

## CHAPTER 1: THE UNIVERSAL THEATER CONTROL SYSTEM

### INTRODUCTION

The *Universal Theater Control System* (UTCS) is a full featured presentation control system, capable of controlling almost any device that might be utilized in a planetarium theater. This means the UTCS can control a wide range of slide projectors, special effects projectors, video projectors, laserdisc players, DVD players, S-VHS players, and video hard disk players. The UTCS can also provide centralized control for cove lighting, room lighting, stage lighting, dimmer panels, digital audio units, and star projectors.

The component based design uses *Intelligent Controllers* to control individual devices with *Modular Interfaces*. Up to 64 *Intelligent Controllers* can control 256 discreet devices and are linked together via a high-speed communication network. The flexible nature of the network allows the *Intelligent Controllers* to be placed wherever they are needed in the theater. Each installation is a unique design based on the theater's control area, seating arrangement, sound system, lighting needs, available devices, and finally, what works best for the operators.

The UTCS can provide consistent, reliable, *Time Code* controlled automated show presentations, semi-automated shows, or completely live presentations using nothing but manual controls.

The keystone of the UTCS is the *Hercules Central Processor*, which uses hardware and software components to provide control over the theater. The *Hercules Show Control Software* is an easy to use interface for entering command cues and writing Show Files. All commands are transmitted over the network via the *Hercules Show Control Card* to the discreet devices through the *Intelligent Controllers*. The *Intelligent Controllers* constantly communicate back through the network to let the *Hercules Show Control Software* know the status of the entire system.

Manual control for the theater is provided through the *Cygnus Manual Control System*. *Cygnus Manual Control System* use the same communication network as the *Hercules Show Control Software*. The *Cygnus Manual Control System* are available in several configurations depending on the needs of the individual theater. The *Cygnus Manual Control System* can be used to augment automated shows, or provide unscripted presentations that use audience participation and questions as the focus.

The individual components of the UTCS will be introduced and discussed in more detail in the following chapters of this manual. Since each theater is unique, not all components may be present in the current system.

