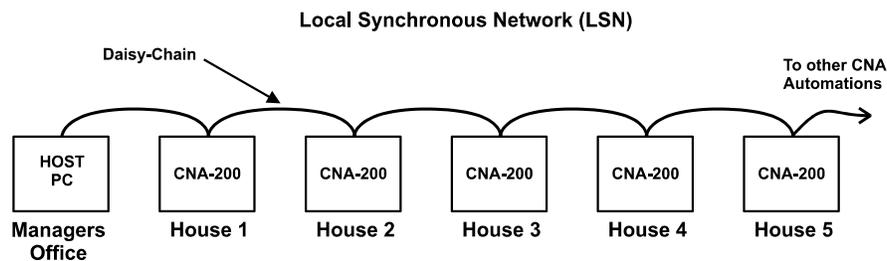
CNA-200 Mainboard Configuration

Various aspects of operation can be customized with DIP switch settings. The switch definitions for each CNA automation are described in the following sections.

CNA-200 DIP Switch Settings
Current to version 1.029

39325 CNA Main CPU Board

*Switches are shown in default positions

ON
OFF

S1   S2   S3

BOOTLOADER (S1-1)
POWER UP DEFAULT (S1-2)
32   (S1-3)
16   (S1-4)
8   (S1-5)
ID NUMBER   4   (S1-6)
2   (S1-7)
1   (S1-8)
MANUAL CONTROL SCREEN (S2-1)
PASSWORD (S2-2)
CHECK FOCUS DELAY (S2-3)
FIRE STOP (S2-4)
ALWAYS OFF (S2-5)
ALWAYS OFF (S2-6)
EVENT LOGGING (S2-7)
CONTENT PLAYER ENABLE (S2-8)
ALWAYS OFF (S3-1)
ALWAYS OFF (S3-2)
ALWAYS OFF (S3-3)
ALWAYS OFF (S3-4)
ALWAYS OFF (S3-5)
CHECK FOCUS ALARM DISABLE (S3-6)
ALWAYS OFF (S3-7)
ALWAYS OFF (S3-8)

Figure 1.1

S1-1 Bootloader

On : Force Bootloader.
Off : Normal Use. (Factory Default)

The Bootloader program supports the LSN flash update network commands to load the CNA-200 application program into flash memory over the LSN. The Bootloader itself is erase protected and cannot be erased by the user. This protection ensures that the Bootloader can always be reloaded even if the rest of the flash memory is corrupted through programmer error or by other means. If flash memory was corrupted, setting this switch to on will force the Bootloader program at power up.

Note: Applies to version 1.016 and up

S1-2 Power Up Defaults

On : Force "Supervisory Defaults" on power up. Default Supervisory data will be restored on each power up overwriting all user programmed supervisory data.
Off : Will **not** overwrite user programmed supervisory data on power up. (Factory Default)

Note: Applies to version 1.000 and above

S1-3 through **S1-8** are used to set the ID number. The number is represented as a 6-bit binary number which allows for 64 possible ID numbers (0-63). Do not use 0 (zero) as an ID number. It has been reserved for the PC Gateway Interface. Each bit (switch) has a decimal value. Add up the decimal values to get the ID number. For example, ID number 15 would be 8+4+2+1=15 or a DIP switch setting of 001111. See Figure 1.2.

S1-3 On : 1 Decimal value = 32
       Off : 0 Decimal value = 0 (Factory Default)

S1-4 On : 1 Decimal value = 16
       Off : 0 Decimal value = 0 (Factory Default)

S1-5 On : 1 Decimal value = 8
       Off : 0 Decimal value = 0 (Factory Default)

S1-6 On : 1 Decimal value = 4
       Off : 0 Decimal value = 0 (Factory Default)

S1-7 On : 1 Decimal value = 2
       Off : 0 Decimal value = 0 (Factory Default)

S1-8 On : 1 Decimal value = 1 (Factory Default)
       Off : 0 Decimal value = 0

Figure 1.2

S2-1   Manual Control Screen

On   : Enable the "Manual Control" screen. (Factory Default)
Off   : Disable the "Manual Control" screen.

The Manual Control screen allows the manual control of most outputs including: sound, lens, masking and lights. Starting with version 1.016, the volume level can also be adjusted.

Note: Applies to version 1.011 and above

S2-2   Password

On   : Requires use of the "high level" password to access many of the
         programming functions. (Factory Default)
Off : Disables the password. No password is required to access the
         programming functions.

High level password is user-configurable for version 1.021 and up.
This switch's function can be overridden from the host or locally with
version 1.029 and up.

Note: Applies to version 1.000 and above

S2-3   Check Focus Delay

On   : Enables the "Check Focus Delay" function. In Clock Start or
         Timed Start the alarm will sound prior to the show starting.
         (Factory Default)
Off : Disables the "Check Focus Delay" function.

The Check Focus feature alerts the operator that the show is about to start.
In Timed Start the alarm will begin to sound 7 seconds prior to the show
starting. This gives the operator time to make any quick adjustments and
to insure the image on the screen is in focus.
*This feature is available for manual start inputs as well with firmware
versions 1.022 and above*.

Note: Applies to version 1.006 and above.

S2-4   Fire Stop Option

On   : Enables the "Fire Stop" function. (Factory Default)
Off : Disables the "Fire Stop" function.

39331 Booth Termination Board - Converts the Remote Stop input to a
Fire Stop input and the Slide Projector relay (K13) to a Fire Stop output.
Fire Stop *acts* like a Remote Stop with the following exceptions:
• Sound is Muted.
• Slide Projector on 39330 *Console Termination Board* is turned off *or*
  held off.
• K13 relay (Slide Projector) on Booth Termination board is turned on.
• Zones 3-16 are unaffected by a firestop input.
If this feature is enabled the slide projector must be wired to the 39330
Console termination board.

39332 Termination Board - Remote Stop input must be enabled on board. (W1-OPT1 jumper across pins 2 and 3 changes the Film Tension input to a Remote Stop input.) Converts the Remote Stop input to a Fire Stop input. Fire Stop *acts* like a Remote Stop with the following exceptions:

• Sound is Muted.
• Slide Projector is turned off *or* held off.

Note: Applies to version 1.011 and later

S2-5   Always Off

On   : Undefined
Off   : Undefined (Factory Default)

This switch's function is not defined, it should remain in the "OFF" position.

Note: Applies to version 1.000 and later

S2-6   Always Off

On   : Undefined
Off   : Undefined (Factory Default)

This switch's function is not defined, it should remain in the "OFF" position.

Note: Applies to version 1.000 through version 1.016

S2-7   Event Logging

On   : Enabled - Events are sent to the Host.
Off   : Disabled - Events are not sent to the Host. (Factory Default)
Cinenet Host software, in conjunction with the CNA has the ability to keep a record of events that take place during a sequence of events. This DIP switch setting enables and disables it.

Note: Applies to version 1.014 and later

S2-8   Content Player Option

On   : Enables interface with Digital Content Player
Off   : Disables interface option. (Factory Default)
This switch allows the eCNA to interact with a digital content player.
Serial commands exchanged between the content player and CNA
automation allows the digital projector and film projector to share the
screen in a coordinated manner

* See CAI user Guide
Note: Applies to version 1.000 and later

S3-6   Check Focus Delay alarm

On   : Disables the RCM/ RSM-10 "Check Focus Alarm"
Off   : Enables the RCM/ RSM-10 "Check Focus Alarm" (Factory
         Default)

Check focus alarm warns operator when a show is about to begin so final
focus adjustments may be made prior to show start.

Note : Applies to version 1.029 and above

S3-1 through S3-5, S3-7&8 Always Off

On   : Undefined
Off   : Undefined (Factory Default)

Note: Applies to version 1.000 through version 1.016

Control Panel (Operator Interface)

The automation controller and front panel interface can either be surface mounted to the booth wall or can be mounted in a standard 19" rack. The unit houses the main CPU, the front panel interface and the power supply for local and LIN power.

The control panel is used to setup, program and run the shows. It also displays error and status messages to the user. The control panel has nine manual override switches used for emergency manual control. These are rocker switches and their general functions should be obvious to the operator. All manual controls circumvent the electronic circuitry giving the user the ability to control the major functions in the event of an automation failure. The manual control functions are listed below:

1. PROJECTOR - Maintained ON/AUTO
2. LAMP - Maintained ON/AUTO
3. CHANGEOVER - Momentary OPEN/CLOSE
4. LENS (*LENS & MASKING) - Momentary FLAT/SCOPE
5. LENS (*LENS & MASKING) - Momentary SPECIAL
6. CURTAIN - Momentary OPEN/CLOSE
7. HOUSE LIGHTS - Momentary UP/DOWN
8. STAGE LIGHTS - Momentary UP/DOWN
9. AUXILIARY - Momentary ON1/ON2

*Front panel with DPDT switches.
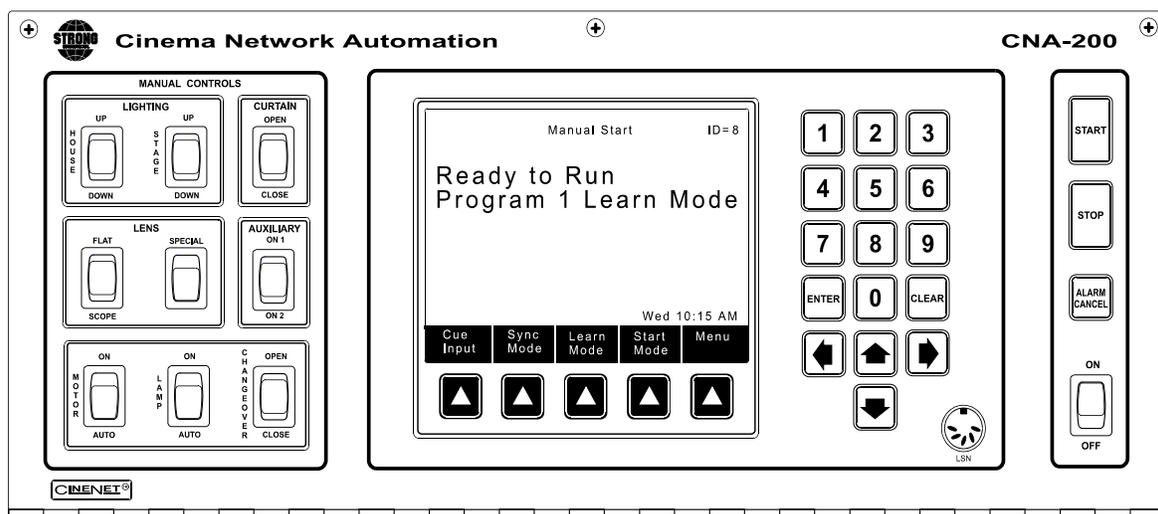
Figure 1.3

To the right are POWER, START, STOP and ALARM CANCEL keys. The programming keypad and display screen make up the remainder of the panel.

The keypad consists of numeric, cursor and *soft* keys. The Display Screen shows the current status of the system in the RUN mode or the data being edited in the SET-UP mode.

POWER - This switch is used to turn the automation on.

STOP - Forces the automation to a stop condition or cancels a timed or clock start operation.

START - This key is used to manually start or restart the presentation which will run the selected program.

ALARM CANCEL - This key will cancel a local and remote alarm. It also serves to clear fault messages displayed on the screen. Pressing the Alarm Cancel key once will cancel the alarm. Pressing the key again will clear the fault condition. (See *System Fault and Status Messages*).

Keypad

The keypad is used for data entry. This is used to set up and program the system. It is also used for selecting the start mode, feature formats, sync enable and cue learn. The function of each key is briefly described below.

ENTER - This key is used to save edited data and move the cursor to the next field to edit.

CLEAR - This key is used to reset a numeric data field to 0.

CURSOR (right, left, up, down) - These keys are used to change screens or fields to view or edit data.

SOFT KEYS - These keys are specific to each screen in the system and will change as you move to different screens.

CNA-200 Home Screen

This is the CNA-200 *Run Mode* or *Home* screen. This screen provides the user with information such as Show status, Program number, Cue Learn and Cue number, Sync Mode, Start Mode and film format messages.


```
              Manual Start           Id=10
                                      Host

Ready to Run
Program 1
Time to start 15:00


Sound: Non-Sync -50.0dB    Lens: Flat


                              Fri  1:50 PM
 Cue     Sync    Learn   Start   Home
 Input   Mode    Mode    Mode
```
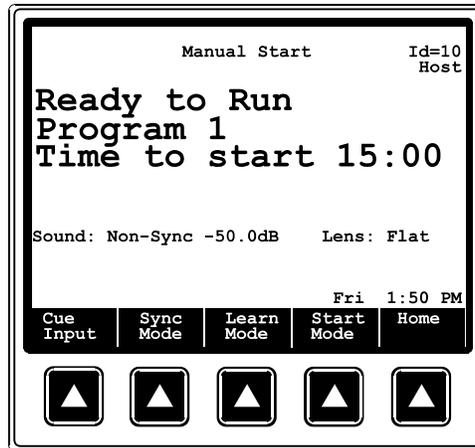
Figure 1.4: *Run Mode* or *Home* screen.

The Display Screen can be adjusted to provide the best viewing angle. Open the front door on the CNA-200 and find the blue potentiometer. Turn the pot with a small flat blade screwdriver until the desired viewing angle is achieved.

Section 2
Setup

Introduction

STOP - Please note at this point you should have completed the entire installation of the automation system. If you have not, refer to *PR001 CNA Installation Manual*.

This section describes how to setup and customize the system to meet the specific requirements of the theatre. The initial setup will be performed by the installing engineers and can be changed only by Supervisory personnel using the high level password. A low level password allows a lower level of programming for daily operations. Generally, the day-to-day operation will require only modification of show start times or film *format* changes that occur with normal changes of feature films.

The specific topics covered in this section are as follows:

- Power up Screen

- Set-up Menu

- Set-up Supervisory

- Set-up Dimmer

- Set-up Sound

- Set-up Programs

- Set-up Cue Learn Times

- Set-up Clock Start Times

- Copy Functions

- Local Copy

- Network Copy

- Manual Control

- Network Status Screens

- Remote Monitor

Power Up Screen

Apply power to the system. The screen will display the following power-up message:

```
*********************
** Strong CNA-200 **
**     Cinenet      **
**    Automation    **
*********************

   Version  1.029   Checksum  41852

         Ram Test Passed
         Power Up Reset
```
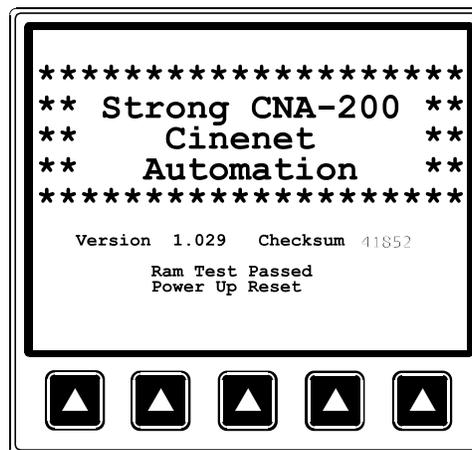
Figure 2.1

This message is displayed for five seconds each time the system is powered up. This screen indicates the software version number (i.e. Version 1.029) and the checksum number (i.e. Checksum 41852). The Checksum number is the arithmetic sum of the contents of the *firmware,* which is calculated upon each power up. This number should be recorded and posted for future reference. See Addendum for version numbers and their checksums.

Also on power up, a general purpose RAM test is performed to check the integrity of the system memory. The "RAM Test Passed" message indicates the memory is OK. There are several different methods by which the computer can be reset (or rebooted). The last message on this screen indicates the type of reset that occurred. The message "Power up Reset" is displayed each time the unit is powered up. If you see a message that is different than this, contact the factory.

Figure 2.2 shows the main screen, or the *Run Mode* screen. This screen will display run-time information during and between shows providing the user with critical feedback of show progress, film format, interlock status and fault conditions. From this screen the operator can activate or change modes of operation such as *start*, *sync* and *cue learn* mode. The *Run Mode* screen is explained in detail in the *Operation* section of the manual.

The lower section of the display is dedicated to defining the *softkeys*. These keys will change as you move to different screens in the system. The keypad to the right of the display will generally be used for entering numeric data and scrolling fields and screens.
To begin the system setup, press the MENU key.

```
        Manual Start           Id=10
                               Host

Ready to Run
Program 1



Sound: Non-Sync -50.0dB    Lens: Flat


                       Fri  1:50 PM
┌──────┬──────┬──────┬──────┬──────┐
│ Cue  │ Sync │Learn │Start │ Home │
│Input │ Mode │ Mode │ Mode │      │
└──────┴──────┴──────┴──────┴──────┘
```

```



              Menu
          Select Function
┌──────┬──────┬───────┬───────┬──────┐
│Set-up│ Copy │Network│Manual │ Home │
│      │      │       │Control│      │
└──────┴──────┴───────┴───────┴──────┘
```
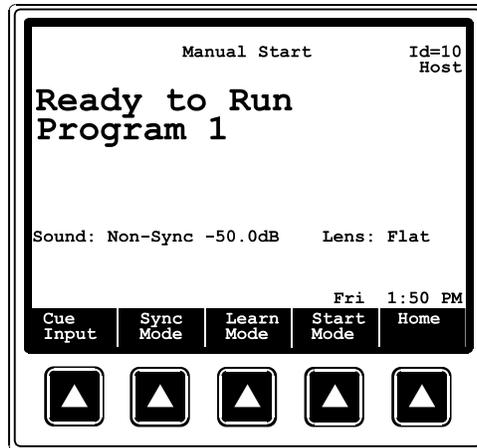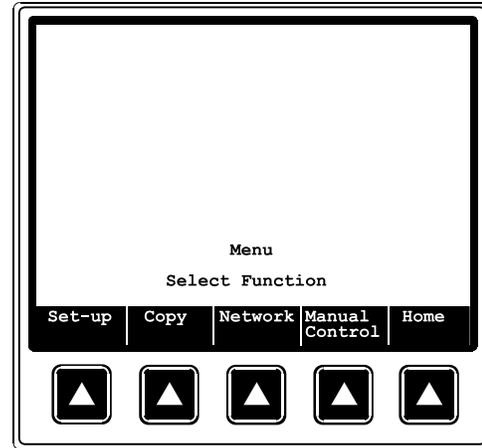
Figure 2.2: Home   Figure 2.3: Main Menu

Figure 2.3 shows the Main Menu screen. Here, you select the function or *sub-menu*.
Following are diagrams showing the menu structure of the CNA-200.

Figure 2.4 applies to software versions 1.003 through 1.010. Home is the main run screen. Pressing the [Home] key from any screen will take you to the main run screen.
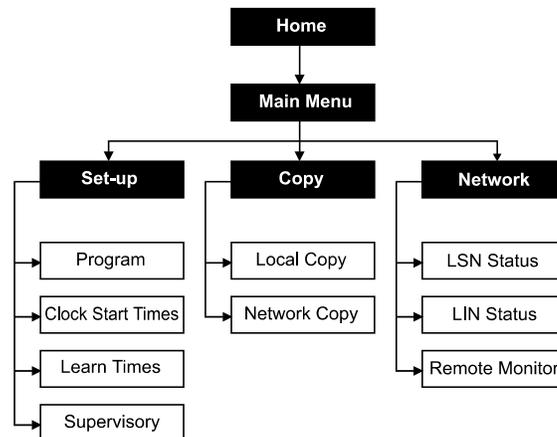
Figure 2.4: Menu structure for version 1.003 through 1.010.

The main menu was expanded in version 1.011 to include the Manual Control screen. Figure 2.5 applies to software version 1.011.
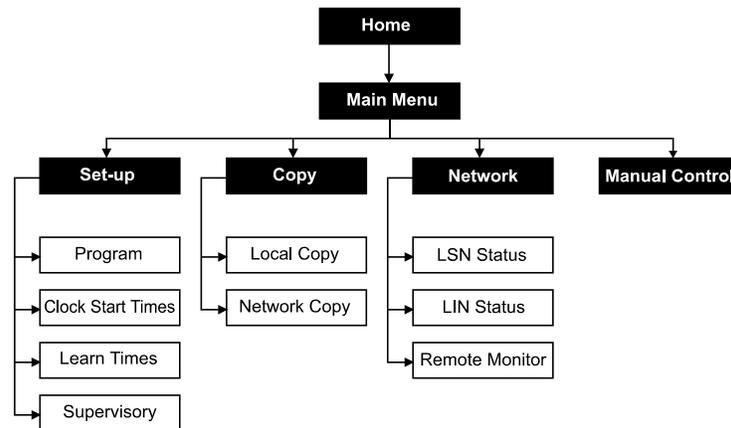
Figure 2.5: Menu structure for version 1.011.

