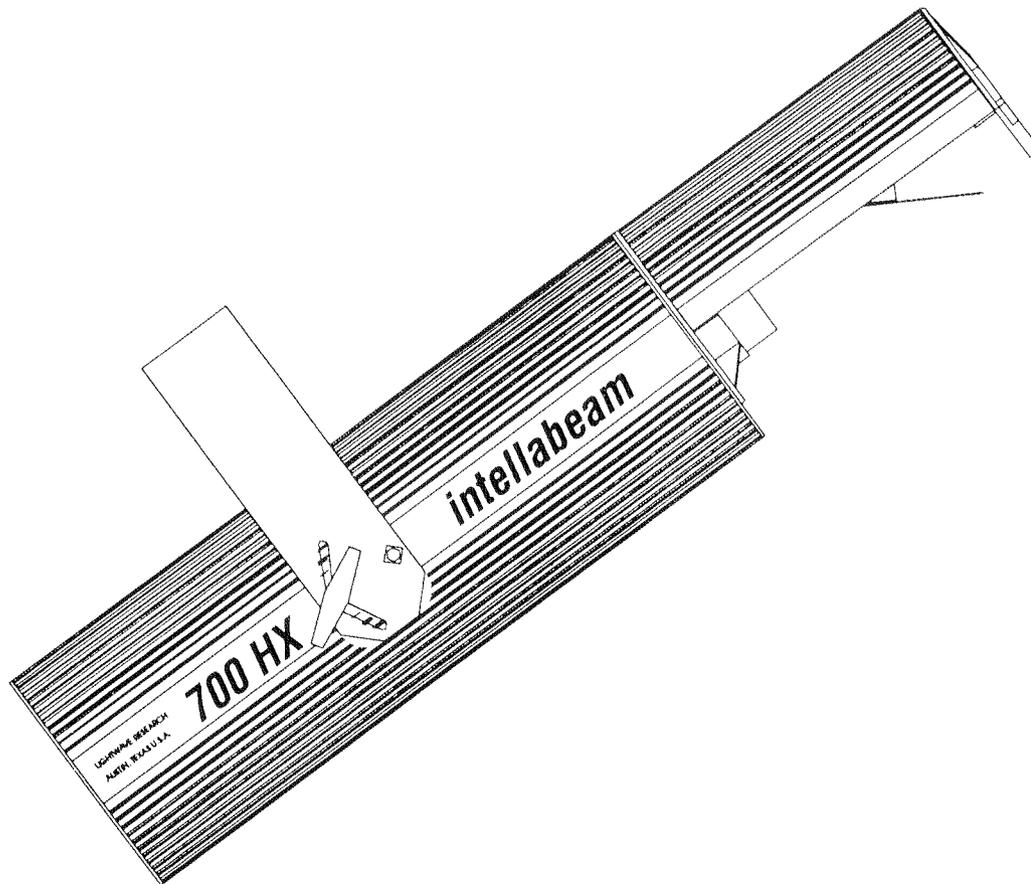
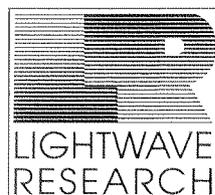


# *intellabeam 700 HX*



## *User Manual* *Version 1.0*



2209 WEST BRAKER LN.  
AUSTIN, TX 78758 U.S.A.

# ***intellabeam 700 HX***

## ***User Manual***

***Version 1.0 - Revised 5/92***

by  
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# *Introduction*

Congratulations on your purchase of the Lightwave Research Intellabeam 700 HX System. The Intellabeam 700 HX provides designers and operators a versatile, fully integrated system with unprecedented brightness, speed and accuracy for the creation of complex lighting cues and scenes. Each microprocessor-based fixture can be easily programmed into a scene with precise beam positioning; choice of variable beam sizes, colors, gobo patterns, and light intensity; and variable speed programming for mirror scanners, colors, gobos, and strobe effects. The result is a lighting system that is ideal for theatrical applications, stage, studio, concert touring and nightclubs.

The Lightwave Research Intellabeam controller allows you to program and store a complex light show in a few simple steps and to play it back with the touch of a button. Once your light show is programmed and recorded, it is secure in the internal storage space of the controller. The stored show can be protected from unauthorized editing by simply removing the power keyswitch.

The building blocks of a light show on the Lightwave Research Intellabeam controller are called **Pages**. A Page is one static setting of all functions and fixtures (sometimes called a scene or look). A Page is made up of a fixture or group of fixtures whose **Constructs** (Color, Gobo, Gate, Iris, Dim, Speed, Crossfade, Delay, and Position) are set and stored in the controller's internal storage space. The controller's internal storage space is divided into nine **Memories**. A Memory is a block of internal storage space consisting of ninety-nine programmable Pages.

After you have stored several Pages in a Memory, you can create a **Sequence**. A Sequence (also called a Chase or Loop) is a group of Pages arranged in a certain playback order, separated from the other Pages in a Memory by a **Non-initialized Page** or Pages. A Non-initialized Page is any Page in a Memory which you designate as a placeholder. This Page contains no Fixture Construct information; it marks the beginning or ending of a Sequence.

When you have created a Sequence which you want to include in your Show, you can store that Sequence as a **Preset**. A Preset is a reference to a single Page or a Sequence of Pages which may be recalled with a single Preset key press. You can then playback the Presets which you have created, in any order you choose, to form a light show specific to your needs.

# SECTION 1

## PRELIMINARY PLANNING

### Unpacking the Intellabeam System

---

The shipping carton which contains the **controller** will also contain the following materials:

- One Intellabeam User Manual
- Two controller keys
- One book of Intellabeam schematic drawings
- One Intellabeam Backup 5 1/4 in. Floppy Disk
- One allen wrench

The shipping carton which contains the **fixture** will also contain the following materials:

- One MSR 700 lamp
- One Mirror with mount
- One yoke (See Fig. 1.1)
- Lamp installation instructions
- Two clamping T-handles \* (See Fig. 1.1)
- Two 8 mm (3/8 x 16 x .500) allen cap bolts \* (See Fig. 1.1)
- Lamp optimization instructions

**\* Note:** The two 8 mm (3/8 x 16 x .500) allen cap bolts and the two clamping T-handles are already installed when the fixture is shipped. You will need to remove them in order to install the yoke.

If your cartons do not include all these items, contact your High End Systems dealer or distributor immediately.

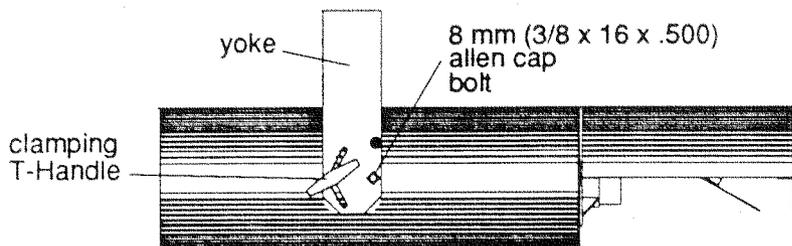


Figure 1.1 Intellabeam Fixture: Side View

Prior to setting up the Intellabeam system, the electrical and structural requirements of the system should be considered. The proper power distribution system should be in place and the correct cables should be constructed or purchased before the Intellabeam system is set up.

**NOTE:** Both the fixture and the controller should be mounted in a location which is away from direct heat and protected from moisture.

## **Power Requirements**

---

### **Fixture**

---

The Intellabeam fixture requires no dimming or switching circuits for operation. All that is required is a 100V, 120V, or 220/240V supply at either 50 or 60 hertz. The voltage is set at the factory, but may be easily changed to suit the requirements of the location.

Listed below are the average current requirements per fixture at the specified voltages:

at 100VAC, 60/50hz	≈ 10.0 amps
at 120VAC, 60/50hz	≈ 8.5 amps
at 230VAC, 60/50hz	≈ 4.0 amps

Multiple fixtures may be placed on a single circuit. The number of fixtures allowed per circuit depends on the current rating of the circuit.

**CAUTION:** All fixtures should be earth grounded for proper operation. Erratic operation may result from improperly grounded fixtures.

## Fixture Voltage Selection

---

If the voltage or frequency of the local power grid differs from the factory setting of the fixture or controller, it can be easily re-configured to operate at the required voltage and frequency combination. The fixture has a set of jumpers that are wired into a quick disconnecting terminal block. The jumpers can be set so that the fixture can operate at 100V, 120V, or 220/240V at either 50 or 60 Hertz.

### Changing the Fuse

---

- **DO NOT APPLY POWER TO THE FIXTURE UNTIL YOU HAVE RE-CONFIGURED THE FIXTURE TO OPERATE AT THE REQUIRED VOLTAGE AND FREQUENCY COMBINATION OF YOUR LOCAL POWER GRID.**
- Before you reconfigure the jumper wires, you need to change the fuse on the rear panel of the fixture according to Table 1.1.
- Replace the old fuse with a new fuse of the correct amperage. (See Table 1.1 to locate the new voltage and corresponding fuse amperage.) **REPLACE THE MAIN FUSE ON THE REAR OF THE FIXTURE WITH A TYPE "FST", 5mm X 20mm, 250V, TIME LAG FUSE OF THE CORRECT VALUE.**

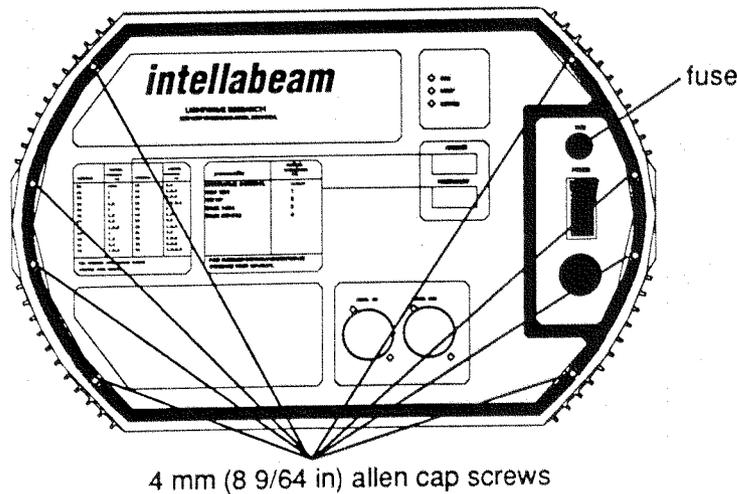
SELECTION	PIN# TO PIN#	SELECTION	PIN# TO PIN#
100 Volts 60 Hertz 20A Fuse	1 2 5 6	100 Volts 50 Hertz 20A Fuse	1 2 5 7
120 Volts 60 Hertz 12.5A Fuse	1 3 5 6	120 Volts 50 Hertz 12.5A Fuse	1 3 5 7
230 Volts 60 Hertz 10A Fuse	1 4 5 6	230 Volts 50 Hertz 10A Fuse	1 4 5 7

**Table 1.1 Fixture Voltage Configuration**

- Locate the fuse on the rear panel of the fixture, just above the power switch.
- Remove the fuse by turning it and pressing in on it at the same time. The fuse will be loosened and you will be able to pull it out easily.
- You will now need to remove the rear panel to reconfigure the jumpers, in order to change the voltage of the fixture.

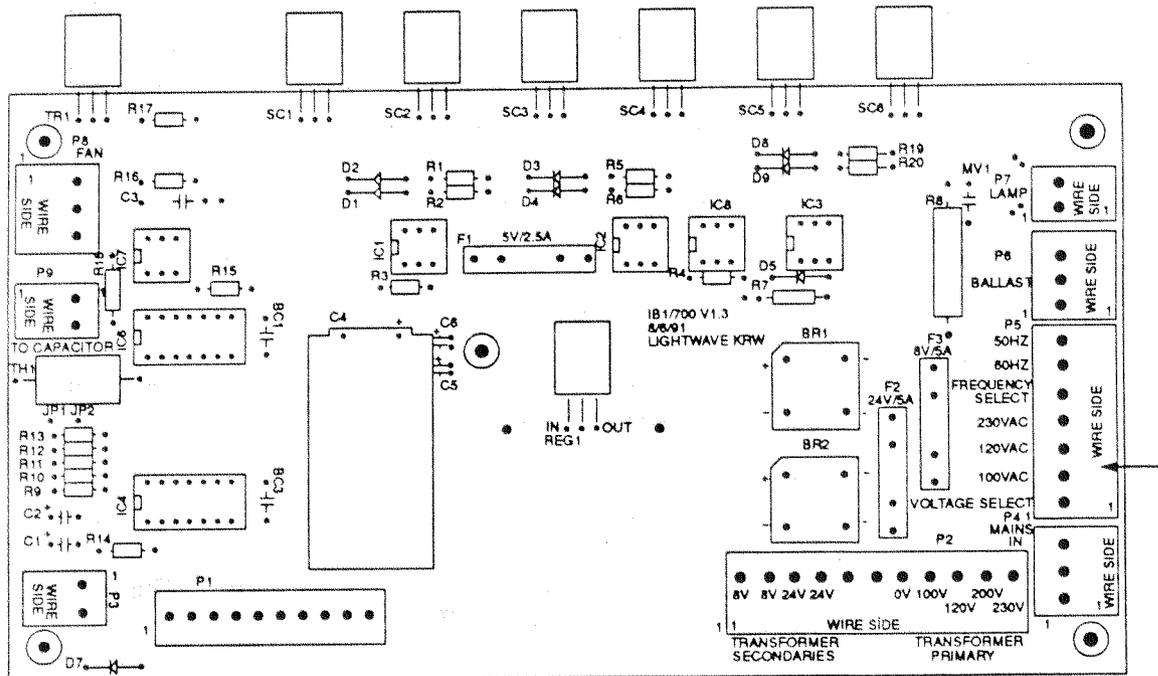
## Changing the Jumpers

- To change the jumpers, first disconnect power to the unit and take off the rear panel by removing the eight 4 mm (9/64 in) allen cap screws securing it. (See Fig. 1.2)



**Figure 1.2 Intellabeam Fixture: Rear Panel**

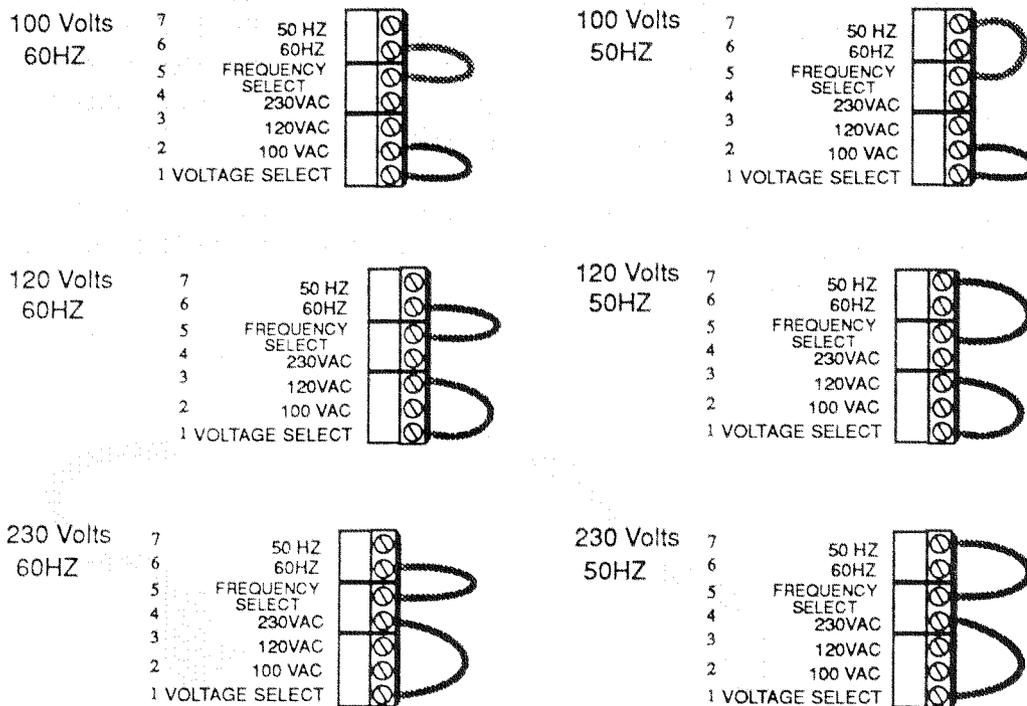
- Carefully lower the rear panel out of the way, taking care not to strain the wiring harnesses attached to it.
- Inside the fixture there will be a printed circuit board (the power supply board) in plain view. On the far right hand side of this board is a multi-pin connector labeled "voltage select". (See Fig. 1.3)



**Figure 1.3 Intellabeam Power Supply Board**

VOLTAGE  
SELECT  
CONNECTOR

- You can remove the connector, or you can change the jumpers while the connector is still in the fixture.
- To remove the connector, pull the connector towards the right side of the fixture (towards the jumpers) until it slides out.
- Reconfigure the jumpers as shown. (See Fig. 1.4)



**Figure 1.4 Multi-pin Connector Voltage Selection Configurations**

## Controller

The controller requires very little power (approximately 300 milliamperes at 115VAC and approximately 150 milliamperes at 230VAC). You can switch the voltage from 115 to 230 Volts without changing the fuse.

### Controller Voltage Selection

The controller can operate at 115 or 230 Volts. The Voltage Select switch on the rear chassis near the line cord allows easy external access for choosing the appropriate voltage. Switch number two on the 8-position Personality DIP switch located on the rear chassis of the controller must also be set for proper operation. It should be in the "OFF" position for 60 Hertz operation and in the "ON" position for 50 Hertz operation.

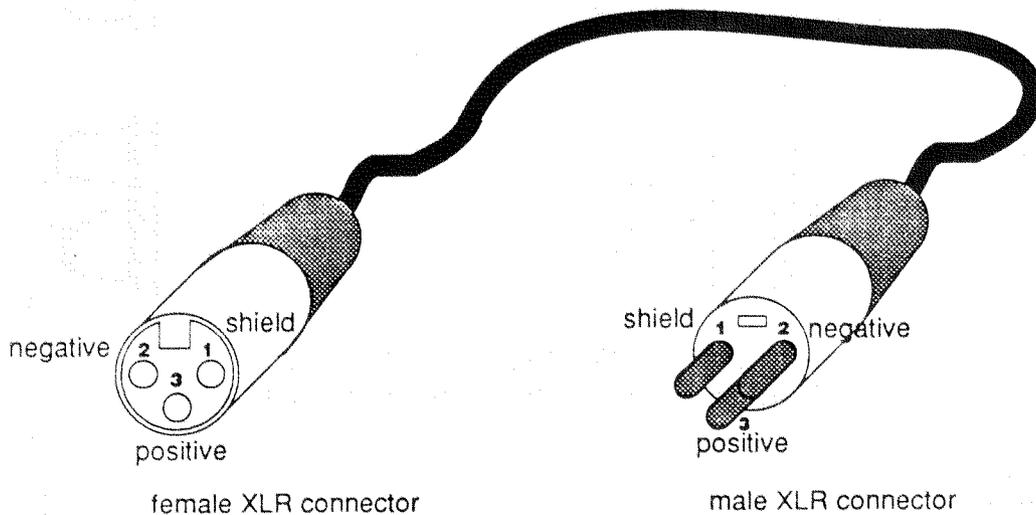
## Data Cable Requirements

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Both the Intellabeam fixture and controller require 3-pin XLR connectors for data input and data output. (See Fig. 1.4)

Data cables should be constructed using shielded, two-conductor cable with a male 3-pin XLR connector on one end and a female 3-pin XLR connector on the other end. Pin 1 is the shield, Pin 2 is the data compliment (negative), and Pin 3 is the data true (positive). Microphone cables will work if the pin connections are correct (the same as described above). Each cable should be tested with a VOM for correct polarity and to make certain that neither connector is grounded before use.

**CAUTION:** Do not use the ground lug on the XLR connectors. Do not connect the shield to ground or allow contact to ground. Grounding the shield could cause a ground loop and cause erratic behavior.



**Figure 1.4 Properly Constructed Data Cable**

## Additional Hardware

---

In addition to a power source and data cables, you will need **heavy duty pipe clamps** and safety cables to set up the Intellabeam system. The fixture's yoke is designed so that you can hang the fixture using either one or two clamps. **Safety cables** are an important part of securely mounting the fixture and are *highly recommended*.

# SECTION 2

## SETTING UP

### Assembling the Fixture

---

The first step in assembling the fixture is to attach the yoke as described in the following instructions. After you attach the yoke, you will need to install the mirror and the lamp. The final and most important step in assembling the fixture is the optimization of the lamp.

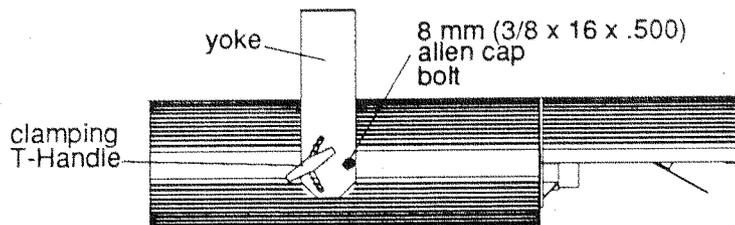
#### Attaching the Yoke

---

**You will need..**

**8 mm (3/8 in) allen wrench**

1. Remove the two 8 mm (3/8 x 16 x .500) allen cap bolts and the two clamping T-handles from the fixture. (See Fig. 2.1)
2. Align the mounting holes on the yoke with those on the fixture.

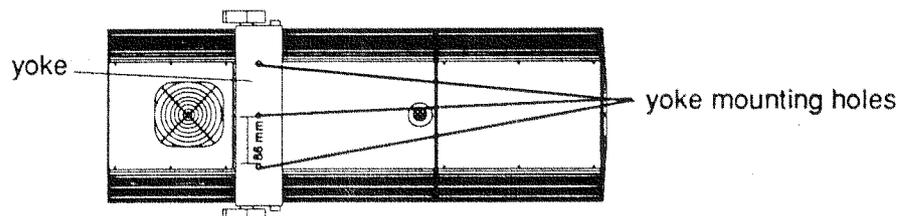


**Figure 2.1 Intellabeam Fixture: Side View**

3. Insert the 8 mm (3/8 x 16 x .500) allen cap bolts through the round holes on the yoke and insert the clamping T-handles into the slotted, curved cut outs on the yoke.
4. Tighten the 8 mm (3/8 x 16 x .500) allen cap bolts with your allen wrench.

The main function of the clamping T-handles is to position the angle of the fixture. They should not be tightened completely until the fixture is in place and positioned correctly.

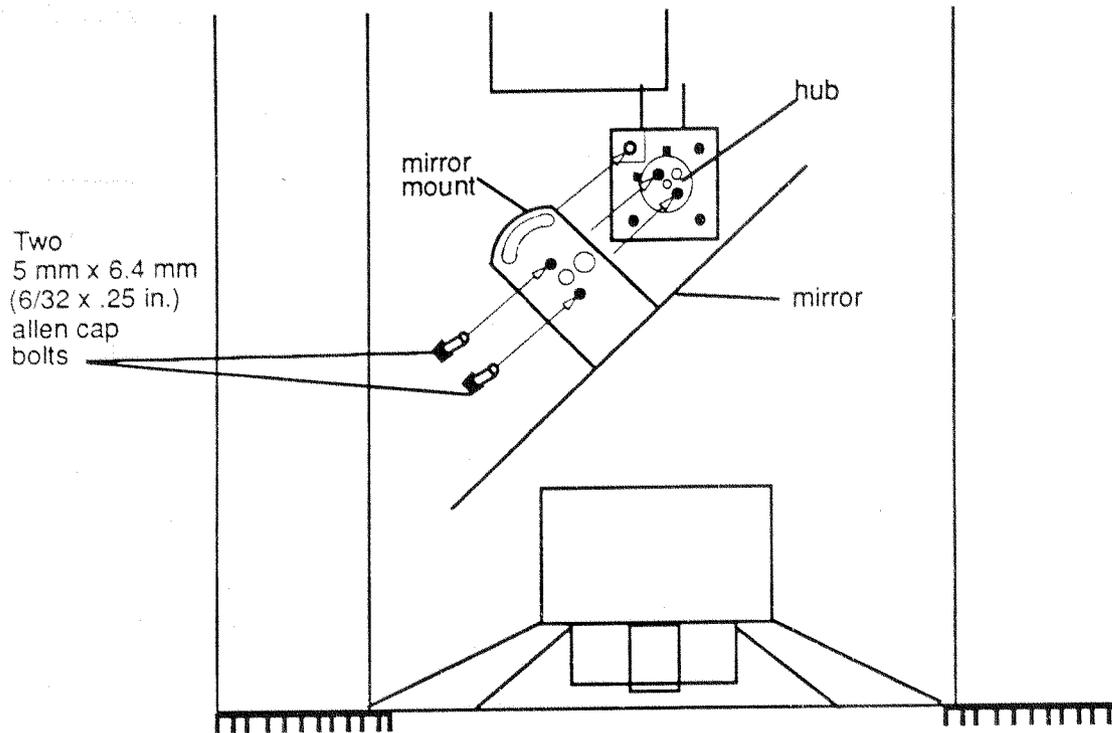
On the top of each yoke are three mounting holes [13 mm (.5 in) diam.] which allow two different ways to mount the fixture. The three holes are spaced 86 mm (3.4 in) apart (See Figure 2.2). The fixture may be mounted with a single clamp in the center of the yoke, or with two clamps on either side of the yoke.



**Figure 2.2 Intellabeam Fixture: Top View**

## Installing the Mirror

1. Using the allen wrench supplied with the controller, remove the two 5 mm x 6.4 mm (6/32 x .25 in.) allen cap bolts from the hub on the motor in the mirror head.  
(See Fig. 2.3)



**Figure 2.3 Intellabeam Fixture: Mirror Head**

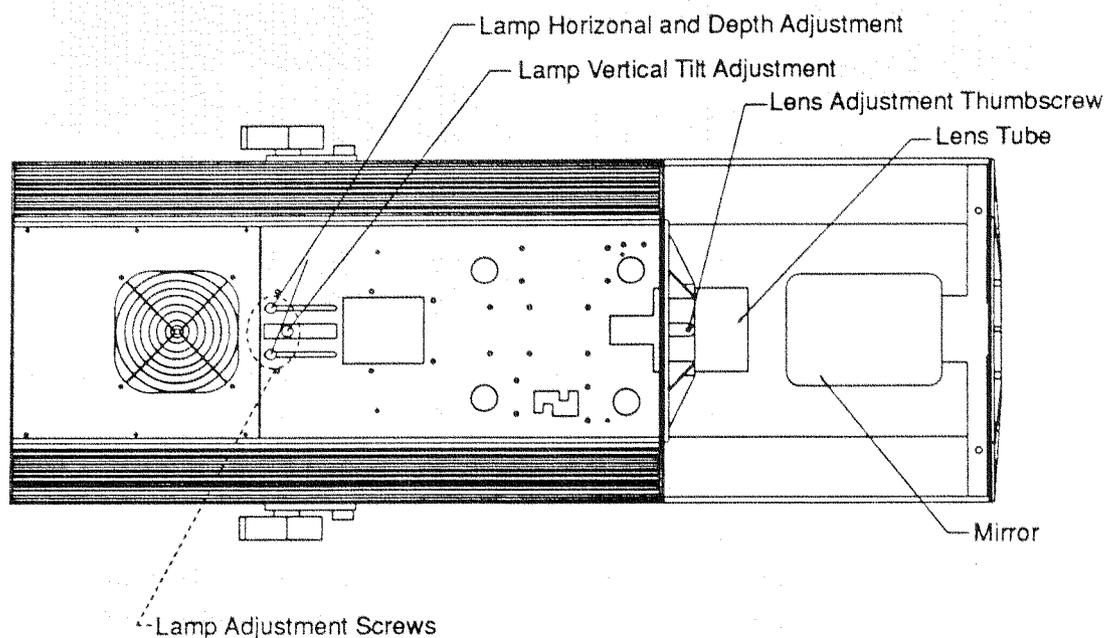
2. Remove the mirror (attached to the mount) from its foam packaging.
3. Place the mirror mount (with the mirror attached) on the hub.
4. Align the holes on the hub with the holes on the mirror mount. (See Fig. 2.3)
5. Replace the two 5 mm x 6.4 mm (6/32 x .25 in) allen cap bolts and tighten them securely using the allen wrench that is supplied with the controller.
6. When the mirror is installed, remove the protective blue plastic film from the face of the mirror.