# UNIVERSAL THEATER CONTROL SYSTEM

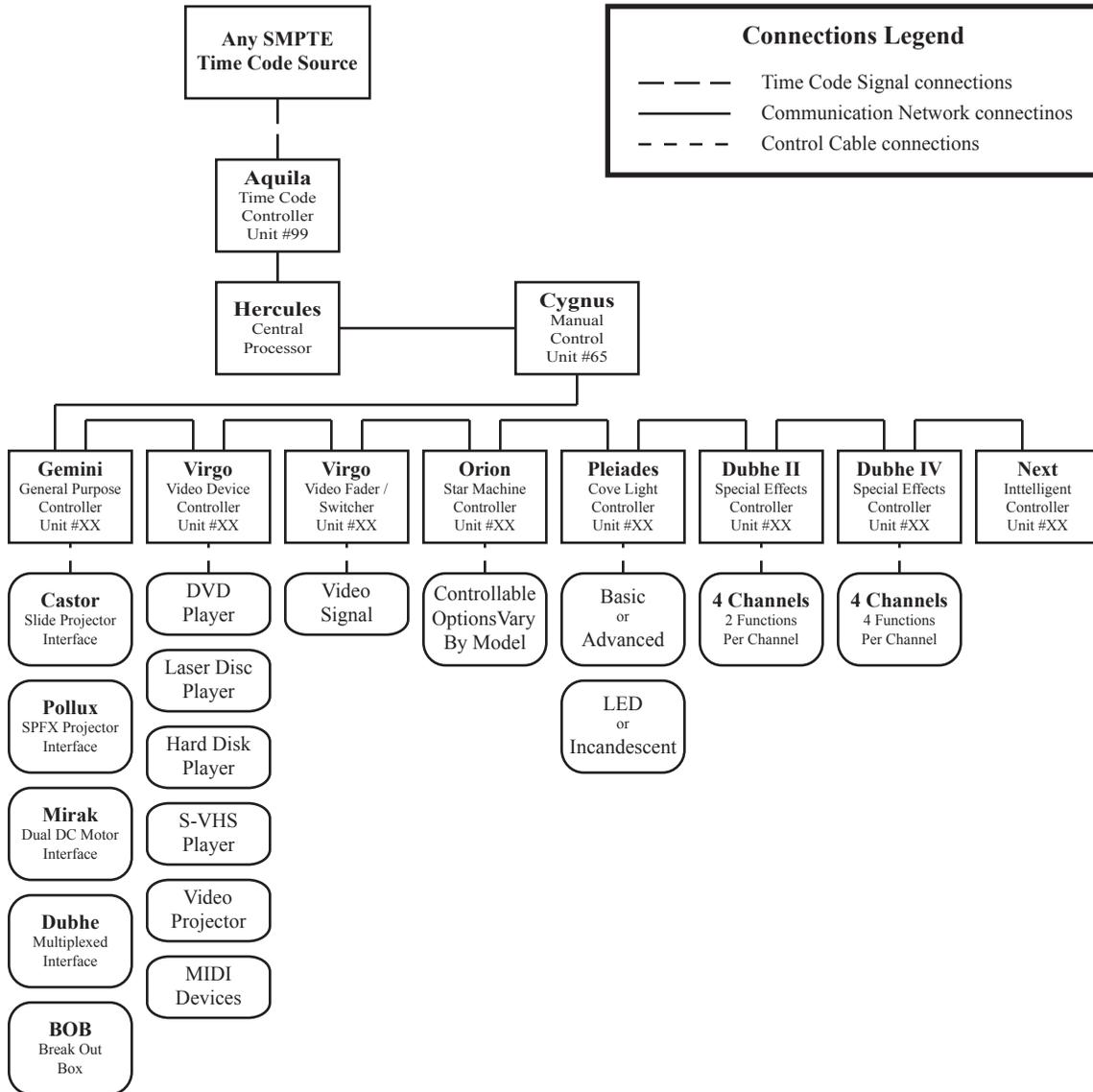
## UTCS HIERARCHY

A generalized system diagram is located below.

The *Intelligent Controllers* are identified on the communications network with **Unit Numbers**. The *Intelligent Controller Unit Numbers* are stored in the *Hercules Configuration File* along with the devices that are attached to them.

Control cable connections from the *Intelligent Controllers* to their devices will vary on the device being controlled.

**Note:** *Time Code* is the controlling factor for automated playback, and is not necessary for manual operations.



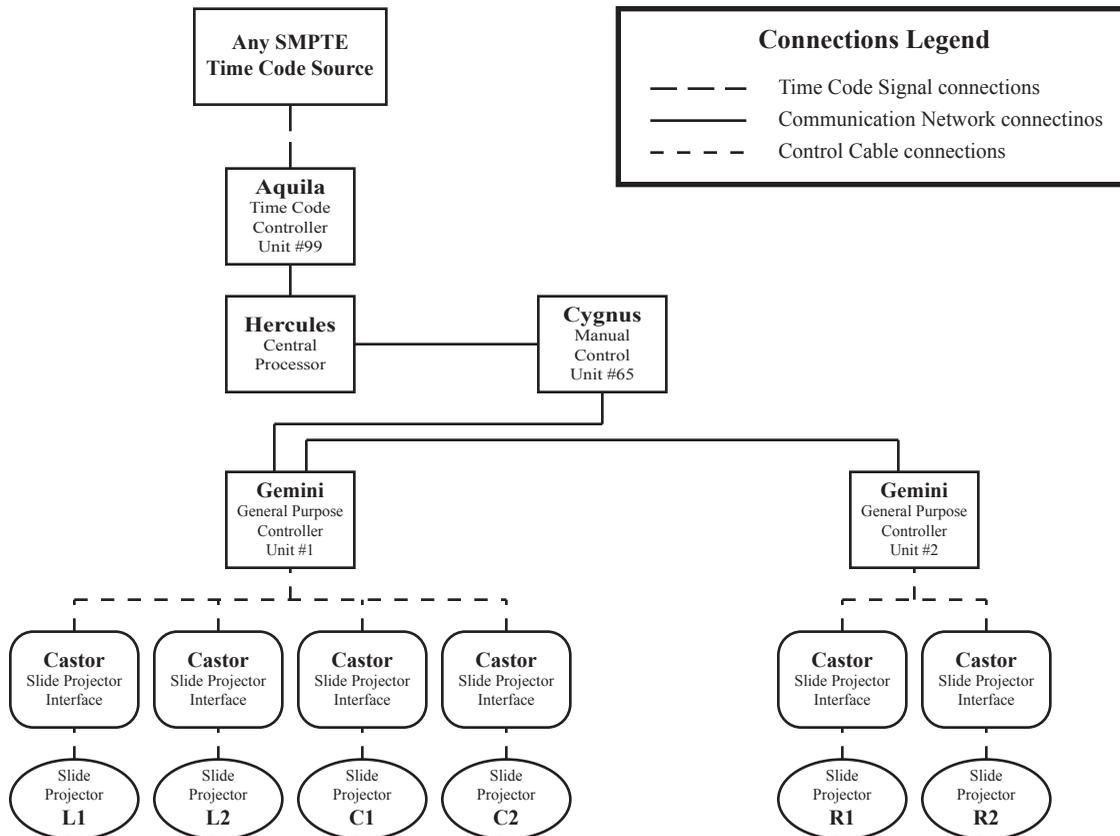
# UNIVERSAL THEATER CONTROL SYSTEM

## SYSTEM EXAMPLE 1

The diagram below illustrates a **UTCS** installation using the devices defined in the default *Configuration File*.

The *Aquila* connects directly to the *Hercules Central Processor* via a dedicated connector. If a *Cygnus EX Manual Control Brain* is used in the system, then a communication cable will go from the *Hercules Central Processor* to the *Cygnus*, before continuing to the other *Intelligent Controllers* in the system. Otherwise, any *Intelligent Controller* can be connected to the *Hercules Central Processor* and then onto the rest of the communications network.