The menu system was expanded in version 1.013. Figure 2.6 applies to version 1.013. Pressing the [Home] key "backs" out to the main run screen (one screen at a time).
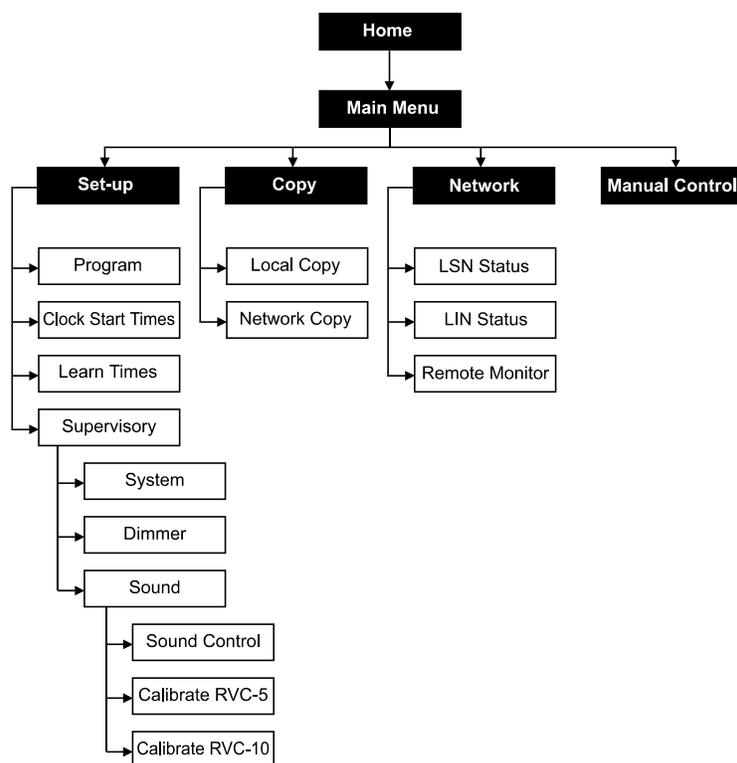
Figure 2.6: Menu structure for version 1.013.

The menu system was changed again in version 1.016. Figure 2.7 applies to version 1.016 through 1.029.
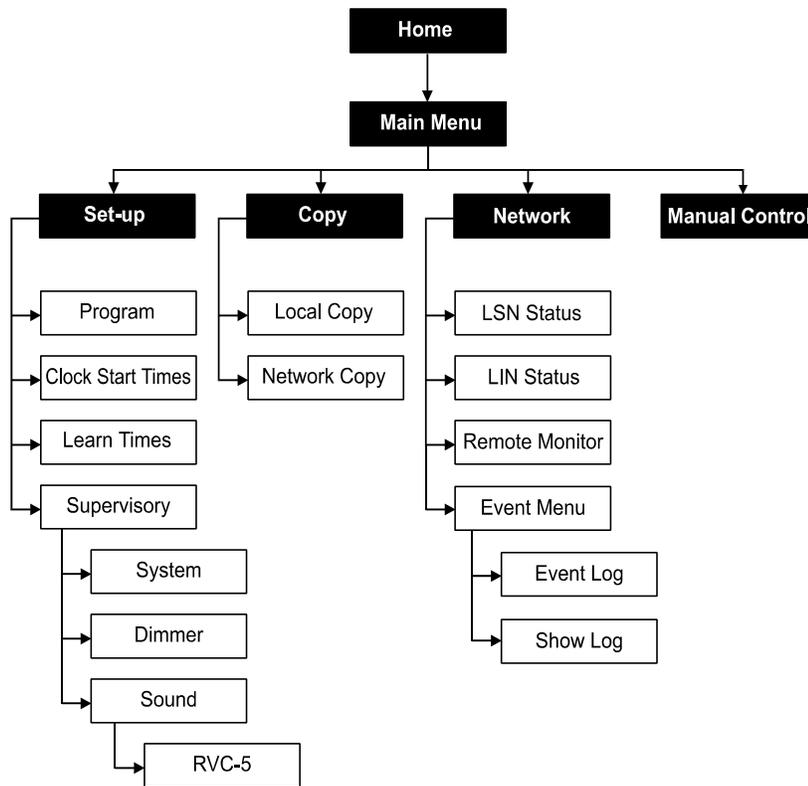
Figure 2.7: Menu structure for Version 1.016 to 1029

Set-up Supervisory

Supervisory is a set of system functions including relay contact configurations, power up states, maintenance schedules, interlock configurations and other system parameters. Supervisory allows the installation engineer to configure the system to support the booth and auditorium equipment.

From the main run screen, press [Menu][Set-up][Set-up Super] to enter the Supervisory screen.
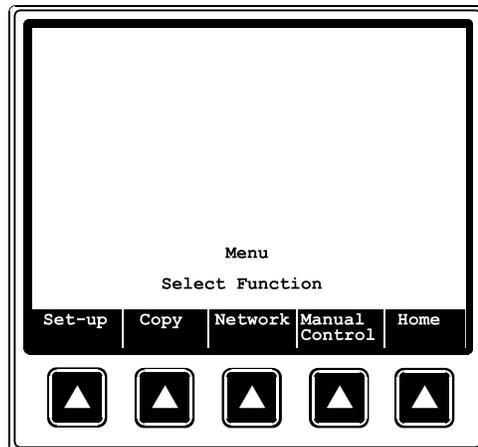
Figure 2.8
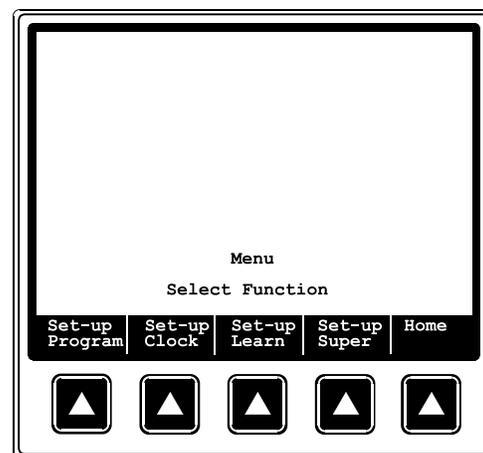
Figure 2.9

If you have software versions 1.004 or above you will need to enter the *high level* password at this point to get full access to all CNA system parameters. (Entering the *low level* password at this screen will provide limited access.)

Figure 2.10

Version 1.013 expanded Supervisory to include System, Dimmer and Sound setup. If you have version 1.013, pressing [Set-up Super] will take you to the menu screen shown in figure 2.11. Press [Set-up System] and enter password, as described above, to edit the CNA system parameters.
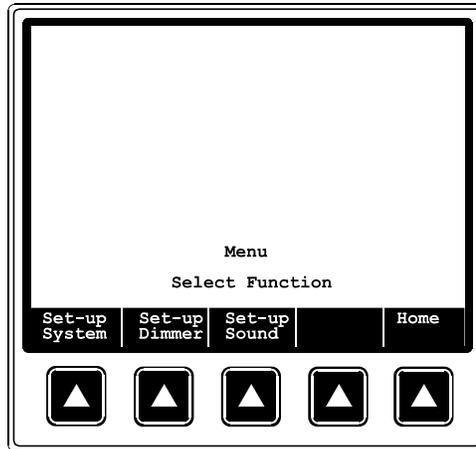
Figure 2.11   Figure 2.12

Use the [Prev Page] and [Next Page] softkeys to move to the different screens. Use the (left, right, up, down) *cursor* keys to move to different fields within each screen. The cursor will highlight the field to be edited. Edit the fields with the number keys or the [Select Message] softkey. Moving to the next field with either the cursor keys or the *Enter* key will save the data in the previous field.

Note: New in version 1.013 are the [Prev Message] and [Next Message] keys. They replaced the [Select Message] key. These new keys allow you to scroll through a list in both directions.

The CNA system screens are shown below.

Page 1:
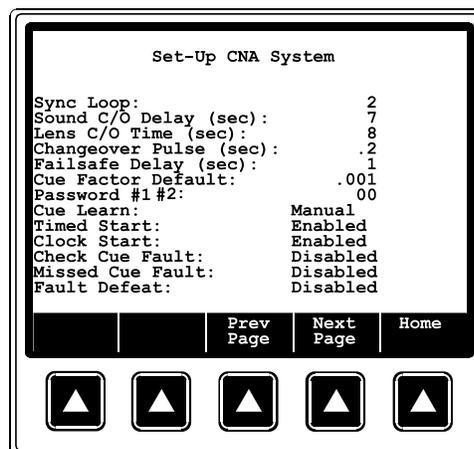
Figure 2.13: Applies to all versions.

Press the [Next Page] key to get to the second Supervisory screen. This is used to display accumulated Run Hours, Set Maintenance Schedules, Time of Day, date and 12 or 24 hour Time Format.

Page 2:

```
        Set-Up Supervisory

Run Hours:                      0 Elapsed
Schedule A (hrs):        0      0 Elapsed
Schedule B (hrs):        0      0 Elapsed
Schedule C (hrs):        0      0 Elapsed
Schedule D (hrs):        0      0 Elapsed
Time (24Hr)/Date:    13:00 11/13/1999 Tue
Time Format:                    12Hr




                      Prev    Next    Home
                      Page    Page
```

Figure 2.14: This page 2 applies only to versions 1.003 through 1.005.

```
        Set-Up CNA System

Run Hours:                      0 Elapsed
Schedule A (text):Rotate Xenon Bulb
         (hrs):          0      0 Elapsed
Schedule B (text):Check Projector Oil
         (hrs):          0      0 Elapsed
Schedule C (text):Clean Film Sensors
         (hrs):          0      0 Elapsed
Schedule D (text):
         (hrs):          0      0 Elapsed
Time  (24Hr)/Date:   13:00 11/13/1999 Tue
Time Format:                    12Hr
Remote Stop Alarm (sec):        30

                      Prev    Next    Home
                      Page    Page
```
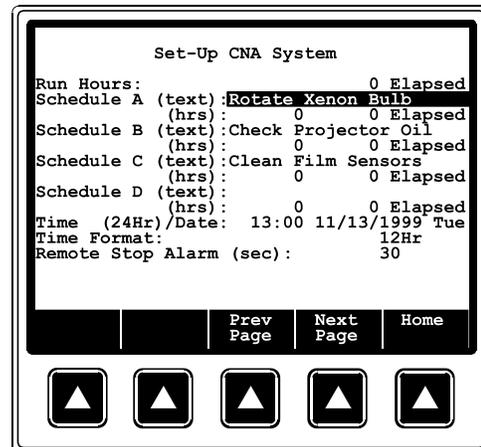
Figure 2.15: This page 2 applies only to version 1.006 and up.

Press the [Next Page] key to get to the third screen. Use *up*, *down*, *right* and *left* cursor keys to move to the desired field. This screen is used to configure the outputs. You can customize the relay *Contacts*, *Power-up* and *Fault-to* states.

Page 3:   Page 4:

```
        Set-Up CNA System

   Output      Contacts   Power-up Fault-to
Lens:         Pulsed      No-op    No-op
Masking:      Pulsed      No-op    No-op
Sound:        Pulsed      Non-Sync Non-Sync
H. Lights:    Pulsed      Up       Up
S. Lights:    Pulsed      Up       Up
Curtain:      Pulsed      None     No-op
Slide Proj:   Maintained  On       On
Out 1:        Pulsed      No-op    No-op
Out 2:        Pulsed      No-op    No-op
Out 3:        Maintained  No-op    No-op
Out 4:        Maintained  No-op    No-op


Prev    Next    Prev    Next    Home
Message Message Page    Page
```

Figure 2.16: Applies to all versions.

```
        Set-up CNA System

Output 1 Controls:      Curtain Open
Output 2 Controls:      Curtain Close
Output 3 Controls:      None
Output 4 Controls:      None






Prev    Next    Prev    Next    Home
Message Message Page    Page
```
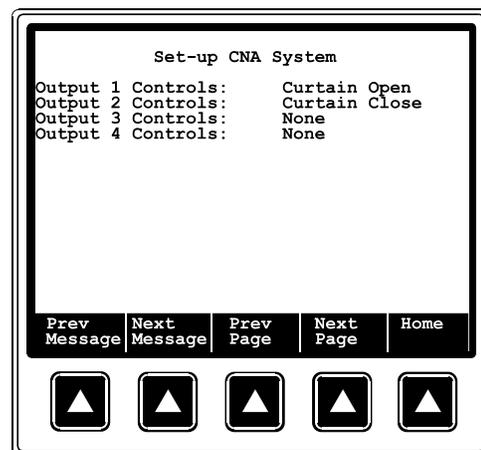
Figure 2.17: Applies only to version 1.013 or later.

Press the [Prev Page] key to go back to the previous Supervisory screens.

When editing the *numeric* data fields, there may be values that are out of range. If you enter an out range value and then try to move to the next field, the screen will display either a **DATA RANGE TOO HIGH** or **DATA RANGE TOO LOW** message. Entering a legal value will clear the message, and allow you to move to the next field.

The following is a list of CNA system Supervisory functions and definitions:

Sync Loop: **1**

The CNA-200 automation *Synchronous Network* is capable of supporting up to twenty (20) sync loops at one time. The Sync Loop number assigns the automation to one of twenty sync loops. This function can be accessed with either password. Legal entries are 0 through 20. 0 disables the system from the *Local Synchronous Network* (LSN) and synchronous operation. Enter the data with the number keys.

Sound C/O Delay (sec):   **3**

The sound changeover delay determines the delay time between the show start input and the sound changeover from the *non-sync* music source. For example, with the Sound C/O Delay set at 5, five seconds after the show starts the changeover will open. And five seconds after the last (end of show) cue is encountered the changeover will close. The legal range is 3 to 59 seconds. Enter data with the number keys.

Lens C/O Delay (sec):   **5**

This represents the time required for the lens turret to change positions from flat to scope. It is the time the changeover will remain closed during lens changes. The result is a black screen. To determine the desired value, simply time the lens turret and add 1 second. The legal range is 0 to 9 seconds. 0 disables the function. Enter data with the number keys.

Changeover Pulse (sec):   **.2**

This setting controls the duration or width of the pulse sent to the changeover. It is recommended that the Changeover Pulse be set to the minimum value that allows the changeover to complete its full stroke. The legal values are .1 to 1.0 seconds. Enter data with the number keys.

Failsafe Delay (sec):   **2**

This function is a film *bobble* delay designed to prevent premature shutdown caused by platter or other types of rewind and film transport equipment during startup or any other portion of the presentation. Any time the failsafe does not sense film presence during a presentation the Failsafe Delay timer is started, if film is detected before the timer expires, the presentation is not shutdown. If, however, film is not detected before the timer expires, the presentation is stopped and the alarm will sound. Legal entries range from 1 to 10 seconds.
 Enter data with the number keys.

Cue Factor Default: **.002**

This function is used in conjunction with CNA-200 *Cue Learn* system. The system learns the cue locations the first time a presentation is shown and places a "window", based on the Cue Factor number.   In the event of a missed cue, the CNA-200 maintains the proper timing of events by automatically inserting a cue at the end of the window.

Simply put, the cue window time is the *Cue Factor* multiplied by the *Cue Time*. For example, if The Cue Factor Default is .001 and the cue occurs 50 minutes into the presentation, the size of the window is: .001 X 50 = .05 minutes or (.05 X 60) 3 seconds. Remember, the time of each window is based on the distance the cue is from the beginning of the film. So it follows that the further the cue is from the beginning of the film, the larger the window will be. Based on this, select a Cue Factor you can live with. For an average length movie, a Cue Factor Default setting of .002 is good.

Note: For more information see *Cue Window Factor*.

Password #1, #2:   **12**

This function sets the *low level* or projectionist's password. Password #1 allows access to the Sync Loop number in Supervisory, Clock Start Times, Programs (format instruction only) and Cue Learn Times. It allows the projectionist to access the functions necessary to perform the job, while maintaining protection of the high level information. Legal entries are 00 through 99. Enter data with the number keys.
The high level password , Password #2 allows full access to program changes and other sensitive operating parameters. This can be any value from 0000 to 9999, it is entered in the same manner as the low level password described above. This High level password can be enabled/disabled with a DIP switch (See "DIP switch settings") This switch's operation can be overridden on CNA's with version 1.029 and above firmware. This override function is configurable as "On, Off or Default" in the first password configuration field. "On" requires a password regardless of DIP switch position, "Off" grants full access to programming without password, and "Default" allows the DIP switch to function as it always has. (Host 1.016 required for Host configuration of this parameter)

Cue Learn: **Manual**

This setting allows the Cue Learn Mode to be *manually* or *automatically* terminated at the end of the first presentation. In the Manual mode the operator is required to manually de-activate the Cue Learn Mode by pressing the Learn Mode key after the first presentation is completed.   In the Auto mode the CNA-200 assumes that all cues were in their proper location and the presentation went as planned. At the end of the first presentation the CNA-200 will automatically de-activate the Cue Learn Mode. The entries are **Auto** and **Manual**. Toggle the message with the Select Message key.

Timed Start: **Enabled**

This function controls access to the timed autostart function. The entries are **Enabled** and **Disable**d. When Timed Start is disabled the operator can not access the Time Start feature. Toggle the messages with the Select Message key.

Clock Start: **Enabled**

This function controls access to the clock autostart function. The entries are **Enabled** and **Disabled**. When Clock Start is disabled the operator can not access the Clock Start feature. Toggle the messages with the Select Message key.

Check Cue Fault: **Disabled**

When using the system Cue Learn mode feature there is a fault message that is displayed after running the presentation in *Learn* mode. The message **"CHECK CUE LEARN TIMES"** is displayed as a reminder to the operator to verify the cue times after the first show. This message can be suppressed by setting it to Disabled. Toggle the message with the Select Message key. See *Cue Learn Mode*.

Missed Cue Fault: **Disabled**

When using the system Cue Learn mode feature there is a fault message that is displayed after running the presentation in *Learned* mode. For example, the message **"MISSED CUE 3"** will be displayed if the system did not see cue foil 3 during the show. This message can be suppressed for those theatres that do not use cue foil on the film, or for some other reason do not want to see this fault message. Toggle the message with the Select Message key. See *Cue Learn Mode* for more information.

Fault Defeat: **Disabled**

This function allows the operator to *bypass* the Film Presence, Film Motion, Film Tension and Xenon Fault inputs. This would normally be used only for testing purposes, not for normal operation.

When Fault Defeat is set for Enabled, all the fault inputs are *bypassed*. When set for Enabled, the message **"FAULT DEFEAT ENABLED"** will be displayed as a reminder to the operator. The selections are Enabled and Disabled. Toggle the message with the Select Message key.

Run Hours: **12345**   **Elapsed**

This is a status only field, showing the number of hours the system has been running. It represents the accumulated time the projector has been operating. The elapsed time may be reset by entering **1 2 3 4 CLEAR**.

Schedule A,B,C,D (hrs):   150   50 Elapsed

These are four timed schedules which allow the setting of a timer (in hours) which will notify the operator each time the elapse time reaches the *set point.* For example, if Schedule A is set at 100 hours, the operator would be notified at 100 hour intervals. The message **"MAINTENANCE SCHEDULE A FAULT"** is displayed on all screens.

The Elapsed timer must be reset to 0 in Supervisory by pressing **1 2 3 4 CLEAR** with the cursor on the Elapsed time field. This will clear the fault message. Setting the set point to 0 disables the Maintenance Schedule fault message.

Note: Version 1.006 and later allows a 22 character message to be attached to each maintenance schedule. The messages are programmed from the Host computer and are displayed in the CNA system supervisory.

These timers are most commonly used to drive periodic maintenance or keep track of specific equipment life such as the xenon bulb. The set point range is 1 to 65535 hours. Data entry is made with the number keys.

Time of Day (24Hr):   14:30   3/21/1997 Fri

This function is used to set the internal clock. Enter the time in a 24 hour format. Cursor right to edit the Month, Day, Year and Day of week.

Time Format: 12Hr

The clock can be set for either the 12 or 24 hour format. Toggle the message with the Select Message key.

Remote Stop Alarm (sec):   30

Note: Version 1.006 and later. This function serves as a remote network alarm. When set to a non-zero time the alarm will pulse (for the programmed time) if another CNA automation on the network has faulted. Setting the time to 0 will disable this feature. Setting the time to 99 will sound the alarm until the alarm is canceled at the CNA that caused the fault or a Remote Monitor.

Output Configuration

The third and fourth screens are used to configure the relay outputs. Most outputs can be configured for pulsed or maintained contacts, power-up state and fault-to state.

Output	Contacts	Power-up	Fault-to
Lens:	Pulsed	No-op	No-op
Masking:	Pulsed	No-op	No-op
Sound:	Pulsed	Non-Sync	Non-Sync
H. Lights:	Pulsed	Up	Up
S. Lights:	Pulsed	Up	Up
Curtain:	Pulsed	No-op	No-op
Slide Proj:	*Maintained*	Off	Off
Out 1:	Pulsed	Off	Off
Out 2:	Pulsed	Off	Off
Out 3:	Pulsed	Off	Off
Out 4:	Pulsed	Off	Off

The fields shown in italics cannot be edited. The contacts can be set for pulsed or maintained. The Power-up fields determine the power-up states of the outputs, and the Fault-to fields determine what the output will do on a fault condition. The legal values for lights are Up, Down, Mid 1 and Mid 2 and no-op. The legal values the curtain are Open, Close, None and No-op. Legal values for the lens and masking are None, special, scope, flat, and no-op. And the legal entries for the rest are On, Off and No-op.