## Installing the Lamp

### CAUTION

Whenever you are handling the Intellabeam lamp, wear clean gloves. Any contact with dirt or oil from soiled gloves, skin, fingers, etc. could create a hot spot on the lamp glass which could cause premature aging and damage. If the lamp is soiled in any way, clean it carefully with an alcohol wipe.

1. Unplug the unit before doing any work inside. The three LED indicators (Fan, Lamp, and Motor) located on the rear panel of the fixture should **not** be lit.
2. Remove both access doors (bottom and top) from the fixture by loosening the spring-mounted thumbscrews in each door and sliding the doors off. The spring-mounted thumbscrew is secured to the door in such a manner that it will not fall out.
3. Locate the three lamp adjustment screws on the underside of the fixture. (See Figure 2.4).

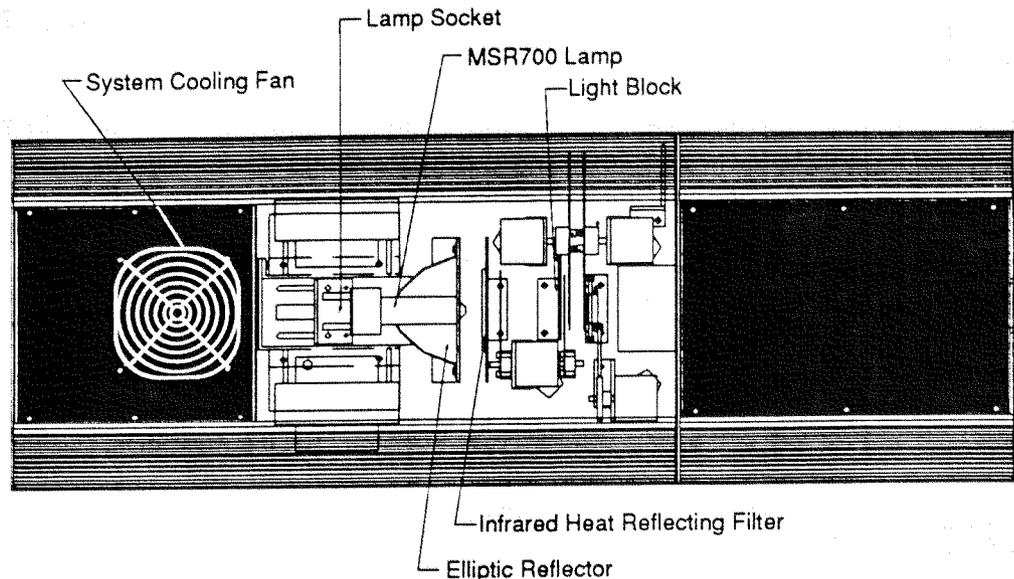


**Figure 2.4 Intellabeam Fixture: Bottom View with Access Door Removed**

4. Loosen all three lamp adjustment screws and slide the lamp socket as far back as possible towards the rear of the fixture.
5. Put on your leather gloves.
6. Remove the lamp from its packaging.
7. Holding on to the ceramic base of the lamp, gently lower the glass portion of the lamp into the reflector. **Avoid touching any part of your skin to the lamp's glass envelope. Oil and residue from your fingers can create a "hot spot" on the lamp,**

causing the lamp to age prematurely. (If you accidentally touch the lamp to your skin, wipe the lamp clean with a sterile alcohol pad (supplied with the lamp) before applying power to the fixture.)

8. Level the lamp in the reflector and guide the lamp into the lamp socket.  
(See Fig.2.5)



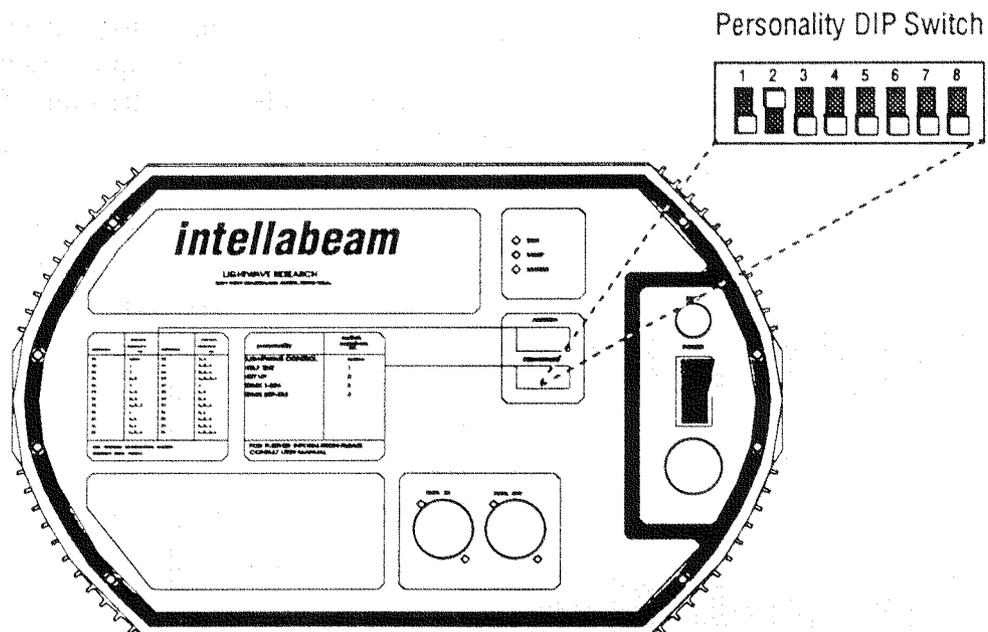
**Figure 2.5 Intellabeam Fixture: Top View  
with Access Door Removed**

9. Firmly press the lamp into the socket until you hear or feel a slight click. You do not need to make any adjustments to the lamp mount blocks.
10. Replace the top access door of the Intellabeam fixture and secure it in place by tightening the spring-mounted thumbscrew.
11. Do not replace the bottom access door. You will need to leave the bottom access door off in order to optimize the lamp. (See the Optimization Instructions, which follow, in this Section of the manual.)

## Lamp Optimization

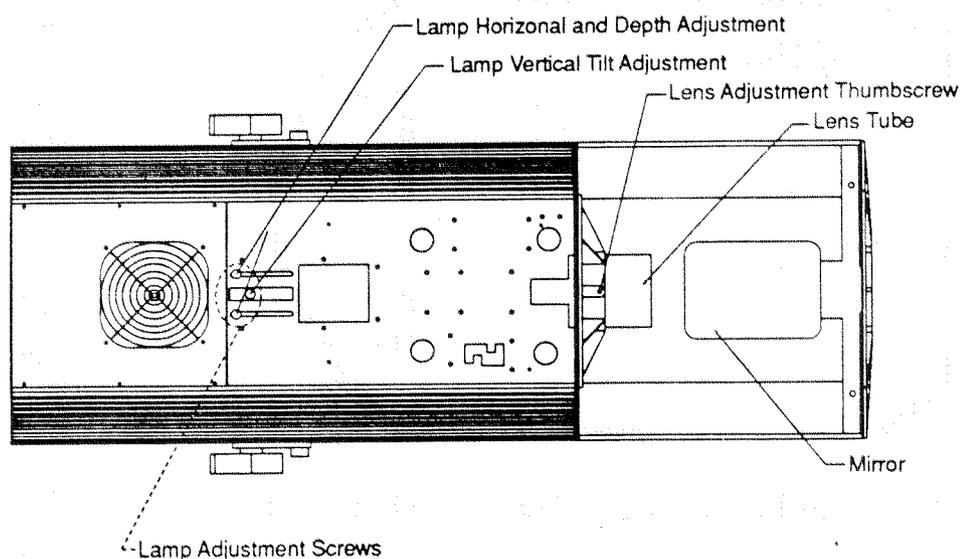
**CAUTION: NEVER OPERATE THE INTELLABEAM FIXTURE WITHOUT FIRST OPTIMIZING THE LAMP. DAMAGE TO THE FIXTURE WILL OCCUR WITHIN MOMENTS OF OPERATION, IF THE LAMP IS MISALIGNED.**

1. Make sure that the top door of the Intellabeam fixture is securely in place by tightening the spring-mounted thumbscrew on the door.
2. Locate the Personality DIP Switches on the rear panel of the fixture. (See Fig.2.6)
3. Put the fixture in the “Set up” mode by setting Personality DIP Switch #2 to the “On” (up) position. Make sure that all of the other Personality DIP Switches are in the “Off” (down) position. (See Fig. 2.6)
4. Locate the Power Switch on the rear panel of the fixture. (See Fig. 2.6)
5. Turn the fixture on. When the power is switched on in “Set Up” mode, the lamp will strike.
6. Position the fixture so that the beam is pointed at a flat surface at a distance that is roughly equal to the desired throw distance.



**Figure 2.6 Intellabeam Fixture: Rear Panel**

7. Loosen the lens adjustment thumbscrew on the lens tube at the front of the fixture. (See Fig. 2.7)
8. Adjust the focus of the lens by moving the lens tube back and forth to achieve a sharp focus on the illuminated surface. Re-tighten the lens adjustment thumbscrew.
9. Locate the three lamp adjustment screws directly below the lamp mount, on the bottom of the fixture. (See Fig. 2.7)
10. Loosen the two larger black outermost lamp adjustment screws.
11. Slide the lamp mount back and forth, moving the lamp in the reflector until the beam is at its maximum brightness. The light should be evenly distributed across the beam with the brightest point of light in the center of the beam.
12. When the optimal position is achieved, re-tighten the lamp adjustment screws.
13. Now you need to make the fine adjustments. One at a time, loosen and adjust the two lamp adjustment screws. Move each lamp adjustment screw back and forth to make sure that the brightest point of light is centered in the beam. Re-tighten the screws when your adjustments are complete.
14. Use the white lamp adjustment thumbscrew in the center to adjust the height of the lamp until the beam is as bright and even across the circle of light as it can be.
15. You may need to re-focus after you have achieved optimum output from the lamp. You can do this by loosening the lens adjustment thumbscrew and moving the lens tube back and forth until the circle of light has a sharp edge. Tighten the lens tube retaining screw when the focus is set.
16. After completing the optimization process, the lens tube may be re-adjusted to produce a sharp-edged beam for mid-air projection. Depending on the trim height and application, the surface projection of the beam will be more or less out of focus. Ideally, the lens tube should be adjusted after hanging the fixture at the actual trim height.



**Figure 2.7 Intellabeam Fixture: Bottom View  
with Access Door Removed**

## Fixture Configuration

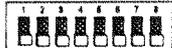
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On the rear panel of the fixture you will find two 8-position DIP switches labeled “PERSONALITY” and “ADDRESS.” These switches change the operating mode of the fixture. They are used for testing, set up, and control of specialized parameters.

### Setting the Fixture Personality DIP Switch

---

The purpose of the Personality DIP switch on the rear of the fixture is to configure it for specific requirements. By turning particular switches on or off, the fixture will respond in different ways. For example, with all switches in the “OFF” position, the fixture operates in a normal manner with the Lightwave Research Intellabeam controller. The purpose of each of the switches is outlined below.

**No Switches On: Normal Mode** 

All switches in the “OFF” position, the fixture operates in a normal manner under the control of the Lightwave Research Intellabeam controller.

**Switch # 1 : Self-Test** 

Switch number one pertains to the built-in self testing function.

- When it is in the “ON” position, an internal self-diagnostic routine that tests each function of the fixture is activated. A controller is not required to perform a self-test, which allows problems to be isolated to the fixture or to the controller/cable combination. The LEDs on the rear panel of the fixture indicate problems with the fixture lamp, fan, or motors. If either the color or the gobo wheel optical sensor is not triggered by the corresponding wheel, the fixture will emit an audible tone.
- In normal operation, switch number one should be in the “OFF” position.

Personality DIP Switch

**Switch # 2 : Set-up Mode**



Switch number two pertains to setting up and adjusting the lamp after installation.

- When switch number two is in the “ON” position, the lamp will ignite in order to adjust and focus it without the aid of a controller. It is very important to optimize the lamp before operating the fixture. Failure to do so could result in damage to the fixture.
- In normal operation, switch number two must be in the “OFF” position.

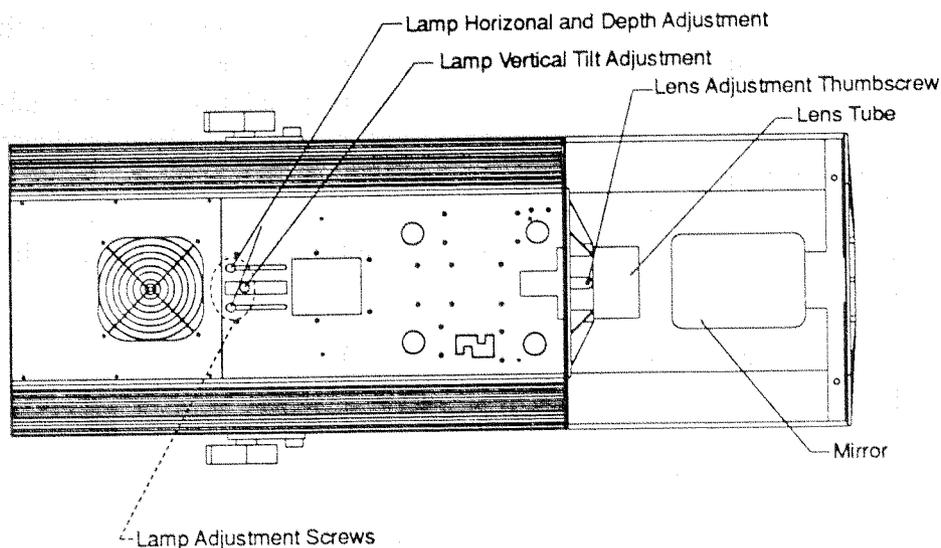
Personality DIP Switch

**Switches # 1 & 2 : Focus Mode**



When switches one and two are both in the “ON” position, the fixture is in Focus mode. The fixture will emit a plain white beam with the multiple dot gobo pattern. This gobo allows the user to focus more accurately than when a single circle of light is used. Using the multiple dot gobo, the focus is more accurate and even throughout the beam because each small circle of light in the multiple dot pattern can be observed and fine tuned.

To focus the fixture, turn on DIP switches one and two. Turn the fixture on. Position the fixture so that the beam is projected onto a white or neutral colored wall or object at the desired throw distance. Locate the lens adjustment thumbscrew. (See Fig. 2.8) Loosen the lens adjustment thumbscrew and slide the lens back and forth until each small circle in the gobo pattern has a sharp edge and is strong and even across the beam. Tighten the lens adjustment thumbscrew when a satisfactory focus has been achieved.



**Figure 2.8 Intellabeam Fixture: Bottom View with Access Door Removed**

Personality DIP Switch

**Switch # 3 : DMX-512 Control (Channels 1-256)**



Switch numbers three, four, and five pertain to direct control of the fixture using DMX-512 protocol. In order to use a DMX-512 type controller instead of the Lightwave Research controller, switch number three or four should be turned on. DMX uses 7 or 8 contiguous channels. If the first channel of the group is 1-256, switch number three should be “ON.” If the first channel of the group is 257-512, switch number four should be “ON.” Since the address selection DIP switches can only address 256 channels, there is a separate Personality DIP switch for the first set of 256 channels (channels one through 256) and one for the second set of 256 channels (channels 257 through 512). Switch number five allows a DMX-512 type controller access to more color and gobo effects, since some DMX-512 controllers have limited resolution.

- Switch number three should be “ON” when using DMX-512 channels 1 through 256.
- Switch number three should be “OFF” when using DMX-512 channels 257 through 512.

Personality DIP Switch

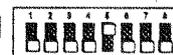
**Switch # 4 : DMX-512 Control (Channels 257-512)**



- Switch number four should be “ON” when using DMX-512 channels 257 through 512.
- Switch number four should be “OFF” when using DMX-512 channels 1 through 256.

Personality DIP Switch

**Switch # 5 : DMX-512 Control (Color & Gobo Effects)**



Switch number five allows a DMX-512 type controller access to more color and gobo effects, since some DMX-512 controllers have limited resolution.

- Switch number five should be “OFF” when using DMX-512 controllers with low resolution capabilities. In **Low resolution** mode the **color fader** will access color effects in the following order: from zero to full = color 12, color 11, color 10, color 9, color 8, color 7, color 6, color 5, color 4, color 3, color 2, color 1. In **Low resolution** mode the **gobo fader** will access gobo effects in the following order: from zero to full = gobo 12, gobo 11, gobo 10, gobo 9, gobo 8, gobo 7, gobo 6, gobo 5, gobo 4, gobo 3, gobo 2, gobo 1.

- Switch number five should be “ON” when using DMX-512 controllers with high resolution capabilities (very accurate faders and/or direct numerical control). In **High resolution** mode the **color fader** will access color effects in the following order: zero to full = color 1 (white), reverse color spin 8 - reverse color spin 1, forward color spin 1 - forward color spin 8, half color 12, color 12, half color 11, color 11, half color 10, color 10, half color 9, color 9, half color 8, color 8, half color 7, color 7, half color 6, color 6, half color 5, color 5, half color 4, color 4, half color 3, color 3, half color 2, color 2, half color 1, color 1 (white). (See Fig. 2.10) In **High resolution** mode the **gobo fader** will access gobo effects in the following order: zero to full = gobo 1 (white), reverse gobo spin 8 - reverse gobo spin 1, forward gobo spin 1 - forward gobo spin 8, gobo 12, gobo 11, gobo 10, gobo 9, gobo 8, gobo 7, gobo 6, gobo 5, gobo 4, gobo 3, gobo 2, gobo 1 (white). (See Fig. 2.9)

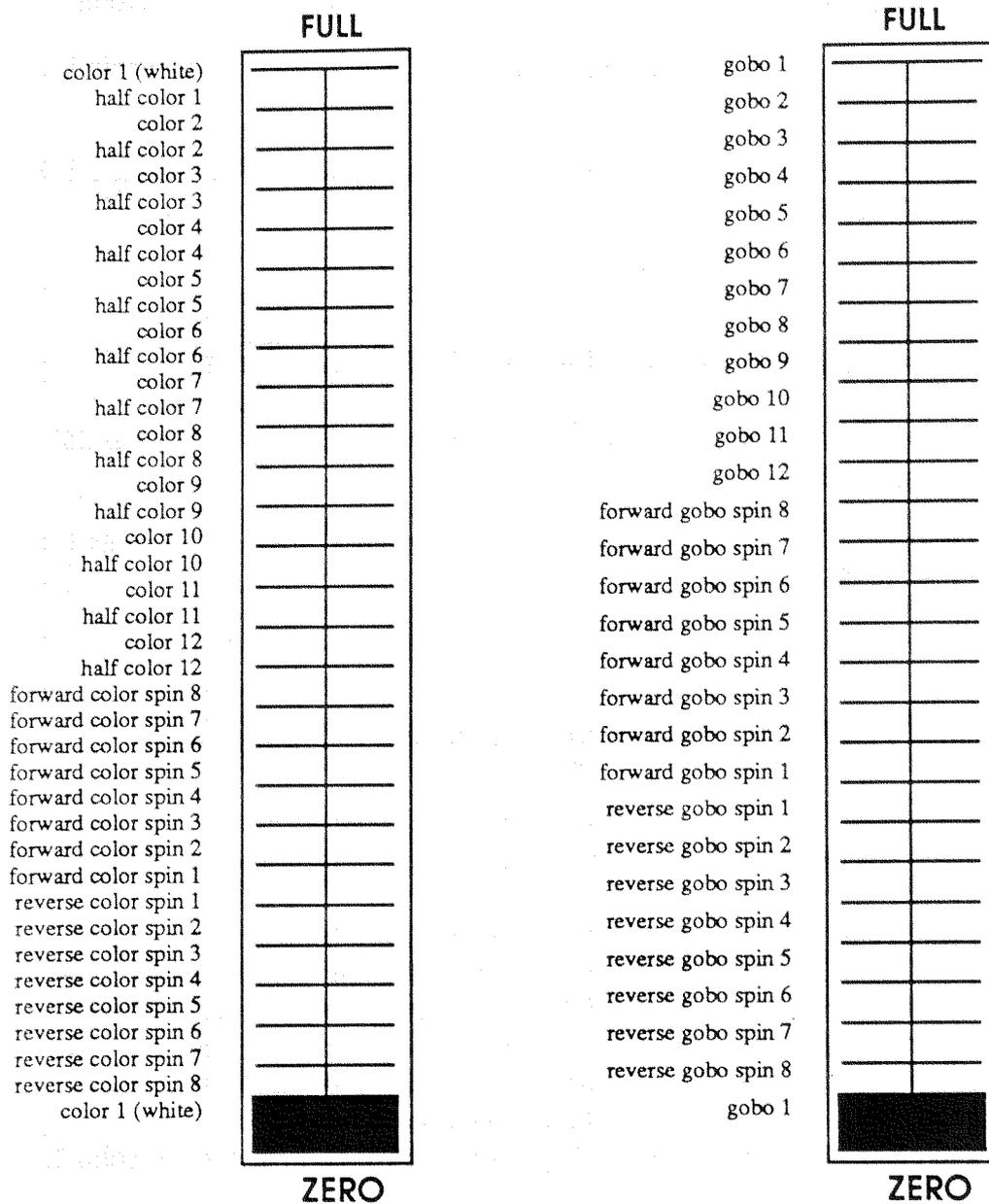


Figure 2.9 DMX Faders with High Resolution Capabilities

Personality DIP Switch

### Switch # 6 : Mirror Image



Switch number six is a mirror image switch for the pan motor. By putting this switch in the “ON” position, the pan motor will be inverted. This allows two opposing fixtures to respond to the joystick control in the same direction.

- When switch number six is “ON,” the pan motor movement will be reversed.
- When switch number six is “OFF,” the pan motor will move in its normal direction.

Personality DIP Switch

### Switch # 7 : Color Effects



Switch number seven changes the type of color effects available in the fixture. The fixture can produce either a beam that has each half a different color (two adjacent colors on the color wheel) or a beam which oscillates between two adjacent colors. These effects are programmed on the controller by selecting a color between H1 and H8.

- When switch number seven is “ON,” the controller can access half color positions, providing a split colored beam.
- When switch number seven is “OFF,” the fixture can oscillate between two adjacent colors, producing a color scanning effect.

Personality DIP Switch

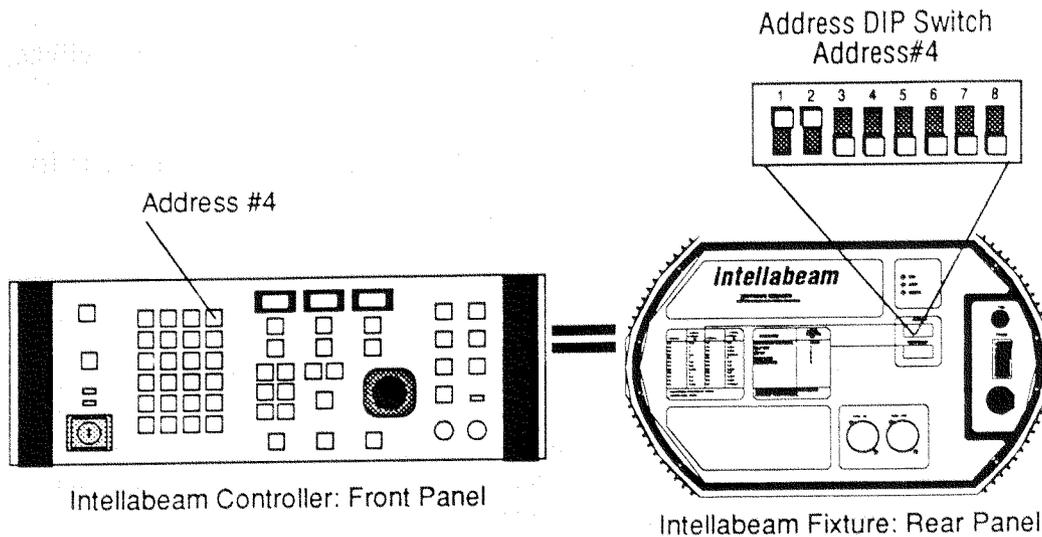
### Switch #8 : Motor Speed Channel for DMX Control



- Switch number eight allows for eight channels of DMX control. The eighth channel enables the programming of motor speed. The motor speed is normally set by the Speed key on the Lightwave Research controller. The motor speed determines how long it takes for a fixture’s beam to reach its programmed position in a particular scene.
- When switch number eight is “ON,” the controller has eight channels of DMX control. (See the following pages for a description of how to set the Address channels for Lightwave Research control and for seven or eight channel DMX-512 control.)
- When switch number eight is “OFF,” the fixture has only 7 channels of DMX control.

## Setting the Fixture Address DIP Switch

The Lightwave Research Intellabeam controller can address 24 different fixtures simultaneously. The Address DIP switches on the rear panel of the controller assign an Address number to each fixture corresponding to an Address number on the controller's Address/Preset keypad (See Fig. 2.10)



**Figure 2.10 Controller Address Key & Corresponding Fixture Address DIP Switch Setting**

The Address DIP Switch settings for 24 Addresses are shown on the rear panel of the controller and in the following table. (See Table 2.1)

ADDRESS #	DIP SWITCH SETTING
01	none
02	1
03	2
04	1,2
05	3
06	1,3
07	2,3
08	1,2,3
09	4
10	1,4
11	2,4
12	1,2,4
13	3,4
14	1,3,4
15	2,3,4
16	1,2,3,4
17	5
18	1,5
19	2,5
20	1,2,5
21	3,5
22	1,3,5
23	2,3,5
24	1,2,3,5

**Table 2.1 Fixture Address DIP Switch Setting**

## Controlling the Intellabeam fixture using USITT DMX-512 Protocol

The Intellabeam fixture may be controlled through the use of USITT's DMX-512 digital transmission standard. The physical and electrical connections should be made according to Table 2.2.

DMX cable from controller	Intellabeam 'data in'
5 pin XLR female	3 pin XLR male
pin 1 - Ground	pin 1 - Ground
pin 2 - Data (-)	pin 2 - Data (-)
pin 3 - Data (+)	pin 3 - Data (+)
pin 4 - not used	
pin 5 - not used	

**Table 2.2: Wiring DMX-512 to Intellabeam fixtures**

The Intellabeam requires either seven or eight consecutive dimmer channels starting with the base channel to be set on the Address DIP switch on the Intellabeam fixture rear panel.

To enable DMX operation, set either fixture personality DIP switch number three to the "ON" position for base channels 1-256 or set personality switch number four to the "ON" position for base channels 257-512.