The remainder of the **UTCS** communication network consists of two *Gemini General Purpose Controllers* and their attached slide projectors. Since there is no specific order that *Intelligent Controllers* should be connected to the communications network, other than the *Cygnus EX Manual Control Brain*, either *Gemini* can be next in line. This not only allows more *Intelligent Controllers* to be added to the system in the future, but allows the *Intelligent Controller* to be placed where it is most convenient.

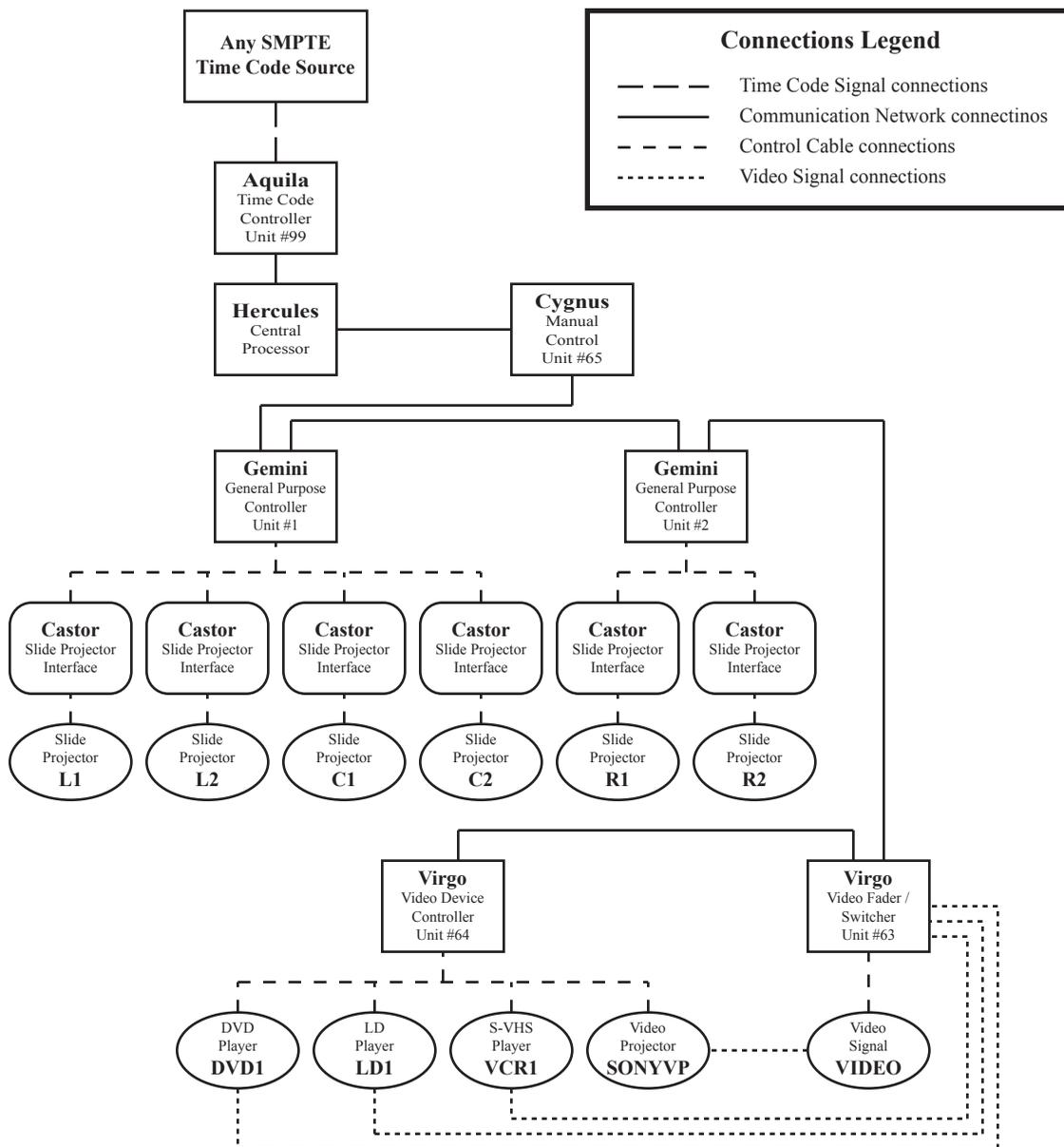


# UNIVERSAL THEATER CONTROL SYSTEM

## SYSTEM EXAMPLE 2

The diagram below illustrates a **UTCS** installation using the devices defined in the default *Configuration File* as well as additional video devices.

The **UTCS** network is the same as the previous example except that two new *Intelligent Controllers* have been added. The *Virgo Video Device Controller* will control the DVD player, the laser disk player, the S-VHS player, and the video projector. The *Virgo Fader/Switcher* will control which of the video sources will be sent to the video projector. Notice that the **Unit Numbers** for the new *Intelligent Controllers* do not need to be in sequential order.



# UNIVERSAL THEATER CONTROL SYSTEM

## WHERE TO START

Where does one begin installing the *Universal Theater Control System*?