Note: Version 1.006 and later: allows programmable Lens and Masking power-up states. Only versions 1.029 and up allow programmable power up states for masking and sound, and Fault-to states for lens, masking, sound, house lights, and stage lights.
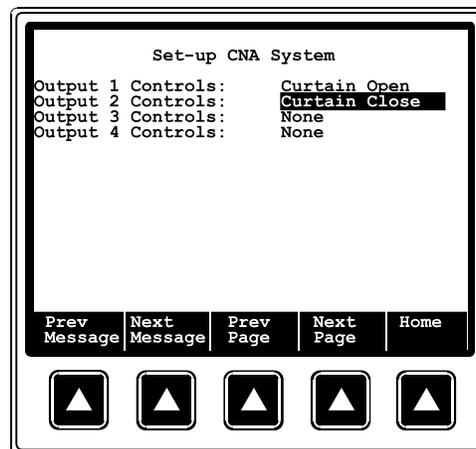
Figure 2.18

Note: Version 1.013 and later. This screen allows the user to configure Out 1, Out 2, Out 3 and Out 4 auxiliary outputs to drive any spare relays that may be available. At this time the "spare relays" supported are as follows:

None (disabled)	**Lens Special**	**Sound Digital 1**
Curtain Close	**Mask Flat ***	**Sound Digital 2 ***
Curtain Open	**Mask Scope ***	**Sound Mono**
Environment *	**Mask Special ***	**Sound Mute**
House Down	**Preamp 1 ***	**Sound Non-Sync**
House Mid 1	**Preamp 2 ***	**Sound SR**
House Mid 2	**Slide Proj B ***	**Sound SVA**
House Up	**Slide Proj C**	**Stage Down**
Lens Flat	**Sound Aux 1**	**Stage Up**
Lens Scope	**Sound Aux 2 ***	

* Requires 39331 Booth Termination board.

For example, the Curtain Open and Close relays can be re-directed to Out 1 and Out 2. Press [Prev Message] or [Next Message] to scroll through the list of relays.

Use the "Aux" instruction in a program to control the outputs. Use the "Aux Out" selections on the Manual Control screen to manually operate Out 1, Out 2, Out 3 and Out 4.

Set-up Dimmer

CNA-200 software version 1.013 (or later) and the QDC-400 Dimmer Control Board is required for this procedure. The CNA-200 and QDC-400 Dimmer Control board allow the user to configure lighting scenes.

Note: Before beginning be sure the QDC-400 Control board, dimmer power modules and lights are wired and tested.

Enter the dimmer set-up screens by pressing [Set-up Dimmer] from the Set-up Supervisory menu. Enter the password to gain access.
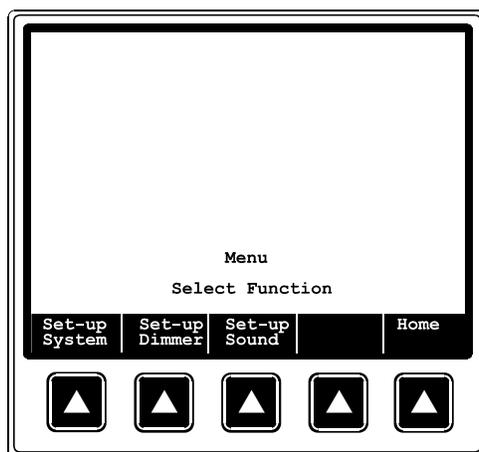
Figure 2.19: Press Set-up Dimmer.   Figure 2.20: Enter high level Password.

The QDC-400 is a four channel dimmer and each channel must be appropriately set to either "House", "Stage" or "None". *Note: Any additional selections are only used for light show programs, which are not yet available.* How these are configured will be determined by the "physical" wiring of the dimmer power modules and lights.

The CNA-200 currently supports up to four QDC-400 Dimmer Control cards. The channels are assigned to the dimmer cards as follows:

Dimmer Card 1: Channel 1, 2, 3, 4
Dimmer Card 2: Channel 5, 6, 7, 8
Dimmer Card 3: Channel 9, 10, 11, 12
Dimmer Card 4: Channel 13, 14, 15, 16

With the cursor on the channel field, enter the number of the channel you want to edit or press the [Prev Page] and [Next Page] keys.

```
        Set-up Dimmer Channels                        Set-up Dimmer Channels
            Dimmer Card 1                                  Dimmer Card 1

    Channel:  ■1=None                          Channel:   1=House

            Level      Fade-In                         Level      Fade-In
             (%)      Time (Sec)                         (%)      Time (Sec)
     Up       0           0                      Up       0           0
     Down     0           0                      Down     0           0
     Mid 1    0           0                      Mid 1    0           0
     Mid 2    0           0                      Mid 2    0           0




              Prev   Next   Home         Prev   Next   Prev   Next   Home
              Page   Page                Message Message Page  Page
```
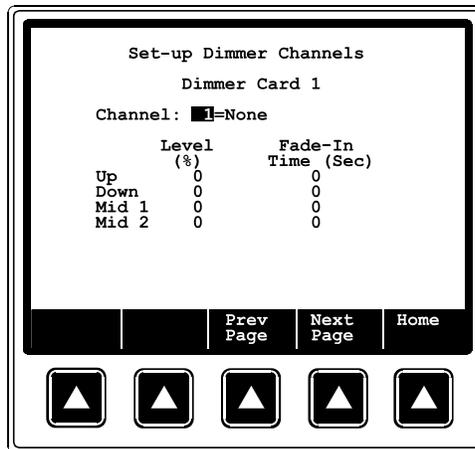
Figure 2.21: Select channel to edit.   Figure 2.22: Select zone.
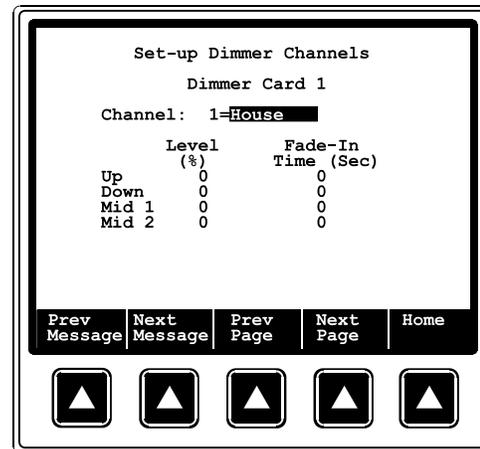
Scroll right to the "zone" field and select either House, Stage or None with the [Prev Message] and [Next Message] keys. This field contains a list of 16 zones and None (disabled). Two of the zones are defined as House and Stage. Currently the CNA-200 only supports the House and Stage zones. The selections in the list are as follows:

None	**ZONE 9 ***
House	**ZONE 10 ***
Stage	**ZONE 11 ***
ZONE 3 *	**ZONE 12 ***
ZONE 4 *	**ZONE 13 ***
ZONE 5 *	**ZONE 14 ***
ZONE 6 *	**ZONE 15 ***
ZONE 7 *	**ZONE 16 ***
ZONE 8 *	

*supported only by versions 1.028 and up of CNA-200 firmware.
Note: Version 1.028 and above software causes lighting zones 3-16 to turn off in the event of loss of LIN communications. These outputs will remain in their current state however if a firestop is encountered.
At power up, zones 3-16 resume their previous states, stopping a show will not affect their current state.

Use the cursor keys to move to the Level and Fade-In Time fields. Enter the desired values for each with the number keys. The fade-in time controls how long it takes the lights to ramp to a new level. Legal values for level are 0 to 100%. Legal values for fade-in time are 0 to 99 seconds.

Note: You can ignore the Stage Mid 1 and Mid 2 levels. The CNA-200 does not currently use them.
See the *QDC-400 Dimmer Controller* manual for more detail on installing and setting up the dimmer.

Set-up Sound

Selecting the "Set-up Sound" supervisory key will allow the set-up of the RVC-5 volume control accessory. To access the RVC-5's settings you must enter the #2 high level password.

The option of RVC-5 Enabled or Disabled is given along with Output 1 and 2 selections offering Eprad DSS, Sony DFP-D3000, Dolby CP65 Dolby CP500 and Ultra Stereo JS-200. (The enabling/ Disabling of the RVC-5 also affects access to the Volume level parameter in the Manual control menu). This function will only be used when a RVC-5 (PN 39370) accessory is used on either the single or booth termination board (PN 39332 or 39331).

Note: See RVC-5 installation manual for more information on this subject
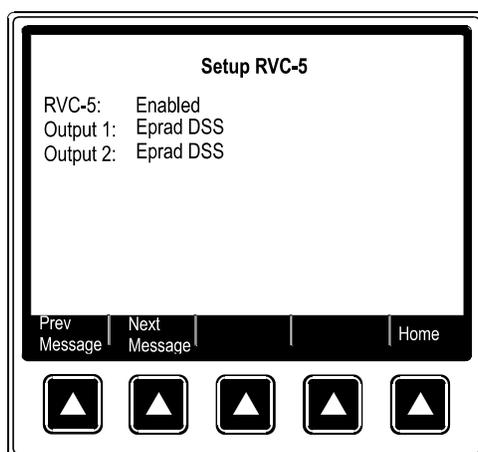
Figure 2.23

Set-up Programs

The engineer/operator can program up to nine (9) individual programs. Each program may contain up to 99 lines or steps of instructions. In this section the procedures and rules for the program functions are covered.

The CNA-200 is a *cue-driven* automation. This means that events, such as lens, masking and sound changes, are initiated by a cue (normally foil placed on the film). These events are stored in the CNA-200's memory and are called *programs*. The CNA-200 gives you the ability to build and store up to nine different programs. Each program can contain up to ninety-nine *instructions* which are performed sequentially. An instruction is a particular function that will be executed during a *program step*. It may have a timed relationship to the step; that is, stage lights may be programmed to dim ten seconds after the instruction is encountered in the program. Each instruction is identified by an *instruction number*.   Figure 2.24 shows the relationship of the cues and the segments of a program in which events are initiated by the automation. Figure 2.24 also shows a typical program segment and the components that make it up.
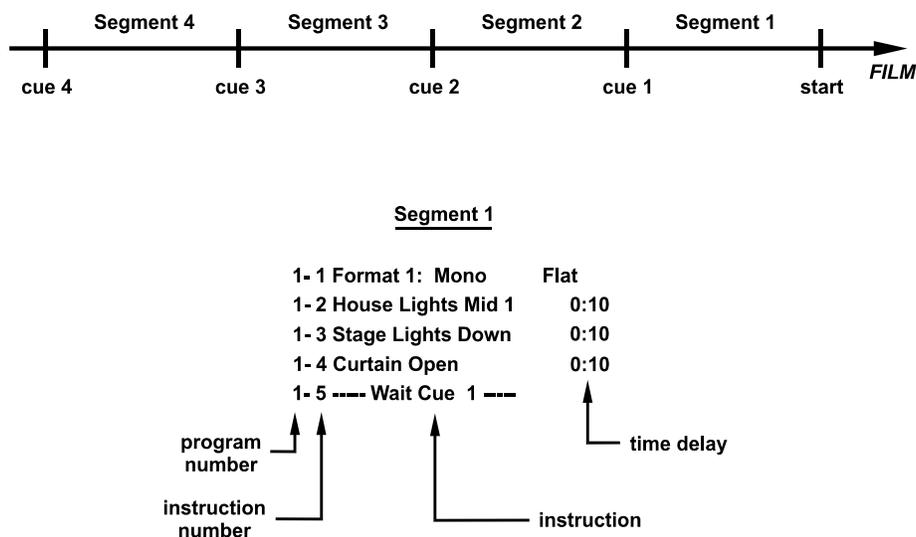
Figure 2.24

The parts of a program are defined below:

Program number This number is the program you are viewing or editing. You can build and save up to nine different programs.

Instruction number Each instruction in a program has a step number. Each program can contain up to ninety-nine (99) instruction steps.

Instruction A program is made up of a sequence of commands called instructions that are designed to execute a specific function. There are currently thirty four unique instructions available.

Time delay Many of the instructions allow a time delayed execution of the function.

Program Instructions

This section is a reference for the program instructions supplied with version 1.003 through 1.029. It includes descriptions of the each instruction, rules governing their application.

There are 34 program instructions that allow the user to customize the presentation. These instructions can be used to control and manipulate the following:

> House and Stage Lighting
> - Curtains
> - Slide Projector
> - Cue Factor
> - Film Sound and Lens Formats
> - Number of Cues
> - Time Delays
> - Projector Control
> - Intermissions

House Lights

1	House Lights Up	00:00 to 59:59 (minutes:seconds)
2	House Lights Down	00:00 to 59:59 (minutes:seconds)
3	House Lights Mid 1	00:00 to 59:59 (minutes:seconds)
4	House Lights Mid 2	00:00 to 59:59 (minutes:seconds)
5	House Lights None	00:00 to 59:59 (minutes:seconds)

Each of these instructions operate in the same manner to control the four House Light outputs. House Lights None would normally only be used when contacts are configured for *Maintained*. A single timer is used to implement these five instructions. Execution of the instruction simply sets and starts the timer. When the timer times out (counts down to zero) the output is set to the desired state. When the outputs are configured for *Pulsed*, a transition to the *on* state will cause the output to occur. Control immediately interprets the next instruction in the list. The time is specified in minutes and seconds.

Note: Executing one of these instructions again (before the timer times out) simply overrides the previous instruction.

Stage Lights

6	Stage Lights Up	00:00 to 59:59 (minutes:seconds)
7	Stage Lights Down	00:00 to 59:59 (minutes:seconds)
8	Stage Lights None	00:00 to 59:59 (minutes:seconds)

This set of instructions each operate in the same manner to control the two Stage light outputs. A single timer is used to implement these three instructions. Execution of the instruction simply sets and starts the timer. When the timer

times out (counts down to zero) the output is set to the desired state. When the outputs are configured for *Pulsed*, a transition to the *on* state will cause the pulse to occur. Control immediately interprets the next instruction in the list. The time is specified in minutes and seconds.

 Executing one of these instruction again (before the timer times out) simply overrides the previous instruction.

Curtain

9	Curtain Open	00:00 to 59:59 (minutes:seconds)
10	Curtain Close	00:00 to 59:59 (minutes:seconds)
11	Curtain None	00:00 to 59:59 (minutes:seconds)
12	Curtain Call	00:00 to 59:59 (minutes:seconds)
13	Curtain Close Early	00:00 to 59:59 (minutes:seconds)

Curtain Open, Curtain Close and Curtain None each operate to control the curtain open and close outputs. A single timer is used to implement these instructions. Execution of the instruction simply sets and starts the timer. Later, when the timer times out the output are set to the desired states. Control immediately interprets the next instruction on the list. The time is specified in minutes and seconds.

Executing one of these instructions again (before the timer times out) simply overrides the previous instruction.

Curtain Call is a special instruction that is active only when running in the *Learned Mode*. Based on the learned time of the next film cue, the instruction calculates the time before that cue and executes a curtain close output. Upon reading that cue the curtain will reopen. For example, with the Curtain Call is set for a time of 10 seconds the curtain will start to close 10 seconds before the next cue is read. When the cue is read the curtains will begin to open. This instruction can be used to close the curtain at the end of a trailer and then reopen the curtain at the beginning of the main feature. Time is specified in minutes and seconds and should be set 2 to 5 seconds longer than the time required for the curtain to fully close. Control immediately interprets the next instruction on the list.

Curtain Close Early is another special instruction that is only active in the *Learned Mode*. The curtain will close prior to the last cue. The amount of time set determines how *early* the curtain closes. This could be used to synchronize the curtain closing with the changeover to prevent the audience from seeing a "white" screen at the end of the presentation.

Slide Projector

14	Slide Projector On	00:00 to 59:59 (minutes:seconds)
15	Slide Projector Off	00:00 to 59:59 (minutes:seconds)

This set of instructions operate to control the Slide Projector output. A single timer controls these instructions. Executing one of these instructions sets and starts the timer. Executing one of these instructions again (before the timer times out) overrides the previous instruction. Time is specified in minutes and seconds. Data entry is made with the number keys

Cue Factor

16	Cue Factor	.000 to .999

This instruction overrides the Cue Factor Default (Supervisory function) for the remainder of the program and adjusts the cue window accordingly. Control immediately interprets the next instruction on the list. Data entry is made with the number keys.

Film Format

17	Format 1: Sound Lens

This instruction allows the film format parameters to be selected. The changeover occurs as defined in supervisory function. System immediately interprets next instruction on the list. Sound selections include: Non-Sync; Mono; SVA; SR; Dig 1; Aux 1; Dig 2; Aux 2. Aux 1 and 2 can be used for any desired function i.e. a mute, synthesized stereo, magnetic, special types of noise reduction. Lens selections include: Flat; Scope; Special. The legal range for the format number comment is 0 to 20.

Wait Cue

18	--- Wait Cue ---	0 to 20

This instruction causes the program to wait for one of the following:

In the *Learn Mode* (Cue Learn active):

1. A film cue
2. Cue input (key)
3. Failsafe (end of film) when last cue is expected by program

In the *Learned Mode* (Cue Learn not active):

1. A film cue within learned cue window
2. Cue input (key)
3. Failsafe (end of film)within last cue window

The failsafe can be used as the last cue if a failsafe shutdown is desired.

Control immediately executes next instruction on the list. Data entry is made with the number keys.

Shutdown Delay

19	Shutdown Delay	00:00 to 59:59 (minutes:seconds)

This instruction extends the normal shut down time of the projector motor in the time specified. Shutdown Delay overrides the *global* end of show timer. This can be used to allow film to clear the projector before shut down. Time is specified in minutes and seconds.

Wait

20	--- Wait ---	00:00 to 99:99 (minutes:seconds)

This instruction causes a delay for the specified time in minutes and seconds. When the Wait instruction is encountered in a program the timer starts to "tick". No other instructions in the program are executed until the timer times out (counts down to zero). This instruction, for example, can be used with the Curtain instructions to perform a "curtain call" or for special intermission features.

A manual cue input or a film cue will abort this instruction and control will immediately execute the next instruction on the list. If used during an intermission, a start input will abort the Wait instruction.

When the time is set to the maximum value of 99:99 the instruction waits indefinitely. A RESUME or remote RESUME will terminate the wait and continue the program.

Changeover

21	Changeover Open	00:00 to 59:59 (minutes:seconds)
22	Changeover Close	00:00 to 59:59 (minutes:seconds)
23	Changeover None	00:00 to 59:59 (minutes:seconds)
24	Changeover Auto	00:00 to 59:59 (minutes:seconds)

The *Sound Changeover* is normally handled automatically by the control. This set of instructions is very powerful and provides the user with more control of the Sound Changeover outputs. Time is specified in minutes and seconds.

Using the Changeover Open, Changeover Close and Changeover None instructions in a program simply override the *automatic* Sound Changeover *logic*, with the exception of a film break.

Use the Changeover None to suppress the automatic open or close of the changeover. Use the Changeover Open and Changeover Close to control the Changeover outputs as desired.

Use the Changeover Auto to return control of the Sound Changeover back to the *automatic* changeover open and close *logic*.

The **delay time** can be used to delay the execution of the instruction by the amount specified. For example if you want the changeover to close, and then re-open after 8 seconds, you would use the instructions as follows:

1-10	Changeover Close	0:00
1-11	Changeover Open	0:08

Enter time with number keys.

Projector Motor/Lamp

25	Projector Motor/Lamp On
26	Projector Motor/Lamp Off

The Projector Motor/Lamp On instruction turns *on* the projector motor and xenon lamp but does not initiate automatic show start logic (changeover open, etc.). A "Wait Cue" instruction (and a film cue) is required to initiate show start logic.

The Projector Motor/Lamp Off instruction causes the projector motor and xenon lamp to turn *off* using the normal show end timers and closes the changeover. This instruction can also be used to keep the projector motor from coming on at the beginning of a show.

Intermission Wait

27	Intermission Wait	00:00 to 99:99 (minutes:seconds)

This instruction is used for intermissions and other special applications. This instruction automatically switches the system to non-sync sound and initializes the projector motor shutdown. The changeover is closed with the normal delay. Shutdown is maintained until the programmed time is expired or a RESUME is received. This instruction requires a Wait Cue instruction (and a film cue) to initiate the *show start logic*.

When the time is set to the maximum value of 99:99 the instruction waits indefinitely. A RESUME or remote RESUME will terminate the wait and continue the program.

Aux

28   **Aux** [**Out** *d*] [*On/Off/No-op*] 00:00 to 99:99 (minutes:seconds)

Note: Version 1.013 and later. This instruction controls the four auxiliary outputs.

Out *d*   Select Out 1, Out 2, Out 3 or Out 4 with the [Prev Message] and [Next Message] keys.

On   This selection causes transition to the *on* state.
Off   This selection causes transition to the *off* state.
No-op   This selection causes the output to do nothing at all!

A timer is used to implement this instruction. Execution of the instruction simply sets and starts the timer. When the timer times out (counts down to zero) the output is set to the desired state. Control immediately interprets the next instruction in the list. The time is specified in minutes and seconds.

Note: Executing the same instruction again (before the timer times out) simply overrides the previous instruction.

Volume, Fade Time

29   **Volume** [*+/-dd.d*]**dB   Fade Time** [*nn*] 00:00 to 99:99 (minutes:seconds)

+/-dd.d   Specifies the volume level in decibels referenced to '0' dB.

nn   Specifies the fade time in seconds.

Note: Version 1.016 and later. Volume in the auditorium can be controlled automatically by using the volume instruction. Enter the volume level with the number keys and change the number to positive or negative with the **+/-** key. Fade time is defined as how many seconds it will take to *ramp* to the new sound level. Enter the fade time with the number keys. The volume instruction has a level range of -50.0dB to +10.0dB and a fade time range of 0 to 10 seconds.

Enter volume instructions for each cue as required. Just like any other instruction, the volume instruction can be added anywhere in a program and must be separated by a Wait Cue or Wait timer instruction.