Personality switch number eight sets the fixture to seven "OFF" or eight "ON" channel mode. The channels are assigned in the following order starting with the base channel:

- 1.Pan
- 2.Tilt
- 3.Color
- 4.Gobo
- 5.Shutter
- 6.Dimming
- 7.Iris
- 8.Speed (Optional)

In DMX-512 mode, the Intellabeam fixture will power up both the lamp and the motors when a valid DMX signal is applied. The DMX signal may be removed for up to one second without affecting the fixture. After one second without a signal, the fixture will close its shutter to go dark, but the lamp will remain on for twenty-five seconds and the fan will run for two minutes.

To 'home' the Intellabeam fixture(s) when using DMX-512 mode, remove, disconnect, or disable the DMX signal for at least five seconds, but no more than thirty seconds. When the signal is replaced, the fixture(s) will home and return to DMX operation.

The Pan channel controls the pan position from left to right. The Tilt channel controls tilt from down to up. In seven channel mode (dip switch number eight "OFF"), if the pan or tilt value makes an instantaneous change of more than ten steps out of 256, the mirror will respond at full speed. Smaller changes will respond more slowly to allow smooth crossfading of pan and tilt. If the speed channel is enabled (dip switch number eight "ON"), the setting of the eighth channel determines the mirror speed. Fixtures receiving identical speed values will have equal travel times. If the speed channel is left at zero, the fixture responds in the same manner as in seven channel mode. When using the speed channel, it is best to *zero crossfade* (cut directly to the new pan and tilt value, and let the fixture perform the move.)

Personality switch number five may be set for high "ON" or low "OFF" resolution mode. The Color and Gobo channels depend on the setting of personality switch 5. The "OFF" position is DMX low-resolution mode, and is intended to help users with small or coarse fader travel. The "ON" position is DMX high-resolution mode, and is intended for users with more accurate faders or direct numerical control of each dim channel.

The **Address DIP switch** on the rear panel of the fixture allows for the selection of up to 512 control addresses when you are using **DMX control**. The Address DIP switch settings corresponding to the fixture addresses are outlined in the tables on the following pages.

**NOTE: DMX-512 CONTROL REQUIRES THAT THE PERSONALITY DIP SWITCH ALSO BE SET FOR EITHER LOW (CHANNELS 1-256) OR HIGH (CHANNELS 257-512) ADDRESSES.**

### 7 CHANNEL DMX-512 TABLE

DMX CHANNEL #'s	FIXTURE ADDRESS DIP SWITCHES ON	INTELLABEAM FIXTURE #	DMX CHANNEL #'s	FIXTURE ADDRESS DIP SWITCHES ON	INTELLABEAM FIXTURE #	DMX CHANNEL #'s	FIXTURE ADDRESS DIP SWITCHES ON	INTELLABEAM FIXTURE #
001 (257) 002 (258) 003 (259) 004 (260) 005 (261) 006 (262) 007 (263)	NONE	Fixture 1	046 (302) 047 (303) 048 (304) 049 (305)			091 (347)		
008 (264) 009 (265) 010 (266) 011 (267) 012 (268) 013 (269) 014 (270)	1,2,3	Fixture 2	050 (306) 051 (307) 052 (308) 053 (309) 054 (310) 055 (311) 056 (312)	1,5,6	Fixture 8	092 (348) 093 (349) 094 (350) 095 (351) 096 (352) 097 (353) 098 (354)	1,2,4,5,7	Fixture 14
015 (271) 016 (272) 017 (273) 018 (274) 019 (275) 020 (276) 021 (277)	2,3,4	Fixture 3	057 (313) 058 (314) 059 (315) 060 (316) 061 (317) 062 (318) 063 (319)	4,5,6	Fixture 9	099 (355) 100 (356) 101 (357) 102 (358) 103 (359) 104 (360) 105 (361)	2,6,7	Fixture 15
022 (278) 023 (279) 024 (280) 025 (281) 026 (282) 027 (283) 028 (284)	1,3,5	Fixture 4	064 (320) 065 (321) 066 (322) 067 (323) 068 (324) 069 (325) 070 (326)	1,2,3,4,5,6	Fixture 10	106 (362) 107 (363) 108 (364) 109 (365) 110 (366) 111 (367) 112 (368)	1,4,6,7	Fixture 16
029 (285) 030 (286) 031 (287) 032 (288) 033 (289) 034 (290) 035 (291)	3,4,5	Fixture 5	071 (327) 072 (328) 073 (329) 074 (330) 075 (331) 076 (332) 077 (333)	2,3,7	Fixture 11	113 (369) 114 (370) 115 (371) 116 (372) 117 (373) 118 (374) 119 (375)	5,6,7	Fixture 17
036 (292) 037 (293) 038 (294) 039 (295) 040 (296) 041 (297) 042 (298)	1,2,6	Fixture 6	078 (334) 079 (335) 080 (336) 081 (337) 082 (338) 083 (339) 084 (340)	1,3,4,7	Fixture 12	120 (376) 121 (377) 122 (378) 123 (379) 124 (380) 125 (381) 126 (382)	1,2,3,5,6,7	Fixture 18
043 (299) 044 (300) 045 (301)	2,4,6	Fixture 7	085 (341) 086 (342) 087 (343) 088 (344) 089 (345) 090 (346)	3,5,7	Fixture 13	127 (383) 128 (384) 129 (385) 130 (386) 131 (387) 132 (388) 133 (389)	2,3,4,5,6,7	Fixture 19
						134 (390) 135 (391)	1,3,8	Fixture 20

DMX channels 1-256 require Intellabeam Personality DIP switch 3 to be "ON."  
DMX channels 257-512 require Intellabeam Personality DIP switch 4 to be "ON."

7 CHANNEL DMX-512 TABLE (continued)

DMX CHANNEL #'s	FIXTURE ADDRESS DIP SWITCHES ON	INTELLABEAM FIXTURE #	DMX CHANNEL #'s	FIXTURE ADDRESS DIP SWITCHES ON	INTELLABEAM FIXTURE #	DMX CHANNEL #'s	FIXTURE ADDRESS DIP SWITCHES ON	INTELLABEAM FIXTURE #
136 (392)			181 (437)			226 (482)		
137 (393)			182 (438)			227 (483)		
138 (394)			183 (439)	2,3,5,6,8	Fixture 27	228 (484)		
139 (395)			184 (440)			229 (485)		
140 (396)			185 (441)			230 (486)		
141 (397)	3,4,8	Fixture 21	186 (442)			231 (487)		
142 (398)			187 (443)			232 (488)	1,2,3,6,7,8	Fixture 34
143 (399)			188 (444)			233 (489)		
144 (400)			189 (445)			234 (490)		
145 (401)			190 (446)	1,3,4,5,6,8	Fixture 28	235 (491)		
146 (402)			191 (447)			236 (492)		
147 (403)			192 (448)			237 (493)		
148 (404)	1,2,5,8	Fixture 22	193 (449)			238 (494)		
149 (405)			194 (450)			239 (495)	2,3,4,6,7,8	Fixture 35
150 (406)			195 (451)			240 (496)		
151 (407)			196 (452)			241 (497)		
152 (408)			197 (453)	3,7,8	Fixture 29	242 (498)		
153 (409)			198 (454)			243 (499)		
154 (410)			199 (455)			244 (500)		
155 (411)	2,4,5,8	Fixture 23	200 (456)			245 (501)		
156 (412)			201 (457)			246 (502)	1,3,5,6,7,8	Fixture 36
157 (413)			202 (458)			247 (503)		
158 (414)			203 (459)			248 (504)		
159 (415)			204 (460)	1,2,4,7,8	Fixture 30	249 (505)		
160 (416)			205 (461)			250 (506)		
161 (417)			206 (462)			251 (507)		
162 (418)	1,6,8	Fixture 24	207 (463)			252 (508)		
163 (419)			208 (464)			253 (509)		
164 (420)			209 (465)			254 (510)		
165 (421)			210 (466)			255 (511)		
166 (422)			211 (467)	2,5,7,8	Fixture 31	256 (512)		
167 (423)			212 (468)					
168 (424)			213 (469)					
169 (425)	4,6,8	Fixture 25	214 (470)					
170 (426)			215 (471)					
171 (427)			216 (472)					
172 (428)			217 (473)					
173 (429)			218 (474)	1,4,5,7,8	Fixture 32			
174 (430)			219 (475)					
175 (431)			220 (476)					
176 (432)	1,2,3,4,6,8	Fixture 26	221 (477)					
177 (433)			222 (478)					
178 (434)			223 (479)					
179 (435)			224 (480)					
180 (436)			225 (481)	6,7,8	Fixture 33			

DMX channels 1-256 require Intellabeam Personality DIP switch 3 to be "ON."  
 DMX channels 257-512 require Intellabeam Personality DIP switch 4 to be "ON."

## 8 CHANNEL DMX-512 TABLE

DMX CHANNEL #'s	FIXTURE ADDRESS DIP SWITCHES ON	INTELLABEAM FIXTURE #	DMX CHANNEL #'s	FIXTURE ADDRESS DIP SWITCHES ON	INTELLABEAM FIXTURE #	DMX CHANNEL #'s	FIXTURE ADDRESS DIP SWITCHES ON	INTELLABEAM FIXTURE #
001 (257)	NONE	Fixture 1	046 (302)	5,6	Fixture 7	091 (347)	6,7	Fixture 13
002 (258)			047 (303)			092 (348)		
003 (259)			048 (304)			093 (349)		
004 (260)			049 (305)			094 (350)		
005 (261)			050 (306)			095 (351)		
006 (262)			051 (307)			096 (352)		
007 (263)			052 (308)			097 (353)		
008 (264)			053 (309)			098 (354)		
009 (265)	4	Fixture 2	054 (310)	4,5,6	Fixture 8	099 (355)	4,6,7	Fixture 14
010 (266)			055 (311)			100 (356)		
011 (267)			056 (312)			101 (357)		
012 (268)			057 (313)			102 (358)		
013 (269)			058 (314)			103 (359)		
014 (270)			059 (315)			104 (360)		
015 (271)			060 (316)			105 (361)		
016 (272)			061 (317)			106 (362)		
017 (273)	5	Fixture 3	062 (318)	7	Fixture 9	107 (363)	5,6,7	Fixture 15
018 (274)			063 (319)			108 (364)		
019 (275)			064 (320)			109 (365)		
020 (276)			065 (321)			110 (366)		
021 (277)			066 (322)			111 (367)		
022 (278)			067 (323)			112 (368)		
023 (279)			068 (324)			113 (369)		
024 (280)			069 (325)			114 (370)		
025 (281)	4,5	Fixture 4	070 (326)	4,7	Fixture 10	115 (371)	4,5,6,7	Fixture 16
026 (282)			071 (327)			116 (372)		
027 (283)			072 (328)			117 (373)		
028 (284)			073 (329)			118 (374)		
029 (285)			074 (330)			119 (375)		
030 (286)			075 (331)			120 (376)		
031 (287)			076 (332)			121 (377)		
032 (288)			077 (333)			122 (378)		
033 (289)	6	Fixture 5	078 (334)	5,7	Fixture 11	123 (379)	8	Fixture 17
034 (290)			079 (335)			124 (380)		
035 (291)			080 (336)			125 (381)		
036 (292)			081 (337)			126 (382)		
037 (293)			082 (338)			127 (383)		
038 (294)			083 (339)			128 (384)		
039 (295)			084 (340)			129 (385)		
040 (296)			085 (341)			130 (386)		
041 (297)	4,6	Fixture 6	086 (342)	4,5,7	Fixture 12	131 (387)		
042 (298)			087 (343)			132 (388)		
043 (299)			088 (344)			133 (389)		
044 (300)			089 (345)			134 (390)		
045 (301)			090 (346)			135 (391)		

DMX channels 1-256 require Intellabeam Personality DIP switch 3 to be "ON."  
 DMX channels 257-512 require Intellabeam Personality DIP switch 4 to be "ON."

### 8 CHANNEL DMX-512 TABLE (continued)

DMX CHANNEL #'s	FIXTURE ADDRESS DIP SWITCHES ON	INTELLABEAM FIXTURE #	DMX CHANNEL #'s	FIXTURE ADDRESS DIP SWITCHES ON	INTELLABEAM FIXTURE #	DMX CHANNEL #'s	FIXTURE ADDRESS DIP SWITCHES ON	INTELLABEAM FIXTURE #		
136 (392)			181 (437)			226 (482)				
137 (393)	4,8	Fixture 18	182 (438)			227 (483)				
138 (394)					228 (484)					
139 (395)					183 (439)			229 (485)		
140 (396)					184 (440)			230 (486)		
141 (397)					185 (441)	4,5,6,8	Fixture 24	231 (487)		
142 (398)					186 (442)			232 (488)		
143 (399)					187 (443)					
144 (400)					188 (444)					
145 (401)	5,8	Fixture 19	189 (445)			233 (489)	4,6,7,8	Fixture 30		
146 (402)					190 (446)				234 (490)	
147 (403)					191 (447)				235 (491)	
148 (404)					192 (448)				236 (492)	
149 (405)					193 (449)	7,8			Fixture 25	237 (493)
150 (406)					194 (450)					238 (494)
151 (407)					195 (451)			239 (495)		
152 (408)					196 (452)			240 (496)		
153 (409)	4,5,8	Fixture 20	197 (453)			241 (497)	5,6,7,8	Fixture 31		
154 (410)					198 (454)				242 (498)	
155 (411)					199 (455)				243 (499)	
156 (412)					200 (456)				244 (500)	
157 (413)					201 (457)	4,7,8			Fixture 26	245 (501)
158 (414)					202 (458)					246 (502)
159 (415)					203 (459)			247 (503)		
160 (416)					204 (460)			248 (504)		
161 (417)	6,8	Fixture 21	205 (461)			249 (505)	4,5,6,7,8	Fixture 32		
162 (418)					206 (462)				250 (506)	
163 (419)					207 (463)				251 (507)	
164 (420)					208 (464)				252 (508)	
165 (421)					209 (465)	5,7,8			Fixture 27	253 (509)
166 (422)					210 (466)					254 (510)
167 (423)					211 (467)			255 (511)		
168 (424)					212 (468)			256 (512)		
169 (425)	4,6,8	Fixture 22	213 (469)							
170 (426)					214 (470)					
171 (427)					215 (471)					
172 (428)					216 (472)					
173 (429)					217 (473)	4,5,7,8	Fixture 28			
174 (430)					218 (474)					
175 (431)					219 (475)					
176 (432)					220 (476)					
177 (433)	5,6,8	Fixture 23	221 (477)							
178 (434)					222 (478)					
179 (435)					223 (479)					
180 (436)					224 (480)					
			225 (481)	6,7,8	Fixture 29					

DMX channels 1-256 require Intellabeam Personality DIP switch 3 to be "ON."  
 DMX channels 257-512 require Intellabeam Personality DIP switch 4 to be "ON."

## Controller Configuration

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The controller should be mounted away from any sources of heat or moisture. Connect a suitable line-level stereo audio feed to the two RCA jacks in the rear panel of the controller if audio effects are desired. The data cables should be connected between the controller and the fixtures as described in the sub-section of Section 2 in this manual titled “Data Cable Connections.”

Located on the rear of the controller is an 8-position DIP switch labeled “PERSONALITY.” The eight switches within the Personality DIP switch are used for testing, set up, and control of specialized parameters. They must be set for correct operation before powering up the system.

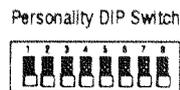
### Controller Personality DIP Switch

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The purpose of the Personality DIP switch on the rear of the controller is to configure it for specific requirements. By turning particular switches on or off, the controller will respond in different ways. For example, with all switches in the “OFF” position, the controller operates in a normal manner as a Master controller. The purpose of each of the switches is outlined below.

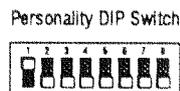
**NOTE:** A switch is “ON” in the **up** position and “OFF” in the **down** position.

#### No Switches On : Normal Mode



All switches in the “OFF” position, the controller operates in a normal manner.

#### Switch # 1 : Master/Slave Mode



Switch number one pertains to the Master/Slave capability. The system is expandable beyond the first twenty-four addresses by linking multiple controllers together via the Master/Slave port.

- When switch number one is in the “ON” position, the controller will only operate in the **Slave mode**. In Slave mode, the controller can be connected to and run by another controller via the 6mm (1/4 in.) stereo plug located on the rear panel of the controller.
- When switch number one is in the “OFF” position, the controller will function as a **Master controller**. All front panel keys will function normally. When a controller is in Master mode, it dictates the mode of playback for all controllers that are slaved to it.

The slaved controller will retain the programming and editing functions, but will not play back any programs. All Standby, Advance and Modulate settings of the slaved controller will be determined by the Master controller. The only accessible function keys on the Slaved controllers are Power, Home, Select, Record, and Erase. If any other function keys on the Slaved controller are pressed, "SL" will be displayed in the LED window.

### Switch # 2 : Time Base

Personality DIP Switch



Switch number two allows the controller to operate at either 50 or 60 Hertz.

- When switch number 2 is "ON" the controller operates at 50 Hertz.
- When switch number 2 is "OFF" the controller operates at 60 Hertz.

### Switch # 3 : Page or Preset Access

Personality DIP Switch



Switch number three sets up the controller to respond to the Remote Analog Access port by controlling either Pages or Presets.

- When switch three is in the "ON" position, the controller is in Preset Level Mode. In Preset Level Mode, the Remote Analog Access port will shift the controller to different **Preset levels**.
- When switch three is in the "OFF" position, the controller is in the Page Access mode. In Page Access Mode, the Remote Analog Access port will access the **Pages** in memory.

### Switch # 4 : 700 HX/MSR 400 Control

Personality DIP Switch



Switch number four sets up the controller to output the 700 HX protocol or the MSR 400 protocol.

- When switch number 4 is "ON" the controller is in MSR 400 mode.
- When switch number 4 is "OFF" the controller is in the 700 HX mode.

Personality DIP Switch



### Switch # 5 : Binary Preset Access

- When switch number five is “ON,” the controller accesses Preset numbers in a binary fashion. (The controller must be in Preset Access Mode, therefore, **DIP switch 3 must also be in the “ON” position.**) It uses the first ten analog input channels in binary combinations to provide remote access to 1023 different Presets. The remaining two analog input channels control Blackout and Standby respectively. Channel eleven puts the controller in Blackout mode. Blackout closes the fixtures’ shutters, but leaves everything else running. Channel twelve functions just like the Standby key on the controller. If the controller is in Standby, channel 12 will take it out of Standby. The fixtures will go back to whatever they were doing before the controller was put in Standby mode.
- When switch number five is “OFF,” the controller accesses Preset numbers on twelve levels. In the Twelve Level Preset Access mode, each channel can activate one of twelve levels of twenty-four Presets. When a level has been selected using a remote access device, the Presets are called up from the Address/Preset key pad on the controller.

Personality DIP Switch



### Switch # 6 : Independent/Dependent Presets Mode

Personality DIP switch number six sets the mode of the Presets as they relate to the Master Dimmer. The two modes were developed to offer the operator a choice based on personal preference.

- When switch number six is “ON,” the controller is in Independent Presets mode. In Independent Presets mode, the Presets are independent of the master dim. When Presets are called, intensity remains unchanged from the last setting. Although not recalled, intensity is recorded with Presets for compatibility with Dependent Presets mode. Slaved controllers’ modulation effects respond to audio input to each individual controller. Sequencing (Auto, Audio 1 & 2) is controlled by the master controller. Slaved controllers’ intensities are independent of the master, and may be controlled by any RS-232 show control program.
- When switch number six is “OFF,” the controller is in Dependent Presets mode. In Dependent Presets mode, the Presets store and recall master intensity as part of the Preset. Slaved controllers’ modulation effects respond to audio input at the master controller. Slaved controllers follow the master dim of the master controller.

### Switches #7 and 8 : No Effect

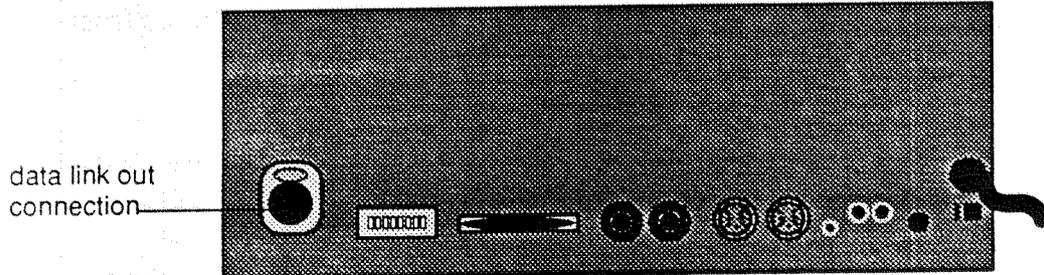
Switch numbers seven and eight are reserved for future use. At this time, they have no effect on the controller’s mode whether they are “ON” or “OFF.”

## Data Cable Connections: General Information

Both the Intellabeam fixture and controller require 3-pin XLR connectors for data input and data output. The data cables should be constructed using shielded, two-conductor cable with a male 3-pin XLR connector on one end and a female 3-pin XLR connector on the other end. Pin 1 is the shield, Pin 2 is the data compliment (negative), and Pin 3 is the data true (positive.)

Microphone cables will work if the pin connections are correct (the same as described above). You should have constructed or purchased all of your cables (one cable for each fixture), as described in Section 1 of this manual, before you attempt to set up the Intellabeam System.

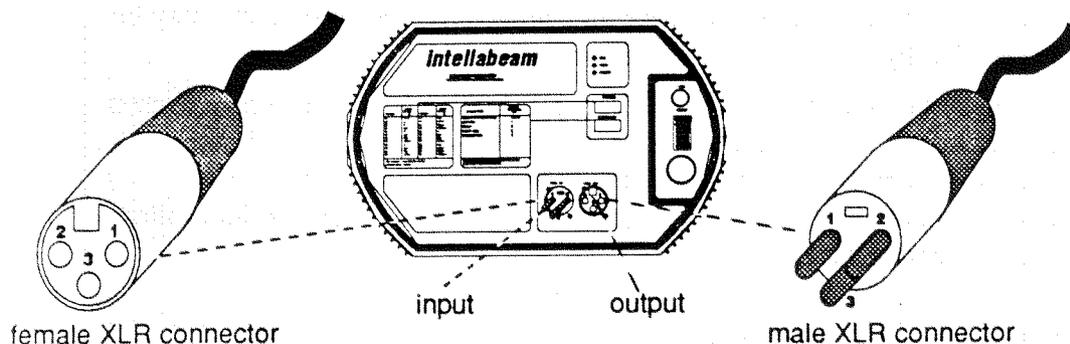
The data link out connection on the Intellabeam controller is a female connection. It is located on the rear panel of the controller in the bottom left corner. (See Fig. 2.11)



**Figure 2.11 Intellabeam Controller: Rear Panel**

The data in connection on the Intellabeam fixture is a male connection. It is located on the rear panel of the fixture near the bottom center of the panel. (See Fig. 2.11 below.)

The data out connection on the Intellabeam fixture is a female connection. The data out connection is located on the rear panel of the fixture (near the bottom center of the panel to the right of the data in (male) connection). (See Fig. 2.12)

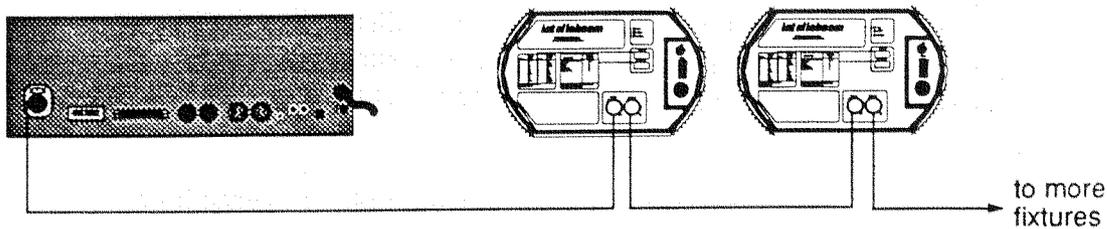


**Figure 2.12 Intellabeam Fixture: Rear Panel**

## Daisy Chain Method

---

1. Plug the male end of a data cable into the data link out connection on the rear panel of the controller. (See Fig. 2.11)
2. Plug the female end of that data cable into the data in (male) connection of the first fixture. (See Fig. 2.11)
3. The easiest way to link the fixtures together is to use the daisy chain method. (See Fig. 2.13)



**Figure 2.13 Intellabeam Data Cable Connections - Daisy Chain Method**

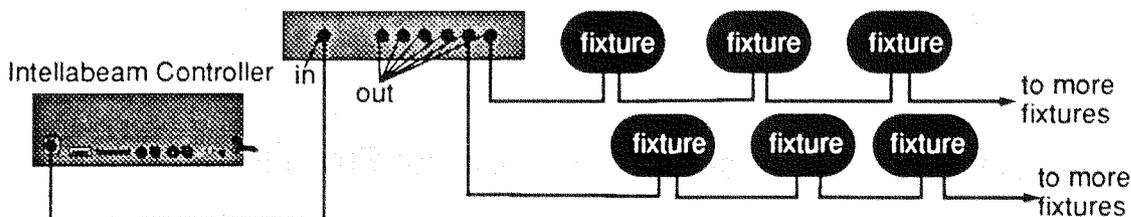
The daisy chain method involves connecting the first fixture to the controller (as in steps 1 and 2 above) then simply connecting the data out connection (female XLR) of the first fixture to the data in connection (male XLR) of the second fixture. Then connect each successive fixture in the same manner in which you connected fixture one to fixture two.

These cables may also be run in parallel at any point, although the daisy-chain method is easier to troubleshoot, and it insures proper signal strength for larger systems. The cables can only run parallel (or "Y") two times before significant signal loss occurs.

## Serial Data Distributor Method

---

A Lightwave Research Serial Data Distributor may be used to split the data signal up to six ways. The single-unit rack-mountable distributor is an active signal splitter. It is commonly used in situations where a group or groups of instruments are separated by a long distance. (See Fig. 2.14)



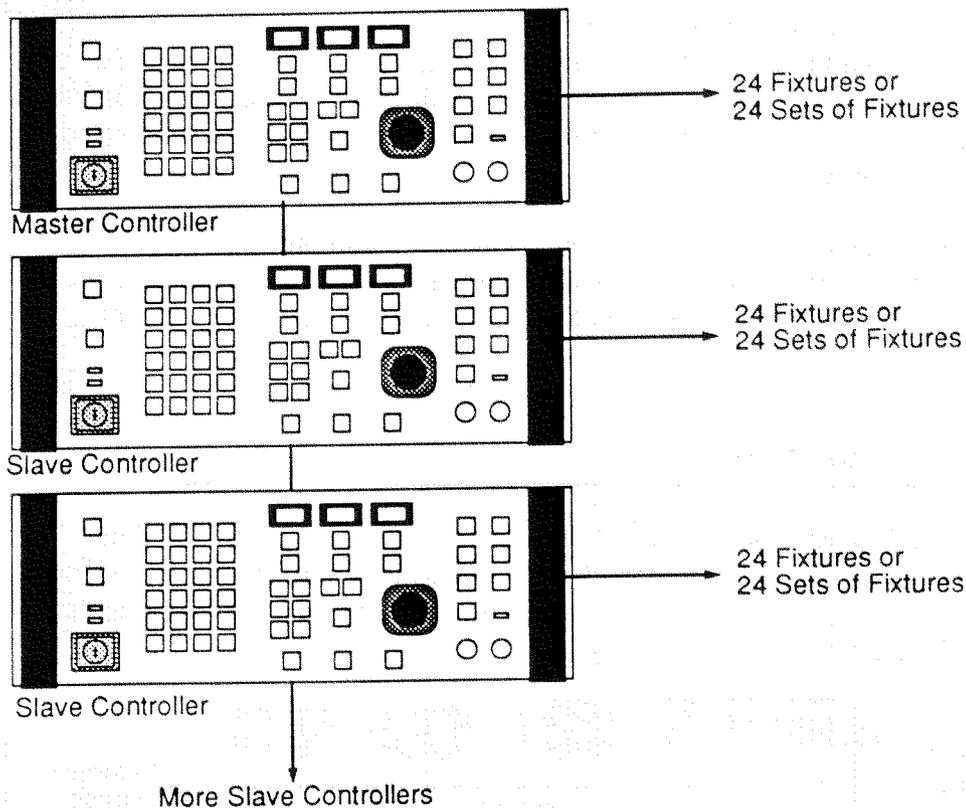
**Figure 2.14 Intellabeam Data Cable Connections - Serial Data Distributor**

## Master/Slave Configuration

Twenty-four Addresses are available on a Lightwave Research Intellabeam controller which will control twenty-four fixtures or twenty-four sets of fixtures. If several fixtures are assigned to the same Address, they will all share the same parameters (color, gobo, dim, gate, iris, speed, crossfade, and delay) and they will all move in response to the joystick when their Address is Selected.