Is the **UTCS** the first control system to be installed in a new theater? Then the installation has a clean, untouched canvas to begin with. Decisions will need to be made before installation can actually begin. Some of those decisions will be dictated by the basic layout of the dome and surrounding theater space. Decisions like how many projectors are to be installed? How much space is available to work with? What types of projectors are they? Where are the electrical outlets? Are they easily accessible and well placed around the theater? Where is the control console located? Is there an equipment rack behind the console? Is there an equipment rack in the next room? Is it located in a projection booth? How are the seats and aisles laid out? Where are the handicapped seating areas, and fire exits?

Is the **UTCS** replacing another control system? If so, some of the groundwork is already done. Presentations have been done with the existing equipment. The locations of slide projectors and other equipment are known. Projector enclosures have been made, shelves have been installed, and a general feel for the theater has been established. Certain pieces of equipment can be relocated, and any unused pieces can be removed. Only locations for new equipment will be untested.

Is this an addition to an existing **UTCS**? Then there should be a general understanding of the control system and how all the components work together. Adding new equipment to the control system should be easier to accomplish, and thought given to the placement of the new pieces.

**East Coast Control Systems** is ready to help figure out the most effective configuration for the theater and even provide professional installation if necessary. We look forward to helping provide the service and solutions necessary for the successful operation of the theater.

## CHAPTER 2: THE UNIVERSAL THEATER CONTROL SYSTEM INSTALLATION

### INTRODUCTION

The *Universal Theater Control System* (UTCS) is easy to install as compared to most systems. The assortment of *Intelligent Controllers*, *Device Interfaces*, communication cables, and control cables may seem a bit daunting at first, but breaking the job into bite size pieces is the best approach. Once a system component is understood, it can be installed in the proper location for the theater. UTCS system components can be broken into four main groups.

#### **Automation Synchronization:**

Placement: Either near the soundtrack/ Time Code source or *Hercules Central Processor*.  
Includes: *Aquila Time Code Controller*

#### **Host Computer/ User Interface:**

Placement: Anywhere convenient to show operators, usually in the console area.  
Includes: *Hercules Central Processor*  
*Cygnus Manual Control System*

#### **Intelligent Controllers:**

Placement: Near the 'action'.  
Includes: *Gemini General Purpose Controller* - Located near a cluster of device interfaces.  
*Virgo Video Device Controller* - Located near the video sources, in equipment rack.  
*Virgo Video Fader/ Switcher* - Located near the video sources, in equipment rack.  
*Pleiades Cove Light Controller* - Located in equipment rack, not frequently accessed.  
*Orion Star Machine Controller* - Usually located in control console.  
*Dubhe II* - Located near projector(s) to be controlled.  
*Dubhe IV* - Located near projector(s) to be controlled.

#### **Device Interfaces:**

Placement: As close as possible to devices to be controlled.  
Includes: *Castor Slide Projector Interface*  
*Pollux Special Effects Interface*  
*Dubhe Multiplexed Interface*  
*Mirak Dual DC Motor Interface*  
*BOB Break Out Box*

# UTCS INSTALLATION

## GETTING STARTED

As mentioned in Chapter 1 of this manual, some thought and consideration should go into the placement of the devices and projectors used in the theater. Once device and projector placement has been mapped out, the physical connection of the **UTCS** components can begin.

Start by placing the projectors and other devices to be controlled in the desired locations. When applicable, connect the *Device Interfaces* to the devices and to the *Intelligent Controllers*. Finally, connect the *Intelligent Controllers* to the communications network.

This chapter gives a brief description of the connection procedures for the more commonly used devices and *Intelligent Controllers*. Each *Intelligent Controller* and *Device Interface* has a chapter devoted to its setup and use.

The hardware and software installation for the **Hercules Central Processor** is covered in Chapter 3. The process of describing the theater and its devices by creating the **Configuration File** is covered in Chapter 4.

The **Cygnus Manual Control System**, if installed, will be the first *Intelligent Controller* in communication network. Plug the two 9 pin (**DB9**) connectors from the communications network into the appropriately labeled communications connectors located on the back panel of the **Cygnus**. The male **DB9** connector of the **Cygnus** will connect back towards the **Hercules Central Processor** and be labeled '**Hercules**'. The female **DB9** will connect towards the first *Intelligent Controller* in the communication network and be labeled '**Gemini**'.

The **Cygnus Manual Control System** will be covered in greater detail in Chapter 6.

## DEVICE INTERFACE INSTALLATION

Each device must be hooked to the appropriate interface by means of control cables. The manner in which this is done varies with the type of device and its particular interface.

## THE CASTOR SLIDE PROJECTOR INTERFACE

Each *Castor Slide Projector Interface* can control any standard slide projector that uses the seven pin **Kodak** connector to access the lamp and tray functions. In addition, a round **DIN** plug is used to access the tray home sensor on compatible projectors. For more information, consult the chapter on the *Castor* elsewhere in this manual. Use the following procedure to connect the *Castor* to the projector.