Lights

30   **Type,** [house, stage, zone 3-16] **level,** [up, down, mid1, mid2] **and delay time.** [nn] 00:00 to 59:59

Selecting this operation lets the programmer chose house, stage, and zones 3-16 Chose up, down, mid1, and mid2. And select delay times.
Note: Version 1.028 and above.

 Sound

31   **Select,** Non-sync, Mono, SVA, SR, Dig1, Aux1, Dig2, Aux2, Mute off, Mute on.

Lens/ Masking

32   **Type**, Flat, Scope, Special

Lens

33   **Type**, Flat, Scope, Special

Masking

34   **Type,** Flat, Scope, Special

A cue key or remote cue from the cue detector will terminate the wait and execute the next Wait Cue instruction.

The following table summarizes the 29 Program Instructions available with versions 1.003 through 1.011. Instruction number 28 was added in version 1.013. Instruction number 29 was added in version 1016. Instructions 30-34 came with version 1.028

No.	Instructions	Range
1	House Lights Up	0:00 to 59:59 minutes:seconds
2	House Lights Down	0:00 to 59:59 minutes:seconds
3	House Lights Mid 1	0:00 to 59:59 minutes:seconds
4	House Lights Mid 2	0:00 to 59:59 minutes:seconds
5	House Lights None	0:00 to 59:59 minutes:seconds
6	Stage Lights Up	0:00 to 59:59 minutes:seconds
7	Stage Lights Down	0:00 to 59:59 minutes:seconds
8	Stage Lights None	0:00 to 59:59 minutes:seconds
9	Curtain open	0:00 to 59:59 minutes:seconds
10	Curtain Close	0:00 to 59:59 minutes:seconds
11	Curtain None	0:00 to 59:59 minutes:seconds
12	Curtain Call	0:00 to 59:59 minutes:seconds
13	Curtain Close Early	0:00 to 59:59 minutes:seconds
14	Slide Projector On	0:00 to 59:59 minutes:seconds
15	Slide Projector Off	0:00 to 59:59 minutes:seconds
16	Cue Factor	.000 to .999
17	Format : Sound Lens	Non-Sync;Mono;SVA;SR; Dig 1;Aux 1;Dig 2;Aux2 Flat;Scope;Special
18	Wait Cue	0 to 20
19	Shutdown Delay	0:00 to 59:59 minutes:seconds
20	Wait	0:00 to 99:99 minutes:seconds
21	Changeover Open	0:00 to 59:59 minutes:seconds
22	Changeover Close	0:00 to 59:59 minutes:seconds
23	Changeover None	0:00 to 59:59 minutes:seconds
24	Changeover Auto	0:00 to 59:59 minutes:seconds
25	Projector Motor/Lamp On	N/A
26	Projector Motor/Lamp Off	N/A
27	Intermission Wait	0:00 to 99:99 minutes:seconds
28	Aux	0:00 to 99:99 minutes:seconds
29	Volume, Fade Time	0:00 to 99:99 minutes:seconds
30	lights, type level, delay	0:00 to 59:59
31	sound	non-sync, mono,sva, sr, dig 1
32	lens/ masking	flat, scope, special
33	Lens	flat, scope, special
34	masking	flat, scope, special

Program Operation

The CNA-200 is a *cue-driven* automation. This means that events, such as lens, masking and sound changes, are initiated by a cue (normally foil placed on the film). These events are stored in the CNA-200's memory and are called **programs**. The CNA-200 gives you the ability to build and store up to nine different programs. Each program can contain up to ninety-nine **instructions** which are performed sequentially. An **instruction** is a particular function that will be executed during a *program step*. It may have a timed relationship to the step; that is, stage lights may be programmed to dim ten seconds after the instruction is encountered in the program. Each function is identified by an *instruction number*.

A **Program** is a series of events that the system will perform in the order in which those instructions are encountered in a Program list. Most instructions have timers that determine when the actual event will take place in relation to when the instructions is encountered. For example, when the "House Lights Down   0:30" instruction is encountered; the system understands this instruction, and proceeds to the next instruction on the list. 30 seconds later the house lights will go down.

Important Program Instructions are: Format, Wait Cue, and Wait.

Format: Format configuration will be displayed when the system is running a film presentation, show the type of sound, lens, and projector speed used. Up to 10 different Format instructions can be used during a program.

Wait Cue: The run input can be thought of as a first cue that starts the program. All instructions are executed until the first WAIT CUE is encountered. The cue may be from the cue detector assembly or from the Cue Input key. The system will then perform the next set of instructions on the list up to the next WAIT CUE instruction. When the last WAIT CUE instruction in the program list is encountered, the system will perform the End of Show functions (changeover close, sound to non-sync, etc.). A maximum of twenty cues may be encountered in a Program.

Wait: Halts the execution of any program instructions for a prescribed period of time in minutes and seconds. WAIT may be used in a Program during a film portion of the program, as well as after the film to initiate programmed intermission functions. After the programmed time has expired, the system performs the next instruction on the list. WAIT may be terminated at any time by pressing the Start or Cue Input.

Building Programs

This simple procedure describes how to insert and edit instructions to build a program. Begin by entering the Program Editor.
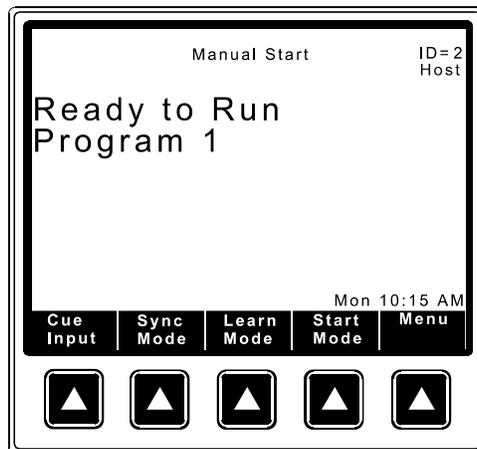
Figure 2.25: Press the [Menu] key to go to the main menu.
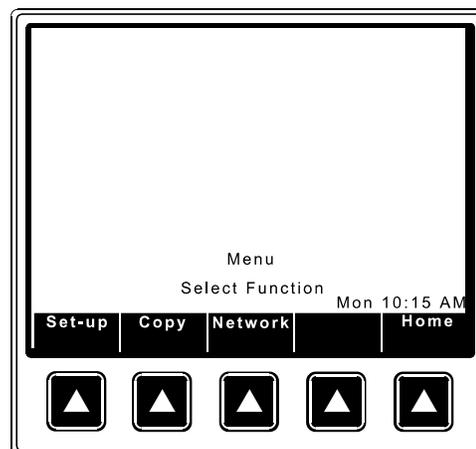
Figure 2.26: Press the [Set-up] key to go to the set-up menu.
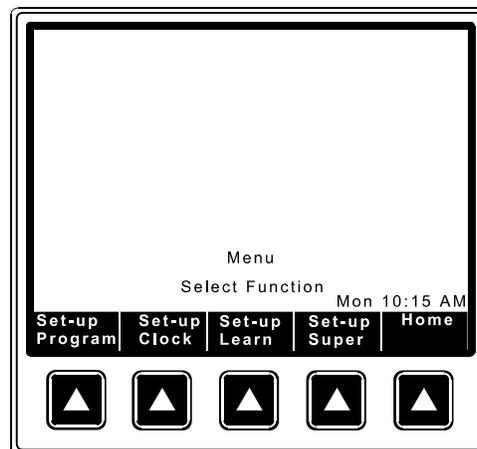
Figure 2.27: Press the [Set-up Program] key.
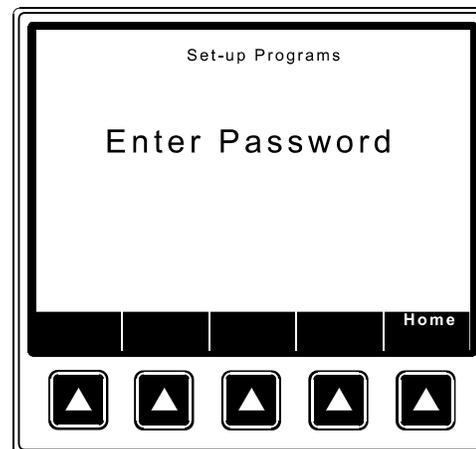
Figure 2.28: Enter the *high level* password.

The screen displays an empty program with the cursor on step 1. (The first number is the program number, the second is the step number.) Begin by pressing the [Insert] key. The cursor will highlight the entire step. Once in **Insert mode** there are two methods of entering instructions. The first method is to use the cursor up and down keys to scroll through the list of 34 instructions. The second method is to enter the number of the instruction. The correct instruction will be inserted and displayed.
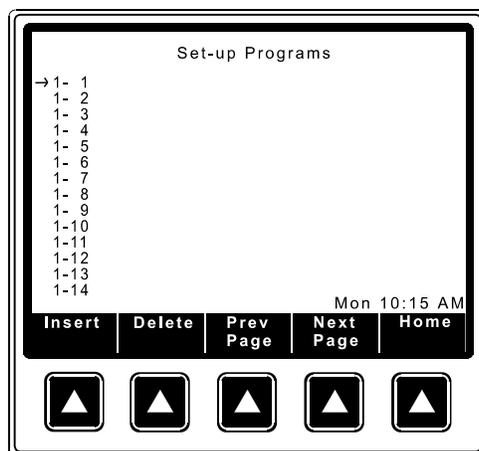
Figure 2.29: Press [Insert].
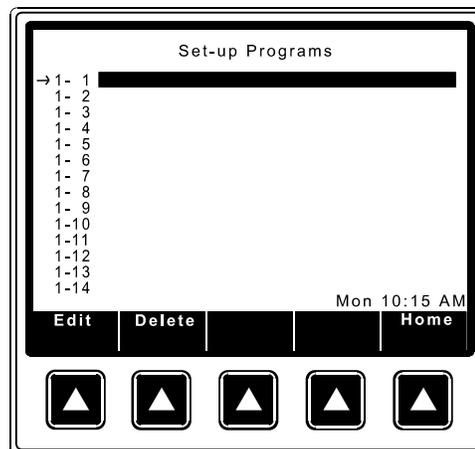
Figure 2.30: The cursor will highlight step 1-1:.
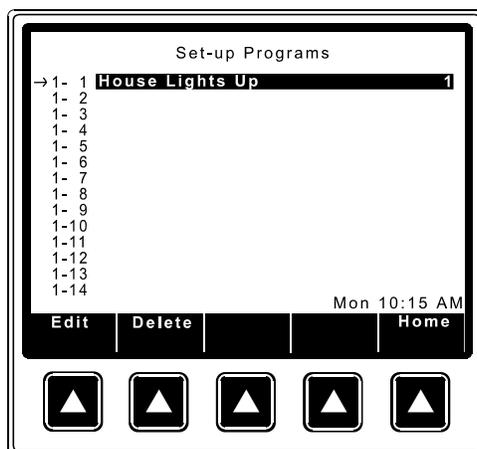
Figure 2.31: Press the cursor down key to scroll the list of instructions 1 through 34.
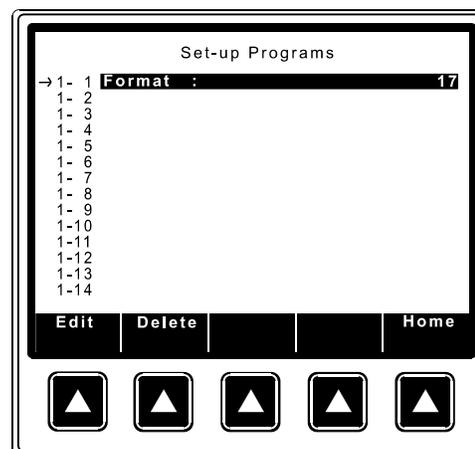
Figure 2.32: Press [1][7][ENTER] to insert the Format instruction.

Insert Mode allows you to edit the fields in each instruction. The Format instruction has three fields to edit. Use the cursor right and left keys to scroll through the fields. Use the number keys to edit the numeric data and the Select Message key to edit text fields.
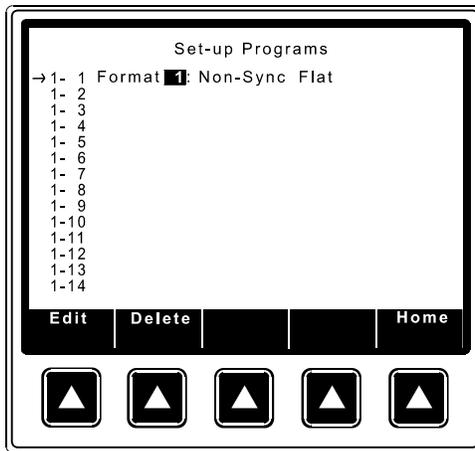
Figure 2.33
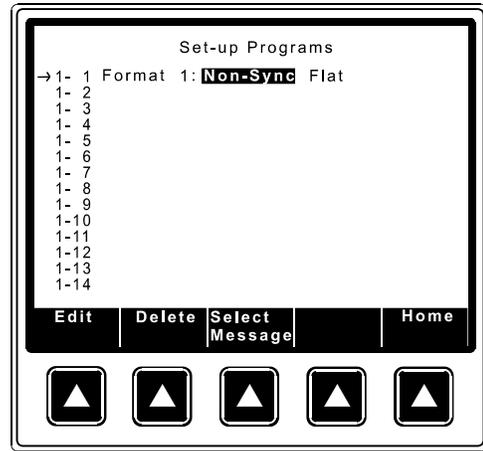
Figure 2.34: Cursor right to next field.

Note: When inserting instructions by entering the instruction number, enter a leading 0 for the single digit instruction numbers. Or press [ENTER] after entering the single digit number.
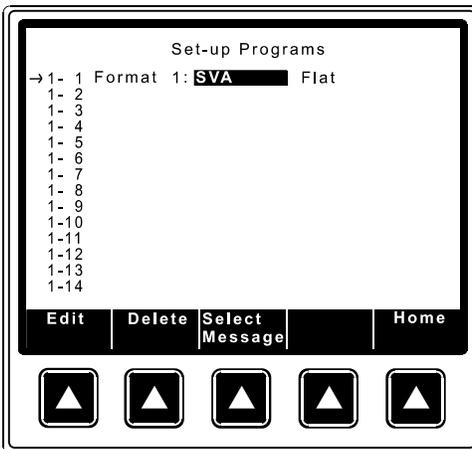
Figure 2.35: Press [Select Message] to change the sound format.
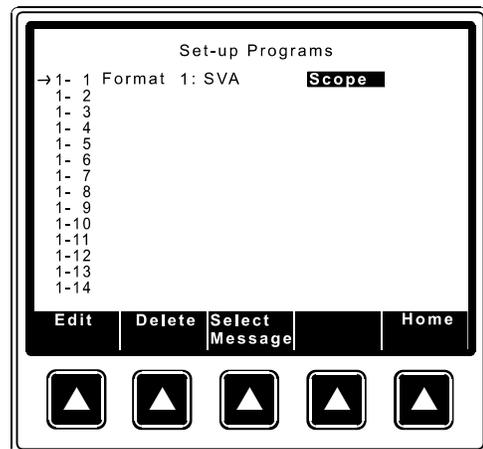
Figure 2.36: Cursor right to the lens format field. Press [Select Message] to edit.
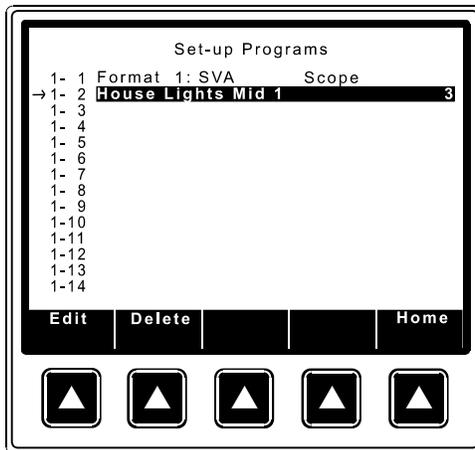
Figure 2.37: Cursor down to the next field and select instruction 3.
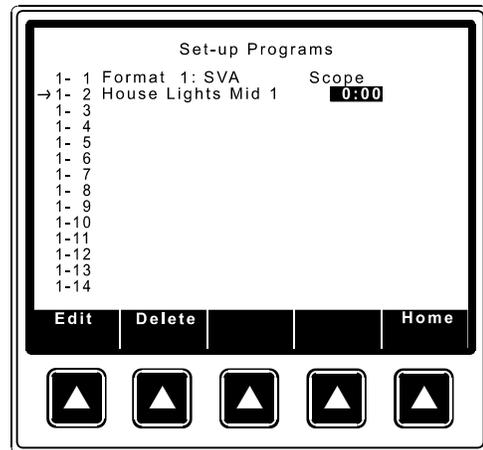
Figure 2.38
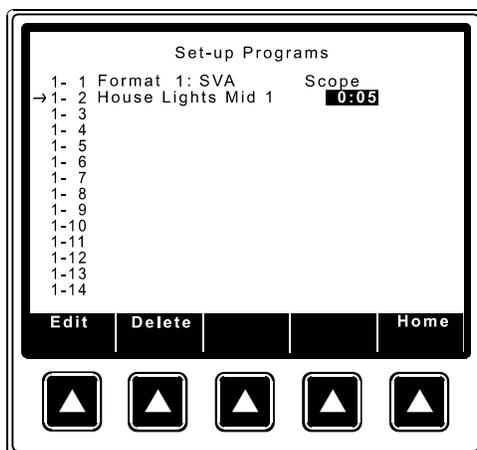
Figure 2.39: Enter a delay time.   Figure 2.40
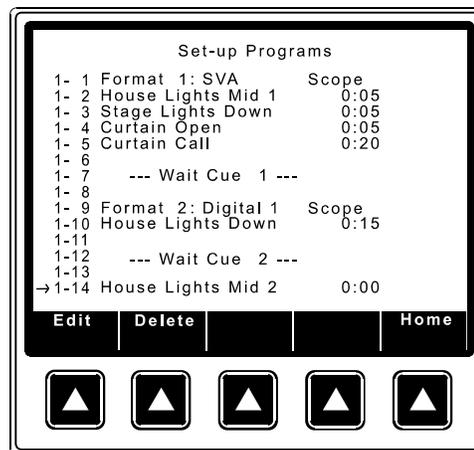
Beginning with version 1.013 software, the [Select Message] key is replace with [Prev Message] and [Next Message] keys. This allows you to scroll through the list of options in both directions.

Programming Notes

Remember "anticipatory" instructions (Curtain Call and Curtain Close Early) must be encountered before the Wait Cue instruction and are only active in the "Learned" mode.

Use the Cue Learn Mode on the first showing of a feature. If film cues are absent, insert cues manually as required using Cue Input key.

To delete an entire program: copy an "empty" program into the program you want to delete; or enter step #1 of the program and repeatedly press Delete to clear all program steps. Be sure all steps are cleared.

The CNA-200 contains a "Canned" program called "Default 1" in the Local Copy screen. Copy this program to one of the program locations. This program can be useful as a starting point and can be modified to meet your particular requirements. *Note: Version 1.006 or later.*

The last Wait Cue instruction will initiate the show close functions.

When data entry is complete verify the information by scrolling through the program and checking it against the written copy. Verify the actual operation of the program by running a "dummy" show. remember to experiment with fault and power loss conditions.

Switching between programs while on a particular step will move you laterally to the same step in the new program.

Set-up Cue Learn

Each time a program is executed the computer stores each cue time in memory. If the CNA-200 was in *cue learn mode* when the show ended the values for the cue times are saved to a table in *battery-backed* memory. The values in this table can be viewed and edited. A program can store up to twenty cue times. Access is granted with *password 1* or *2*. To access the cue times from the Set-up menu, press [Set-up Learn] and enter the password.

```
            Set-up Cue Learn Times
Program    ▮1

   Learn Times              Learn Times
   1      2:47        11       0:00
   2      5:31        12       0:00
   3     98:04        13       0:00
   4      0:00        14       0:00
   5      0:00        15       0:00
   6      0:00        16       0:00
   7      0:00        17       0:00
   8      0:00        18       0:00
   9      0:00        19       0:00
  10      0:00        20       0:00



                               Home

  ▲      ▲      ▲      ▲      ▲
```
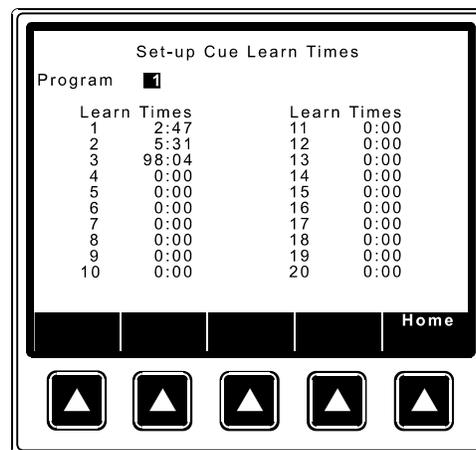
Figure 2.41: From the Set-up menu, press [Set-up Learn] and enter the password.