An Intellabeam system can be expanded practically infinitely by slaving any number of controllers together. When controllers are slaved, one controller, called the Master controller, controls the mode of playback of all of the slaved controllers. The Slave controllers are programmed separately in the normal manner, but their mode of playback is dictated by the Master controller.

Many controllers can be slaved together to include any multiple of twenty-four increments of control. Each fixture or set of fixtures would be Addressed 1-24 corresponding to the Address/Preset keypad of each controller. (See Fig. 2.15)



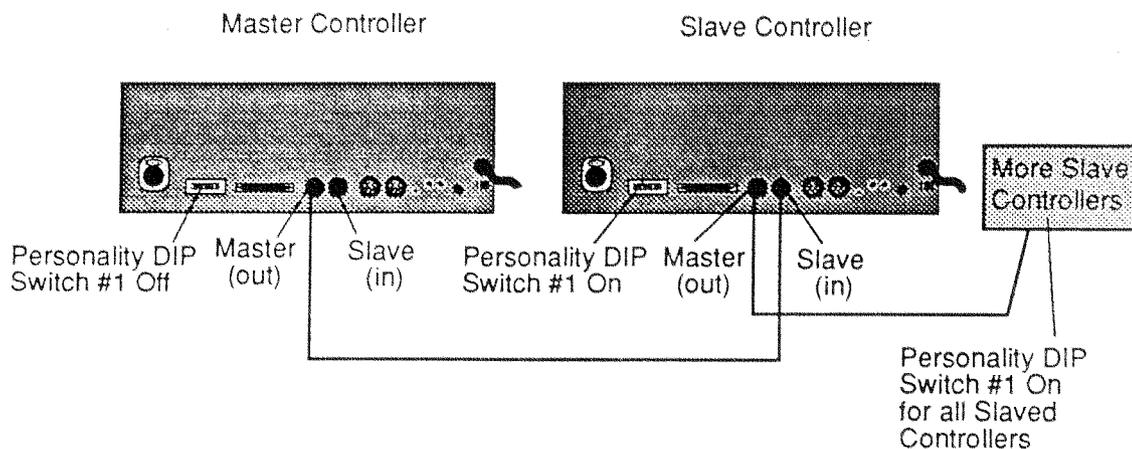
**Figure 2.15 Slaved Intellabeam Controllers: Front Panels**

To put a controller in Slave Mode, set Personality DIP switch number one on the rear panel of the controller to the “ON” or up position.

The Slaved controllers will retain their programming and editing functions, but will not play back any programs. All Standby, Advance, and Modulate settings of the Slaved controllers will be determined by the Master controller.

The only accessible function keys on the Slaved controllers are Power, Home, Select, Record, Standby, and Erase. If any other function keys on the Slaved controllers are pressed, “SL” will be displayed in their Construct display windows.

To slave controllers, run a cable [with a 6 mm (1/4 in) stereo jack connector on each end] from the Master controller's Master (out) jack located on the rear panel to the Slave controller's Slave (in) jack. To slave more than one controller to a single Master controller, continue running cables from one controller to the next, as previously described, in a daisy chain fashion. (See Fig. 2.16)



**Figure 2.16 Location of Master/Slave Jacks**

Example shows the right controller being slaved by the left controller

To program a system in the Master/Slave configuration, each controller must be programmed individually from its own front panel. Each controller must be in Master mode during programming. Playback, however, is controlled only by the Master controller; all Slaved controllers will respond to the front panel of the Master controller in any of the playback modes. All of the LED indicators of the Slave controllers, including Standby, Auto, Audio 1, Audio 2, Color, Gobo, and Light Modulation will mimic the front panel of the Master controller. The only control functions that are retained by the Slave controllers are Power, Address, Home, Select, Record, and Erase. All other functions are disabled and when called, the display will show “SL” for Slave.

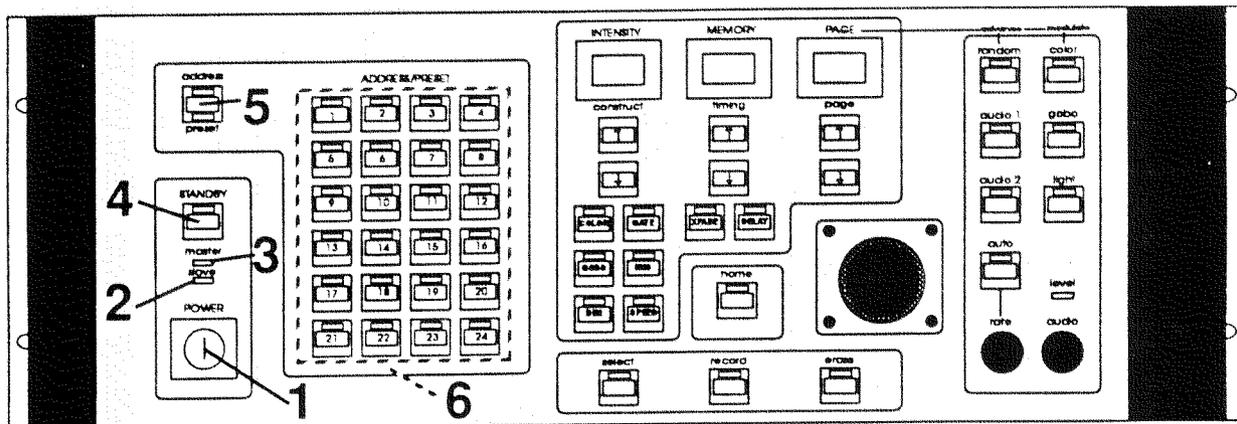
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28. Appendix U  
29. Appendix V  
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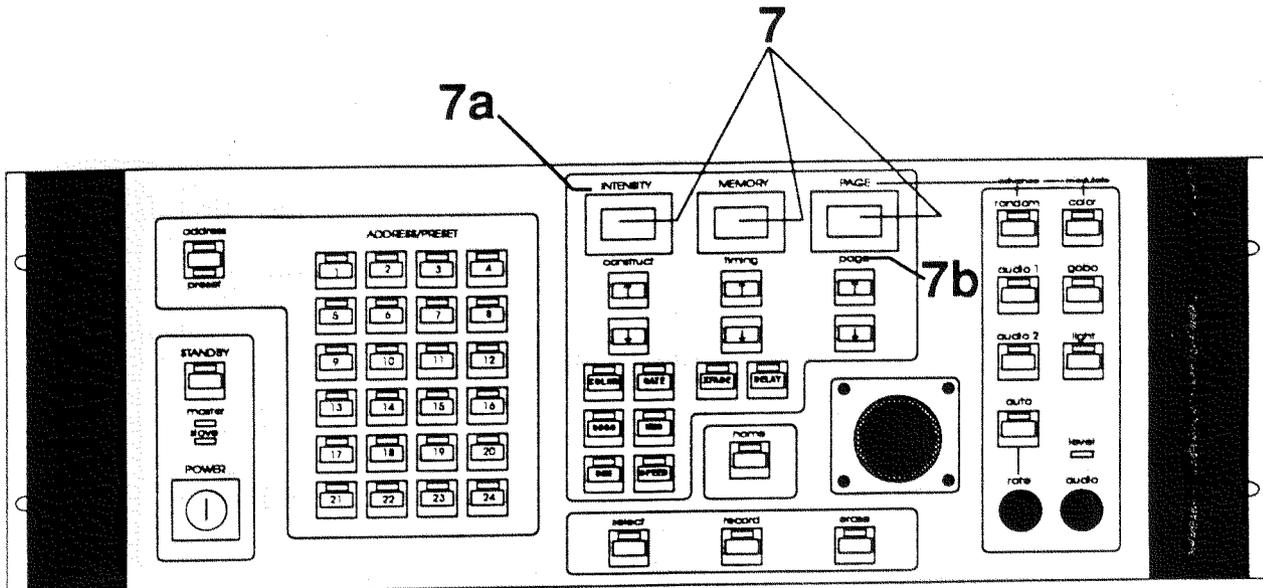
# SECTION 3

## CONTROLLER DESCRIPTION



**Intellabeam Controller: Front Panel**

1. **POWER KEYSWITCH**  
activates controller power and enables fixtures. The key-type switch provides protection from unauthorized users.
2. **SLAVE MODE INDICATOR LED**  
displays mode of controller set by the personality DIP switch located on the rear panel of the controller. When DIP switch #1 is on (up) the controller is in slave mode. The front panel of a Slave controller is used for programming only; it cannot be used for playback functions.
3. **MASTER MODE INDICATOR LED**  
displays mode of controller set by the personality DIP switch located on the rear panel of the controller. When DIP #1 switch is off (down) the controller is in master mode. A controller designated as a Master controls the playback of all the Slaved controllers connected to it.
4. **STANDBY KEY**  
closes the light Gates of all connected fixtures. The controller will default to Standby Mode when it is initially powered up. Depressing and holding this key while powering up will display the current software version number.
5. **ADDRESS/PRESET SELECT KEY**  
toggles the Address/Presets keys between the Address and Preset modes, lighting the corresponding LED to indicate the selection.
6. **ADDRESS/PRESET NUMBERS**  
provide visual confirmation of active Addresses and Presets.
  - In Address mode (which is the default mode), the keys correspond to the 24 fixture Addresses. The twenty-four Address keys can be used to Select an Address for programming, editing, or the viewing of parameters.
  - When switched to the Preset mode, the keys correspond to the 24 individual front panel Presets. Each preset is capable of storing a single Page or a loop of pages (up to 99 consecutive pages) within a memory for instant recall.



## Intellabeam Controller: Front Panel

### 7. LED DISPLAY WINDOWS

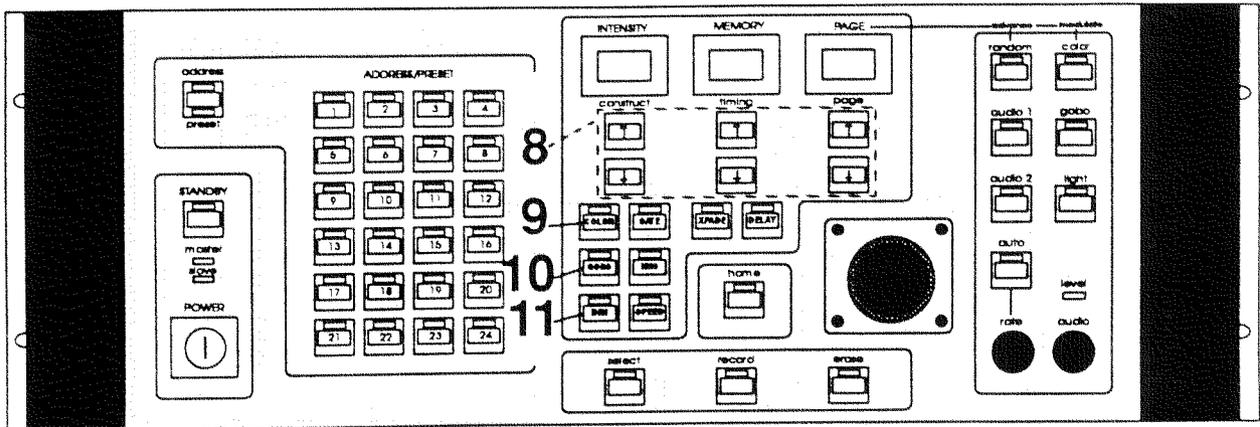
show information about the current mode of the controller.

**7a. I.M.P. Mode:** The controller is in the I.M.P. (Intensity, Memory, Page) mode when there is a decimal point at the **top** of each LED display window. In the I.M.P. mode, the display windows show the current level of the Master Dim setting, the current Memory number, and the current Page number.

- **Intensity Display Window:** indicates the current intensity setting for all Addresses. In I.M.P. mode it is used as a dimming function. By pressing the up and down arrow keys below the Intensity window, the brightness of all the fixtures can be adjusted. Value "00" represents completely dimmed. Value "99" represents full brightness.
- **Memory Display Window:** indicates the current Memory (1-9). Use the up/down arrow keys below this display window to change the Memory number.
- **Page Display Window:** indicates the current Page number (1-99). Use the up/down arrow keys below this display window to change the Page number.

**7b. C.T.P. Mode:** The controller is in the C.T.P. (Construct, Timing, Page) mode when the decimal points are at the **bottom** of each LED window. The C.T.P. mode is used for changing parameters in manual operation of the fixtures and while programming. To get into the C.T.P. mode, press the Select key. The Select LED indicator will then begin flashing, and the decimal points will drop to the bottom of the display. To get back to the I.M.P. display, press the Select key again.

- **Construct Display Window:** indicates the current parameters for each Address (color, gobo, dim, gate, iris, and speed).
- **Timing Display Window:** indicates the current Program settings and Delay times for a Page. Each individual Address can have a different Program, however, the Delay time is the same for all Addresses on a page.
- **Page Display Window:** indicates the current Page number being programmed.



## Intellabeam Controller: Front Panel

### 8. ↑ / ↓ (UP/DOWN ARROW) KEYS

change the intensity, memory, and page numbers in the I.M.P. mode. These keys also change the value of a selected Address' parameters in the C.T.P. mode. When pressed and held, these keys will accelerate to the limits of each parameter. Special functions are located past these limits for Construct parameters. All settings will "wrap-around" in either direction.

### 9. COLOR KEY

is used to set color values and color effects for the selected Address or Addresses while the controller is in C.T.P. mode. When the Color LED is illuminated, the current value is shown in the Construct display window.

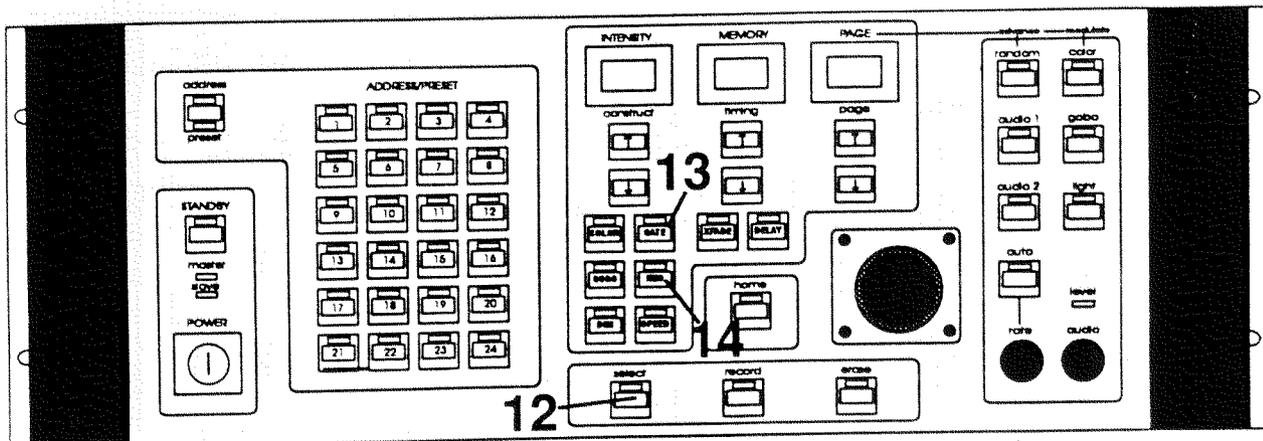
There are twelve colors, eight color effects ("H1" through "H8"), eight forward color spin speeds ("F1" through "F8"), and eight reverse color spin speeds ("A1" through "A8"). The eight color effects will be either half colors or color scanning, depending on the setting of Personality DIP switch # 7 on the rear panel of the fixture. If Personality DIP switch # 7 is **on**, the fixture will produce half color effects. If Personality DIP switch # 7 is **off**, the fixture will oscillate between two adjacent colors, producing a color scanning effect.

### 10. GOBO KEY

is used to set gobo patterns for the selected Address or Addresses while the controller is in C.T.P. mode. When the Gobo LED is illuminated, the current value is shown in the Construct display window. There are twelve gobo patterns, eight forward gobo spin speeds ("F1" through "F8"), and eight reverse gobo spin speeds ("A1" through "A8").

### 11. DIM KEY

is used to set the intensity level for the selected Address or Addresses while the controller is in C.T.P. mode. When the Dim LED is illuminated, the current intensity of the selected fixture is shown in the Construct display window. The intensity can vary from zero to ninety-nine percent. The Dim key is used in conjunction with the Xfade key to set the time it takes a fixture to crossfade.



**Intellabeam Controller: Front Panel**

### 12. SELECT KEY

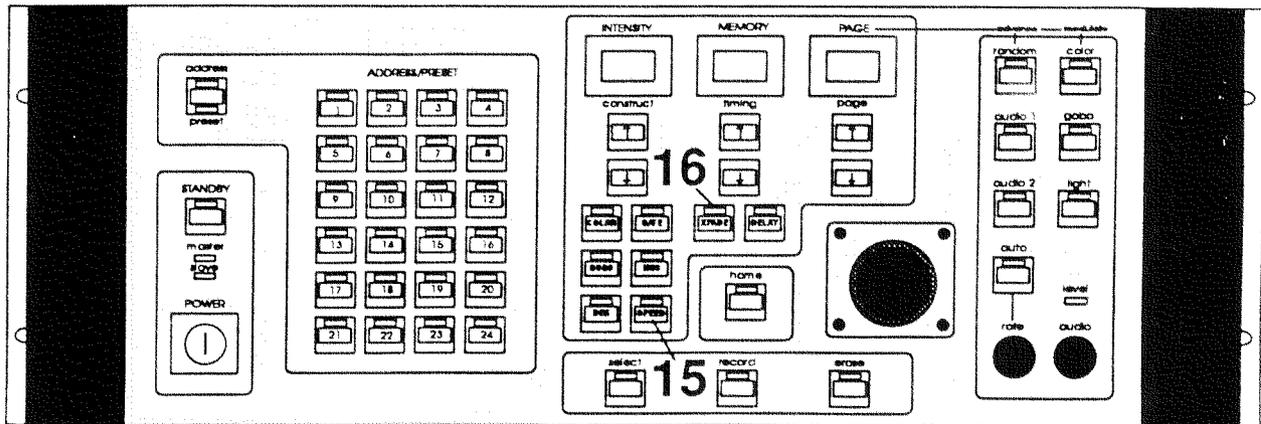
is used for programming, editing, and manual control of selected fixtures. The Select key allows you to choose an Address whose parameters you want to modify and/or store. It is also used to select a Page or a loop of pages in a Memory to be stored as a Preset. Pressing the Select key will toggle the controller between the I.M.P. (Intensity, Memory, Page) mode and C.T.P. (Construct, Timing, Page) mode. (For information on programming the controller, see Section 4 of this manual, Operating the System.)

### 13. GATE KEY

opens and closes the gate(s) of a selected Address or Addresses when the controller is in C.T.P. mode. When the Gate LED is illuminated, the current Gate status of the selected fixture is shown in the Construct display window ("OP" for open, "CL" for closed). In addition to either opening and closing the gate, there are eight strobing speeds available ("F1" through "F8").

### 14. IRIS KEY

is used to set the beam diameter of the iris of selected addresses when the controller is in C.T.P. mode. When the Iris LED is illuminated, the current Iris setting of the selected fixture is shown in the Construct display window. There are ninety-nine iris settings.



## Intellabeam Controller: Front Panel

### 15. SPEED KEY

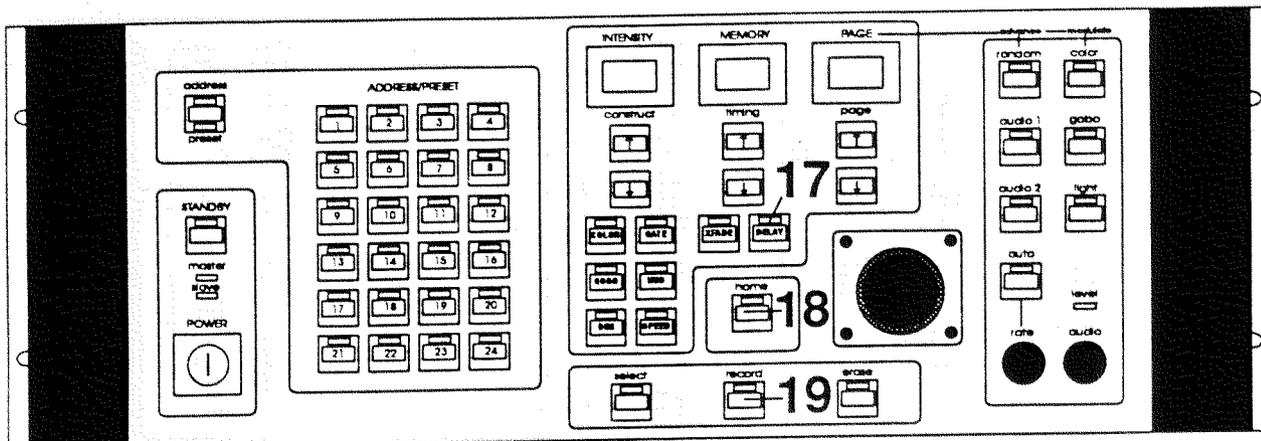
is used to set the pan and tilt speed for selected addresses as the controller advances from one page to the next. The Speed setting determines how long it takes for a fixture (Address) to reach its programmed position on a page. When the Speed LED is illuminated, the current speed setting of the selected fixture is shown in the Construct display window. There are ninety-nine speed settings. Value (01) is the slowest movement, and value (99) is the fastest movement.

The speed setting is a function of time, therefore, all fixtures which have the same speed values will move together, regardless of the distance traveled. For example, if one fixture is only moving one foot and another is moving ten feet, they will start and stop at the same time, provided they have been programmed with the same speed setting. Of course, one will move faster than the other, but they will arrive at their respective positions together.

The speed of movement (change) of the fixture's Color and Gobo wheels can be set to move at the same rate as is set by the Speed key. (Often called "M Speed" - Motor Speed). To apply M Speed to color or gobo: 1) Select a fixture. 2) Then press the Speed key while at the same time pressing the Color key (and/or Gobo) key. If you do not utilize the M Speed function for color and gobo, the Color and Gobo wheels will move at full speed from one page to another causing quick movement rather than gradual movement.

### 16. XFADE KEY

is used to set the crossfade time for intensity and iris size as the controller advances from the previous page into the current page. Both Xfade and Delay are page wide parameters; the crossfade and delay times affect all addresses on one page. When the Xfade LED is illuminated, the current crossfade time is shown in the Timing display. There are one-hundred and eighty-nine crossfade time settings from 0.1 to ninety-nine seconds. If the crossfade time is longer than the Advance rate of the controller, it will not complete the crossfade before it advances to the next page.



## Intellabeam Controller: Front Panel

### 17. DELAY KEY

is used to set the amount of time the controller pauses on the current page before it advances to the next page. The delay time is added to the normal advance time set by the Rate knob. For example, if the advance rate is set to advance a page every two seconds, and the delay time is five seconds, then it will pause on the current page for seven seconds. If the controller is in the Audio Advance mode, the Delay setting is ignored. There is a hold function located after 99 seconds. "HO" holds a page infinitely (until page up arrow key is pressed). Both Xfade and Delay are page wide parameters; the crossfade and delay times affect all addresses on one page. When the Delay LED is illuminated, the current delay time is shown in the Timing display. There are one-hundred and eighty-nine delay settings from 0.1 to ninety-nine seconds and "HO" infinite hold.

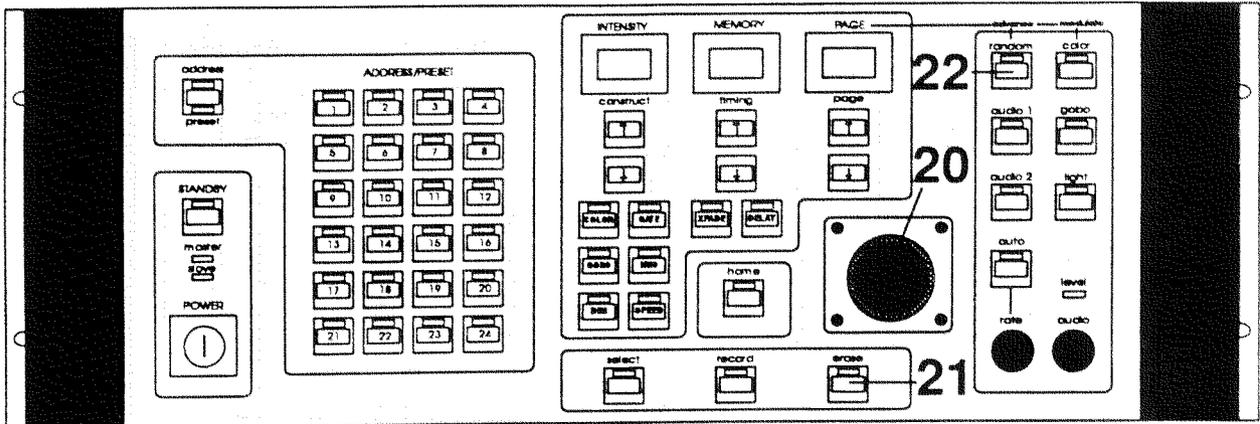
### 18. HOME KEY

closes the dark shutter and resets the selected fixture or fixtures when the controller is in the I.M.P. mode. Resetting the fixture consists of striking the lamp (if it is not already on), and initializing the pan and tilt positions, the color wheel, and the gobo wheel. If a fixture fails to strike upon initial power up, or if it douses itself during operation, it should be homed. Each time the controller is powered up, all fixtures will receive a home signal.

- Depress the Home key. The Home key will flash for 10 seconds during which time any number of Address keys can be pressed (selected to be homed). The Home and Address LEDs will flash for 10 seconds during the homing procedure and then turn off. Once Homed, the fixtures will then join the sequence running and open their light Gates.

### 19. RECORD KEY

stores current parameter values for the selected addresses to memory, or if the controller is in the Preset mode, it will record an active sequence to a Preset memory. The Record key is also used to download memory from a controller to a personal computer or another Intellabeam controller.