1. Plug the slide projector power cord into the receptacle on the rear of the *Castor*.
2. Plug the seven pin **Kodak** connector from the *Castor* into the appropriate receptacle on the rear of the projector.
3. Plug the round **DIN** plug from the *Castor* into the appropriate receptacle on the rear of the projector.

**Note:** It is very easy to insert this plug incorrectly. Be careful to align the indentation in the round metal shroud of the plug with the key of the receptacle to insure correct connection.

**Note:** If the projector does not have this connector, then this projector does not have a tray home sense switch. Simply coil the cable and place it aside. Take special note of programming precautions for projectors without home sense capabilities that will be presented later in the manual.

4. Plug the **Castor** power cord into a convenient receptacle.

**Note:** The *Castor* and the *Gemini* that control it must be on the same electrical power phase to insure that lamp dimming will occur correctly. The easiest way to insure this is to connect the *Castor* and the *Gemini* to the same power circuit.

5. Connect the female end of the wedge shaped 9 pin (**DB9**) control cable to the male plug on the rear of the *Castor*. The two screws can be tightened to insure that the cable will not be accidentally pulled out of the *Castor*.

## THE POLLUX SPECIAL EFFECTS INTERFACE

Each *Pollux Special Effect Interface* can control one full featured special effect projector. Separate control circuits are available for the fan, the lamp, and two auxiliary circuits such as motors. One of the auxiliary circuits has an associated home sense circuit for the automatic homing of device motions. For more information, consult the chapter on the *Pollux* elsewhere in this manual. Use the following procedure to connect the *Pollux* to the projector:

1. Plug the ten pin **Jones** connector into the receptacle on the rear of the *Pollux*.

**Note:** Because there is no standardized method of connecting special effect projectors to interfaces, most projectors will have to be modified to be used with the *Pollux* units. Information on how to accomplish this is presented in the chapter on the *Pollux* later in this manual should it be necessary to perform this task. Alternatively, **ECCS** can accomplish the task for a nominal fee.

2. Plug the *Pollux* power cord into a convenient AC receptacle.

**Note:** The *Pollux* and the *Gemini* that control it must be on the same electrical power phase to insure that lamp dimming will occur correctly. The easiest way to insure this is to connect the *Pollux* and the *Gemini* to the same power circuit.

3. Connect the female end of the wedge shaped 9 pin (**DB9**) control cable to the male plug on the rear of the *Pollux*. The two screws can be tightened to insure that the cable will not be accidentally pulled out of the *Pollux*.

## THE DUBHE MULTIPLEXED INTERFACE

Each *Dubhe Multiplexed Interface* can control either:

- a) 8 lamps, one at a time
- b) 4 lamp/ fan projectors, one at a time
- c) 4 lamp/ motor projectors, one at a time

Use the following procedure to connect the *Dubhe* to the projectors:

1. Plug the projector lamp, fan, or motor power cords into the appropriate AC receptacles on the *Dubhe*.

**Note:** The *Dubhe* uses normal AC receptacles to supply power to the projectors. Most projectors will have to be rewired to provide separate control for the fans or the motors. Information on how to accomplish this is presented in the chapter on the *Dubhe* later in this manual should it be necessary to perform this task. Alternatively, ECCS can accomplish the task for a nominal fee.

2. Plug the *Dubhe* power cord into a convenient receptacle.

**Note:** The *Dubhe* and the *Gemini* that control it must be on the same electrical power phase to insure that lamp dimming will occur correctly. The easiest way to insure this is to connect the *Dubhe* and the *Gemini* to the same power circuit.

# UTCS INSTALLATION

## THE MIRAK DUAL DC MOTOR INTERFACE

Each *Mirak Dual DC Motor Interface* can control the positioning of up to two motions such as those used on slews and zooms. For more information, consult the chapter on the *Mirak* elsewhere in this manual. Use the following procedure to connect it to the device:

1. Plug each of the two 9 pin (**DB9**) connectors from two motion mechanisms to the receptacles on the rear of the *Mirak*.

**Note:** The mechanism will need to be wired to be compatible with the interface. Refer to the section on the *Mirak* for details. **ECCS** will perform this service upon request for a nominal fee.

2. Plug the *Mirak* power cord into a convenient receptacle.

## THE BOB BREAK OUT BOX

There are three different versions of the *BOB Break Out Box* that transform the eight low current, dry contact switch closures in the *Gemini* or *Aquila* into one of the following:

1. **BOB 8P** - eight switched 120 VAC receptacles (5 amps. max).
2. **BOB 4P4S** - four switched 120 VAC receptacles (5 amps. max) and four medium current (5 amp. max.) switch closures.
3. **BOB 8S** - eight medium current (5 amp. max.) switch closures.

The *BOB* connects to the *Gemini* or *Aquila* by means of an included wedge shaped 25 pin (**DB25**) conductor cable. The *BOB* power cord may be plugged into any convenient outlet. Power phasing is not important to *BOB*.

Consult the chapter on the *BOB* elsewhere in this manual for connections to individual devices.