Enter the program number you want to view and press [ENTER]. Now you are viewing the *cue learn times* for Program 1. At this time you may enter or edit the cue learn times by using the number keys. Press the cursor keys or [ENTER] to move to different learn time fields. The learn times are displayed in minutes and seconds. The maximum value that can be entered is 999 minutes 59 seconds (equivalent to 16 hours 39 minutes and 59 seconds). Press the [CLEAR] key to reset the cue time to 0:00. Clear all cue times which are not being used. **Verify upon completion that all cue times are arranged in chronological ascending order.**

Set-up Clock Start Times

The Clock autostart function allows automatic programmed start times on a daily basis. Each day's schedule can be different if required and can consist of any combination of available Programs. Up to ten Programs can be scheduled per day. The Clock function must be enabled in the Supervisory (only with the *high level*, password #2). Schedules can be set with passwords #1 and #2; and the Clock Start Mode can be activated by pressing the [Start Mode] key while in the *Run Mode* screen.
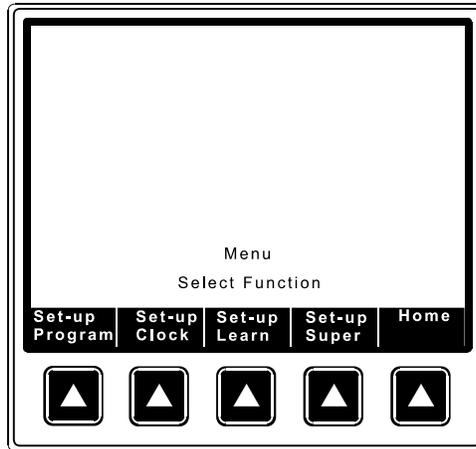
Figure 2.42: From the Set-up screen press [Set-up Clock].
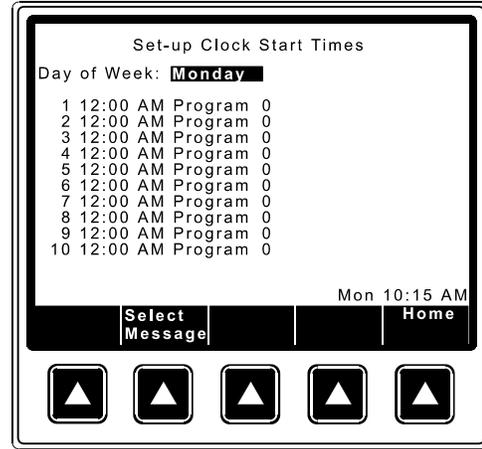
Figure 2.43: Enter the password and press [Select Message] to select a day of the week.
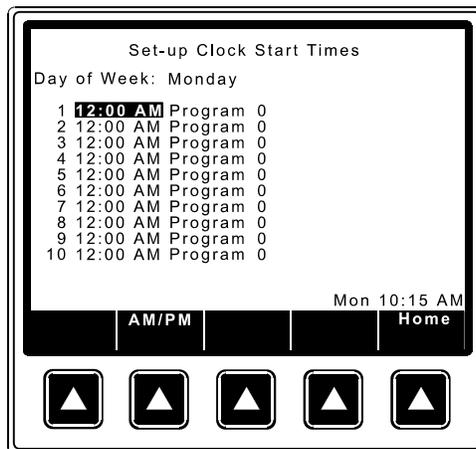
Figure 2.44: Cursor down or press [ENTER] to edit the first start time.
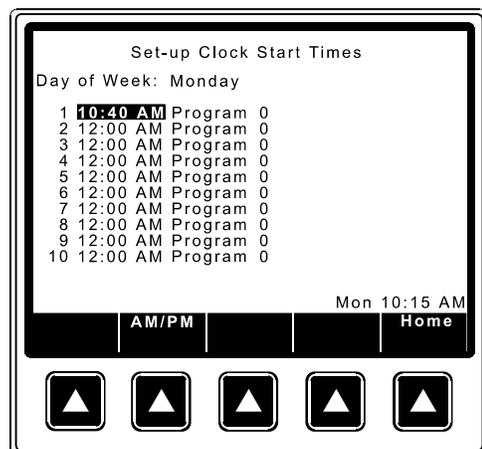
Figure 2.45: Edit the time with the number keys.

In *12 hour mode*, toggle AM and PM with the AM/PM key.

Cursor to the program number field and edit the program number with the number keys. Continue to enter start times for the day in chronological order.
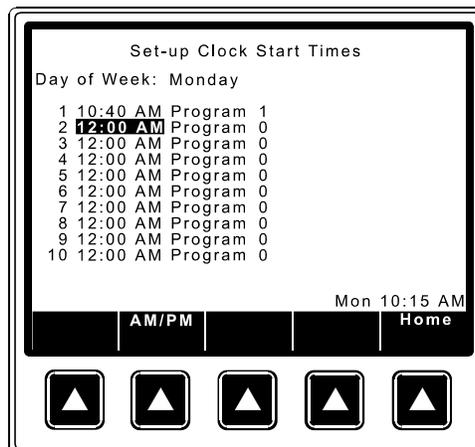
Figure 2.46: Enter start times in chronological order.
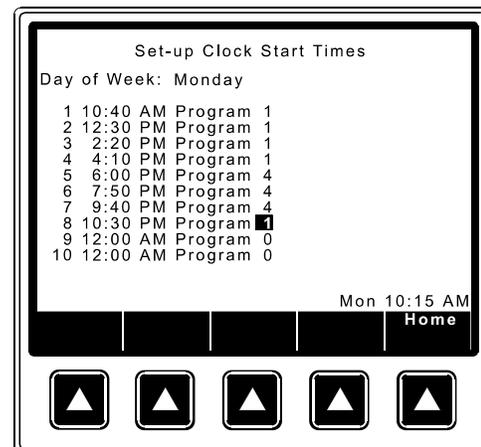
Figure 2.47

If fewer than 10 clock start times are required for the day, enter the number 0 in the program number field. These entries will be ignored. Scroll back to the Day of Week field and select a new day to edit.

HINT: Use the copy function to copy program clock start times from one day to another and edit as required. (See *Local Copy* section.)

The Copy Function

The Copy function can be used to copy Clock Start Times, Programs or Supervisory data from one location to another. The copy function provides the option for a *Local* copy or a *Network* copy. The Local Copy is used to copy Clock Start Times or Program from one location to another. For instance, if clock start times are the same for Monday as for the rest of the week, the times can be entered for Monday and then copied to other days with the same schedule. Similar schedules can be copied and then edited. The same holds true for building Programs. For instance, make Program #4 a copy of Program #2 and edit as required. Using the Local Copy function dramatically reduces the amount of data entry normally required in building programs.

The Network Copy is used to copy Clock Start Times, Programs or Supervisory data from a *remote* CNA-200. This further reduces the amount of data entry, particularly in large multiplexes. Using Network Copy you can only copy program data *from* a remote CNA-200 to the CNA-200 that is performing the copy. You are prohibited from copying *to* a remote CNA-200. If the remote device selected is not responding an error will be generated on the screen.

To access the copy screens press [Copy] from the Main Menu screen.
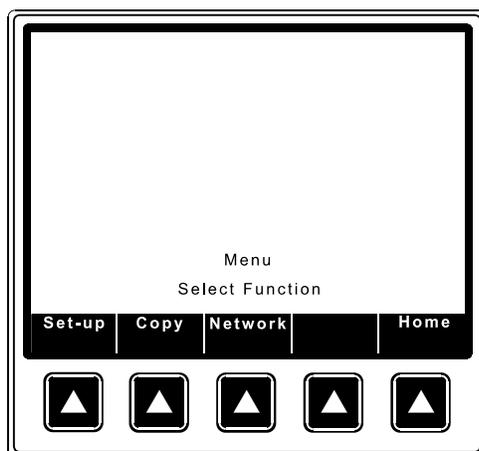
Figure 2.48: Press [Copy] from the Main Menu screen.
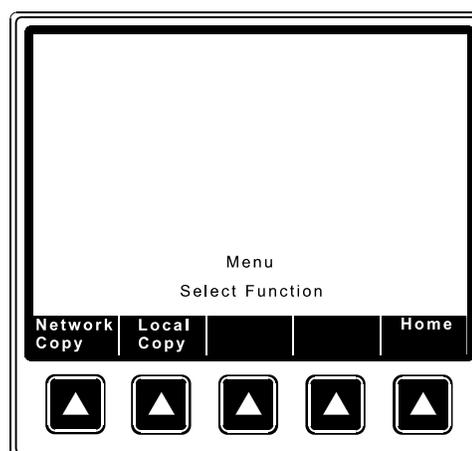
Figure 2.49: From the Copy Menu you can select Local or Network Copy.

Local Copy

This function allows the operator to copy a full days start times to another day. Any day can be copied to any other day. If a full days start times have been set up for Monday, for example, and the same schedule is valid for the other days, the start times can be copied from Monday to Tuesday, from Monday to Wednesday, from Monday to Thursday, and so on.

This screen also allows the operator to copy an entire program from one location to another and then edit the program as necessary.
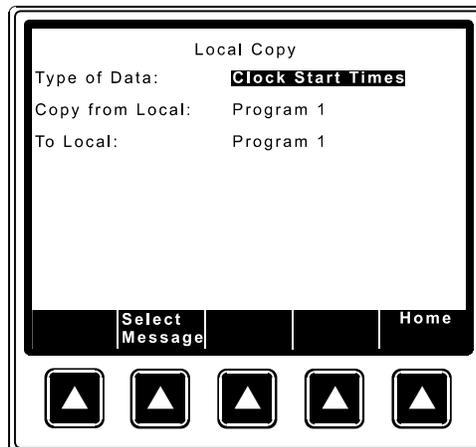
Figure 2.50: Press [Local Copy] and enter the high level password.
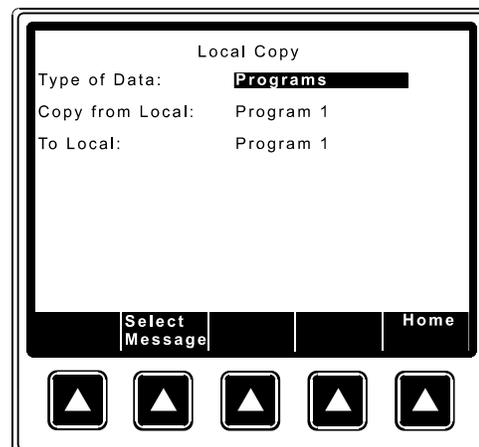
Figure 2.51: Select "Type of Data" to copy by pressing the [Select Message] key.
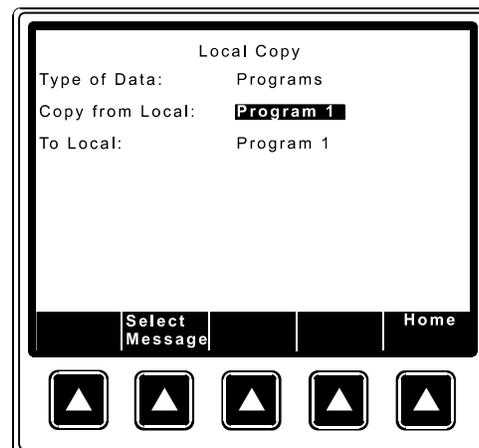
Figure 2.52: Cursor down to the "Copy from Local" field and select the program you want to copy data from.
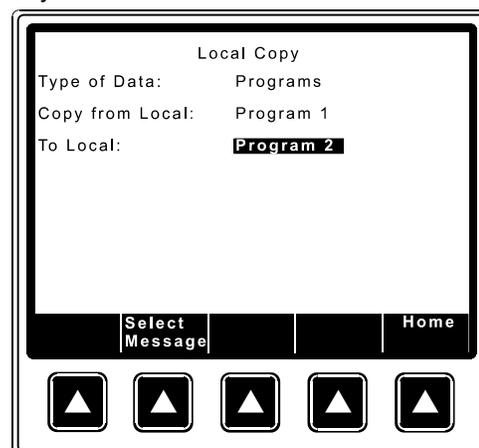
Figure 2.53: Cursor to the "To Local" field and select the program number you want to copy data to.

Note: The [Select Message] key is replaced by the [Prev Message] and [Next Message] key in software version 1.013 or later
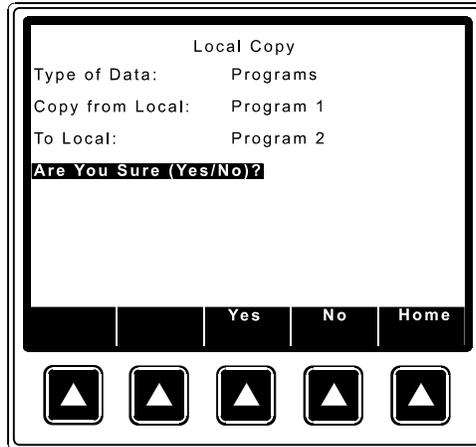
Figure 2.54: Press [ENTER]. You are prompted with an "Are You Sure (Yes/No)?" message.
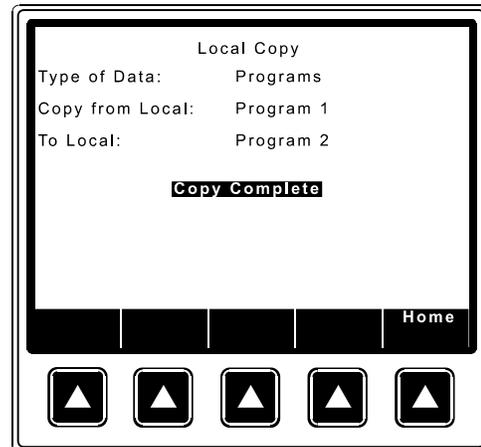
Figure 2.55: Press [Yes] to perform the copy.

The "Copy Complete" message indicates the copy was successful.
The same procedure is followed when copying Clock Start Times.

Note: You cannot copy to a program that is running. The message "Can't Copy to Show in Progress" will be displayed to indicate this.

The Local Copy screen also contains a "canned" program called **Default 1**. You can copy this program to one or more of the program locations. This program is useful as a starting point and can be modified to suite your particular requirements. *Note: Version 1.006 or later.*

The **"Default 1"** program is assembled as follows:

1 Slide Projector Off 0:00	10---Wait Cue 2---
2 Curtain Open 0:00	11
3 House Lights Mid 1 0:00	12 House Lights Mid 20:00
4 Stage Lights Down 0:00	13---Wait Cue 3---
5 Format 1: Mono Flat	14
6 ---Wait Cue 1---	15 House Lights Up0:00
7	16 Stage Lights Up0:00
8 House Lights Down 0:00	17 Curtain Close0:00
9 Format 2: SVA Scope	18 Slide Projector On0:00
	19 Format 3: Non-Sync Flat

Network Copy

The Network Copy function allows the operator to copy Programs, Cue Learn Times, Clock Start Times and Supervisory data from a remote CNA-200.

This function allows the operator to copy Clock Start Times for the whole week from a remote CNA-200. For example, when a movie is moved from one house to another and the start times are to remain the same for the movie, the operator can quickly copy the start times.

When copying from a remote CNA-200 you need to know the ID number of the remote CNA-200 you want to copy from. The ID number of a CNA-200 is normally the same number of the movie house it is in. The start times can be copied using either password #1 or #2.

The Program copy option allows the programmer to copy a program from any remote CNA-200 on the network to any one of the nine (9) program locations at the local CNA-200. It also provides the option to copy *all* the programs at one time. The *cue learn times* are copied with each program. Password #2 is required to copy programs over the network.

This feature is useful when movies are moved from one house to another. For example, the movie in house #4 needs to be quickly moved to house #8 and Program#1 in house #4 is needed to run the movie. It is determined by the operator that the program will be copied to the Program #4 location at the CNA-200 in house #8. The operator would perform the copy from house #8.

Note: Starting with version 1.006, it is possible to copy only the cue learn times for a program.

Select Supervisory Data to copy the Supervisory data from a remote CNA-200. All Supervisory data except for Sync Loop number, Run Hours and Maintenance Schedules are copied by this function. Progress status messages will be displayed as necessary.
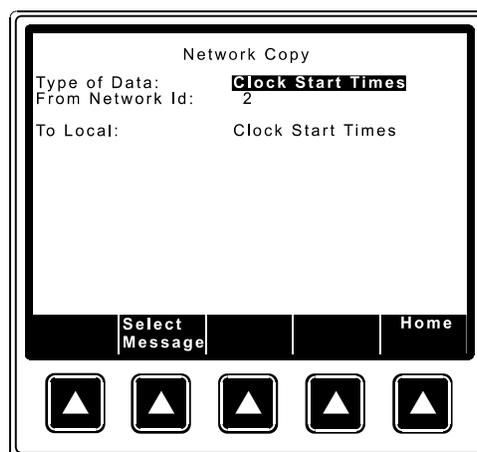
Figure 2.56: Enter the Network Copy screen and select the "Type of Data" to be copied.
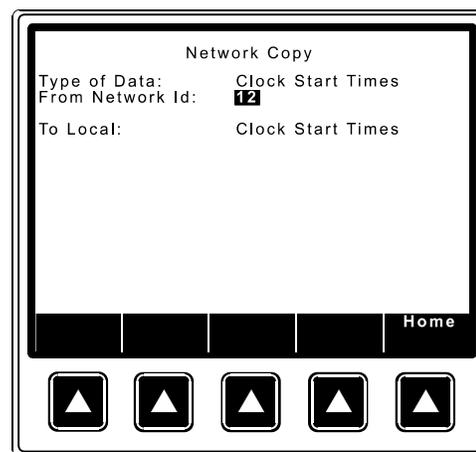
Figure 2.57: Cursor to the "From Network Id" field and enter the Id of the CNA-200 you want to copy data from.

Note: The ID is usually the house number.
Note: The [Select Message] key is replaced by the [Prev Message] and [Next Message] key in software version 1.013 or later.
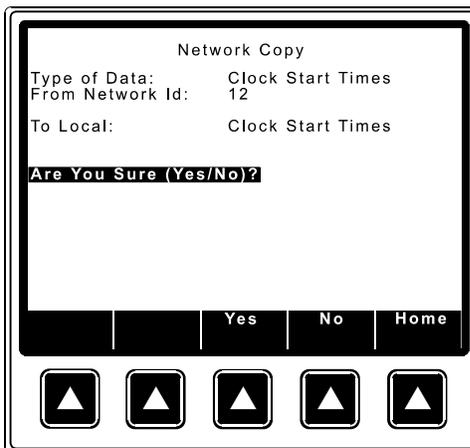
Figure 2.58: Press enter and you are prompted with the "Are You Sure (Yes/No)?" message. Press [Yes] to complete the copy.

The screen will display the message "Network Transfer Complete" to indicate a successful copy.

The "type of data" the Network Copy currently supports is:

Program 1 - 9
All Programs
Clock Start Times
Supervisory Data
Learn Times 1 - 9

Manual Control Screen

Note: Version 1.011 or later. This screen provides a means to manually control or override the CNA-200 outputs. Enter this screen (from the main run screen) by pressing [Menu][Manual Control]. Move the cursor [➜] around the screen with the keypad cursor keys.
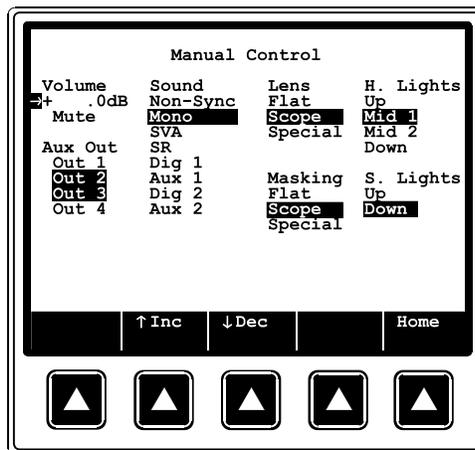
Figure 2.59: Change the volume by pressing [↑Inc] or [↓Dec].
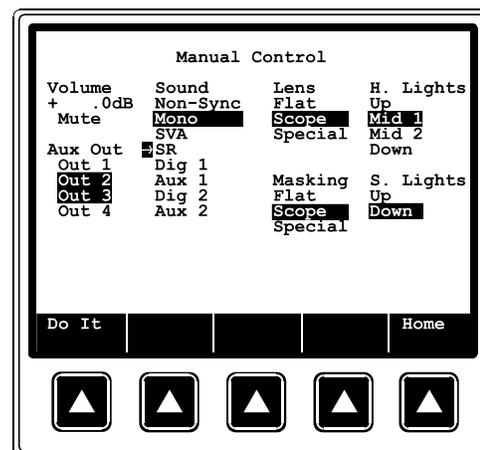
Figure 2.60: Move the cursor to the desired field and press [Do It].

Change the volume by pressing the [↑Inc] or [↓Dec] keys. These keys have a repeat function. Press and hold keys to ramp volume to a new level. Note: Controlling the volume requires the RVC-5 or RVC-10 volume control boards.

Active outputs are indicated with reversed video. To activate an output, move the cursor to the desired field and press the [Do It] key. Sound, Lens, Masking and Lights function like "radio push buttons". One output is always active.

Network Status Screens

There are three Network "Status" screens used to display the status of devices connected to the Local I/O Network (LIN) and the Local Synchronous Network (LSN). The three screens are the LSN Status, LIN Status and Remote Monitor. These screens are a valuable tool for the installation engineer and projectionist.

LSN Status

The "Local Sync Network Status" screen is an *overview* of ID and LOOP numbers of all devices on the network. This includes CNA-200s, CNA-150s, CNA-100s, RSM-10 Remote Monitors and the PC Host. Up to 64 devices can be displayed on this screen.

Figure 2.62: Press the [Network] key
from the Main Menu. Press [LSN
Status].

Each of the 64 positions on the screen represent a network ID number 0 through 63. Each ID will display either a sync LOOP number of or a "." . The "." indicates that there is no device at that ID.