## Intellabeam Controller: Front Panel

### 20. JOYSTICK

is used for positioning the beams of selected fixtures while in the C.T.P. mode. The farther the joystick is moved off its center axis, the farther and faster the beam will move. A slight tap on the joystick will produce a similar small movement of the beam. If it is moved a small amount in any direction, the beam will move slowly until the joystick is released.

### 21. ERASE KEY

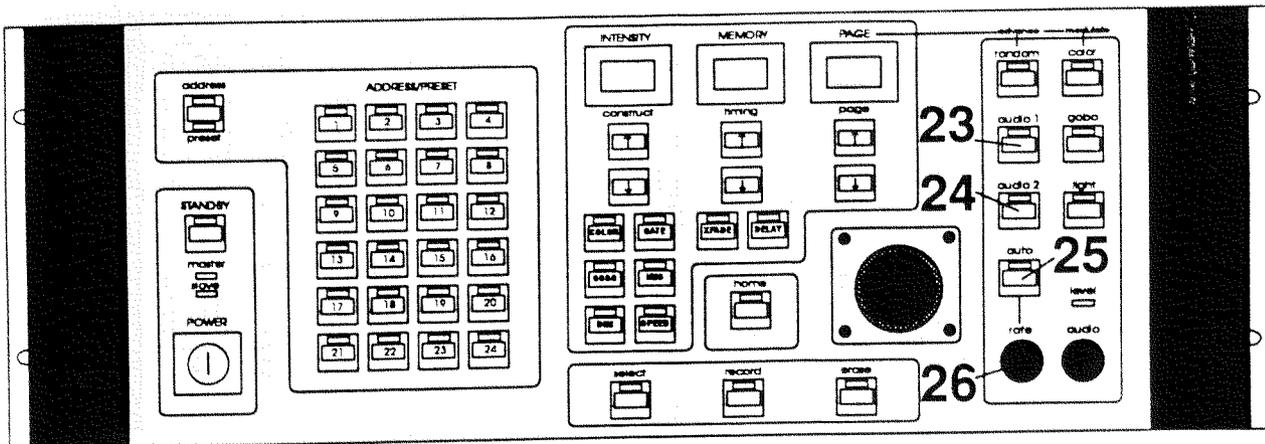
is used for editing page or Preset memory. When the controller is in the C.T.P. mode, pressing the Erase key once will reset all parameters in the current page to their default values, or it will erase a Preset if the controller is in the Preset mode. If the Erase key is pressed twice in succession, it will mark the current page number as a Non-Initialized page, signalling that it is the beginning or end of a loop or sequence. (See Section 4 of this manual.) It is also used to upload memory from a personal computer or another Intellabeam controller. (See Section 6 of this manual.)

## ADVANCE SECTION

Selects the method of sequencing a Memory's Pages

### 22. RANDOM ADVANCE KEY

is a mode that modifies the other Advance modes by sequencing the Pages randomly. Every method of advancing pages is affected by using the Random key, including manual advance, Audio Advance, and Auto Advance. In the Random mode, only initialized pages are played back; pages are not selected from non-initialized pages.



## Intellabeam Controller: Front Panel

### 23. AUDIO 1 ADVANCE KEY

is a mode that changes Pages with the beat of the audio input and ignores any programmed Delay or Crossfade settings. When the Audio 1 function is engaged, the LED indicator illuminates and disengages the Audio 2 and Auto functions. Sensitivity to the audio input is regulated by the Audio knob. When the knob is turned all the way to the right it is most sensitive to the audio input; all the way to the left it is the least sensitive to the audio input.

### 24. AUDIO 2 ADVANCE KEY

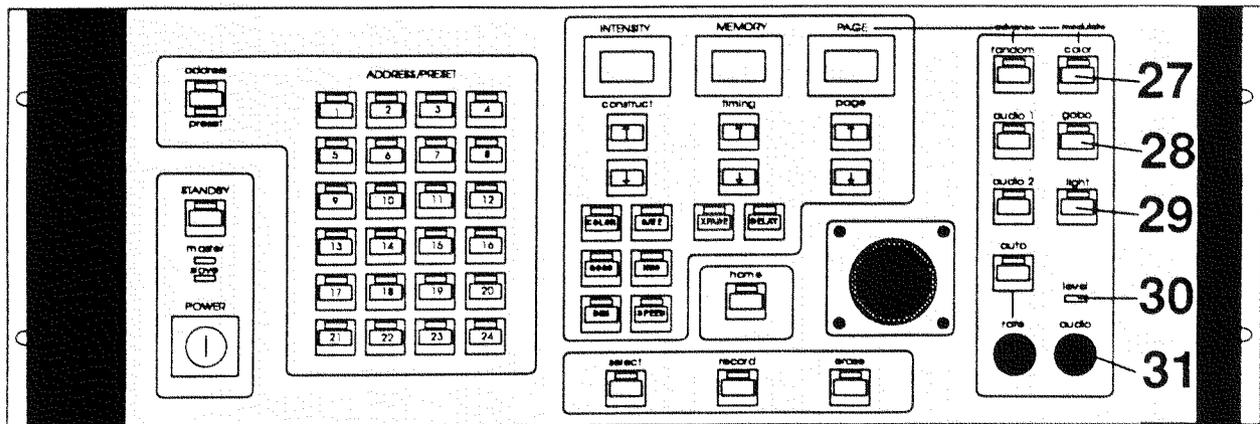
is a mode that halts the changing of Pages with the beat of the audio input and ignores any programmed Delay or Crossfade settings. When the Audio 2 function is engaged, the LED indicator illuminates and disengages the Audio 1 and Auto functions. The sensitivity to the audio input is regulated by the Audio knob. When the knob is turned all the way to the right it is most sensitive to the audio input; all the way to the left it is the least sensitive to the audio input.

### 25. AUTO ADVANCE KEY

advances pages of memory automatically at a rate set by the Rate knob. When the Auto function is engaged, the LED indicator illuminates and disengages the Audio 1 and Audio 2 functions. In this Auto mode, the delay time programmed into a page is added to rate of advancement. Programmed delay times are completed before Page advancement regardless of the Rate knob setting.

### 26. RATE KNOB

regulates the speed of Page change in Auto mode. It also regulates page advance rate in Audio 1 and 2 modes. If the knob is turned completely clockwise, Page change is the quickest, if no delays have been programmed. The maximum advance rate is 0.1 seconds per page when the knob is turned completely clockwise. When a delay is encountered, the knob's time setting is added to the delay time.



## Intellibeam Controller: Front Panel

### MODULATE SECTION

Overrides and changes the parameter settings of all active fixtures with the audio signal.

#### 27. COLOR MODULATE KEY

changes the color of all active fixtures when it detects a low frequency audio signal with an amplitude above the threshold set by the Audio sensitivity knob. Each time the strength of the audio signal exceeds the threshold, the color is bumped to the next position. Color modulation overrides the Color position information except when a Color spin has been programmed.

#### 28. GOBO MODULATE KEY

changes the gobo pattern of all active fixtures when it detects a low frequency audio signal with an amplitude above the threshold set by the Audio sensitivity knob. Each time the strength of the audio signal exceeds the threshold, the gobo pattern is bumped to the next position. Gobo modulation overrides the Gobo position information except when a Gobo spin has been programmed.

#### 29. LIGHT MODULATE KEY

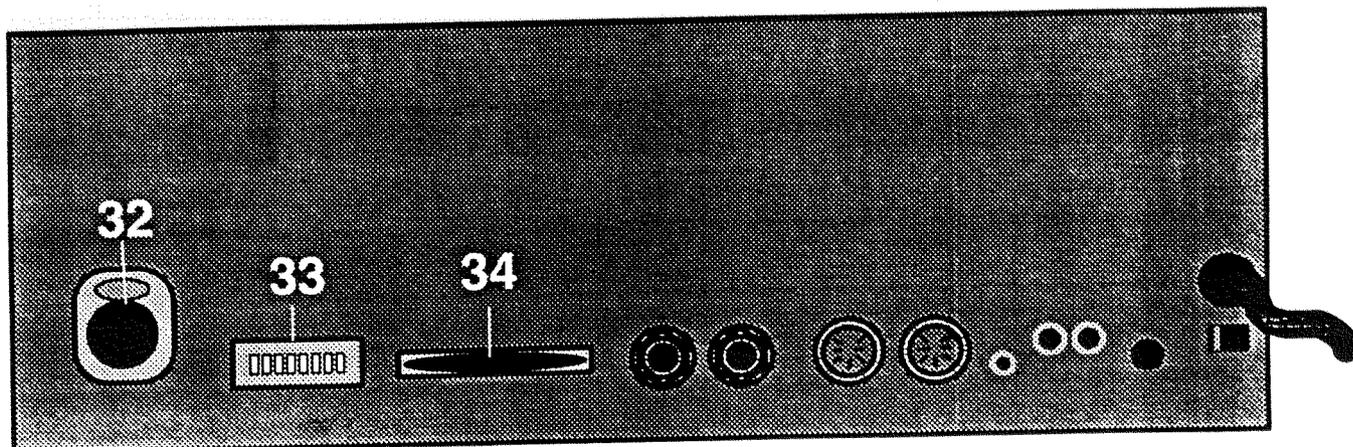
changes the intensity of all active fixtures according to the level of the audio input. When the Light Modulate function is engaged, all fixtures are dimmed to their minimum intensity level until it senses an audio input.

#### 30. AUDIO LEVEL INDICATOR LED

monitors the presence and relative strength of the audio input signal.

#### 31. AUDIO KNOB

adjusts the controller's sensitivity to the musical information for Audio Advance and Modulate. When the knob is turned all the way to the right it is most sensitive to the audio input; all the way to the left it is the least sensitive to the audio input.



**Intellabeam Controller: Rear Panel**

### 32. DATA LINK OUT

XLR female jack that sends control signals to all connected fixtures. The data cables used to carry the control signal should be three pin XLR male to female. Pin 1 is shield, Pin 2 is negative (Data Complement), and Pin 3 is positive (Data True).

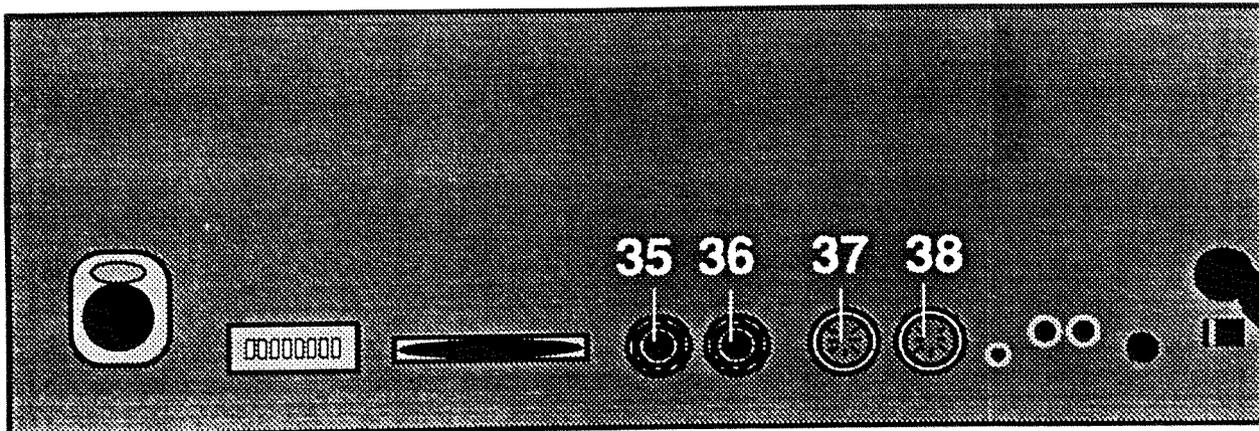
### 33. PERSONALITY DIP SWITCHES

set the mode of operation of the controller. To turn a switch on, put it in the "up" position. To turn a switch off, put it in the "down" position. (For more information about the Personality DIP switches, please refer to Section 1 of this manual.)

- |                                                              |                                                      |
|--------------------------------------------------------------|------------------------------------------------------|
| Switch #1 - On = Slave Mode                                  | - Off = Master Mode                                  |
| Switch #2 - On = 50 Hertz                                    | - Off = 60 Hertz                                     |
| Switch #3 - On = Preset Access                               | - Off = Page Access                                  |
| Switch #4 - On = 400 Protocol                                | - Off = 700 HX Protocol                              |
| Switch #5 - On = Binary Preset Access                        | - Off = Twelve Level Preset Access                   |
| (To use Binary Preset Access Switch #3 & #5 must both be On) | (To use 12 Level Preset Access Switch #3 must be On) |
| Switch #6 - On = Concert Mode                                | - Off = Club Mode                                    |
| Switch #7 - On = No Effect                                   | - Off = No Effect                                    |
| Switch #8 - On = No Effect                                   | - Off = No Effect                                    |

### 34. RS-232 SERIAL PORT

is used to transfer memory data in and out of the controller. The primary purpose of data transfer is to backup program data on a floppy disk for safe keeping or to load a controller from a backup disk or another controller. The controller is capable of communicating through the serial port with any computer that can run a communications package, but a software program for IBM PC's and compatibles is provided with this manual for convenience. This port can also be used for transfer of data with computers when using Lightwave Show Control (or a similar program) to arrange and playback controller presets from a computer. The port operates at 9600 BAUD, 8 data bits, no Parity, 1 stop bit. (See Section 6 of this manual, External Memory Storage and Transfer, for information about data transfer and storage.)



### Intellabeam Controller: Rear Panel

#### 35. MASTER OUT

is a 6 mm (1/4 in) stereo jack for linking from a Master controller to a Slave controller. It is used to expand the system to more than twenty-four addresses. By properly setting the Personality DIP switches on the rear panel of the controllers, one controller can be designated as the Master and one (or more) as the Slave(s). Then by linking them together with a shielded, two conductor data cable made with two 6 mm (1/4") stereo jack connectors (male to male), all Slave controllers can be operated from the Master controller. Personality DIP switch #1 Off = Master Mode.

#### 36. SLAVE IN

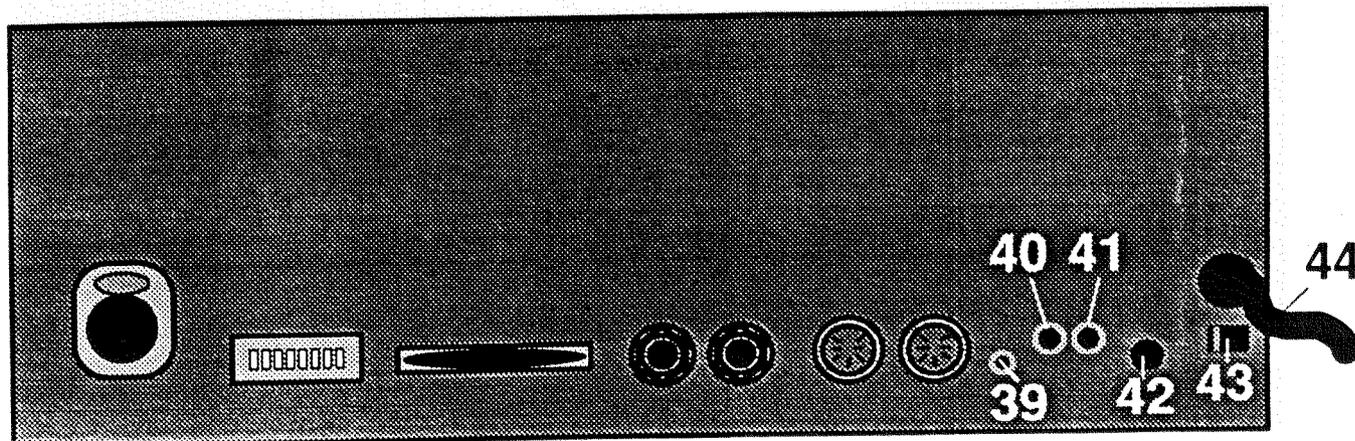
is a 6 mm (1/4 in) stereo jack for linking to a Slave controller from a Master controller or from other Slaved controllers. It is used to expand the system to more than twenty-four addresses. By properly setting the Personality DIP switches on the rear panel of the controllers, one can be designated as the Master and one or more as the Slave. Then by linking them together with a shielded, two conductor data cable made with two 6 mm (1/4") stereo jack connectors (male to male), all Slave controllers can be operated from the Master. Personality DIP switch #1 - On = Slave Mode.

#### 37. REMOTE PAGE SELECT/ANALOG INPUT CONNECTOR

is a locking 8-pin DIN connector (Channels 1-6) that enables the remote recall of a Memory's Pages or Presets using an analog control device such as a dimmer console or touch panel. (See Section 5 of this manual, Remote Access and Control, for more information.)

#### 38. REMOTE PAGE SELECT/ANALOG INPUT CONNECTOR

is a locking 8-pin DIN connector (Channels 7-12) that enables the remote recall of a Memory's Pages or Presets using an analog control device such as a dimmer console or touch panel. (See Section 5 of this manual, Remote Access and Control, for more information.)



### Intellabeam Controller: Rear Panel

#### 39. REMOTE ENABLE

is used to take the controller in and out of the Standby mode from a remote location. The 3.5mm (1/8") mini phone jack input requires a minimum 5 V DC and a maximum of 16 V DC to work properly and to enable the controller.

#### 40. LEFT AUDIO INPUT

accepts a line level audio signal used to trigger audio effects such as Audio Advance, and Color, Gobo, and Light Modulate. The two inputs (left and right) require an RCA connector. The sensitivity of the audio effects is controlled from the front panel of the controller using the Audio knob.

#### 41. RIGHT AUDIO INPUT

accepts a line level audio signal used to trigger audio effects such as Audio Advance, and Color, Gobo, and Light Modulate. The two inputs (left and right) require an RCA connector. The sensitivity of the audio effects is controlled from the front panel of the controller using the Audio knob.

#### 42. FUSE

is a 5 mm x 20 mm, 1.5 amp slow blow fuse.

#### 43. VOLTAGE SELECT

is used to select between 115V AC and 220/240V AC. When the line voltage is changed, the fuse size remains the same for the controller. However, the fixtures require different fuse sizes for different voltage sources. (See Section 2, Setting Up, of this manual for information about changing the fixture voltage.)

#### 44. AC LINE CORD

is the mains supply for the controller.

# SECTION 4

## OPERATING THE SYSTEM

### Initial Power Up

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#### Turning On the Controller

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Before you learn how to program the controller, your Intellabeam System should be completely and properly set up. You should be familiar with the layout of the front panel of the controller (See Sections 1, 2, and 3 of this manual). All of the fixtures should be assembled, optimized, tested, hung, and their Personality and Address DIP switches should be set correctly. All of the data cables should be constructed, tested, run, and connected properly. And all of the fixtures and the controller(s) should be connected to appropriate power sources.

- To turn the controller on, insert the controller key and turn the keyswitch clockwise. This will cause the Master, Standby, and Address LEDs to light and will enable the controller's self testing function.

**CAUTION: DO NOT TOUCH OR MOVE THE JOYSTICK WHEN APPLYING POWER TO THE CONTROLLER. IT IS BEING INITIALIZED AT ITS REST POSITION. THE CONTROLLER USES THE INITIAL VALUE OF THE COORDINATES OF THE JOYSTICK AS A REFERENCE POINT.**

#### Controller Self-Test

---

Upon initial power-up, the controller's CPU and memory will perform a brief self-test. As the controller performs its self-test, the three display windows in the center of the controller will show six dashes in the Intensity and Page windows. The Memory window will count up slowly from 01 to 09 and then count up again very quickly. (See Fig. 4.1)

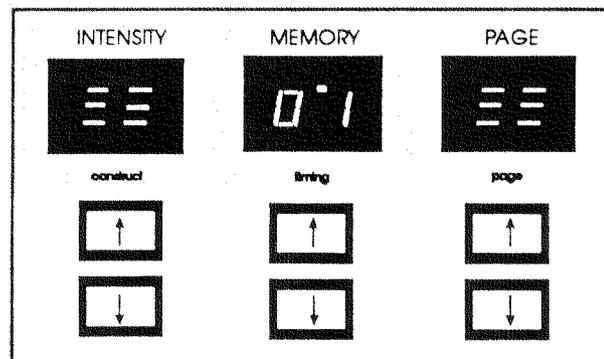


Figure 4.1 I.M.P. Display Self Test

When the self-test is complete, the Display windows will show “9·9” “0·1” “0·1” indicating that the controller is currently at Intensity level 99, Memory 1, and Page 1. The controller will be in Standby mode.

## **Homing the Fixtures**

---

Upon initial start-up, the cooling fans will turn on and the fixtures will all Home. Homing a fixture closes the shutter, strikes the lamp (if it is not already on), turns on the cooling fan, and sets all parameters to their home (default) positions.

Homing allows a fixture or several fixtures and their color wheels, gates, and scanners to be returned to their Home positions at any time with the light Gate closed.

- To home a fixture at any time, press the Home key. The Home key will flash for 10 seconds, during which time any number of Address keys can be pressed (selected to be homed). The Home and Address LEDs will flash for 10 seconds during the homing procedure and then turn off. Once Homed, the fixtures will then join the sequence running and open their light Gates.

When a fixture receives a homing signal, the mirror will start to clatter for about ten seconds while it is being homed. After the motors are homed, it will go through a series of self-diagnostic tests, much like the controller does, to test itself out. If everything checks out, it will idle with the shutter closed, quietly waiting for its next command. If it fails to do so, check the LED indicators on the rear panel and refer to the Troubleshooting Guide in Section 7 of this manual.

The controller will remotely power up the fixtures and the lamp and fan will automatically switch on and off. The lamp and fan will come on upon one of following three conditions; 1.) upon initial power up, 2.) upon receiving a Home command, or 3.) upon coming out of fixture Lockout. Once the lamp is switched off, the fan will continue to operate for a period of about two minutes, then it will automatically shut off

**IMPORTANT: IF ALL LAMPS DO NOT IGNITE AT FIRST, DO NOT TURN OFF THE CONTROLLER. TURNING OFF THE CONTROLLER AT THIS POINT WILL EXTINGUISH ALL OF THE LAMPS AND PREVENT THEM FROM STRIKING UNTIL THEY HAVE HAD SUFFICIENT TIME TO COOL DOWN. INSTEAD OF TURNING THE CONTROLLER OFF, DEPRESS THE HOME KEY, FOLLOWED BY THE ADDRESS(ES) OF THE FIXTURE(S) THAT DID NOT IGNITE. THIS WILL HOME ALL SETTINGS OF THE CHOSEN ADDRESSES AND RE-IGNITE THE LAMPS.**

## Programming

---

The Intellabeam controller has nine separate Memories, each containing 99 Pages. There are a total of 891 total Pages of storage in the controller's memory. Each Page can be programmed individually. A Page (traditionally called a scene) is comprised of the parameters and positions of up to 24 fixture Addresses and their modifications.

### Addresses

---

Twenty-four Addresses are available on a Lightwave Research Intellabeam Controller which will control twenty-four fixtures or twenty-four sets of fixtures. If several fixtures are assigned to the same Address, they will all share the same parameters (color, gobo, dim, gate, iris, speed, crossfade, and delay) and they will all move at the same time in response to the joystick when their Addresses are selected.

### Address Lockout (Fixture Exclusion)

---

This feature enables the temporary removal of one or more fixture Addresses from all sequences. This might be necessary in the event of a malfunction or if you want to remove an Address from a Program for a special event or effect. Removing a fixture in this manner requires no reprogramming because no Memory is actually changed.

- Address Lock-out is performed by pressing and holding (for 20 seconds) the Address key of the Address that is to be locked out.
- The numbers displayed in the LED windows above the up and down arrow keys will begin to flash and then "L.O" will be displayed in the middle display window. The lamp(s) of the fixture(s) will turn off.
- After an Address has been locked out, anytime that Address key is pressed, "L.O" will appear to as a reminder that it is locked-out.

### Address Unlock

---

- Any locked-out Addresses can be returned to normal operation by repeating the above procedure. All Addresses are returned to their un-locked settings upon power up of the controller.
- Press and hold the locked-out Address key for 20 seconds.
- After a few seconds, the LED display will show "L.O" in the middle window. The decimal points will begin to flash and then the settings programmed for that Address will appear in the display windows. The lamp(s) of the fixture(s) will turn on.

## Creating a Page

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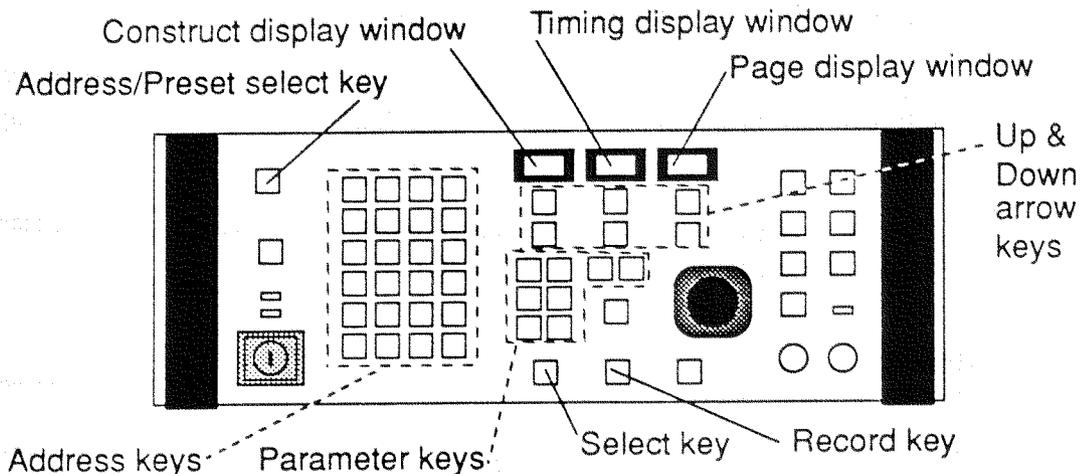
A Page is comprised of the parameters and positions of up to 24 fixture Addresses and their modifications. A single Page can be likened to a 'scene' in traditional lighting desk nomenclature. An individual Page can be as simple as a single fixture, in plain white light, shooting straight out, or as complicated as multiple fixtures with completely different colors and gobo patterns pointing everywhere.

These Pages can be played back as static scenes, simple chases, or very complex chases. No individual chase can be longer than 99 Pages. Creating a Page can be accomplished easily by using the simple four-step method outlined below.

### The Four-Step Method

---

1. Press Select. (See Fig. 4.2)
2. Select one or more Addresses. (See Fig. 4.2)
3. Set the parameters for the selected Address(es). (See Fig. 4.2)
4. Press Record. (See Fig. 4.2)



**Figure 4.2 Intellabeam Controller:  
Front Panel**

To begin Programming, **make sure you are in I.M.P. (Intensity, Memory, Page) mode.** The **decimal points** between the numbers in the display windows will be at the **top of the display windows.** In this mode, you can go to the Memory and Page where you want to begin programming.

If you are not in I.M.P. mode, press the Select key to take you out of C.T.P. (Construct, Timing, Page) mode. This will return you to I.M.P. mode. The Select key toggles the controller between these two modes.

Make sure you are in Address mode. (The light above the Address key will be lit if you are in Address mode.) If you are not in Address mode, press the Address/Preset select key to change the controller to Address mode. The Address/Preset key toggles the controller between these two modes. The Address/Preset key is located in the upper left corner on the front panel of the controller. (See Fig. 4.2)

Use the up/down arrow keys under the Memory and Page display windows to go to a Memory and Page where you want to begin programming.