# UTCS INSTALLATION

## INTELLIGENT CONTROLLER INSTALLATION

Each *Intelligent Controller* is responsible for accepting commands from the *Hercules Central Processor* or the *Cygnus Manual Control System*, and generating the appropriate control signals for the *Device Interfaces*. In order to minimize unnecessary cabling, each controller should be placed close to the interfaces to which it will be attached.

After each device is hooked up to its appropriate interface, each interface must be connected to one control channel of an *Intelligent Controller*. This connection is made by means of a control cable. The control cable carries discrete control signal information to each interface.

The controller must be told what kind of interface is attached to each of its control channels. This is usually performed by means of manipulating a menu from the front panel controls of the controller.

In addition, all *Intelligent Controllers* in a system are linked to each other in a communications network. This network is also linked to the *Hercules Central Processor* and/ or the *Cygnus Manual Control System*. The cable used to form this network is referred to as communication cable. The communication cable carries command and status information between the *Intelligent Controllers* and the *Hercules Central Processor*.

Each controller must be assigned a unique identification number, or **Unit Number**, between 1 and 64. This number is usually selected by means of a menu on the LCD display and the front panel controls of the controller. If the controller does not have an LCD display and front panel controls, such as *Dubhe II* and *Dubhe IV Special Effects Controllers*, then the **Unit Number** is set internally by ECCS and the range is restricted to **Unit Numbers** between 1 and 32.

The communication network will **Daisy Chain** from one controller to the next. The communication cables can be allowed to take the shortest route between controllers. The assignment of **Unit Numbers** has nothing to do with order in which the controllers are physically attached to the network.

As each device is added to the system, make a note of the **Unit Number** and **Slot Number** of the controller to which it is attached, along with the type of device. This information will be necessary when the system is configured for the software.

## TYPICAL UNIT NUMBER SELECTIONS

Although no two theaters are exactly alike, ECCS has tried to ‘standardize’ the use of certain **Unit Numbers** throughout its installations. The typically used **Unit Numbers** and the *Intelligent Controllers* they are associated with are listed below.

<b><u>UNIT #(S)</u></b>	<b><u>INTELLIGENT CONTROLLER</u></b>	<b><u>COMMENT</u></b>
65	Cygnus Manual Control System	Defined in default Configuration File.
99	Aquila Time Code Controller	Defined in default Configuration File.
17 - 32	Orion Star Machine Controller	Unit Numbers vary by model and options.

# UTCS INSTALLATION

## AQUILA TIME CODE CONTROLLER INSTALLATION

The *Aquila Time Code Controller* supplies the *Hercules Central Processor* with timing information in order to synchronize an automated presentation with a soundtrack or other *Time Code* source. Logical placement for the *Aquila* is either near the *Hercules Central Processor* or the *Time Code* source.

Follow these steps to install the *Aquila Time Code Controller*:

1. Plug the wedge shaped 15 pin (**DB15**) *Time Code* cable into the receptacle on the rear of the *Aquila*. The other ends of the cable, terminating in two RCA phono jacks, are used for *Time Code*. One of the jacks is used to output *Time Code*, while the other is used to input *Time Code*. The RCA jacks are color coded, and a label on the **DB15** hood will indicate which is which.
2. Plug the female end of a 9 pin (**DB9**) communications cable to the appropriate connector on the rear panel of the *Aquila*. The male end of this communications cable will plug into the bottom connector of the *Hercules Show Control Card*, labeled *Aquila*.
3. Plug the *Aquila* power cord into a convenient AC receptacle, and turn it on.
4. Using the LCD display and the <SET>, <NEXT>, and <PREV> buttons on the front panel, adjust the settings of the *Aquila* according to the following table. If necessary, refer to the *Aquila* manual for more detailed information on setting these options.

## AQUILA CHARACTERISTICS AND SETTINGS FOR USE WITH THE UTCS

<u>CHARACTERISTIC</u>	<u>SELECTION</u>	<u>COMMENT</u>
MODE:	ECCS - UTCS	This Mode must be used.
CLOCK TYPE IN:	SMP30	Recommended, but type must match source.
CLOCK TYPE OUT:	SMP30	Recommended.
FREEWHEEL:	30 FRAMES	Recommended.
REGENERATION:	OFF	Recommended.
BAUD RATE:	19200	Must use this baud rate.
COMM ECHO:	OFF	Must be OFF.
PLAYBACK:	OFF	Recommended.
AUTO REST:	OFF	Recommended.
SETTINGS LOCK:	LOCKED	Recommended.