LIN Status

The "Local I/O Network Status" screen is an overview of the devices connected to the "I/O" network (i.e. Booth and Console termination panels). Press [LIN Status] to view this screen.
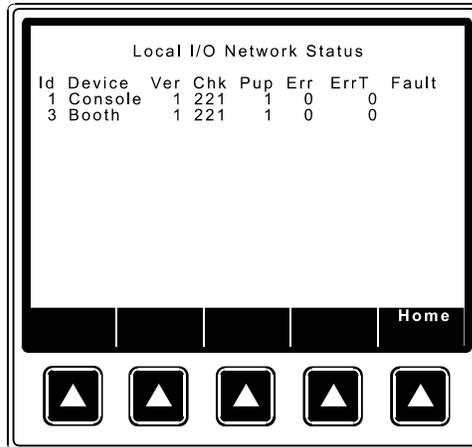
Figure 2.63: Press the [Network] key
from the Main Menu. Press [LIN Status].

Id   Indicates the ID number of the device.

Device   Is the name of the device.

Ver   Is the software version number.

Chk   Is the checksum number.

Pup   Counts the number of times the device was powered up or reset.

Err   Counts the number of times the CNA-200 has polled the remote device with no response.

ErrT   Tracks the number of times the CNA-200 has polled the remote device.

Fault   Fault messages to indicate the type of problem that exists. The messages are:

<div style="text-align:center">

DevErr
CommErr
TimeOut

</div>

DevErr   Indicates that the CNA-200 does not recognize the remote device. This could be due to software version incompatibility.

CommErr   Indicates that the remote device is not responding regularly enough. This could be due to a defective remote device or the wiring to it.

TimeOut   Indicates a communication timeout condition, meaning that the remote device stopped responding after 5 seconds.

Any of these faults will cause a "LOCAL I/O NETWORK FAULT" message to be displayed on the top line of the display. Correct the problem and press the ALARM CANCEL key to clear message.

Following is a list of I/O devices currently supported by the CNA-200.

ID=1	Console	:	Console Termination Panel #1
ID=2	Console	:	Console Termination Panel #2
ID=3	Booth	:	Booth Termination Panel
ID=4	Aux I/O	:	Auxiliary I/O Board #1
ID=5	Aux I/O	:	Auxiliary I/O Board #2
ID=6	Aux I/O	:	Auxiliary I/O Board #3
ID=7	Aux I/O	:	Auxiliary I/O Board #4
ID=8	MCD-35	:	Film Monitor and Cue Detector #1
ID=9	MCD-35	:	Film Monitor and Cue Detector #2
ID=10	ACP-50	:	Auxiliary Control Panel #1
ID=11	ACP-50	:	Auxiliary Control Panel #2
ID=12	RVC-10	:	Remote Volume Control (analog & digital)
ID=13	QDC-400	:	Quad Dimmer Control Board #1
ID=14	QDC-400	:	Quad Dimmer Control Board #2
ID=15	QDC-400	:	Quad Dimmer Control Board #3
ID=16	QDC-400	:	Quad Dimmer Control Board #4

Notes: The Single Termination Panel P/N 39332 is reported as both a Console and Booth.

Remote Monitor

This screen displays the status of all CNA automations on the network.
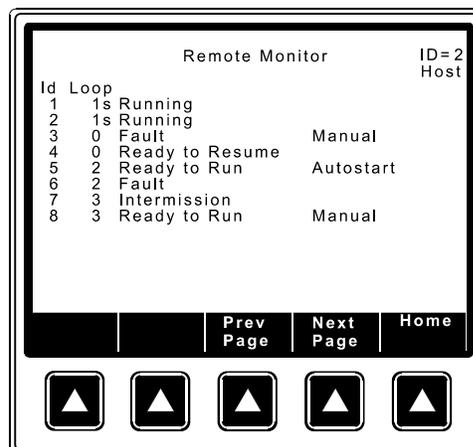
Figure 2.64: Press [Network] from the
Main Menu. Press [Remote Monitor].

The CNA automations will be displayed in order of ID number. The next column displays the Loop number. An "s" is displayed to indicate running synchronous or interlock. The following messages will be displayed to indicate the various conditions:

Ready to Run
Ready to Resume
Running
Intermission
Fault
Fault - Alarm
Manual
Autostart

The "Fault - Alarm" message is displayed to indicate an alarm condition. If the alarm is from a remote CNA automation, the local screen will display:

REMOTE ALARM AT ID: dd

where dd is the ID number of the CNA where the fault occurred. The alarm at all remote CNA-200 automations will sound in short beeps (if "Remote Stop Alarm" is enabled).

The main run screen will also indicate a remote alarm and Id number.
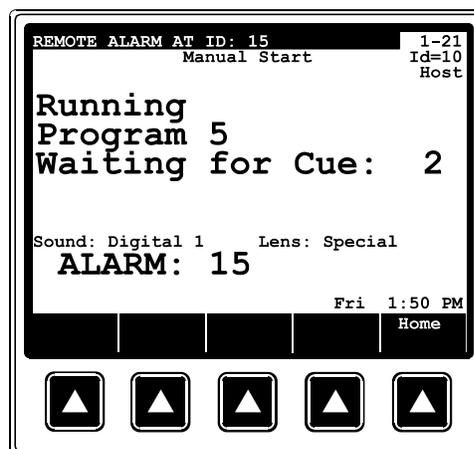
Figure 2.65

Section 3
Operation

Cue Learn Function

The "Wait Cue" instruction waits for a cue input before executing subsequent instructions in the program. Cues can be input manually using the Cue Input key, or foil cues on the film can be sensed by the cue detector of the failsafe assembly.

The Cue Learn function should be used on the first run of the program and after any change is made to the film itself (adding, deleting or moving cues). Using the internal clock, the CNA-200 will "learn" when the cues of a particular film should occur. After learning cue times all subsequent presentations will be run in the "Learned" mode. The CNA-200 will expect to encounter these cues at particular times. If film cues are not encountered within a specified "window", the system will automatically "insert" a cue allowing the program to carry out the next set of instructions. If any of the film cues are missed during a presentation an error message will be displayed at the end the show indicating which cues were missed. The size of the "window" is defined by the Cue Factor Default function in the Supervisory. The Cue Factor Default can be overridden by using the Cue Factor instruction in the Program allowing you to vary the width of the "window" throughout the Program. Note that the Cue Input key on the control panel is always active.

The Cue Learn function in the Supervisory can be set to Auto or Manual. In the Auto mode Cue learn is automatically disabled after the first run of the program, after which all subsequent runs will be in the "Learned" mode. In the Manual mode Cue Learn must be disabled manually by pressing the Cue Learn key.

Cue Window Factor

The Cue Window Factor is a function of the cue times measured. Briefly, in Cue Learn Mode, the system measures the cue times produced using the film cue foils. Thereafter, if cues are missing, the system automatically supplies them. The width of the window is calculated using the Cue Window Factor and is *centered* around the normal cue time. Using this system, the projectionist does not have to be concerned about any missing or errant cues, once cues have been learned.

The cue window is calculated to be sufficiently wide to accommodate any timing variations due to changes in motor speed caused by power line voltage or frequency fluctuations.

The Cue Window is calculated by the following equation:

Cue Window = (CWF value) x (cue location)

EXAMPLE: CWF value = 0.002, cue location = 2 hours

Cue Window = 0.002 x 2 hours or 120 minutes or 7200 seconds

Cue Window = 0.004 hours = .24 minutes = 14.4 seconds

The Cue Window would be interpreted as follows. With a CWF value of 0.002, the CNA-200 would memorize the cue locations and wrap them in a 0.002 window. If an end cue was sensed at the 2 hour mark, the window would be 2:00:00 +/- 7.2 seconds for a total window of 14.4 seconds.

Illustrated it would look like this:

```
                        END CUE
START                   2:00:00
|-----------------------------|
                        --->|  |<--- Cue Window of 14.4 seconds
Starting at 1:59:52.8 and
Ending at 2:00:07.2
```
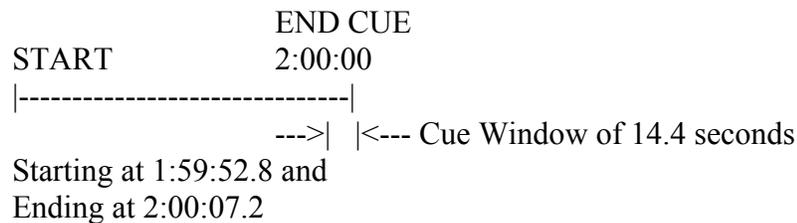
Given a normal 2 hour presentation with four cues, we could establish a table indicating their respective time locations.

Name	Cue	Time from Start
Trailer	1	0.0015625
Show	2	0.004537037
Credits	3	0.0753009259
End	4	0.0833333333

Utilizing the same CWF value for each cue, the CNA-200 would construct a cue window table:

Name	Cue	Time from Start	Cue Window		
			Start	End	Size
Trailer	1	0.0015625	0.00156	0.0016	0.3 sec.
Show	2	0.004537037	0.00453	0.0045	0.8 sec.
Credits	3	0.0753009259	0.07515	0.07545	13.0 sec.
End	4	0.0833333333	0.083252	0.08341	14.4 sec.

Under normal conditions the CNA-200 will only recognize cues within the four established windows. If none are sensed it automatically inserts one at the end of a window which maintains your professional presentation. If cues are sensed outside the windows, they are assumed false and ignored.

The value of the cue window factor is determined by analyzing your local utility company's power fluctuations. This is done with the CNA-200. Simply keep the unit in the Cue Learn Mode for several days. After each presentation of the same show, record the cue values displayed in the Cue Learn setup screen.

To analyze the values, determine the maximum fluctuation in overall run time.

LEARNED CUE VALUES

Cue	Show 1	Show 2	Show 3	Show 4	etc.
Cue 1	0.001	0.001	0.001	0.001	------------
Cue 2	0.0028	0.0028	0.0028	0.0028	------------
Cue 3	0.07292	0.07308	0.07301	0.07331	------------
Cue 4	0.07986	0.08005	0.07997	0.08028	------------

The widest fluctuation would be between shows 1 and 4. To estimate the CWF value, calculate the average fluctuation in run time by simply subtracting the low overall run time from the high overall run time (1:55:36 minus 1:55:00) and divide by 2. Then divide this number by the average run time [(1:55:36 + 1:55:00) divided by 2].

The result is as follows:

Average fluctuation = (HIGH VALUE - LOW VALUE) divided 2
= (1:55:36 - 1:55:00) divided by 2
= (0:00:36) divided by 2
= 18 seconds

The average run time is simply calculated as follows:

Average run time = (HIGH VALUE + LOW VALUE) divided by 2
= (1:55:36 + 1:55:00) divided by 2
= 3:50:36 divided by 2
= 1:55:18 or 1 hour, 55 minutes and 18 seconds

The deviation is calculated as follows:

Deviation = AVERAGE FLUCTUATION/AVERAGE RUN TIME
= 0:00:18/1:55:18 (convert to seconds)
= 18 seconds/6918 seconds
= .002602

Your Cue Window Factor should not be less than the deviation. In our example the Cue Window Factor should not be less than 0.003.

We recommend adding 0.002 to the calculated three digit value. In our example the value in three digits is 0.005. A logical CWF should be 0.005.

The CWF value of 0.005 is logical in light of actual conditions. If you find lights coming up early at credits, you may wish to open the credit window up with a larger value. Remember, every 0.001 equals an increase in the window size of 3.6 seconds for every hour of movie length.

Our investigation indicates that power fluctuations normally represent a speed fluctuation of less than 0.1 percent (CWF value of less than 0.002).

Synchronous Operation

The CNA-200 systems are capable of running film synchronously in a multi-projector booth. The CNA-200 can be programmed for any one of twenty sync loops. This allows for up to twenty different sync loops on the network at one time. Pressing the Sync Mode key will activate the sync operation. To change the Sync Loop number, press [Menu][Set-up][Set-up Super][Set-up System], and enter either password. Set the loop number with the number keys.

Important: As a precaution, de-activate sync mode before changing the sync loop number. Changing loop numbers while sync is active may cause a fault to another machine that is running a show.

To run in sync the following conditions must be true:

1. A *sync cue* must be added to the beginning of the film. This is the first cue that is seen by the automation. It acts to initiate the start up sequence for each machine.

2. Sync Mode on each automation in the loop must be enabled.

3. The sync loop number on each automation in the loop must be the same.
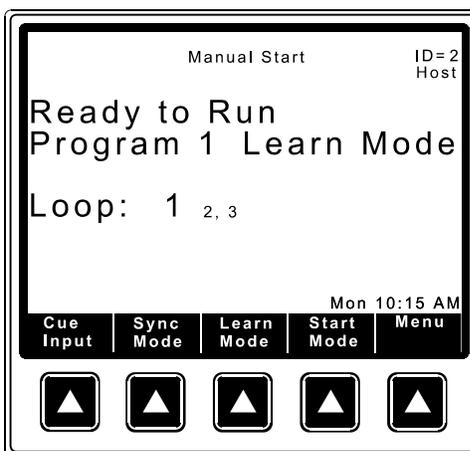
Figure 3.1

Figure 3.1 shows that Sync Mode is enabled. The Loop number is displayed in large text and the Id numbers on the sync loop are displayed in smaller text after the Loop number.

To begin a movie, insure that the sync cue is positioned somewhere before the cue detector on the first machine. Press the [START] switch on any machine in the loop. All projectors will start simultaneously. As the sync cue passes through each projector, the show start sequence will initiate.

At the end of the show each machine will shut down independently as the tail of the film runs out of the projector. On endless loop systems all projectors will continue to run until the last machine see the end cue. At that time all projectors will shut down simultaneously.

Note: Version 1.006 added "(t)" and "(c)" to sync status line to indicate timed or clock start mode.

```
                Manual Start            ID=2
                                        Host

Ready to Run
Program 1 Learn Mode

Loop:  1  2(t), 3


                                    Mon 10:15 AM
  Cue      Sync      Learn    Start      Menu
 Input     Mode      Mode     Mode
```
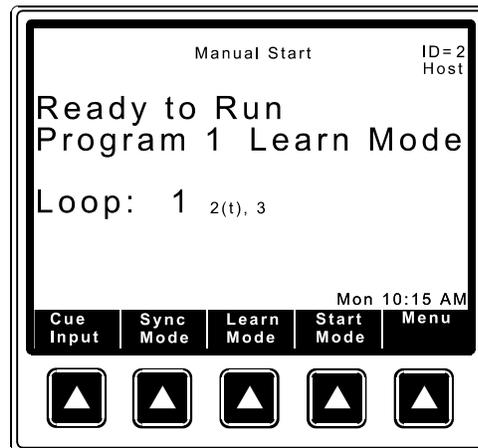
Figure 3.2: Id #2 is in timed start mode.

Endless Loop Operation (Single Machine)

The CNA-200 makes *Endless Loop* operation simple and flawless. You will need a sync cue at the beginning of the film (optional -> and a Wait Cue 0 instruction in the program). Position the sync cue before cue detector. Just as in sync interlock, this cue acts to initiate the start-up sequence. It is not necessary that the show be started at the precise same point in the film each time. The sync cue guarantees a perfect start that is consistent from show to show.

Running the Presentation

It is necessary that the operator be fully familiar with the CNA-200 and its features before running film. In particular, the Cue Learn feature and its use should be thoroughly understood. Initial running of each presentation, or of a film presentation that has been changed, should be conducted with the system in the Learn mode.

There may be times, either during a show or just testing the unit, where it may be necessary go from a "Ready to Resume" state to a "Ready to Run" state. As a convenience to the user, this can easily be done by pressing and holding the [STOP] key, and then pressing the [START] key until the display reads "Ready to Run". Release the [START] key first. This also forces the "Manual" start condition.

The following section describes the normal start up and shut down sequences of the CNA-200 automation. These sequences can be modified by using special instructions.

Start Up Sequence (with format instruction). When the automation is started the projector and lamp are turned on. The lens is driven to it's programmed state. After the sound changeover delay, the changeover is opened and the film sound is selected. The sound changeover delay is programmable from 3 to 59 seconds.

```
              ┌─────────────┐
              │    Start    │
              └──────┬──────┘
                     │
         ┌───────────────────────┐
         │  Projector/Lamp ON    │
         │     Lens Change       │
         └───────────┬───────────┘
                     │
         ┌───────────────────────┐
         │   Sound C/O Delay      │
         │   (3 - 59 seconds)     │
         └───────────┬───────────┘
                     │
         ┌───────────────────────┐
         │     Film Sound        │
         │   Changeover Open     │
         └───────────┬───────────┘
                     │
         ┌───────────────────────┐
         │    Wait for Cue 1      │
         └───────────────────────┘
```
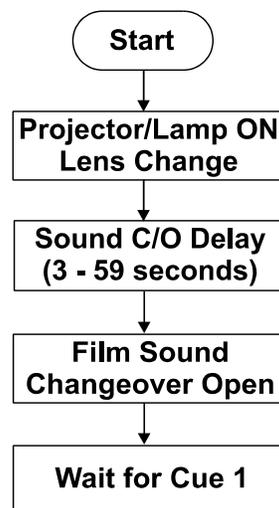
Cue (with a lens change). At the cue the changeover is closed, sound is muted and the lens is driven to it's new state. After the lens changeover time , the changeover opens and the film sound is selected. The lens changeover time can be programmed from 0 to 9 seconds.

```
                    ( Cue )
                       |
           ┌───────────────────────┐
           │  Changeover CLOSE     │
           │     Sound MUTE        │
           │    Lens Change        │
           └───────────────────────┘
                       |
           ┌───────────────────────┐
           │   Lens C/O Time       │
           │   (0 - 9 seconds)     │
           └───────────────────────┘
                       |
           ┌───────────────────────┐
           │     Film Sound        │
           │   Changeover Open     │
           └───────────────────────┘
                       |
           ┌───────────────────────┐
           │   Wait for next Cue   │
           └───────────────────────┘
```
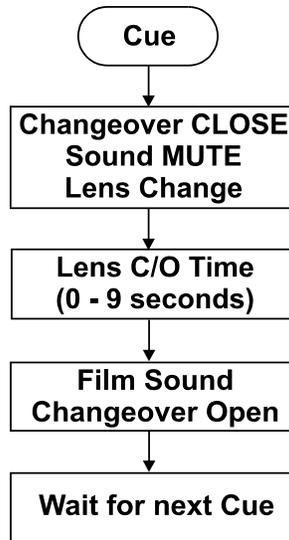
End of Show Sequence (with format instruction). When the last film cue is encountered, the changeover closes and sound and lens are driven to their new state. The shutdown delay has a programmable range of 7 seconds to 59 minutes:59 seconds.

```
                ( Last Film Cue )
                       |
           ┌───────────────────────┐
           │  Changeover CLOSE     │
           │       Sound           │
           │    Lens Change        │
           └───────────────────────┘
                       |
           ┌───────────────────────┐
           │   Shutdown Delay      │
           │ (00:07 - 59:59 mm:ss) │
           └───────────────────────┘
                       |
                ( End of Film )
                       |
           ┌───────────────────────┐
           │   Projector/Lamp OFF  │
           └───────────────────────┘
```
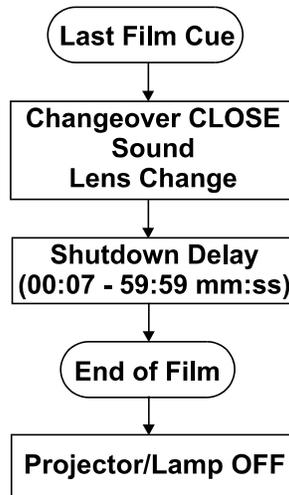
There are a two ways the CNA-200 can end a show. The *film run-out* method is the most typical way to end the show. Insert a Wait Cue instruction at the end of the program. (Do not put a cue on the film.) The shut down sequence will begin when the end of the film is encountered.

```
                          film        last            end of
                          cue        film cue          film
        film    SHOW      |   CREDITS  |                 ●
      <─────────────────────────────────────────────────
                          |            |                 
                       Wait Cue     Wait Cue       Wait Cue
                      instruction  instruction    instruction

                           The last "Wait Cue"
                        instruction in the program ──┘
                        waits for the end of the film.
```
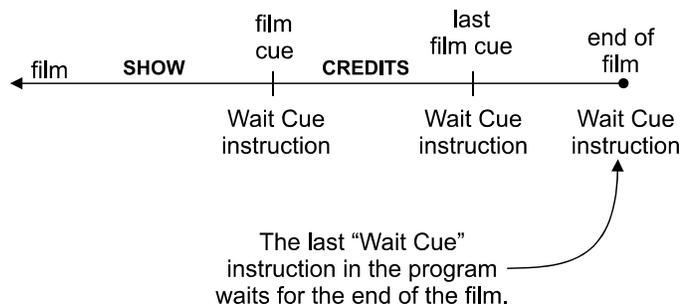
*The projector motor shuts off at the end of the film.