- Step #1 Press the Select key. The Select key LED will start to flash. The controller is now in C.T.P. (Construct, Timing, Page) mode. The displays will go dark until an Address is chosen.
- Step #2 Select an Address by pressing the numbered key in the Address/Preset area of the controller.

### **Range Select**

---

If you want to select a block of addresses, simultaneously press both the highest and lowest numbered address keys of the desired range. This action will select several or all fixtures at once. All addresses from the lowest numbered key to the highest numbered key will be selected. (For, example, to select 1 - 8, press keys 1 and 8 at the same time.)

After you have selected the Address or Addresses, the decimals in the display windows will drop to the bottom and the chosen Address's LED will flash with the Select key's LED. The Gate LED in the Construct section and the Delay LED in the Timing section will illuminate. All parameters will be at their default values unless prior programming has occurred.

- Step #3 Set the parameters for the selected Address or Addresses. You can set all of the parameters (color, gobo, dim, gate, iris, speed, crossfade, and delay) for the selected Address(es) by pressing each parameter key and adjusting the setting with the up/down arrow keys under the Construct display window (for color, gobo, dim, gate, iris, speed) or Timing display window (for crossfade and delay).
- Step #4 Press the Record key to save all of the parameter settings which you have changed.

## Description of Parameters

---

### 1. Joystick

The joystick will position the beams of selected fixtures while in the C.T.P. mode. The distance that the joystick is moved from center is proportional to the speed that the beam is moved.

### 2. Color

There are twelve colors ("01" through "12"), eight color effects ("H1" through "H8"), eight forward color spin speeds ("F1" through "F8"), and eight alternate (reverse) color spin speeds ("A1" through "A8"). The color effects will be either half colors or color scanning. (Fixture Personality DIP Switch #7 - "OFF" = color scanning effects; DIP Switch #7 - "ON" = half color positions)

All colors and effects can be selected by depressing the Color button while in the C.T.P. mode and advancing the up/down arrow keys. The Construct display will read "01" through "12", "H1" through "H8", "F1" through "F8", then "A1" through "A8" in sequence. "H1" through "H8" are half colors or scanning effects.

### 3. Gobo

There are twelve gobo patterns ("01" through "12"), eight forward spin speeds ("F1" through "F8"), and eight alternate (reverse) spin speeds ("A1" through "A8").

Gobo patterns and spin effects can be selected by depressing the Gobo button while in the C.T.P. mode and advancing the up/down arrow keys. The Construct display will read "01" through "12", "F1" through "F8", then "A1" through "A8" in sequence.

### 4. Gate

The gate acts as a dark shutter and as a strobe effect with eight strobe speeds. It can be opened and closed when the controller is in the C.T.P. mode by depressing the Gate button and advancing the up/down arrow keys buttons. When the Gate LED is illuminated, the current Gate status of the selected fixture is shown in the Construct display. "OP" is for open, "CL" is for closed, and "F1" through "F8" are for the eight strobe speeds).

### 5. Iris

The iris can be programmed for various size beams and crossfading iris effects. The size of the iris can be changed when in the C.T.P. mode by depressing the Iris button and advancing the up/down arrow keys buttons. When the Iris LED is illuminated, the current Iris setting of the selected fixture is shown in the Construct display. There are ninety-nine iris settings.

## 6. Dimming

The intensity level of each fixture can be programmed from full intensity to completely dimmed. It can be changed while in the C.T.P. mode by depressing the Dim button and advancing the up/down arrow keys. When the Dim LED is illuminated, the current intensity of the selected fixture is shown in the Construct display. The intensity settings range from zero to ninety-nine. The Xfade button is used in conjunction with the Dim button to set crossfade times.

## 7. Speed

The speed of the beam movements can be programmed into memory for a great variety of motion. While in the C.T.P. mode, depress the Speed button and change the settings by advancing the up/down arrow keys buttons. When the Speed LED is illuminated, the current speed setting of the selected fixture is shown in the Construct display. There are ninety-nine speed settings.

The speed setting is a function of time, therefore, all fixtures which have the same speed values will move in together, regardless of the distance traveled. For example, if one fixture is only moving one foot and another is moving ten feet, they will start and stop at the same time, provided they have been programmed with the same speed setting. Of course, one will move faster than the other, but they will arrive at their respective positions together.

The speed of movement (change) of the fixture's Color and Gobo wheels can be set to move at the same rate as is set by the Speed key. (Often called "M Speed" - Motor Speed). To apply M Speed to color or gobo: 1) Select a fixture. (Press the Select key and an the Address key(s) of the fixture(s) to which you want to apply an M Speed Setting.) 2) Then press the Speed key while at the same time pressing the Color key (and/or Gobo) key. If you do not utilize the M Speed function for color and gobo, the Color and Gobo wheels will move at full speed from one Page to another causing quick movement rather than gradual movement.

## 8. Crossfade

The fixture can crossfade from one intensity to another, or from one iris size to another. Crossfade times can be set by depressing the Xfade button and advancing the up/down arrow keys while in the C.T.P. mode. When the Xfade LED is illuminated, the current crossfade time is shown in the Timing display. There are ninety-nine crossfade time settings from 0.1 to ninety-nine seconds.

If the crossfade time is longer than the Advance rate of the controller, then it will not complete the crossfade before it advances to the next Page. Both Xfade and Delay are Page wide parameters; the crossfade and delay times affect all addresses on one Page.

## 9. Delay

When the controller is in the Auto mode, it advances through the Pages of memory at a rate that is determined by the Rate control knob. If a delay is programmed into a Page, it is added to the advance rate before it continues to the next Page. For example, if the advance rate is set to advance a Page every ten seconds, and the delay time is five seconds, then it will pause on the current Page for fifteen seconds.

If the controller is in the Audio Advance mode, the Delay setting is ignored. Both Xfade and Delay are Page wide parameters; the crossfade and delay times affect all addresses on one Page. When the Delay LED is illuminated, the current delay time is shown in the Timing display. There are ninety-nine delay settings from 0.1 to ninety-nine seconds. Just past 99 seconds is a hold function. "HO" in the display window is for holding on the present Page for an infinite time or until a change is made manually.

## 10. Position

The Intellabeam controller version 2.03 or higher has a time-saving function called position memory (commonly called "Preset focus"). To check which version of software is installed in your controller, press and hold the Standby key while turning the controller on by turning the keylock clockwise. Position memory enables a Page to refer to another Page for pan and tilt positions. This allows many Pages to use the pan and tilt position of another single reference Page. When that one reference Page is altered, all Pages which refer to it reflect the change. **Memory nine is the memory designated as "position memory."** All ninety-nine Pages of memory nine can be programmed as position reference Pages. However, memory nine may also be used as a regular memory for programming normal Pages.

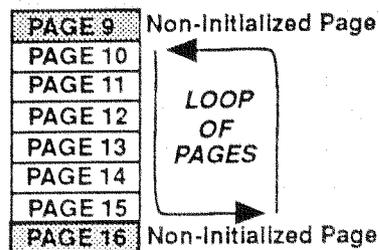
Position memory provides for a simple process by which an entire show can be quickly updated when it moves from one venue to another by simply changing a few reference Pages. For a complete description and instructions, see the portion of this section of the manual titled "Position Memory" (Preset Focus).

## Creating a Non-Initialized Page

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To create a Loop of Pages, a Non-Initialized Page needs to be created. A Non-Initialized Page acts as a 'placeholder' to indicate the beginning or ending of a chase or loop.

The controller's memory automatically places a Non-Initialized Page before Page 1 and after Page 99. However, if you wanted to program a Loop from Page 10 to Page 15, for example, you would need to make Pages 9 and 16 Non-Initialized Pages in order for Pages 10 through 15 to act as a Loop.



Step #1 Go to the Page to be 'Non-Initialized'

Use the up/down arrow keys under the Page display window to go to the Page that you want to define as a Non-Initialized Page.

Step #2 Press Select

Press the Select key. The LED above the Select key will flash, indicating that the controller is now in C.T.P. (Construct, Timing, Page) mode. The intensity and memory indicators will go blank except for a decimal point at the bottom of each display window. The number of the Page which you are programming will be displayed in the Page display window.

Step #3 Press Erase

Press the Erase key. C.L will appear in the Construct display window and 0.0 will appear in the Timing display window.

Step #4 Press Erase

Press the Erase key again. Both the Construct display window and the Timing display window will briefly go blank, then the controller will automatically exit out of C.T.P. Mode into I.M.P. Mode.

## Position Memory (Preset Focus)

The Intellabeam controller revision 2.03 or higher has a time-saving function called position memory (commonly called "Preset focus"). Position memory allows a Page to refer to another Page for pan and tilt positions. This allows many Pages to use the pan and tilt position of another single Page. When that one reference Page is altered, all Pages which refer to it reflect the change. **Memory nine is the memory designated as "position memory."** All ninety-nine Pages of memory nine can be programmed as position reference Pages.

The following scenario is a typical example of position memory: A show is programmed for a specific focus (i.e. lead singer - down stage center, drummer - up stage center, keyboard player - stage left). In memory nine, Page one is programmed with all fixtures hitting the lead singer. Since this position is stored in Page one of memory nine, it will be referred to as "position number one" or "position one." Similarly, positions two and three for the drummer and keyboard player are programmed into memory nine, Pages two and three respectively.

A show can be programmed in memories one through eight, or in Pages of memory 9 that have not been used as position reference Pages. The positions of the fixtures can now be easily adjusted by position number instead of by joystick movement on each individual Page.

Position memory provides for a simple process by which a show can be quickly updated when it moves from one venue to another. At each venue the fixtures may be mounted in different positions and the stage and trusses might be arranged differently. In the above example, only Pages one, two, and three of memory nine will need to be changed in order to update the whole show. All Pages with positions one, two, and three will be adjusted automatically.

### Setting Reference Pages in Memory Nine

- Go to Memory nine.
- Press the Select key.
- Press the Address key(s) for one or more fixtures.
- Use the joystick to position the fixtures as desired on a reference point (i.e. lead singer - center and front.)
- Press the Record key.

## Using the Position of Reference Pages in Memory Nine

---

- Go to the Memory and Page which you want to program.
- Press the Select key.
- Press the Address key(s) for one or more fixtures which you want to refer to the position(s) of the fixtures on a certain Page in memory nine.
- Press the Delay key (or Xfade key) until the LED above it is out. (Both the LED above the Delay key and the LED above the Program key need to be out.) The display now shows either “JS” for joystick, or 1 through 99 for position numbers which refer to Positions in Memory nine. If the display shows “JS,” it means that the position of this fixture is determined by the positioning of the joystick on the **current** Page and that no Position in Memory nine is referenced.
- Use the up and down arrow keys below the Timing window to adjust the position number of the Page in Memory nine to which you want to refer.
- Press the Record key.

The fixtures which you selected will automatically use the position of the fixtures on the selected reference Page in memory nine. Now any time you change the position of the Addresses on the reference Pages in Memory nine, the Pages which refer to that Page for position will also change.

## Motor Speed

---

The Color and Gobo functions may be synchronized to equal the rate of change determined by the Speed setting (the “M Speed” or Motor Speed). That is, the amount of time it takes for the fixture to reach its programmed position is the amount of time it will take for the color (or gobo or both) to change to their programmed settings. The color (and/or gobo) wheel will change gradually, going through each setting until it reaches its final designated setting for a length of time set by the Speed key. If the M Speed is not programmed; 1) the default M speed setting is the fastest speed available and 2) the M speed is independent of pan and tilt.

- Go to the Memory and Page which you want to program.
- Press the Select key
- Press the Address key of the Address (or Addresses) you wish to program.
- Press the Speed key and set the rate of change desired by using the up/down arrow keys under the Construct display window.
- To match the rate of change of the Color (and/or Gobo) wheel with the setting of the Speed key, press and hold the Speed key while also pressing the Color (and/or Gobo) key.
- Press the Record key. The rate of change of the Color (and/or Gobo) wheel will now match the rate of change determined by the Speed setting on this Page.

## Presets

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A Preset is a recording of a programmed Page or sequence of Pages. Presets are provided to allow immediate recall of a programmed Page or sequence of Pages. Presets store all of the Parameters, Advance and Modulate Settings that were programmed with a Page or sequence of Pages. The Advance and Modulate Settings can be changed during the Preset recording process. The Page Advance rate is stored with each Preset. These Advance and Modulate settings can also be adjusted during the playback of a Preset. The Audio level is independent of the Presets.

The Intellabeam Controller is capable of storing up to 1,023 Presets using the Remote Analog Access port. In most cases, however, Presets are selected by front panel access, using the 24 Preset keys. Each Preset can hold either a single Page (a static scene) or a large group of consecutive Pages (a chase or loop) which advances automatically.

### Recording A Sequence (Loop or Chase)

---

To record a Loop (Chase) as a Preset, the Loop must be running. That is, the Pages must be advancing in auto playback mode or an audio playback mode. A Loop is a group of consecutive Pages bounded by a Non-initialized Page before the group of consecutive Pages and a Non-initialized Page after the group of consecutive Pages. (See Creating a Non-initialized Page in this section of the manual.)

- Press the up or down arrow key under the Page display window to go to any Page in the loop which you want to record as a Preset.
- Press the Auto key. The Pages will start advancing, playing back the loop.
- To record a Preset, the controller must be in Preset Mode. Press the Address/ Preset Select key to change the controller from Address Mode to Preset Mode. The Preset LED below the Address/Preset Select key will light to indicate that the controller is in Preset Mode.
- Press the Select key. The Select LED will flash.
- Press the Preset Number on the front panel where the Loop is to be stored.

You can now adjust the Advance Method, Advance Rate, and Modulate Settings. These settings will be recorded as part of the Preset. Whenever you playback a Preset, the Preset will advance through its Pages according to the Advance Method, Advance Rate, and Modulate Settings you set when you recorded the Preset.

However, if you ever want to change the Advance Method, Advance Rate, or Modulate Settings when you are playing back a Preset, you can do so manually while the Preset is playing. These manual adjustments will not permanently change the way the Preset plays back. The Preset will return to the settings that were selected when it was recorded.

- Press any of the keys in the Advance and Modulate sections on the controller and set the Rate knob to the desired rate of Page advance.
- Press the Record key. You have now recorded a Loop as a Preset.

### **Recording A One Page Preset (Scene)**

---

If you want to record a single Page (static scene) as a Preset, the Page does not need to be bound on either side by Non-Initialized Pages in order to be recorded as a Preset as does a Loop of Pages.

- Go to the Page that you want to record as a Preset.
- Select Preset mode by pressing the Address/Preset select key.
- Press the Select key.
- Press the numbered Preset key where you want to store that Page as a Preset.
- Press the Record key.

### **Programming a Preset in Twelve Level Preset Access Mode**

---

Twelve Level Preset Access is a way of expanding the number of available Presets from twenty-four (the twenty-four Preset buttons on the front panel of the Lightwave Research Intellabeam controller) to 288 by using an auxiliary controller. Programming in Twelve Level Preset Access is similar to programming Presets as usual with the Lightwave Research Intellabeam controller with one exception; one of the twelve analog inputs on the rear of the controller must be activated during programming. Before beginning, make sure the Lightwave Research Intellabeam controller is configured for Twelve Level Preset Access by setting the Personality DIP switch on the rear of the controller to switch #3 "ON." Also, make sure an analog controller is correctly patched to the Remote Analog inputs on the rear of the controller. (See *Twelve Level Preset Access on page 73.*)

To program a Preset using Twelve Level Preset Access:

- Put the controller in Preset mode by pressing the Address/Preset key until the Preset LED lights.

- Press the up or down arrow key under the Page display window to go to any Page in the loop which you want to record as a Preset.
- Press the Auto key. The Pages will start advancing, playing back the loop.
- Press the Select key. The Select LED will flash
- Activate the 0-10V input channel on which the desired Preset is to be stored. For example, to program the first level of twenty-four Presets, turn on channel one on the auxiliary controller, to program the second level of twenty-four Presets, turn on channel two on the auxiliary controller, etc.
- Press the Preset number on the front panel where the Preset is to be stored. You can now adjust the Advance method, Advance rate, and Modulate settings. These settings will be recorded as part of the Preset. Whenever you playback a Preset, the Preset will advance through its Pages according to the Advance method, Advance rate, and Modulate settings you set when you recorded the Preset. However, if you ever want to change any of the advance or modulate parameters when playing back a Preset, it can be done manually while the Preset is playing. These manual adjustments will not permanently change the Preset. It will automatically revert to the initial settings as recorded.
- Press the Record key. The Select LED will stop flashing and the Preset will now be recorded.
- To recall the Preset, press the Address/Preset Select key until the Preset LED lights. This puts the Lightwave controller in the Preset mode. Turn on the channel on the auxiliary controller on which the Preset was recorded. Press the numbered Preset key on the Lightwave controller of the Preset you wish to recall.

### **Programming a Preset in Binary Preset Access Mode**

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Binary Preset Access is a way of expanding the number of available Presets from twenty-four (the twenty-four Preset buttons on the front panel of the Lightwave Research Intellabeam controller) to 1023 by using an auxiliary controller. This feature is available on ML88C versions 2.02 and above. Programming in Binary Preset Access is similar to programming Presets as usual with the Lightwave Research Intellabeam controller with one exception; any combination of the first ten of the twelve analog inputs on the rear of the controller must be activated during programming. Before beginning, make sure the controller is configured for Binary Preset Access by setting the Personality DIP switch on the rear of the controller to switches #3 & #5 "ON." Also, make sure an analog controller is correctly patched to the Remote Analog inputs on the rear of the controller. (See *Binary Preset Access on page 73.*)

To program a Preset using Binary Preset Access:

- Put the controller in Preset mode by pressing the Address/Preset key until the Preset LED lights.
- Press the up or down arrow key under the Page display window to go to any Page in the loop of Pages which you want to record as a Preset.
- Press the Auto key. The Pages will start advancing, playing back the loop.
- Press the Select key. The Select LED will flash.
- Activate any combination of the first ten of twelve 0-10V input channels. This unique combination of activated and non-activated channels can be represented as a binary number with ten digits in which the Preset is stored.

For example, Preset one may be stored in the binary equivalent of one, which is channel one "ON" and every other channel "OFF." Preset number 948 may be stored in the binary equivalent of 949, which is channels 3,5,6,8,9, and 10 all "ON" and every other channel "OFF." (For quick reference, see Appendix E: Binary Access Chart.)

- Press a numbered Preset key on the front panel of the Intellabeam controller. Which Preset key is pressed is not important; this action is just used to alert the controller that a Preset is about to be recorded. You can now adjust the Advance method, Advance rate, and Modulate settings. These settings will be recorded as part of the Preset. Whenever you playback a Preset, the Preset will advance through its Pages according to the Advance method, Advance rate and Modulate settings you set when you recorded the Preset. However, if you ever want to change any of the advance or modulate parameters when playing back a Preset, it can be done manually while the Preset is playing. These manual adjustments will not permanently change the Preset. It will automatically revert to the initial settings as recorded.
- Press the Record key. The Select LED will stop flashing and one of the Preset LED's on the front panel will light up indicating that a Preset has been recorded. The LED that lights will not necessarily be the one that was pressed, but the one corresponding to the remainder of the decimal equivalent of the binary Preset number divided by twenty-four. In the above example, decimal Preset number 948 divided by twenty-four is thirty-nine with a remainder of twelve - so the LED for the Preset key number twelve will light up.
- To recall the Preset, press the Address/Preset Select key until the Preset LED lights. This puts the Lightwave controller in the Preset mode. Turn on the channel on the auxiliary controller on which the Preset was recorded. Press the numbered Preset key on the Lightwave controller of the Preset you wish to recall.

## Copying

---

The Intellabeam controller remembers all parameters that are programmed by the operator. Because of this internal Memory, it is easy to repeat certain parts of the controller's Memory by copying parameters.

The copying function of the controller allows the user to copy:

- certain parameters of an Address to another Address or Addresses.
- the entire contents of a programmed Page to any another Page in any other Memory.
- a group of programmed Pages to any other group of Pages in any other Memory.

## Page Copy

---

This method of copying allows for the entire contents of a programmed Page to be copied to any other Page in any other Memory. This is most useful for creating a Loop or Chase of Pages that only contain slight changes, such as movement changes or single parameter changes.

- First, make sure that you are not in C.T.P. mode, that is, the Select key LED is not lit or flashing. Go to the Page to be copied using the up/down arrow keys under the Memory and Page display windows.
- Press Select. The two left displays will be dark. Go to the Memory and Page you wish to copy to with the Memory and Page up-down arrows. When you do this, the Construct display window will show P.C and your destination will be indicated in the Memory and Page windows.
- Depress Record. The Page copy is complete. This procedure can be repeated as often as you wish.

## Block Copy

---

When multiple consecutive Pages need to be repeated, the Block copy function is very useful. If you wish to have multiple chases with slight parameter changes each time the chase repeats, you can utilize this function to save a great deal of time.

- Go to the group of Pages you want to copy, using the up/down arrow keys under the Memory and Page display windows.
- Press the Select key.

- Press the Auto key, located in the Advance section on the front panel of the controller to the right of the joystick. The Construct display indicates **S.P**, for Start Page. The first Page of the sequence is automatically selected, but it can be changed now if you want a different Page in this sequence to be the starting Page.
- Press the Auto key again. The Construct display now shows **E.P**, for End Page. The Memory and Page displays indicate the last Memory and Page the controller will copy. The last Page of the sequence is automatically selected, but it can be changed now if you want a different Page in this sequence to be the ending Page.
- Press the Auto key once again. Note the Construct display window now shows **C.P**, for Copy Page.
- Using the up-down arrow keys under the Memory and Page display windows, go to the location (Memory and Page) where you want the block of Pages you are copying to begin. The Default condition for this is the Page where you first pressed Select.
- **(Optional Step)** Using the up/down arrow keys under the Intensity display window at this point will toggle the controller between Copy Page (**C.P.**) and **Copy Inverse (C.I.)**. Copy Inverse reverses the sequence of Pages that you are copying.
- Press Record. After a brief display of the Page numbers advancing, the Select key LED will go out and the controller will be back in I.M.P. mode.

### **Address Parameter Copy**

---

Once an Address has been programmed, some or all of the parameter settings can be copied to other Addresses on the same Page or onto another Page. This will save a great deal of time when many fixtures on a Page or within a Loop of Pages need to have the same or similar settings.

#### Copy All Parameters (Except Position) From One Address to Another

- Press the Select key.
- Select the Address with the parameters to be copied.
- Use the up/down arrow keys to go to the Page and /or memory to which you want to copy the Address parameters.
- Select the Addresses which you want to receive all of the same parameters as the first Address (except joystick position).
- Press the Record key to save changes or Select to discard changes.

## **Copy Selected Parameters From One Address to Another**

- Press the Select key.
- Select the Address with the parameters to be copied.
- Select the parameter(s) to copy by pressing the appropriate construct keys or by altering the value of the selected parameter. Position may be selected by moving the joystick, but this will not copy the exact position of the Address you are copying, it will copy the original position plus the movement of the joystick.
- Press the numbered key(s) of the Address(es) which you want to have the same parameters you selected to copy from the first Address.
- Press the Record key to save changes or Select to discard changes.

## **Copy Selected Addresses From One Page to Another**

- Press the Select key.
- Select the Addresses to be copied.
- Use the Up and Down Arrow keys under the Page Display window to go to the Page to receive the selected Addresses. All parameters (selected or not) of the selected Addresses will be copied to the new Page.
- Press the Record key to save changes or Select to discard changes.

## **Copy Positions of Addresses From One Page to Another Within the Same Memory**

- Press and hold the Select key.
- Select the Addresses whose positions are to be copied.
- Release the Select key any time after at least one Address has been selected. By doing this you have selected the position of these Addresses.
- If you want to copy any other parameters in addition to the position, press those parameter keys now.
- Use the Up and Down Arrow keys under the Page Display window to go to the Page (in the same memory) to where you want the Address position to be copied. Only the selected parameters of the selected Addresses (including position) will be copied to the new Page. Address positions can only be copied within the same memory.
- Press the Record key to save changes or Select to discard changes.

## Editing Pages

---

When you edit a Page that has been previously programmed, one or more address LEDs will typically be lit, indicating that the gates of these fixtures are open. If you select an already-programmed fixture, you will notice the Construct display window will show **O.P** if the gate is open, or “F1-F8” if a strobe is set. Modifying the Addresses on a Page can be accomplished in the same fashion as programming previously un-programmed fixtures.

- To change the programming of certain Addresses on a Page, make sure you are in I.M.P. (Intensity, Memory, Page) mode, that is, the decimal points between the numbers in the display windows are at the top of the display windows. If you are not in I.M.P. mode, press the Select key to take you out of C.T.P. (Construct, Timing, Page) mode. This will return you to I.M.P. mode.
- Use the up/down arrow keys under the Memory and Page display windows to go to a Memory and Page where you want to program.
- Press the Select key. The Select key LED will start to flash. The controller is now in C.T.P. mode (Construct, Timing, Page). The displays will go dark until an Address is chosen.
- Select an Address or Addresses which you want to program by pressing the numbered keys in the Address/Preset area on the controller.
- After you have selected the Address or Addresses, the decimals in the displays will drop to the bottom and the chosen Address's LED will flash with the Select key LED.
- The Gate LED in the Construct section and the Delay LED in the Timing section will illuminate. All parameters will be at their default values unless prior programming has occurred.
- After an Address or Addresses have been selected, you can set all of the parameters (color, gobo, dim, gate, iris, crossfade, and delay) for the selected Address(es) by pressing each parameter key and adjusting the setting with the up/down arrow keys under the Construct and Timing display windows.
- To save all of the new parameter settings, press Record.

## Erasing Pages

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You may want to erase a Page if there are undesirable or old Pages in memory. It is often best to clear out these Pages to prevent confusion in future programming. An erased Page is not a Non-initialized Page. An erased Page does not act as a 'placeholder' Page in a loop of Pages.

- To erase a Page, go to the Page you wish to delete using the arrow keys under the Memory and Page display windows.
- Press the Select key. The Construct and Timing display windows will go blank.
- Press the Erase key once. C.L will appear in the Construct display window.
- If you are certain that this is the Page you want to erase, press the Record key. Both the Construct and the Timing Displays will briefly go blank, then the controller will automatically exit out of C.T.P. mode into I.M.P. mode.

## All Memory Erase

---

- To erase all memory from a controller (not including locked memories), turn the controller off.
- Press and hold the Select key and the Erase key.
- Turn the controller on. The Memory display window will count up through the memories. Then the controller will run a normal self-test. All memory is now erased from the controller.

## Memory Lockout

---

Entire Memories can be protected from unauthorized editing or Programming. To lock a Memory to protect it from being changed:

- Press and hold the Standby key while turning on the Key Switch.
- While still pressing the Standby key, you may Lock or Unlock the Memories by pressing the corresponding Address key number in the Address/Preset Region of the controller.

When an LED in the Address/Preset Section 1-9 is lit, it indicates that these Memories are available for Programming. If the LEDs are off, it means that the Memories are Locked. You may toggle between Locked and Unlocked as long as Standby is pressed. Once Standby is released, the controller will perform its normal Memory check.

A locked Memory is protected from all Erase and Record functions (including All-Memory Erase). If a protected Memory is accessed and an attempt is made to Record an adjusted setting, L.C will be displayed in the first window, indicating that changes may be made temporarily but not Recorded.