## GEMINI GENERAL PURPOSE CONTROLLER INSTALLATION

Each *Gemini General Purpose Controller* can provide four independent channels of low voltage control signals for any of the following device interfaces:

1. The *Castor Slide Projector Interface*
2. The *Pollux Special Effects Projector Interface*
3. The *Dubhe Multiplexed Interface*
4. The *Mirak Dual DC Motor Interface*

Follow these steps to install the *Gemini General Purpose Controller*:

1. Plug the 9 pin (**DB9**) connector of the control cable from the interface into one of the four control ports on the rear of the *Gemini*. The control ports are the blue **DB9** receptacles to the right of the power entry module. They are numbered 1 through 4, with number 1 closest to the power entry module.
2. Plug the two 9 pin (**DB9**) connectors from the communications network into the communications port on the rear of the *Gemini*. The communications connectors are black and are located at the center bottom of the back panel. In a typical installation, the male **DB9** connector of the *Gemini* will connect back towards the *Hercules Central Processor*, while the female **DB9** will connect towards the end of the line. The last *Gemini*, or other *Intelligent Controller*, on the network will not have a cable connected to the female **DB9**.
3. Plug the *Gemini* power cord into a convenient AC receptacle, and turn it on.

**Note:** The *Gemini* and its associated lamp dimming interfaces must be on the same electrical power phase to insure that lamp dimming will occur correctly. The easiest way to insure this is to connect the *Gemini* and the interfaces to the same power circuit.

4. Using the LCD display and the <SET>, <NEXT>, and <PREV> buttons on the front panel, set the 'UNIT NUMBER' of this *Gemini* and the types of interfaces on each of the four control channels. If necessary, refer to the chapter on the *Gemini* for more detailed information on setting these options.

# UTCS INSTALLATION

## VIRGO VIDEO DEVICE CONTROLLER INSTALLATION

Each *Virgo Video Device Controller (VDC)* can provide four independent channels to send serial command strings to devices that understand the following serial communication protocols:

1. RS-232
2. RS-422
3. MIDI (Requires optional MIDI upgrade.)
4. DMX

Follow these steps to install the *Virgo Video Device Controller*:

1. Plug the male 9 pin (**DB9**) connector from the device control cables into one of the four control ports on the rear of the *Virgo*. The control ports are the blue **DB9** receptacles to the right of the power entry module. They are numbered 1 through 4, with number 1 closest to the power entry module.  
  
**Note:** Not all control cables are wired the same way. Make sure the proper control cable is used with device to be connected. Refer to the *Virgo Video Device Controller* manual for control cable wiring diagrams.
2. Plug the two 9 pin (**DB9**) connectors from the communications network into the black communications connectors located on the rear panel of the *Virgo VDC*. In a typical installation, the male **DB9** connector of the *Virgo VDC* will connect back towards the *Hercules Central Processor*, while the female **DB9** will connect towards the end of the line. The last *Intelligent Controller* on the network will not have a cable connected to the female **DB9**.
3. Plug the *Virgo VDC* power cord into a convenient AC receptacle, and turn it on.
4. Using the LCD display and the <SET>, <NEXT>, and <PREV> buttons on the front panel, set the 'UNIT NUMBER' of the *Virgo VDC* and the types of devices on each of the four control channels. If necessary, refer to the chapter on the *Virgo Video Device Controller* for more detailed information on setting these options.

# UTCS INSTALLATION

## VIRGO VIDEO FADER/ SWITCHER INSTALLATION

Each *Virgo Video Fader/ Switcher (VFS)* provides video signal manipulation and video input selection capabilities. The type of input, composite or S-Video, will depend on the unit purchased.

The *Virgo VFS* does not contain circuitry to convert between video formats. All video signals must be either composite video or S-Video. The sources cannot be mixed.

Follow these steps to install the *Virgo Video Fader/ Switcher*:

1. Connect to video output from a video playback device (DVD, Laser Disc, S-VHS, or DVR) to one of the connections labeled 'In #'.

**Note:** Connect the most commonly used video playback device to 'In 1'. This is the default input selected when the *Virgo VFS* is powered on.

2. Connect the video output, labeled 'Out', to the video projector or line doubler.

**Note:** The connection labeled 'Mon' is for a video monitor and is not used in all theater systems. The monitor can be used to check the video signal before it is projected into the theater.

3. Plug the two 9 pin (**DB9**) connectors from the communications network into the black communications connectors located on the rear panel of the *Virgo VFS*. In a typical installation, the male **DB9** connector of the *Virgo VFS* will connect back towards the *Hercules Central Processor*, while the female **DB9** will connect towards the end of the line. The last *Intelligent Controller* on the network will not have a cable connected to the female **DB9**.

4. Plug the *Virgo VFS* power cord into a convenient AC receptacle, and turn it on.

5. Using the LCD display and the <SET>, <NEXT>, and <PREV> buttons on the front panel, set the 'UNIT NUMBER' of the *Virgo VFS*. If necessary, refer to the chapter on the *Virgo Video Fader/ Switcher* for more detailed information about the unit.

# UTCS INSTALLATION

## DUBHE II INSTALLATION

Each *Dubhe II Special Effects Controller* is capable of controlling up to four special effect projectors. Each of the special effect projectors can have two functions such as a lamp and fan, or a lamp and motor.

Follow these steps to install the *Dubhe II Special Effects Controller*:

1. Plug the lamp power cord for a special effect projector into an outlet labeled ‘**Lamp #**’. If the special effect also has a separate fan or motor power cord, plug it into the ‘**Fan/ Mtr #**’ outlet with the same number, ‘#’, as the lamp.