The second method to end a show is with the *end of show timer*. By default the end of show timer is 7 seconds. This can be stretched out to 59 minutes; 59 seconds with the Shutdown Delay instruction. The timer starts when the last film cue is encountered. The shut down logic will begin when the timer expires or the end of the film is encountered (whichever is first).
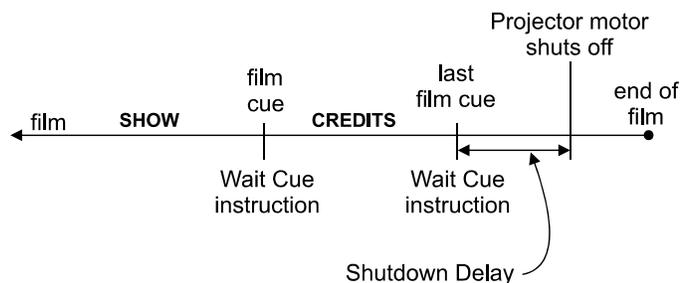
*The projector motor shuts off when the timer expires
or the end of the film.

Note: Using the second method in 'learn mode', a film break during the credits will not sound the alarm since the last wait cue is waiting for the end of the film. In the 'learned mode', however, the CNA has memorized the last cue and the end of the film. Therefore, the alarm will sound if the film breaks during the credits.

Event and Show Log

Note: Version 1.016 or later. A history of automation activity can be found in the event log file. This file can be viewed with CNA-200 screens and the Host program. The CNA automation maintains this log file of up to 1365 events in battery-backed memory. Event log records can be viewed in chronological order with the CNA-200 "Event Log" screen. Events can also be viewed for a particular show with the "Show Log" screen.

Each event record contains automation and event parameters as well as real time status. The Event record contains the following data:

1. Network ID (1 through 63)
2. Record Version Number (event record version)
3. Network Device Type (CNA-100/150 or CNA-200)
4. Event Code Number
5. Event Code Name
6. Event Flags 1 (type of event and real time status)
7. Show Sequence Number (0 through 9999)
8. Time & Date
9. Show Down Timer (in seconds at time of event)
10. Sync Loop ID Number (at time of event)
11. Program Number (at time of event)
12. Show Status (at time of event)
13. Cue Number (at time of event)
14. Parameter 1 through Parameter 8 (event specific data)

If the Host program is running, events are sent to the Host immediately after they have occurred. Once an event has been sent to the Host it will not be sent again. Events are only sent to the Host at Id=0. Therefore it is important for technicians using their laptop interface *not* to have their Host set at Id 0. It is recommended that Id 63 be reserved for the "Secondary" Host. If Id 63 is already being used by a device, another available Id must be used.

There are currently 52 different events. Each event is defined below.

Event	**No.**	**Description and Cause**
Battery	(26)	Low Battery Fault - Real Time Clock chip lost battery backup.
ClkHostF	(54)	Host forced a clock set by using the "synchronize clocks" option.
ClkHostR	(53)	Clock was set from Host after the CNA requested time. (This happens on a CNA power up and at 4:00 am if the host is up.)
ClkKeyBd	(52)	Clock was set from CNA Keyboard.
ClrBuffH	(49)	CNA Event Log Buffer was cleared from Host.
ClrBuffK	(48)	CNA Event Log Buffer was cleared from CNA keyboard (1-2-3-4-CLEAR)
ClrSnumH	(51)	Show Number was cleared (reset to 0) from Host program.
ClrSnumK	(50)	Show number was cleared (reset to 0) from CNA-200 keyboard (1-2-3-4-5-CLEAR)
CueAuto	(40)	Automatic Cue - automation issued a cue at the end of a cue window.
CueAuto0	(44)	Automatic Cue 0 - This always happens at show start (not in sync).
CueFilm	(42)	Film Cue (learn mode).
CueFS	(43)	Failsafe Cue (learn mode) - end of show failsafe shutdown
CueKeyBd	(45)	Keyboard Cue from CNA .
CueVFLM	(39)	Valid Film Cue - film cue occurred inside window (learned mode).
CueVFS	(41)	Valid Failsafe Cue (learned mode) - end of show failsafe shutdown.
Com_T/O	(19)	Sync Communications Timeout. Id =*Parameter 1*
Failsafe	(10)	Film Presence or Tension Fault (in progress or not in progress).
IntmStrt	(5)	Intermission Start - programmed intermission .
Intm_End	(6)	Intermission End - cue *or* start *or* timer.
IntrLock	(18)	Sync Interlock Fault. Id =*Parameter 1*.
KeyAbort	(46)	Stop/Start key abort - show program was aborted.
LIN_Flt	(17)	Local I/O Network Fault. Id =*Parameter 1*.
Motion	(11)	Film Motion Fault.
MemLTime	(15)	Learn Times Memory Fault.
MemProg	(14)	Program Memory Fault. Program Number =*Parameter 1*, Step Number =*Parameter 2*.
MemSTime	(13)	Clock Start Times Memory Fault
MemSuper	(12)	Supervisory Memory Fault
No_Mastr	(22)	Need Master to Resume
Not_RRes	(21)	Not Ready to Resume Fault. Sync Id =*Parameter 1*
Not_RRun	(20)	Not Ready to Run Fault. Sync Id =*Parameter 1*
ReadyRes	(25)	Ready to Resume Fault.
ReadyRun	(9)	Ready to Run (not in progress).

ResetClk	(37)	Loss of Clock Reset. Year =*Parameter 1*, Month =*Parameter 2*, Day =*Parameter 3*, Hour =*Parameter 4*, Minute =*Parameter 5*, Second =*Parameter 6* (parameters 1 through 6 are the captured old time)
ResetDog	(35)	Watchdog Reset. Year =*Parameter 1*, Month =*Parameter 2*, Day =*Parameter 3*, Hour =*Parameter 4*, Minute =*Parameter 5*, Second =*Parameter 6* (parameters 1 through 6 are the captured old time)
ResetExt	(33)	External Reset. Year =*Parameter 1*, Month =*Parameter 2*, Day =*Parameter 3*, Hour =*Parameter 4*, Minute =*Parameter 5*, Second =*Parameter 6* (parameters 1 through 6 are the captured old time)
ResetHlt	(36)	Halt Monitor Reset. Year =*Parameter 1*, Month =*Parameter 2*, Day =*Parameter 3*, Hour =*Parameter 4*, Minute =*Parameter 5*, Second =*Parameter 6* (parameters 1 through 6 are the captured old time)
ResetPup	(34)	Power up Reset. Year =*Parameter 1*, Month =*Parameter 2*, Day =*Parameter 3*, Hour =*Parameter 4*, Minute =*Parameter 5*, Second =*Parameter 6* (parameters 1 through 6 are the captured old time)
ResetTst	(38)	Test Reset. Year =*Parameter 1*, Month =*Parameter 2*, Day =*Parameter 3*, Hour =*Parameter 4*, Minute =*Parameter 5*, Second =*Parameter 6* (parameters 1 through 6 are the captured old time)
Resumed	(8)	Show Resumed
Show_End	(4)	Show End - Transition from "in progress" to "not in progress"
StartClk	(3)	Clock Start - Show started in "Clock" mode (local)
StartMan	(1)	Manual Start - LIN Start, Keyboard Start, Sync Start (slave)
StartTim	(2)	Timed Start - Show started in "Timed" mode (local)
StopFire	(23)	Fire Stop Fault
Stop_Man	(7)	Manual Stop - LIN Stop, Keyboard Stop
Stop_Rem	(24)	Remote Stop - LSN RSM-10, LSN sync stop
Sched_A	(27)	Maintenance Schedule A
Sched_B	(28)	Maintenance Schedule B
Sched_C	(29)	Maintenance Schedule C
Sched_D	(30)	Maintenance Schedule D
UserCode	(47)	User Code - *Parameters 1-7* are user entry and *parameter 8* is the show number
XenonFlt	(16)	Xenon Lamp Fault

Event Log

To view events at the CNA-200 press [Menu][Event Menu]. At this point you can either view the Event Log or the Show Log screens. Press [Event Log].
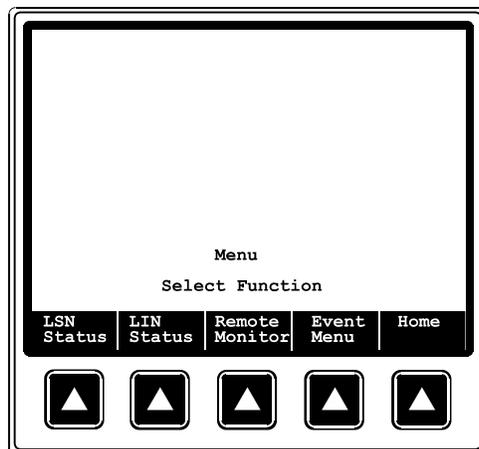
Figure 3.3: Press the [Event Menu] key.   Figure 3.4: Press the [Event Log] key.
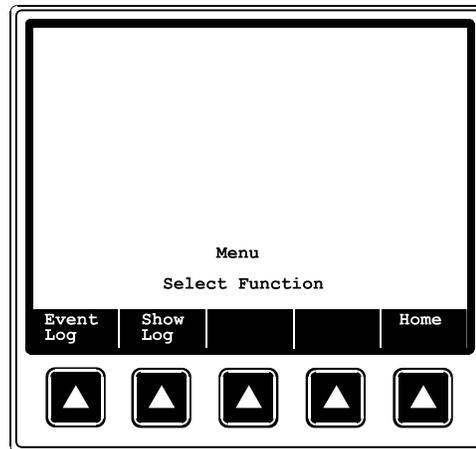
This is the Event Log screen. Upon entering this screen, you will be viewing the last 12 records of the file with the most current event (for that filter) on the bottom line.
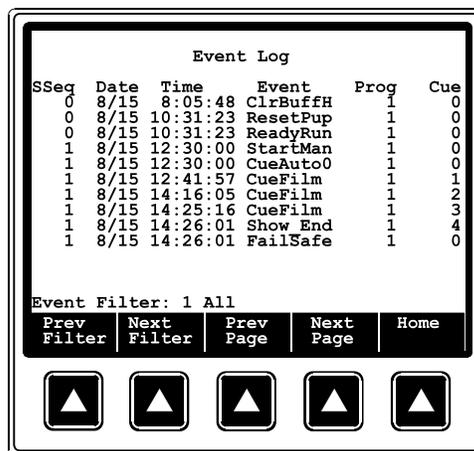
Figure 3.5: Event Log screen.

Figure 3.5 shows all the events that a typical 3 cue show would have. The first event indicates that the event buffer was cleared from the Host program. The second and third events indicate that the CNA-200 was powered up and Ready to Run at 10:30:23. From the next series of events we can see that the show started at 12:30:00, received 3 film cues and ended at 14:26:01.

Press [Next Page] and [Prev Page] to page through the event file. The CNA-200 will let you know when it has reached beginning or end of the file. You can also use the up and down cursor keys to scroll through the file one line at a time.

This shows how the CNA-200 moves through and displays the Event file.

Event Filters

Event Filters were designed to allow the user to easily locate information that is of a particular interest. The event filters are listed and defined below.

Event Filter: 1 All
2 Buffer Overflow
3 Computer
4 In Show
5 Major Fault
6 Minor Fault
7 Resume
8 Scheduled Events
9 Show Start/End
10 Unscheduled Shutdown
11 User Code

1   All - This filter displays all events in memory.

2   Buffer Overflow - This filter will display only the events that were logged when events not yet logged to the Host were over written in memory. This would indicate that events were permanently lost.

3   Computer - These events are computer memory faults and reset conditions.

4   In Show - These are the events that were logged while the show was in progress. This includes the "start" event.

5   Major Fault - These high priority faults that either caused the show to shutdown or prevented a show from starting.

6   Minor Fault - These are low priority faults that do not cause a show to shutdown or prevent a show from starting. These faults are usually status only such as the Maintenance Schedules and Low Battery Faults.

7   Resume - This filter only includes the Resumed event.

8   Scheduled Events - These are normal operating events such as show start, show end, cues and scheduled messages.

9   Show Start/End - This displays all show start and show end events.

10 Unscheduled Shutdown - These are events that caused an undesired interruption in the show. These faults effect the quality of a presentation.

11 User Code - This filter displays all the user code events. The user codes can include the operator Id and other information related to a particular show.
Press [Next Filter] or [Prev Filter] to scroll the 11 filters. Selecting the Show Start/End filter displays all start and end events in the file.
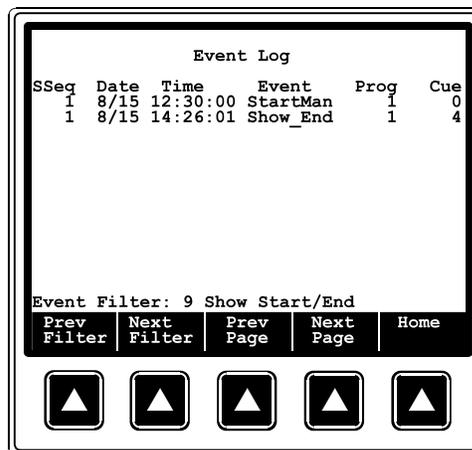
Figure 3.6: Select the desired filter with
the [Next Filter] or [Prev Filter] keys.

Show Log

The Show Log screen provides the user with a summary of automation activities for a particular show. The Show Sequence number (Sseq) is shown in the upper right corner of the screen. This screen displays the following information.

> **Show Number**
> **Program Number**
> **Start Mode**
> **Learn Mode**
> **Sync Loop Number (if sync was activated)**
> **Start Time**
> **End Time**
> **Total Down Time**
> **Event and time of event**
> **Cue Number**
> **Parameters 1 through 8 (event specific)**

Upon entering the Show Log screen, the last show will be displayed. To view a previous show, press [Prev Show]. The event filters that are available on the Event Log screen are also available on the Show Log screen. Press the [Filter] key to make the [Prev Filter] and [Next Filter] keys available. Use these keys to select a new filter.
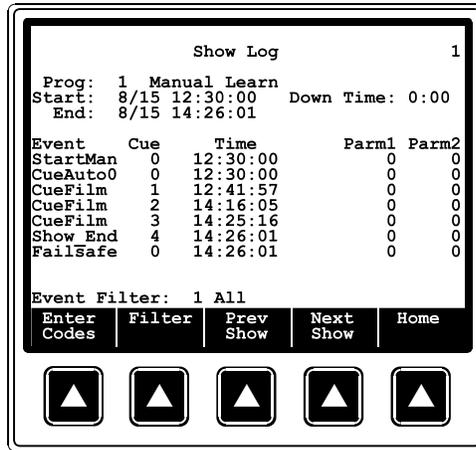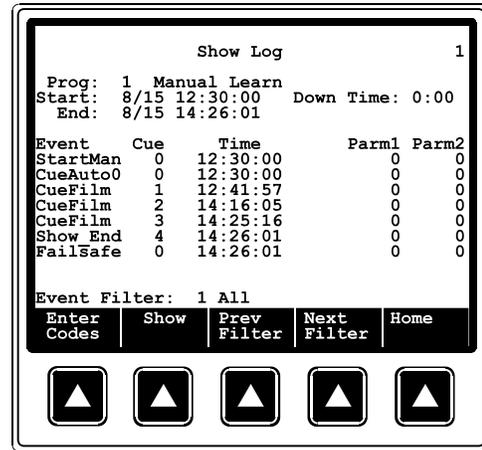
Figure 3.7   Figure 3.8

The Show Log screen also allows user input. Press the [Enter Codes] key to enter user codes for the show. The operator can enter numeric codes in up to seven different fields. These codes can be defined by management to have specific significance. For example, a numeric code could be entered in the "Problem Code:" field that would indicate more specifically what caused a failsafe shutdown. Or a number could be entered in the "Test Code:" field to mark a show as a "dummy" or "test" show.
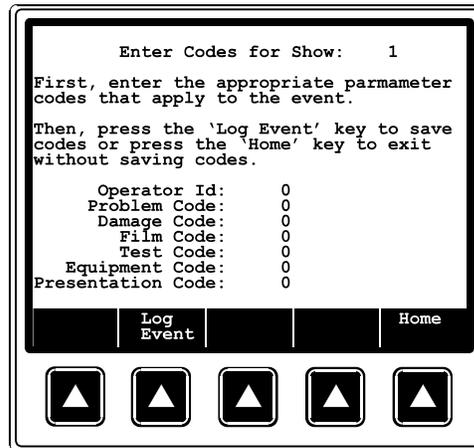
Figure 3.9

Pressing the [Log Event] key will save the user code(s) as an event. When the Event is viewed at the Event or Show Log screens, parameters 1 through 7 will contain the user entered codes.

Parameter 1 = Operator Id
Parameter 2 = Problem Code
Parameter 3 = Damage Code
Parameter 4 = Film Code
Parameter 5 = Test Code
Parameter 6 = Equipment Code
Parameter 7 = Presentation Code
Parameter 8 = Show Number

The show number will automatically be attached to the event and contained in parameter 8.

Note: To view the parameters 1 through 8 from the Show and Event Log screens press the cursor right and cursor left keys.

System Fault and Status Messages

The CNA-200 has a list of fault status messages that can be displayed due to various internal or external conditions. Most of these messages displayed indicate system faults. There are also some internal power up and reset diagnostic messages, most of which will not and should not be displayed under normal operating conditions.

Fault Condition Messages

The Fault Condition messages can be divided into three categories: Internal *memory* faults, *run-time* faults and *failsafe* faults.

Memory Faults

The internal memory faults are generated when there is a "checksum" error. Briefly, a checksum is an arithmetic sum of the contents of memory that is stored in the memory itself and is re-computed and checked each time the CNA-200 is **powered up**. Each of the Programs (1 through 9), Supervisory, Cue Learn Times and Clock Start Times have a checksum. The fault messages are displayed and "blinked" on the top line of the display. Following are a list of the memory faults the CNA-200 can display.

<div align="center">

SUPERVISORY MEMORY FAULT
CLOCK START TIMES MEMORY FAULT
PROGRAM 1- 0 MEMORY FAULT
PROGRAM 2- 0 MEMORY FAULT
PROGRAM 3- 0 MEMORY FAULT
PROGRAM 4- 0 MEMORY FAULT
PROGRAM 5- 0 MEMORY FAULT
PROGRAM 6- 0 MEMORY FAULT
PROGRAM 7- 0 MEMORY FAULT
PROGRAM 8- 0 MEMORY FAULT
PROGRAM 9- 0 MEMORY FAULT
LEARN TIME MEMORY FAULT

</div>

Supervisory Memory Fault

A *Supervisory* memory fault indicates a checksum error in the Supervisory set-up data. Clear the fault message by pressing the ALARM CANCEL key. Enter the Set-up Supervisory screen and verify the Supervisory data. If necessary, edit to correct any data. Press the Home key to re-calculate the checksum and return to the Run Mode Screen. Cycle power to verify that there are no other checksum errors.

Clock Start Times Memory Fault

A *Clock Start Times* memory fault indicates a checksum error in the Clock Start times. Clear the fault message by pressing the ALARM CANCEL key. Enter the Set-up Clock Start Times screen and verify the start times for each day of the week. If necessary, edit to correct any data. Press the Home key to re-calculate the checksum and return to the Run Mode Screen. Cycle power to verify that there are no other checksum errors.

Program dd-dd Memory Fault

If any of the *Program* memory faults are displayed on power up, *clear* the fault message by pressing the ALARM CANCEL key. Enter the Set-up Program screen and select the program that has the fault. Scroll through the program to verify it. If all the steps look okay, press the Home key to re-calculate the checksum and return to the Run Mode Screen. Cycle power to verify that there are no other checksum errors.

Learn Time Memory Fault

A *Learn Time* memory fault indicates a checksum error in the saved Cue Learn times. Clear the fault message by pressing the ALARM CANCEL key. Enter the Set-up Cue Learn Times screen and verify the learn times for each program. If necessary, edit to correct any data. Press the Home key to re-calculate the checksum and return to the Run Mode Screen. Cycle power to verify that there are no other checksum errors.

Run-Time Faults

These messages will be displayed if there are the following network communications faults.

<div align="center">

LOCAL I/O NETWORK FAULT
SYNC INTERLOCK FAULT ID=XX
SYNC COMMUNICATIONS TIMEOUT ID=XX

</div>

Local I/O Network Fault

The *Local I/O Network Fault* is caused due to a loss in communications with a Local I/O Network device or another network problem. This could be the Booth Termination Panel, Console Termination Panel or other I/O Network device, or a wiring problem. This fault will cause a shutdown during a show or prevent a show start between shows. This fault is latched and you are required to press the ALARM CANCEL key to clear the fault. Although this will cancel the fault and allow a show to start, there is a problem with the Local I/O Network or one of the devices and it must be repaired. See the Troubleshooting section for possible causes of this fault.

Sync Interlock Fault

Sync Interlock Fault ID=XX is displayed when either a master or one of the slaves in the sync loop has lost it's sync input (sync switch). All CNA-200s on the sync loop will display this message and sound their alarms. This message will also be displayed if one of the units on the loop had a "watchdog reset". If this was the case, all units will display this message except for one that had the watchdog reset.

Sync Communications Fault

Sync Communications Fault ID=XX is displayed when there is a loss of communications with a unit on the sync loop. This could be due to a loss of power of the master or one the slaves on the loop. In this case all units on the sync loop would display this message except for the one that lost its power. This fault can also be caused by defective wiring, such as an open or short on the communications link.

Failsafe Faults

There a number of local and synchronous failsafe faults that will shutdown a show that is running or prevent a show from starting or resuming.

Local Failsafe Faults

This is a list of messages that can be displayed due to one of the failsafe faults.

FILM PRESENCE OR TENSION FAULT
FILM MOTION FAULT
XENON LAMP FAILURE FAULT

Film Presence or Tension Fault

This fault indicates that the film failsafe does not sense film presence or the film tension is excessive. Correct the problem to clear the message.