When program data is crossloaded between controllers or downloaded from a computer, if the controller receiving the data has one or more memories locked, those memories will not be overwritten by the new data. For example, if you want to copy memories one, two, and three on controller A from controller A to controller B while keeping memories four through nine on controller B the way they are, you will need to lock memories four through nine on controller B before the program data is transferred. (See Section 6 of this manual, *External Memory Storage and Transfer*, for a complete description of the memory transfer procedures.)

## Playback

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### Page Playback - Manual Advance

---

To manually playback the Pages within a Memory:

- If the controller is in Standby mode, remove the controller from Standby by pressing the Standby key.
- Press either the up or down arrow key beneath the Page display window once. The fixtures will change their settings immediately according to what has been recorded on each Page. The controller will advance one Page at a time each time an arrow key under the Page display window is pressed.
- If either the up or the down arrow key under the Page display window is pressed and held, the Pages will change quickly until 1 or 99 is reached. If the up/down arrow key is released and then pressed again, the process will begin over.

### Page Playback - Automatic Advance Modes

---

#### Auto Playback Mode

- Press the Auto key in the Advance section on the controller located to the right of the joystick. The controller will automatically begin to playback all of the Pages within a Memory until it encounters a Non-Initialized Page. When it encounters a Non-Initialized Page, it will go back to the first Initialized (Programmed) Page it encounters and playback all of the Pages within that loop of Pages (between the two Non-Initialized Pages).
- You can adjust the rate at which the Pages are played back by turning the Rate knob located just below the Auto key in the Advance section on the controller. If the Rate knob is turned as far as it will go clockwise, the playback will be fastest. If it is turned as far as it will go counterclockwise, the playback will be the slowest. The Rate knob adds to the Delay time, if there is a Delay time set on a Page.

## Audio Input Playback Modes

---

If you have a musical source plugged into the RCA audio input(s) on the rear panel of the controller, you can utilize the audio playback modes.

**Audio 1:** Press the Audio 1 key. This method of Auto playback uses the audio signal received through the RCA audio input(s) on the rear panel of the controller to *advance Pages with the beat* of the musical information. The strength of the audio signal can be adjusted using the Audio knob located directly to the right of the Rate knob. The strength of the signal is indicated by the Audio level LED located just above the Audio knob. (Turn knob to Left = weak audio signal, Right = strong audio signal)

**Audio 2:** Press the Audio 2 key. This method of Auto playback uses the audio signal received through the RCA audio input(s) on the rear panel of the controller to *halt the advance of Pages with the beat* of the musical information. The strength of the audio signal can be adjusted using the Audio knob located directly to the right of the Rate knob. The strength of the signal is indicated by the Audio level LED located just above the Audio knob. (Turn knob to Left = weak audio signal, Right = strong audio signal)

**Color Modulate:** Press the Color key in the Modulate Section on the controller. This key instructs all active fixtures to begin changing colors from their current settings with the beat of the audio input. Color modulation overrides the Color program information.

**Gobo Modulate:** Press the Gobo Modulate key in the Modulate Section on the controller. In the Gobo Modulate mode, each active fixture changes gobo patterns when it detects a low frequency audio signal with an amplitude above the threshold set by the Audio Sensitivity knob. Each time the strength of the audio signal exceeds the threshold, the gobo pattern is bumped to the next position. Gobo modulation overrides the Gobo program information.

**Light Modulate:** Press the Light Modulate key in the Modulate Section on the controller. In the Light Modulate mode, the light intensity of all active fixtures follows the level of the audio input. When the Light Modulate function is engaged, all fixtures are dimmed to their minimum intensity level until it senses an audio input.

## Preset Playback

---

Presets store a Page or group of Pages and their Advance setting, Modulate setting, Master dim setting, and the Rate knob setting. However, when a Preset is played back, the Advance and Modulate controls can be altered for live control over the Preset playback. Any changes made to the Advance and Modulate selections during Preset playback will not affect the Advance and Modulate selections stored in the Preset Memory. When a Preset is played back, it will continue to playback indefinitely until another Preset is selected.

### Preset Playback Advance Modes

---

Presets are played back in the same manner as playing back a loop of Pages within a Memory. [The Playback Advance Modes are: Auto, Audio, and Modulate - Color, Gobo, Light.]

- Press the Address/Preset Select key to choose Preset mode. The Preset LED will light. The controller is now in Preset Mode.
- Select the number of the Preset by pressing the corresponding key on the Address/Preset keypad. The Preset will automatically begin to play back. (Presets are played back in the same manner as a Sequence (Loop) of Pages in a Memory. See *Programming a Preset in Binary Preset Access Mode on page 58* and *Programming a Preset in Binary Preset Access Mode on page 58*.)

### Live Control of Fixtures During Preset Playback

---

- Press the Select key. The Select LED will flash.
- Select the number of the fixture or fixtures which you want to manually control by pressing the corresponding key(s) on the Address/Preset keypad. You will now have “live” control over the selected fixtures. You can change any of these fixtures Constructs, however, you can not record the changes made at this time.
- Press the Select key. The Select LED will stop flashing. The fixture(s) which you selected for “live” control will return to the settings recorded in the current Preset and will join the Sequence running.

## **Automatic All-Memory Playback**

---

The Intellabeam controller can automatically sequence through (playback) all of the Pages in all of its Memories.

To automatically sequence through all of the Pages of all of the Memories programmed into a controller:

- Press and hold the up or down arrow key below the Memory display window until the display reads A.1 or A.9.
- Release the arrow key and the Initialized Pages in Memory 1 will be sequenced through according to the Advance mode and Rate setting. Upon the completion of playing back Memory 1's highest Initialized Page, the controller will advance to Memory 2, and playback all of its Initialized Pages. This playback process will continue through Memory 9.
- An "A" will precede each Memory number as the Memories play back. When the controller reaches Memory 9, Page 99, it will wrap around and continue to run through Memories 1-9 until memory sequencing is disabled.
- To disable All-Memory Sequencing, press and hold the up or down arrow key below the Memory display window until "A" no longer appears in the display.

# **SECTION 5**

## **REMOTE ACCESS AND CONTROL**

### **Remote Analog Access**

---

Any control device such as a dimmer console or a control desk can be used to remotely access the Intellabeam controller memory. Twelve channels are required to control ninety-nine pages of a selected memory, or up to 1023 presets.

The controlling device connects to the Remote Analog Access port on the rear panel of the Intellabeam controller via two 8-pin locking DIN connectors. The minimum turn-on voltage for each channel is 3 V DC, and the maximum safe voltage input is 16 V DC.

There are two types of remote access; Page Access and Preset Access. Personality DIP switch number three on the rear panel of the controller is used to choose between page access or preset access. (Switch #3 "Off" = Page Access; Switch #3 "On" = Preset Access.) In addition, if the controller is in the Preset Access mode, then Personality DIP switch number five determines whether to access presets through binary combinations of the input channels, or whether each input corresponds to one of twelve levels of twenty-four presets. (Switch #5 "Off" = Preset Level Access; Switch #5 "On" = Binary Preset Access.)

In Page Access mode, the Remote Analog Access port on the rear panel of the controller has priority over the front panel of the controller. An active input channel will prevent any subsequent change of page numbers or presets on the controller front panel until the active input channel is de-activated. However, in Preset Access mode, the input channels and the controller front panel can be active at the same time.

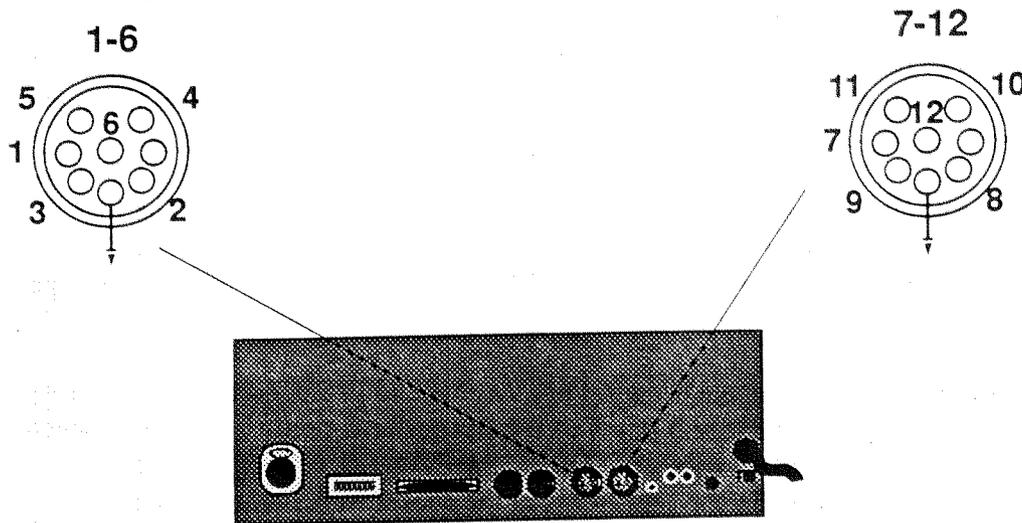
The analog input port can be used with the controller in or out of the Standby mode.

- If the controller is in Standby mode, the analog input signal will override it. The Standby key will begin to flash, indicating that it is receiving a higher priority signal. As long as the analog port is active, the Standby key will continue to flash. When the analog port is de-activated, the controller will return to the Standby mode. Only the Remote Enable input can override the analog input port. It can be used with the controller in or out of the Standby mode.

- If the controller is not in the Standby mode, the analog input signal will take control of the front panel as prescribed. When the input port is de-activated, the controller will resume normal operation.

**NOTE:** A FLASHING STANDBY LED INDICATES THAT THE CONTROLLER IS BEING OVERRIDDEN BY THE REMOTE ANALOG INPUT PORT.

The following illustration and chart show the pin numbers and channel assignments for the Remote Analog Access ports on the rear panel of the controller.



**Figure 5.1 Pinout of Remote Access Ports**

REMOTE ANALOG CONNECTORS		1 - 6 & 7 - 12
CHANNEL NUMBER	PIN NUMBER	
1 or 7	3	
2 or 8	4	
3 or 9	5	
4 or 10	6	
5 or 11	7	
6 or 12	8	
common negative	2	
not used	1	

**Table 5.1 Controller Pinout for Remote Analog Access Port**

## Remote Page Access

---

To use the Remote Page Access feature, the auxiliary controller should be connected as described on the previous pages in this section, and Personality DIP switch number three on the rear panel of the Intellabeam controller must be set in the “off” position.

**NOTE:** The Memory from which the Pages are remotely accessed must be selected from the Intellabeam controller front panel. This Remote Access feature does not remotely change Memories: it is for calling up Pages within a pre-selected Memory.

### In the Page Access Mode:

- Input channels one through twelve correspond directly to page numbers one through twelve. Activating channel one will call up page one on the control panel, and channel two will call up page two, and so on.
- If any combination of two channels are turned on simultaneously, it will call up the page number corresponding to the combination of the two channel numbers, with the lowest channel number first and the highest channel number second. For example, if channels one and two are activated simultaneously, it will call up page twelve on the control panel. If channels three and seven are activated, it will call up page thirty-seven.
- Channels ten, eleven and twelve, besides corresponding to the matching page numbers, are also used as special function keys.
  - Channel ten is a ten-times multiplier. That means that when channel ten is active, it will multiply any other active channel by ten and call up the resulting page number. For example, if channels five and ten are activated, it will call up page fifty.
  - Channel eleven is a number doubler. It will cause any other active channel to be doubled before calling up the page number. If channels two and eleven are activated, it will call up page twenty-two.
  - Channel twelve is a number inverter. If channels two, four, and twelve are activated, it will call up page forty-two (instead of twenty-four).

Table 5.2 below, summarizes the function of the twelve Remote Analog input channels.

If more than two of the input channels one through nine are activated simultaneously, only the lowest two will be selected. The Advance, Modulate, and Memory selection features remain fully active when the controller is in the Remote Access mode.

<b>Channels 1-12</b>	<b>Access Page 1-12</b>
<b>Channels 10-12</b>	<b>Are also special function keys</b>
<b>Channel 10</b>	<b>Ten times multiplier for channels 2-9, Allows access to Pages 20, 30, 40, 50, 60, 70, 80, &amp; 90</b>
<b>Channel 11</b>	<b>Number doubler for channels 2-9 Allows access to Pages 22, 33, 44, 55, 66, 77, 88, &amp; 99</b>
<b>Channel 12</b>	<b>Number inverter for channels 2-9 Inverts the order of the two lowest channels activated simultaneously, e.g. 23 will become 32</b>

**Table 5.2 Remote Analog Input Channel Functions**

## Remote Preset Access

---

To use the Remote Preset Access feature, the auxiliary control device should be connected as described on the previous pages of this section of the manual, and Personality DIP switch number three on the rear panel of the Intellabeam controller must be set in the “on” position. Also, switch number five must be set to choose between binary preset access or twelve level preset access. (Switch #5 “off” = 12 Level Access, Switch #5 “on” = Binary Access)

In the **twelve level preset access** mode, each channel can activate a different level of twenty-four presets, but the actual presets are still called up from the Address/Preset keypad on the controller. In the **binary preset access** mode, there are 1023 combinations of ten of the input channels that correspond to 1023 presets. This mode offers the greatest flexibility for totally remote, “hands off” control.

### Twelve Level Preset Access

---

In the twelve level preset access mode, there are twelve levels of twenty-four presets, or a total of 288 presets available when used in conjunction with the remote analog input port. Each level of twenty-four Presets can be accessed by activating the corresponding analog input channel. For example, the first level of presets can be called up by activating analog input channel number one. The second level can be called up by activating channel two, and so on. The signal used to activate a level of presets can be a momentary signal or it can be a latching signal. If the remote analog port is not used, then the controller can only access the twenty-four Presets stored in level one. Level one is the default setting.

Once the appropriate analog input channel has been activated, a particular preset can be called up by depressing an Address/Preset key (numbered keys 1-24) on the Intellabeam controller. That preset will continue to operate until: 1) another preset key is depressed, 2) the preset level number is changed, or 3) the controller is put in the Standby mode. To program presets in the twelve level preset access mode, see *Programming a Preset in Binary Preset Access Mode on page 58* in Section 4 of this manual.

### Binary Preset Access

---

In the binary preset access mode, there are 1023 presets available by using different combinations of the first ten input channels. The last two channels are used for a master blackout and a remote enable, respectively. For example, one preset can be called up by activating analog input channels one and two. Another can be called up by activating input channels three, four, and seven. This can be continued until every possible combination of the ten channels is exhausted. The use of combining input channels in this manner is very similar to counting in binary, hence the term, “binary preset access.”

The input signal to activate a preset can be momentary or it can be a latching signal. Similar to the 12 level access mode, the preset selected using binary preset access will continue to playback until: 1) another preset key is depressed, 2) the preset level number is changed, or 3) the controller is put in the Standby mode. To program presets in the binary preset access mode, see *Programming a Preset in Binary Preset Access Mode* on page 58 in Section 4 of this manual.

## Remote Enable

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Located on the rear panel of the controller is a Remote Enable input jack that allows an external source to take the controller in and out of the Standby mode. The Remote Enable input overrides all other functions.

The jack is a normally closed, 3.5 mm (1/8 in) mini-phone jack that accepts a 3.5 mm mini-phone plug. The controller functions routinely with no input to the Remote Enable input. When a plug inserted into the jack, the controller goes into the Standby mode and remains there until voltage (+5 - +16 VDC) is sensed. The voltage restores the controller to its prior mode of operation.

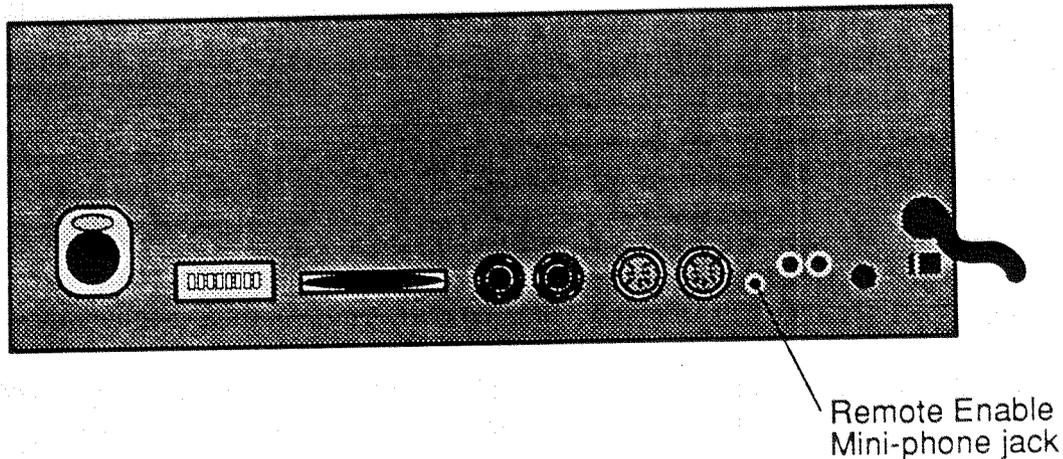


Figure 5.2 Remote Enable Mini-phone Jack

# SECTION 6

## EXTERNAL MEMORY STORAGE AND TRANSFER

### General Information

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The Intellabeam controller contains a self-recharging NiCad battery backup for memory storage. All programming information is automatically retained even during power down or power failure. It is possible, however, to backup the memory on a high-density floppy disk or hard drive to insure against the loss of data or to increase the amount of programming space available.

To connect a computer to the Intellabeam controller for memory backup, plug in one end of an RS-232 serial cable into the RS-232 Serial port on the rear panel of the Intellabeam controller and the other end into the RS-232 Serial port on the rear panel of the computer. (See Figure 6.1)

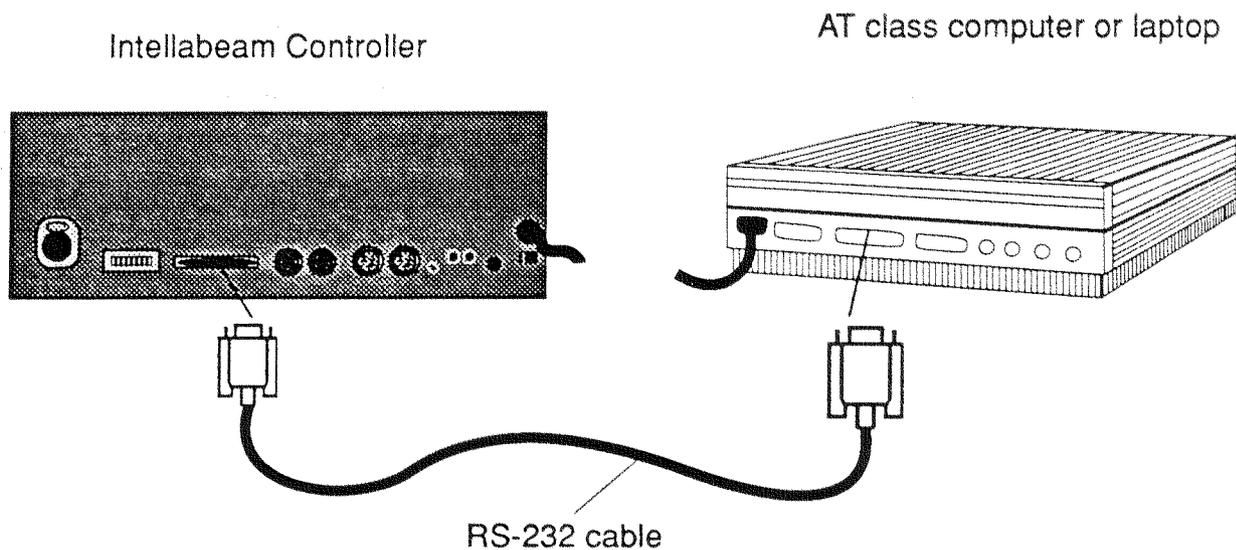


Figure 6.1 Computer Backup of an Intellabeam Controller

**NOTE:** Memory storage and transfer can be performed with most commercially available communications software capable of ASCII file transfer.

Inside the front cover of this manual is a 5 1/4 in. floppy disk which contains a software communication program used to transfer a controller's memory to and from a computer. **Note:** You should make a backup copy of the floppy disk provided with your Intellabeam. Use this backup copy to run the program. If the backup disk is damaged, you should make another copy of the original disk to use. Due to the possibility of damage, you should always run the program from a backup disk, not the original disk.

Memory transfer requires an IBM AT™ (or compatible) with a 720K (or larger) floppy drive or a hard drive and an RS-232 serial port. Any Macintosh™ computer may also be used with the appropriate software and cable. The controller and computer should be linked together with a standard RS-232 cable using their respective RS-232 output ports.

## **Memory Transfer of Locked Memories**

When program data is crossloaded between controllers or downloaded from a computer, if the controller receiving the data has one or more memories locked, those memories will not be overwritten by the new data.

For example, if you want to copy memories one, two, and three on controller A from controller A to controller B while keeping memories four through nine on controller B the way they are, you will need to lock memories four through nine and unlock memories one, two, and three on controller B before the program data is transferred. The end result of data transfer will be that controller B's memories one, two, and three will be replaced by controller A's memories one, two, and three. Memories four through nine on controller B will not be replaced by controller A's memories four through nine.

A locked memory can be transferred, but not overwritten. For example, if memories one, two, and three on controller A were locked memories, they could still be copied to controller B as long as memories one, two, and three on controller B were unlocked.

## Setting up for Data Transfer with a Computer

- Put the controller in the Standby mode by pressing the Standby key to initiate a memory transfer.
- To begin the program, boot up the computer and insert the disk into the floppy drive.
- From the DOS prompt, type the command "IB"
- Press the ENTER key.
- After loading, the program will display the title "Lightwave Backup and the current Version number," followed by the menu.
- Select from the menu by typing the first letter of the line or moving the light bar with the arrow keys until the proper line is highlighted and pressing the Enter key.
- The program will then provide instructions on how to proceed.

## Downloading

---

**Note:** To cancel the transfer of data at any time during the downloading process, press the Select key. The downloading process will take approximately fifteen minutes.

To download the memory from the controller to the computer:

- Follow the steps described previously in “Setting up for data transfer with a computer”.
- Choose the “S” (save) option from the backup program menu.
- It will then prompt you to enter a file name to which the memory will be saved. Enter a file name.
- After entering the file name, press and hold the Record key for approximately eight seconds until the display reads “S A 0 1 0 1.”
- When the computer is ready to receive the data, press the Record key again to begin the transfer to the computer.
- The controller will display the memory and page number as it is being saved to disk. After saving all nine memories and ninety-nine pages, the program will prompt you to terminate the transfer at the computer keyboard.
- Return the controller to normal operation by pressing the Select key.
- Upon completion of the memory transfer, all memories will have been downloaded to the computer and saved on disk. The controller will still retain all of the data.

## Uploading

---

**Note:** To cancel the transfer of data at any time during the uploading process, press the Select key. The uploading process will take approximately fifteen minutes.

To upload the memory from the computer to the controller:

- Follow the steps described previously in “Setting up for data transfer with a computer.”
- The controller must be in the Standby mode to initiate a memory transfer.
- Choose the “P” (play) option from the backup program menu.
- It will then prompt you to enter the file name from which the memory will be loaded. If you do not know the file name, all of the files can be listed by choosing the “L” (list) option from the main menu. Enter the file name.
- After entering the file name, press and hold the Erase key for about twenty seconds until the display reads “PL 01 01.”
- When the Erase key is released the Select key LED will light up. The computer will prompt you to enter a “Y” (yes) on the keyboard and the transfer will begin.
- As the file is being transferred to the controller, the Memory and Page display will count up. When the transfer is complete, the display will be at memory nine, page ninety-nine, and the controller will be loaded with the new memory.
- Press the Select key once to return to normal operation.

## Crossloading

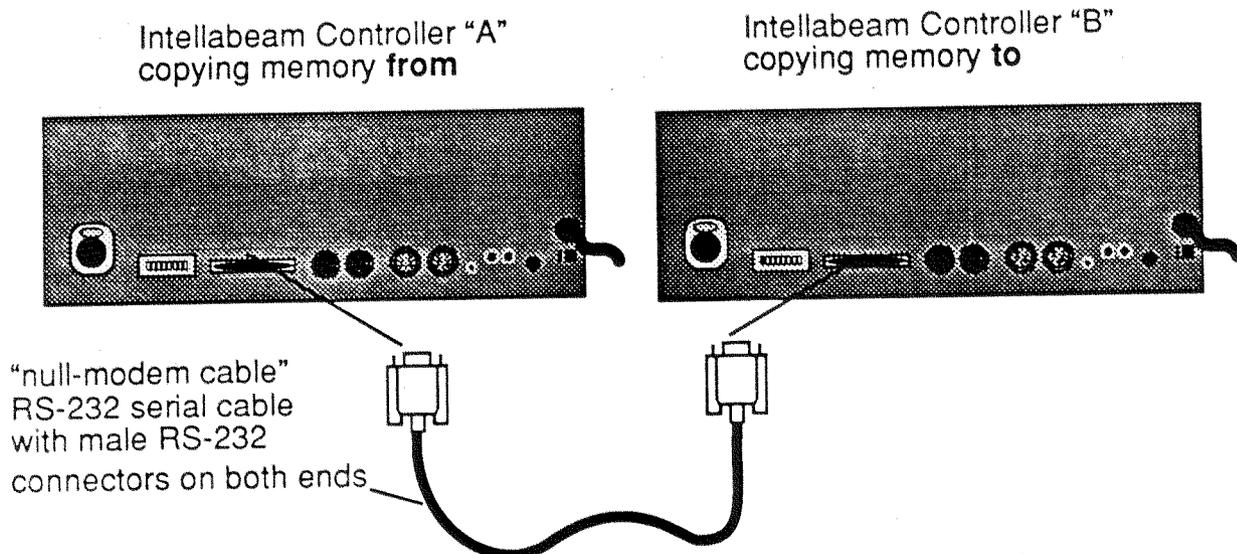
To crossload the memory from one controller to another controller:

- It is possible to copy the memories from one controller (controller "A") to another controller (controller "B"). (See Figure 6.2) To do so requires a null-modem cable. A null-modem cable is a cable with a male RS-232 connector on both ends, with only three wires connected in the following fashion; pin seven to pin seven, pin two on one connector to pin three on the other, and pin three on one to pin two on the other (See Table 6.1)
- Put the controllers in the Standby mode by pressing the Standby keys to initiate a memory transfer.

CONNECTOR "A"	CONNECTOR "B"
Pin 2	Pin 3
Pin 3	Pin 2
Pin 7	Pin 7

**Table 6.1 Pin Out for Crossloading Memory**

- Connect the RS-232 cable between the two RS-232 ports on the back of the controllers. (See Fig. 6.2)



**Figure 6.2 Intellabeam Controller Backing Up another Intellabeam Controller**

- Put controller “A” (the controller being copied from) in the Save mode by pressing and holding the Record key for about twenty seconds until the display reads “S A 01 01.”
- Put controller “B” in the Play mode by pressing and holding the Erase key for about twenty seconds until the display reads “PL 01 01.”
- Press the Record key of controller “A” to begin the transfer.
- When the transfer is complete, the display will be at memory nine, page ninety-nine, and the controller will be loaded with the new memory.
- Press the Select key once on each controller to return to normal operation.

## **Preset Playback from a Computer**

Several computer programs have been designed to exchange serial data between a computer to a controller, such as Lightwave Research's Show Control. These programs are designed to allow you to store, organize, and playback one or more controller's presets from a computer keyboard. It is possible to link several Lightwave Research Intellabeam controllers to one computer to playback their presets. In order to do this the computer has to be able to identify each controller separately, therefore, each controller must be assigned a unique I.D. number.