**Note:** The outlet functions are set with jumpers located on the **Dubhe II** motherboard and are preset by ECCS. See the chapter on the *Dubhe II Special Effects Controller* for information about changing jumper settings, as well as special effect wiring considerations.

2. Plug the two 9 pin (**DB9**) connectors from the communications network into the communications connectors located on the rear panel of the *Dubhe II*. In a typical installation, the male **DB9** connector of the *Dubhe II* will connect back towards the *Hercules Central Processor*, while the female **DB9** will connect towards the end of the line. The last *Intelligent Controller* on the network will not have a cable connected to the female **DB9**.

**Note:** The **Unit Number** is set via a series of dip switches located on the **Dubhe II** motherboard, and are preset by ECCS. See the chapter on the *Dubhe II Special Effects Controller* for information on how to change the **Unit Number**.

3. Plug the *Dubhe II* power cord into a convenient AC receptacle to turn it on.

# UTCS INSTALLATION

## DUBHE IV INSTALLATION

Each *Dubhe IV Special Effects Controller* is capable of controlling up to four special effect projectors. Each of the special effect projectors can have four functions such as a lamp, a fan, and two motors.

Follow these steps to install the *Dubhe IV Special Effects Controller*:

1. Plug the power cords for a special effect projector functions into the labeled outlets. With the lamp function going to the '**Lamp #**' outlet, the fan function going to the '**Fan**' outlet, the motor 1 function going to the '**Motor 1**' outlet, and the motor 2 function going to the '**Motor 2**' outlet. If a reset switch is available, it will be connected to the *Dubhe IV* '**Home Relay**' connector with a **DB9**.

**Note:** The outlet functions are set with jumpers located on the **Dubhe IV** motherboard and are preset by **ECCS**. See the chapter on the *Dubhe IV Special Effects Controller* for information about changing jumper settings, as well as special effect wiring considerations.

2. Plug the two 9 pin (**DB9**) connectors from the communications network into the communications connectors located on the rear panel of the *Dubhe IV*. In a typical installation, the male **DB9** connector of the *Dubhe IV* will connect back towards the *Hercules Central Processor*, while the female **DB9** will connect towards the end of the line. The last *Intelligent Controller* on the network will not have a cable connected to the female **DB9**.

**Note:** The **Unit Number** is set via a series of dip switches located on the **Dubhe IV** motherboard, and are preset by **ECCS**. See the chapter on the *Dubhe IV Special Effects Controller* for information on how to change the **Unit Number**.

3. Plug the *Dubhe IV* power cord into a convenient AC receptacle, and turn it on.

# UTCS INSTALLATION

## ORION STAR MACHINE CONTROLLER INSTALLATION

The *Orion Star Machine Controller* is typically installed by ECCS personnel, and should be only be attempted by qualified individuals. The *Orion* utilizes several component boxes to control a star machine. The number of component boxes and their configuration will depend not only on the model of star machine, but the options the star machine possesses as well.

Once installed the component boxes of the *Orion* are connected to the **UTCS** network in the same manner as all other *Intelligent Controllers*. Plug the two 9 pin (**DB9**) connectors from the communications network into the communications connectors located on the rear panel of the *Orion* component box. In a typical installation, the male **DB9** connector of the *Orion* component box will connect back towards the *Hercules Central Processor*, while the female **DB9** will connect towards the next *Orion* component box, or the end of the line. The last *Intelligent Controller* on the network will not have a cable connected to the female **DB9**.

The **Unit Numbers** associated with the *Orion* are assigned by ECCS and may vary depending on the model of star machine being automated. Changing the **Unit Numbers** should only be done under the guidance and direction of ECCS.

# UTCS INSTALLATION

## PLEIADES COVE LIGHT CONTROLLER INSTALLATION

The *Pleiades Cove Light Controllers* are typically installed by ECCS personnel, and should be only be attempted by qualified individuals. The number of component boxes that make up the *Pleiades* depends on whether the cove system installed is the *Pleiades Advanced* or *Pleiades Basic*.

Once installed, the component boxes of the *Pleiades* are connected to the UTCS network in the same manner as all other *Intelligent Controllers*. Plug the two 9 pin (DB9) connectors from the communications network into the black communications connectors located on the rear panel of the *Pleiades* component box. In a typical installation, the male DB9 connector of the *Pleiades* component box will connect back towards the *Hercules Central Processor*, while the female DB9 will connect towards the next *Pleiades* component box, or the end of the line. The last *Intelligent Controller* on the network will not have a cable connected to the female DB9.

If an advanced system is installed, use the LCD display and the <SET>, <NEXT>, and <PREV> buttons on the front panel, set the 'UNIT NUMBER' of the three *Pleiades* component boxes. Each of the component boxes should have a unique Unit Number. Refer to the chapter on the *Pleiades Cove Light Controller* for more detailed information about the various settings required for the correct operation of the advanced cove system.

A *Pleiades Basic* system will require a single component box with a **Unit Number** that is internally set by ECCS.