Film Motion Fault

This fault indicates that the film motion sensing device did not detect the proper film speed after 2 seconds. Press the ALARM CANCEL key to clear the message.

Xenon Lamp Failure Fault

This fault indicates that the xenon lamp failed to light after 10 seconds. Press ALARM CANCEL to clear the message.

Sync Interlock Failsafe Faults

This fault indicates the master or one of the slave CNA-200s has a failsafe fault that is preventing the interlock loop from *resuming* a show. The following messages are displayed to indicate the fault.

SYNC ID=dd NOT READY TO RUN
SYNC ID=dd NOT READY TO RESUME
SYNC: NEED MASTER TO RESUME
SYNC REMOTE STOP FAULT

Where *dd* is the remote CNA-200 ID number (1 through 63)

Sync ID=dd Not Ready to Run

This fault indicates that the automation can not start a show because at least one of the CNA-200 remotes are not in the "Ready to Run" condition.

Sync ID=dd Not Ready to Resume

This fault indicates that the automation can not start a show because at least one of the CNA-200 remotes are not in the "Ready to Resume" condition.

Sync: Need Master to Resume

There is no master. The master may be lost if the communication wires are disconnected, power is lost or the sync input (sync switch) is not enabled at the master.

Sync Remote Stop Fault

Indicates a fault on a remote CNA-200 when interlocked. Correct the problem to clear the message.

Status Messages

Status messages serve as a reminder that a particular action or service be performed. These messages will not prevent the CNA-200 from operating normally. Following is a list of messages the CNA-200 can display.

MAINTENANCE SCHEDULE A FAULT ✸✸
SCHEDULE A: XXXXXXXXXXXXXXXXXXXXX ✸
MAINTENANCE SCHEDULE B FAULT ✸✸
SCHEDULE B: XXXXXXXXXXXXXXXXXXXXX ✸
MAINTENANCE SCHEDULE C FAULT ✸✸
SCHEDULE C: XXXXXXXXXXXXXXXXXXXXX ✸
MAINTENANCE SCHEDULE D FAULT ✸✸
SCHEDULE D: XXXXXXXXXXXXXXXXXXXXX ✸
MISSED CUE X
CHECK CUE LEARN TIMES
REMOTE ALARM AT ID:dd
FAULT DEFEAT ENABLED
LOW BATTERY FAULT
LIN REMOTE START INPUT✸
LIN REMOTE STOP INPUT✸
LSN REMOTE START INPUT✸
LSN REMOTE STOP INPUT✸

✸ Version 1.006 or later.
✸✸ Version 1.003 through 1.006.

Maintenance Schedule Fault

This status message indicates the maintenance is required for schedule A, B, C or D. Reset the timer in Supervisory when maintenance has been performed. You must reset the timer in Supervisory, by pressing 1 2 3 4 CLEAR, to clear the message.

Missed Cue

This message indicates that specific cue inputs were not received by the cue detector and an automatic cue was issued (Learned Mode). This indicates the film cues may be worn or missing. Clear the message by pressing the ALARM CANCEL key. This message may be suppressed with a setting in the Supervisory.

Check Cue Learn Times

This message is displayed after a show is run in Cue Learn Mode. This is a reminder to view and verify the Learn times. Clear the message by pressing the ALARM CANCEL key. This message may be suppressed with a setting in the Supervisory.

Remote Alarm at ID:dd

This message indicates a Fault - Alarm condition at remote CNA-200, where dd is the ID number.

Fault Defeat Enabled

This message serves as a reminder to the operator that the Film Presence, Film Motion, Film Tension and Xenon Faults are bypassed. Set the Fault Defeat to Disabled to clear the message.

Low Battery Fault

Low battery fault indicates that the battery has gone below a pre-determined threshold voltage during a power down condition. If this message is displayed along with any *memory fault* messages, the low battery condition probably caused the other memory fault(s).

**LSN Remote Start Input, LSN Remote Stop Input,
LIN Remote Start Input, LIN Remote Stop Input**

The network start and stop messages let the operator know that a start or stop input is asserted either at a remote control station on the LSN or LIN. Note: Version 1.006 or later.

Network Status Messages:

"CAI COMMUNICATIONS TIMEOUT"
"CP COMMUNICATIONS TIMEOUT"
"CP NOT IN AUTOMATION MODE"
"CP NOT READY"
Note: Version 1.022 and up

Additional Software

CineNet Host Software Package

The CNA-200 automation is optimally configured and used with the CineNet HOST software package. The Host program allows remote setup, data transfer and programming in a user-friendly format. Additional hardware and software is required. First there must be a Host Computer, this can be any DOS-based PC with either 1 free ISA slot or an RS-232 Serial port that is not in use, installed on that PC there must be CineNet Host networking software. This software allows the PC to interface with the CNA. The only additional piece of hardware required is a network controller. This can be in the form of a ISA card installed in the PC, or a convenient external package such as the VNC or PCI-64 network interface.

See the CineNet HOST user manual for further details on installation.

Host software provides Event logging, both LIN and LSN Network status, configuration, programming/ copy functions, and remote firmware upgrades. Different CNA/ Host combinations will have different functions and options available. Firmware upgrade from CNA version 1.021 to any version higher requires a special bootloader upgrade, new units will have the new software, but older versions of CNA may need a quick fix in the field in order to upgrade successfully. See the Host manual or contact Strong for details.

CineSuite Software Package

The CineSuite software package is a more advanced version of HOST software including three software applications:

CineSuite Manager: This is the main user interface. When creating CNA programs, settings CNA supervisory functions or monitoring CNA operations, this is the application that will be used.

CineSuite Router: The CineSuite Router is used to manage traffic between the various CineSuite applications. Users only need to set the client application to point to the computer that has the CineSuite router running and it can then communicate with all other clients connected to the same router.

CineNet Driver: This is the software application that connects the CNA Gateway and automations to the computer.

The CineSuite software operates over TCP/IP communications protocol meaning that it can be used in conjunction with the internet via a modem or any ethernet connection. It allows remote access to the automation network and provides a means of remotely monitoring devices on the LIN.
CineSuite Reporter software has a full color interface for quick identification of remote problems. Reporter can also email status reports to managerial personnel and generate reports over long periods of time in order to help quantify efficiency in staff and equipment.
CineSuite similarly requires a Host PC and a hardware interface device. The Host PC must be at least a 486/66Mhz running windows 95 or above. The CineSuite package is constantly under development with new features being added regularly. See the CineSuite Guide for additional information.

Section 4
Addendum

Software Changes:

This section details the CNA-200 software changes.

Version: 1.006
Checksum: 3395
Date: 7/15/1997

This version requires Host V1.003 and is compatible with CNA-100 V1.05.

1. Aux output on 39330 Rev. 1 Console Termination board now follows the "Slide Projector" output on the 39331 Booth Termination Board.
2. Added "Canned" program called "Default" to the Local Copy screen.
3. Added the ability to copy *only* "Cue Learn Times" to the Network Copy screen.
4. Maintenance Schedule A, B, C, and D now have 22 character programmable text. The text must be edited at the Host program and copied to the CNA.
5. The Remote Stop Alarm message now has programmable "beep" time. It is also terminated when the remote condition is satisfied or when the local alarm cancel is pressed.
6. Added "REMOTE: dd, dd, dd..." status message to the main run screen. Where dd is the CNA Id number.
7. Added four new status messages associated with run and stop inputs:
   a. "LIN REMOTE START INPUT"
   b. "LIN REMOTE STOP INPUT"
   c. "LSN REMOTE START INPUT"
   d. "LSN REMOTE STOP INPUT"
8. Added "Check Focus Delay" to Clock and Timed start. S2-3 On to enable; Off to disable.
9. Lens and Masking now support programmable "Power Up" defaults.
10. I/O communications now "re-sends" setup data to I/O devices when Supervisory parameters is updated. (Changeover pulse time.)
11. Pressing and holding the front panel Stop key and then pressing the front panel Start key now forces "Manual" start mode in addition to resetting the control to the "Wait" state.
12. Added "(t)" and "(c)" to Sync status line to indicate "Timed" or "Clock" Start mode.
13. Stop key now works the same everywhere - forcing switch to "Show Hold" mode.
14. Start key is now active in all start modes. Also Sync operation can be started from any machine in any start mode (you no longer have to be in "manual" to start as a slave.)

Version: 1.007
Checksum: 58872
Date: 9/17/1997

This version requires Host V1.004 and is compatible with CNA-100 V1.06

1. Added support for newly designed MCD-35 Cue Detector for Local I/O
   Network (LIN).
Note the CNA software "Auto Detects" the MCD-35 the first time it responds to a
poll. Once this board is detected the "Motion" and "Presence" inputs on the
Console Board are then ignored. It would be a good idea to leave the Console
Board inputs "open" rather than "shorted" to cause a fault in the event that the
MCD-35 board does not respond to polls on power up. (Not a requirement, just a
suggestion...)
2. Timed Start Time now counts in Minutes:Seconds rather than in
   Hours:Minutes.
3. Increased Motion Fault time from 2 seconds to 3 seconds.
4. *Fixed Bug*: Lens and Lens Masking pulse configuration now correctly
   control their respective outputs. Prior versions were both controlled by Lens
   Masking Pulse configuration flag.

Version: 1.008
Checksum: 60425
Date: 11/4/1997

Fixed Bug: The network Remote Monitor screen now only displays CNA
automations. (Previous version also showed secondary Hosts.)

Version: 1.009
Checksum: 58565
Date: 2/2/1998

This version requires Host V1.004 and CNA-100 V1.07.

1. Added "Resume-bypass" of the Sound Changeover Delay. The Sound
   Changeover Delay is now bypassed for a Resume.
2. Added automatic "Wait Cue for 0" on step 0 of the program. When a "Wait
   for Cue 0" instruction is inserted in the program, the program now always
   waits for cue 0 (Sync enabled or Sync disabled). When Sync is enabled and
   a "Wait for Cue 0" instruction is not present, the program automatically waits
   for cue 0. To run a film (Sync enabled or Sync disabled) correctly with the
   "sync cue" present on the film, a "Wait for Cue 0" instruction must be in the
   program.

Version: 1.010
Checksum: 59829
Date: 4/6/1998

This version requires Host V1.004 and CNA-100 V1.07.

1. Re-worked Sound outputs to operate as expected with the "Wait for Cue 0"
    and "Format" instructions at startup. Previous versions allowed the sound to
    incorrectly change right at start or not until the "Wait for Cue 0" instruction
    when proceeded by a "Format" instruction.

Version: 1.011
Checksum: 14218
Date: 10/16/1998

This version requires Host V1.005 and CNA-100 V1.08.

1. Added LIN communications support for new ACP-50 Auxiliary Control
    Panel device. Added support for ACP-50 Volume & Mute Keys. Volume
    keys are however disabled for this version pending the development of the
    remote volume control.
2. Selecting new sound formats now clears the new "Mute" flag.
3. Sound and Lens now pulse when set to the "same" state again.
4. Added Fire Stop Option Dip switch:
    S2-4 OFF = Normal Stop, ON = Fire Stop

    This new "Fire Stop" option:
    a. Stops the Show,
    b. Forces Sound to Mute,
    c. Forces Console Slide Projector off,
    d. Forces Booth Slide Projector On (new fire stop output).
    e. Forces all other outputs to their "Fault To" state.

    When S2-4 is Configured for "normal" operation both Slide Projector outputs
    perform the "Slide Projector" function and the Remote Stop simply stops the
    show if it is in progress (both same as in previous version).
5. Check Focus Alarm now only follows others on our SYNC loop if our SYNC
    switch is enabled.
6. Added "Manual Control" override screen.

Version: 1.013
Checksum: 28234
Date: 7/30/1999

This version requires Host V1.007 and is compatible with CNA-150 V3.030 and CNA-100 V1.08, V2.03

1. Added support for 4 QDC-400 Dimmer "LIN" devices.
2. Restructured Menu system. Also Home key now "backs" out to Home.
3. Added "Aux" output instruction #28.
4. Added 4 new flags to System Parameters to configure the 4 Auxiliary Outputs to drive any spare relays that may be available.
5. Manual Override Screen now controls "Aux" outputs when they are configured.

Version: 1.016
Checksum: 23717
Date: 2/4/2000

 This version requires Host V1.010 and is compatible with CNA-150 V3.050 and CNA-100 V2.05.

1. Now supports Flash updating from Host. Added 4 new Network Commands: Flash Status, Go To Bootloader, Go To Application and Update Flash.
2. Reworked Memory Map, Power up and Vectors to support Flash Updating.
3. SW1-1 now forces Bootloader in case the Application Real Time Operating System is corrupted.
4. SW1-1 On=Force Bootloader, Off=Run Application if possible
5. Fixed Slide Projector on Booth Board when not configured for Fire Stop Operation (SW2-4). This output was disabled starting with Versions 1.011.
6. Added "Remote Reset" power up message.
7. Added "QDCBOOT" Type 8 to LIN status screen. Also fixed text to correctly read "ACP-50".

Version: 1.017
Checksum: 20075
Date: 2/29/2000

This version requires Host V1.010 and is compatible with CNA-150 V3.050 and CNA-100 V2.05.

1. Added RVC-5 sound table support for "Sony DFP-D3000" sound processor.

Version: 1.018
Checksum: 28575
Date: 5/11/2000

This version requires Host V1.011 and is compatible with CNA-150 V3.050 and CNA-100 V2.05.

Fixed bug to prevent Show start from forcing House and Staged lights up and sound to Non-sync when waiting for Cue 0.

Version: 1.019
Checksum: 58862
Date: 6/8/2000

This version requires Host V1.011 and is compatible with CNA-100/ 150 V2.070/ V3.070. Also RCM-10 V2.010 and RCM-10 V2.020

Added provisions for Fire stop input from RCM-10 W/ V2.020 firmware. RCM-10 version 2.010 function is unchanged (remote stop). SW 2-4 operation remains as before.

Note: Both CNA-200 and RCM-10 need upgrades for added functionality (RCM must be V2.020)

Version: 1.020
Checksum: 23744
Date: 6/8/2001

Same functions as V1.019 externally, improved software internally.
(Fixed scan related blip on non sync output when fire stop input was asserted)

Version: 1.021
Checksum: 3844
Date: 8/23/2001

Added password #1 configuration support.
The first time this program is executed, the password logic will default to "00" and "3141" which will cause a "Supervisory Memory Fault" to occur.
Note: When performing a remote RTOS upgrade from this version it may be necessary to run "CNAERASE" program, performing a regular RTOS upgrade may render CNA inoperative until properly configured. See Host manual for details.

Version: 1.022
Checksum:
Date: 9/10/2002

1. Added support for content player on p6 port, Network 2. 5V RS 485 converter required to interface with CNA, DIP SW2 bit 8 Sets.
2. Added "Check focus delay" functionality for all manual start inputs.
3. Added the following new Error Messages:
       "CAI COMMUNICATIONS TIMEOUT"
       "CP COMMUNICATIONS TIMEOUT"
       "CP NOT IN AUTOMATION MODE"
       "CP NOT READY"

Version: 1.023
Checksum: 57865
Date: 5/16/2003

Enhanced communication error status reporting, now net must be down for intended 8 second period before fault.(Added CLINK2TMR to prevent erroneous "CAI COMMUNICATIONS TIMEOUT" error)

Version: 1.024
Checksum: 36247
Date: 6/12/2003

Improved functionality (Added logic to "WAIT" instruction (18) to update DRMQ when KODAK CP is enabled and not in SYNC or WAIT CUE 0 mode. This keeps the motor off prior to pre-show)

Version: 1.025
Checksum: 58111
Date: 8/27/03

1. Eliminated "Supervisory Memory Fault" When stage lights were up during boot

2. Improved event logging consistency for "intermission start and end"

3. Improved compatibility with Kodak pre-show:
    -Projector motor/ lamp ON
    -Projector motor/ lamp Off
    -Intermission wait now waits for Kodak pre-show to complete when
    programmed prior to WAIT CUE1
Additionally projector motor/ lamp can be used to extend pre-show and normal intermissions.

4. Automatic end of pre-show eliminates need for film cue placed at beginning of film when running in standalone (not sync) mode.

Version: 1.028
Checksum: 12633
Date: 4/20/2004

1 Light zone control for zones 3-16 implemented. Names configurable for zones 3-16 through host.
2 Firestop condition does not affect Zones3-16
3 Loss of LIN communication will cause zones 3-16 to turn off.
4 Last settings for zones 3-16 resume at power up
5 Major faults don't affect zones 3-16

Version: 1.029
Checksum: 41852
Date: 1/19/2005

1- Added new password control features:
(Note: Latest version (1.016) of Host program required for remote change)
  Software override of DIP switch 2-2 password enable setting permits user to administer password setting regardless of switch position. This feature is enabled via a Host PC. Options are:

Default	Use traditional control, switch 2-2 enables/ disables system password
Off	No password required to access setup/ programming parameters.
On	Password always required, switch 2-2 has no effect.

Feature is accessible locally via the CNA's setup menu.

2- Switch 3-6 now disables/ enables the check focus delay alarm on the RCM-10/ RSM-10 Remote station when the CNA starts a show.
Switch definitions:

    Off = Enable   RSM-10 Check focus alarm
    On = Disable RSM-10 Check focus alarm

3- Added programmable power-up states for the following:

Masking	(Flat, scope, special, none, No-Op)
Sound	(Non-Syn, Mono, SVA, SR, Dig 1, Aux 1, Dig 1, Aux 2, Mute off, Mute on, No-Op)

4- Added programmable "fault-to" states for the following parameters, these are the settings defaulted to after a fault is encountered:

Lens	(Flat, Scope, Special, None, No-Op)
Masking	(Flat, Scope, Special, None, No-Op)
Sound	(Non-Syn, Mono, SVA, SR, Dig 1, Aux 1, Dig 2, Aux 2, Mute off, Mute on, No-Op)
House Lights	(Up, Down, Mid 1, Mid 2, No-Op)
Stage Lights	(Up, Down, No-Op)

Bootloader Changes:

Date: 2/4/2000
Version: 1.000
Checksum: 40157 (Base 10)

Initial bootloader used in CNA system.
    1. Created this Boot Loader Program to load the following programs into FLASH:

    CNA-100   V2.05
    CNA-150   V3.050
    CNA-200   V1.016

2. This program uses LSN Network Device Type = 4 (CNABOOT).

3. Now supports LSN FLASH update Network commands ($40 to $43).

Date: 5/9/2000
Version: 1.001
Checksum: 44570 (Base 10)

1. Moved "LDY #SWAPCNT" up 3 lines in Calculate Checksum routine (CALCPCHK) to increase the rate the watchdog is toggled. Should not have been a problem.

2. Now toggles watchdog in FL_PROGBK routine since a byte write may take as long as 60 milliseconds

Date: 9/16/2002
Version: 1.010
Checksum: 44558 (Base 10)

Latest versions at this time:
    CNA-100   V2.09
    CNA-150   V3.090
    CNA-200   V1.022

1.   Changed "CPE SAVEP,Z" to "CPE 0,X" in FL_PROG routine to correctly test for "POSSIBLE TIMEOUT OR JUST WENT DONE". The previous logic might report a write as failed. The logic must be currently taking the earlier branches - Since there were no reports of this failure from the field at this time.

Date:10/7/2002
Version: 1.020
Checksum: 61822 (Base 10) $F17E

Latest versions at this time:
>   CNA-100   V2.09
>   CNA-150   V3.090
>   CNA-200   V1.022

1. Rewrote FL_ERASE routine. The original interpretation of the multiple sector erase sequence was wrong - but worked with the FLASH parts at that time ("non-lettered": AM29F010). However the new parts ("lettered" AM29F010B) no longer accept this interpretation. Basically, the "unlock" portion of the command should only be issued once, then within 50 microseconds write the Sector Erase command ($30) to multiple sectors.

2. Reworked the comments for FL_ERASES - Indicating it should only be used to erase a single sector.

3. Moved call to "PROTFY" in main loop down a few lines from just after "JSR FL_ERASE" to just after "JSR FL_WAITE". I don't think this was a problem, since this program runs in ram. This change should now let the "FL_ERASE" routine correctly perform the FLASH Reset function if it is ever necessary.

4. Increased FLASH erase timeout from 15 to 20 seconds.

Index:

List of Illustrations:

CNA-200 Parts List:

Below is a listing of the major components that make up the CNA-200, the technician or theatre manager may find it useful when ordering replacement parts in the event of an automation component failure.

Description	OEM#	Strong#
CNA-200 Display interface board	39327-1	5172010
CNA-200 CPU Mainboard	39325	5172008
CNA-200 Replacement Display	65001	-NA-
CNA-200 Display conversion kit	65001-K-(AorB)	-NA-
CNA-200 Replacement Overlay w/ Front panel	39323-1	-NA-
CNA Power supply	39328	5198304
CNA Replacement power transformer	64011	-NA-
CNA-200 Wall-Mount Replacement Overlay w/ Front panel	39323-1W	-NA-
CNA-200 Display inverter	39329	-NA-
CNA-200 VFD Backlight replacement	39319	-NA-
DPST Rocker Switch, Power and Overrides	39336	-NA-
SPDT Rocker Switch, Overrides	39337	-NA-
SPDT Rocker Switch, Overrides	39338	-NA-

Note: **Other specific parts available upon request, contact Strong International for assistance.**