### **Setting the Controller I.D. Number**

- Press and hold the Standby key.
- Turn the controller ON (OFF and ON) if necessary.
- The Revision number will be displayed. It must be 2.03 or higher.
- Press the Intensity down arrow once. The display should show “I.D. = 0” or some other I.D. number.
- Use the Page up and down arrows to adjust the I.D. number.
- The Standby button may now be released.

An I.D. of 0 (zero) is a special case. A controller set to I.D. 0 will respond to all commands sent to all I.D. numbers.

For more information about Lightwave Research Show Control, call your High End Systems Dealer/Distributor.



# **SECTION 7**

## **GENERAL MAINTENANCE & TROUBLESHOOTING GUIDE**

### **General Maintenance and Cleaning**

---

Before doing any work on an Intellabeam system, make sure that all power is turned off to the fixture as well as to the controller. Maintenance and cleaning should be done on a regular basis. The fixtures should be kept clean of all dust and dirt that could cause overheating or malfunctions.

#### **Cleaning the Outer Surfaces**

---

- Unplug the units (fixture and controller), then wipe them off with a soft cloth or tissue or use a small vacuum to remove the built-up dust and dirt.
- If the controller is in an environment susceptible to moisture, take care to prevent any fluids from entering the switches on the faceplate.
- To clean the lens and mirror, apply a small amount of mild glass cleaning solution to a clean, soft cloth or tissue. Gently wipe the lens and mirror surfaces with the cloth, being careful not to apply excessive pressure to the mirror while cleaning.

#### **Cleaning the Internal Components**

---

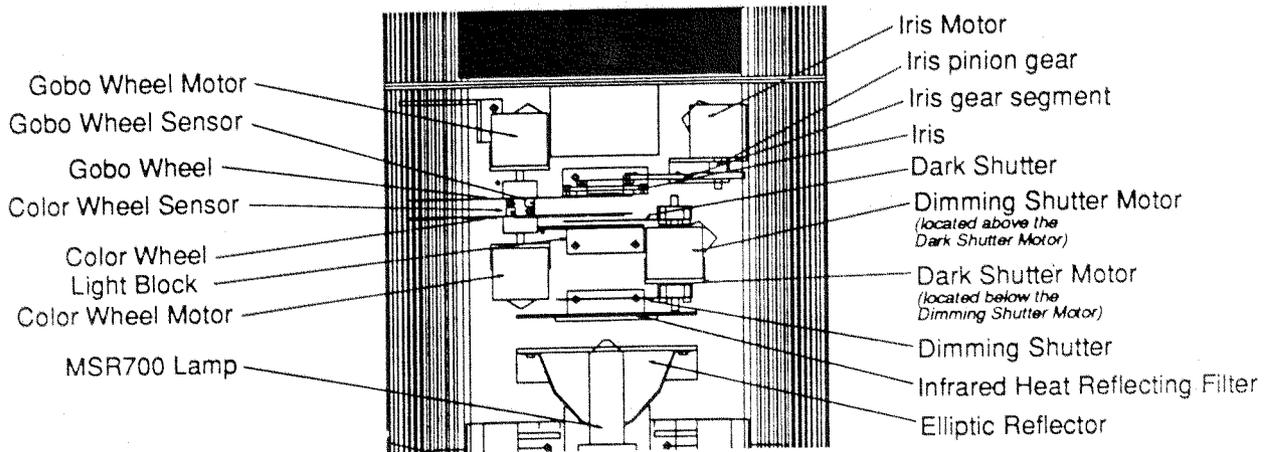
**CAUTION: BEFORE OPENING ANY OF THE ACCESS DOORS TO CLEAN THE INTERNAL COMPONENTS OF THE FIXTURE, MAKE SURE THAT THE POWER IS DISCONNECTED TO PREVENT POSSIBLE ELECTRICAL SHOCK OR ACCIDENTAL EXPOSURE TO ULTRAVIOLET RADIATION.**

- Remove the top access door by loosening the thumbscrew and sliding the door off of the fixture. With the top access door removed you will have access to: the lamp, stepper motors, reflector, infrared filter, iris, color wheel, gobo wheel dimming shutter, and gate wheel. (See Figure 7.1)

## Stepper motors, Reflector, Dark Shutter, Infrared filter and Iris

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The stepper motors, reflector, dark shutter, infrared filter, and iris should be cleaned with a feather duster or a low pressure compressed air source to remove any accumulated dirt or dust. **CAUTION:** Special care should be taken when cleaning around the iris because it is made of very thin, delicate metal which could be easily damaged. (See Fig. 7.1)



**Figure 7.1 Intellabeam Fixture: Top Access Door Removed**

### Color and Gobo wheels

---

- To remove the color and gobo wheels for cleaning, you will need an extra long wrench. The wrench handle should be at least 15 cm (6 in) long. The nuts which you will remove are 8 mm (5/16 in) in diameter.
  - It is best to clean one wheel at a time so that you can easily remember the starting position and orientation of each wheel when you re-install it.
  - Loosen, but do not remove, the two 8 mm (5/16 in) nuts on the inner side of the wheel.
  - Slide the wheel carefully over the nuts. **CAUTION:** Take care not to bend the wheels during removal.
  - Clean the color and gobo wheels with a small amount of glass cleaning solution and a soft cloth.
  - Re-install the wheels by inserting each wheel into its sensor and then sliding it over its mounting bolts.
  - Be sure to replace all of the wheels in their proper positions or they could be mismatched with the rest of the system.
  - Re-tighten the nuts which hold the wheels in place.
  - Replace the top access door and tighten the thumbscrew.

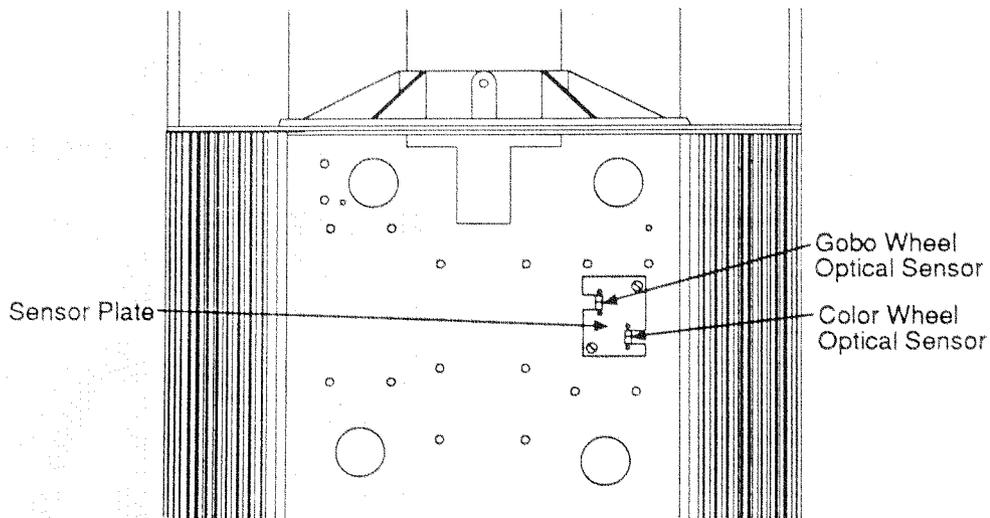
## Optical sensors

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- The **optical sensors**, located below the color and gobo wheels, electronically sense the small notches on the edge of the wheels in order to keep track of the “home” positions of the wheels.

These sensors may require periodic cleaning in order to prevent airborne contaminants such as dust and dirt from inhibiting their function. If the sensors get too dirty, the wheels could spin continuously when they receive a homing signal. If this happens, the sensor plate should be removed in order to clean the optical sensors.

- Remove the bottom access door by loosening the thumbscrew and sliding the door off of the fixture.
- Locate the two screws which hold the sensor plate in place. (See Fig.7.2.)



**Figure 7.2 Intellabeam Fixture: Bottom Door Removed**

- Remove the plate on which the sensors are mounted by taking out the two screws. Note the orientation of the sensor plate, being sure to replace it in the same manner.
- Gently wipe the sensors with a cotton swab.
- Replace the sensor plate, and tighten the two screws which hold it in place.
- Replace the bottom access door and tighten the thumbscrew.

## Troubleshooting and Repair

The internal components of an Intellabeam system contain high voltage sources. You should refer servicing to qualified personnel. Some of the following information involves servicing that should only be undertaken by experienced technicians. There are, however, very simple ways to isolate the source of any problems that may arise. This section is designed to help in pinpointing problems so that a quick solution may be found.

### Diagnostic LED Indicators

Each Intellabeam fixture has three LED indicators on the rear panel near the line cord. The fan indicator is red, the lamp indicator is yellow, and the motor indicator is green (See Fig. 7.3). Their purpose is to indicate the logic activity of their corresponding circuits. These indicators provide essential clues to isolating problems. Before attempting any repairs, make sure to note the condition of these indicators.

#### Fan LED

The red fan LED indicator monitors the fan and is powered by the 5V DC logic supply. It should glow steadily when the power to the fixture is on, the data cable is plugged in, and the fan is functional. When the controller is turned off, the fan will continue to run for approximately two minutes, then both the fan and the LED indicator will turn off.

#### Lamp LED

The yellow lamp LED indicator monitors the lamp. It should glow steadily when the lamp is on. If the lamp extinguishes or fails to strike, then the indicator will flash at a rate of one flash per second. This LED indicator will turn off fifteen seconds after the controller is turned off or the fixture is locked out.

#### Motor LED

The green motor LED indicator monitors the power to the motor drive circuit and is powered by the 24V DC motor supply. It should stay on when there is power to the fixture, regardless of the status of the controller.

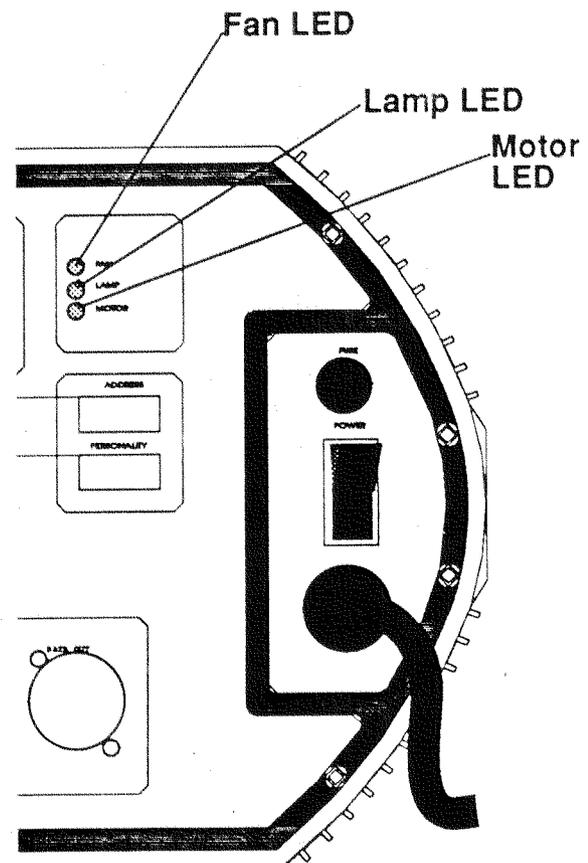


Figure 7.3 Intellabeam Fixture: Rear Panel

## Troubleshooting Guide

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This troubleshooting guide is for the basic diagnosis of an Intellabeam system. It is meant to be used as a guideline to point out simple solutions for common problems. If the problem encountered is beyond the scope of this guide, please contact your High End Systems dealer/distributor for further guidance or for an on-site examination of your system. Due to the modular nature of Lightwave Research products, most repairs are quickly and easily accomplished.

The following are some common problem situations along with suggested solutions and tips to solving them.

### **Lamp does not strike:**

If the lamp does not strike, check the status of the yellow LED indicator. If it is flashing, then wait five minutes and home the fixture. If it still does not strike, then try replacing the lamp. If that still does not work, then you will need to refer servicing to a qualified technician.

### **Lamp does not strike, and LED indicators do not come on:**

If all three of the diagnostic LED indicators are off, then it is likely that power has been lost to the fixture. Check the main fuse on the rear panel of the fixture. Check the power input with a VOM meter. If there is voltage, then test the Amp line fuse on the rear panel. (See Fig. 7.3) A power interruption to one fixture will not affect others in the system, however, loss of the cooling fan during operation could be detrimental to the lamp.

### **Gobo or Color wheel cannot find home position:**

If the unit is continuously homing itself, then emitting an audible tone, the optical sensors may need to be cleaned. To clean the optical sensors, follow the optical sensor cleaning procedures described earlier in the general maintenance portion of this section.

**Fixture does not respond to the controller:**

If the fixture fails to respond to the controller and the red fan LED and the yellow lamp LED indicators both fail, then there could be a problem with the data link. Put the fixture in the Self-test mode to help isolate the source of the problem. If all functions and LED indicators work properly upon self-test, then the problem is most likely with the data link. Check the data link to the fixture by replacing it with a known good cable and running the fixture in the normal mode of operation.

If a problem cannot be diagnosed and corrected, it may be quickest and easiest to replace the rear panel or the power supply board, depending on the nature of the problem.

The rear panel of fixture houses the input and output data jacks, DIP switches, power switch, and fuse holder. The logic board is mounted to the inside of this panel. The power supply board is mounted to the fixture body just inside the rear panel opening. These are the only two printed circuit boards in the entire fixture, and they contain all of the electronic circuitry.

All electronic components are easily accessed with the rear panel removed. All circuit boards use plug-in connectors for wiring, therefore, no de-soldering is necessary should board replacement become necessary. The rear panel is secured to the body with 8 allen screws.

If all other attempts at repair are unsuccessful, the fixture may be returned to the factory for repair by calling a High End Systems dealer for a Return Authorization number.

**NOTE: BEFORE RETURNING ANY EQUIPMENT TO THE MANUFACTURER FOR SERVICE, BE SURE TO OBTAIN A RETURN AUTHORIZATION (R.A.) NUMBER FROM A LIGHTWAVE RESEARCH DEALER. ALL EQUIPMENT SHOULD BE SHIPPED IN ORIGINAL PACKAGING, OR SUITABLE CONTAINER.**

## Replacing Parts

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Should it become necessary to replace an internal part in the fixture, follow the directions given below.

### Lamp Replacement

---

If a lamp failure occurs, be sure to observe the diagnostic LED indicators to make sure that the failure is not a symptom of another problem. If a lamp fails to strike on initial power up and the yellow LED indicator on the rear panel of the fixture is flashing, then the lamp may be bad, or it is too hot to strike. If the lamp does strike initially but then extinguishes by itself, or if power is interrupted to the unit, then the lamps will have to cool down for a period of 10 to 15 minutes before trying to re-start the lamp.

**CAUTION: ALWAYS ALLOW THE LAMP TO COOL FOR 10 TO 15 MINUTES BEFORE ATTEMPTING TO REPLACE OR RE-STRIKE IT. TO REPLACE THE LAMP, FOLLOW THE LAMP INSTALLATION, ADJUSTMENT, AND OPTIMIZATION INSTRUCTIONS OUTLINED IN SECTION 2 OF THIS MANUAL.**

The MSR 700 lamp has an average rated life of 1000 hours. Lamps are rated by the lamp manufacturer for average service life based upon a statistical sample of a group of test lamps. The actual life is directly dependent upon the input voltage and the number of times it is turned on and off. In addition, as a lamp ages, it tends to lose some of its intensity. Normally, this is not noticeable because all of the lamps in a system are aging at approximately the same rate. But if one lamp is replaced before the others in the system, it could be noticeably brighter.

**Please refer to Section 2, Setting Up, of this manual for instructions on how to install the MSR 700 lamp.**

## Replacing the Gobo and Color Wheels

- To replace the **color and gobo wheels**, you will need an extra long wrench. The wrench handle should be at least 15 cm (6 in) long. The nuts which you will remove are 8 mm (5/16 in) in diameter.
- It is best to replace one wheel at a time so that you can easily remember the starting position and orientation of each wheel when you install the new wheel. Be sure to note the orientation of the wheel before removing it, because it is possible to install the new one 180 degrees out of alignment.
- Loosen, but do not remove, the two 8 mm (5/16 in) nuts on the inner side of the wheel.
- Slide the wheel carefully over the nuts. **CAUTION:** Take care not to bend the wheels during removal.
- Install the new wheels by inserting each wheel into its sensor and then sliding it over its mounting bolts.
- Be sure to replace all of the wheels in their proper positions or they could be mismatched with the rest of the system.
- Re-tighten the nuts which hold the wheels in place.
- Replace the top access door and tighten the thumbscrew.

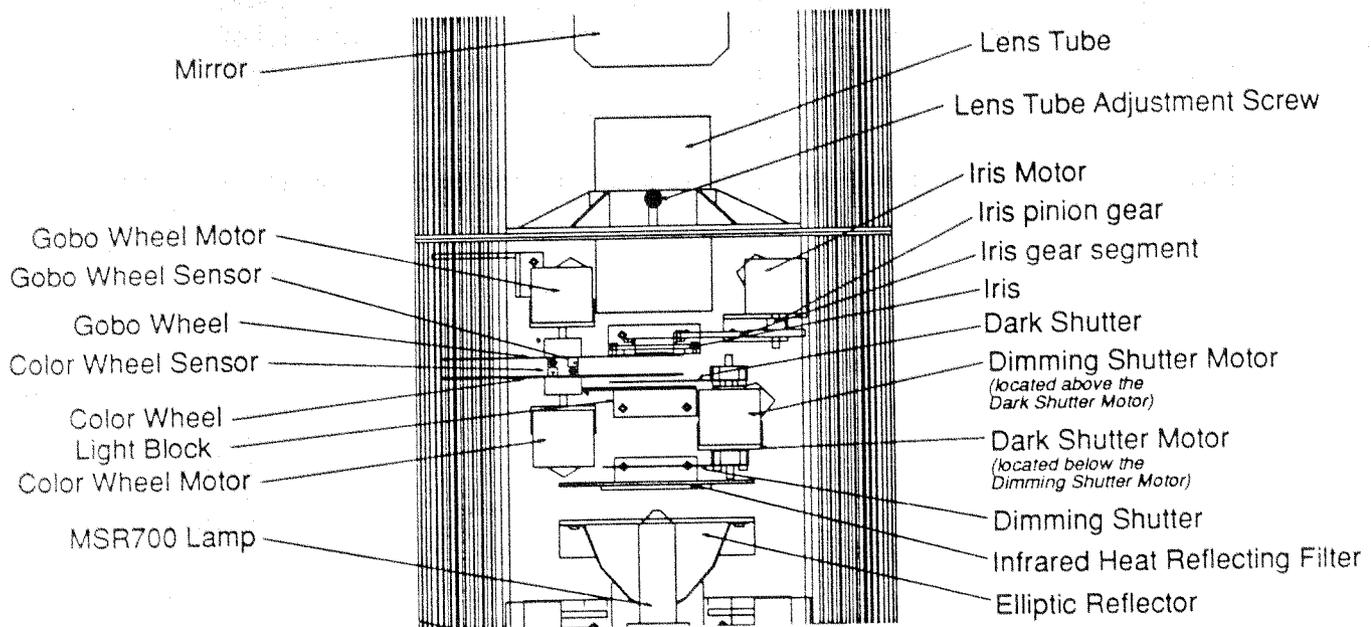


Figure 7.6 Intellabeam Fixture: Top Access Door Removed

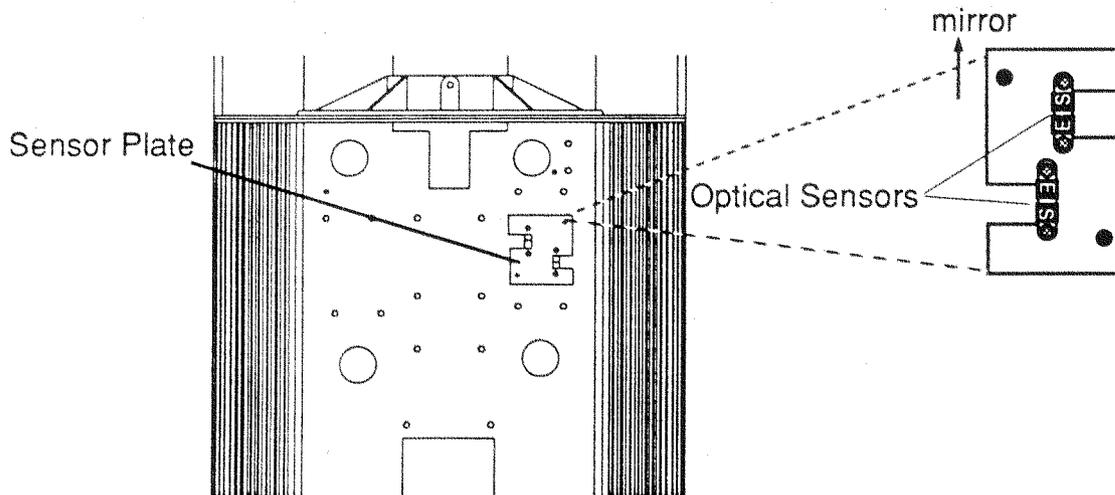
## Replacing the Optical Sensors

The optical sensors, located below the color and gobo wheels, electronically sense the small notches on the edge of the wheels in order to keep track of the “home” positions of the wheels.

These sensors may require periodic cleaning in order to prevent airborne contaminants such as dust and dirt from inhibiting their function. If the sensors get too dirty, the wheels could spin continuously when they receive a homing signal. If this happens, they should be removed and replaced (See Fig. 7.2 for the location of the optical sensors).

- Remove the bottom access door by loosening the thumbscrew and sliding the door off of the fixture.
- Locate the two screws which hold the sensor plate in place. (See Fig.7.2)
- Remove the plate on which the sensors are mounted by taking out the two screws.
- Remove the old sensors and replace them with the new, being certain to match the orientation of the “E” and “S” located on the old sensors. (See Fig. 7.7)
- Replace the sensor plate, and tighten the two screws which hold it in place.
- Replace the bottom access door and tighten the thumbscrew.

**NOTE: IT IS ESSENTIAL TO POSITION THE SENSORS CORRECTLY WHEN REPLACING THEM IN THE FIXTURE.)**



**Figure 7.7 Intellabeam Fixture: Bottom Door Removed**

## Mirror/Mirror Assembly Replacement

---

Mirror replacement requires the removal of two 6/32" x 1/4" allen screws that attach it to the tilt motor. The mirror and bracket are replaced as a complete assembly.

Please see Section 2 of this manual, "Setting Up," for instructions on how to install the mirror assembly.

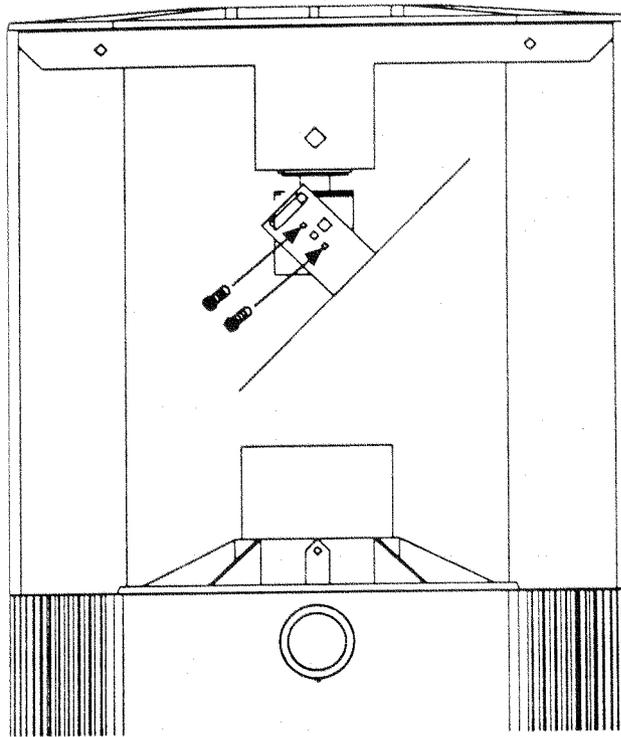


Figure 7.8 Intellabeam Fixture: Mirror Installation

# **SECTION 8**

## **WARRANTY AND PRECAUTIONS**

### **Unpacking**

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#### **Saving the Shipping Materials**

---

Do not discard the Intellabeam controller shipping carton and packing materials or the Intellabeam fixture shipping carton and packing materials. These shipping cartons and packing materials are specifically designed to protect these products during transport.

If you ever need to return a product for repair or maintenance, you must return it in its original shipping carton and packing materials. You will be billed for a new shipping carton and new packing materials if you return your Intellabeam fixture or controller in a non-factory shipping carton with non-factory packing materials.

**Note:** Before sending anything to the factory, be sure to call your HES Dealer/Distributor for a Return Authorization Number. Any goods shipped without an RA number will be refused at the factory.

#### **Inspecting the Contents**

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The contents of each shipping carton should be carefully removed and inspected for signs of freight damage. If any such damage is found, you need to notify both the shipping agent and the sales agent immediately.

Any damage incurred in shipping is the responsibility of the carrier. In the case of hidden damage, a claim should be made as soon as discovered and all packing material retained for inspection.

**Note:** Freight Damage Claims are invalid for fixtures or controllers shipped in non-factory shipping cartons and packing materials.

## Limited Warranty

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Your Intellabeam system is covered by a one year parts and labor limited warranty. It is the owner's responsibility to furnish receipts or invoices for verification of purchase, date, and dealer or distributor. If purchase date cannot be provided, date of manufacture will be used to determine warranty period.

## Returning a Warranted Item for Repair

---

It is necessary to obtain a return authorization number (RA#) from your dealer/ point of purchase **BEFORE** any units are sent in for repair. The manufacturer will make the final determination as to whether or not the unit is covered by warranty. This warranty does not cover lamps, fuses, or glass parts. Please Note: Freight Damage Claims are invalid for fixtures shipped in non-factory boxes and packing materials.

All shipping will be paid by the purchaser. Items under warranty shall have return shipping paid by the manufacturer only in the Continental United States. **Under no circumstances will freight collect shipments be accepted.** Prepaid shipping does not include rush expediting such as air freight. Air freight can be sent customer collect in the Continental United States.

**REPAIR OR REPLACEMENT AS PROVIDED FOR UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER. LIGHTWAVE RESEARCH, INC. OR ITS AGENTS SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ON THIS PRODUCT. EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.**

Warranty is void if the product is opened, misused, damaged, or modified in any way. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

## Precautions

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When handling and working with the Intellabeam System, please observe the cautions and warnings listed below.

### Cautions

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- Please note and heed the Warning labels found on the outer panels of both the controller and the fixture.
- Tighten the thumbscrews securely on both the top and bottom access doors of the fixture.
- The Intellabeam System is not designed for residential use.

### Warnings

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- To avoid electrical shock and reduce the risk of fire, do not operate either the fixture or the controller near moisture of any kind.
- For further protection against fire, fuses must only be replaced by those with the specified voltage and current ratings.
- Do not operate this unit near flammable materials.
- Remove power before re-lamping.
- Never remove the top door of the fixture when the lamp is on.
- The Intellabeam 700 HX lamp produces ultraviolet radiation. Prolonged exposure to the unshielded lamp can cause skin and eye burns.
- These units contain no user-serviceable parts. Servicing must be conducted by the manufacturer or other qualified service personnel.



## Appendix A: Fixture Specifications

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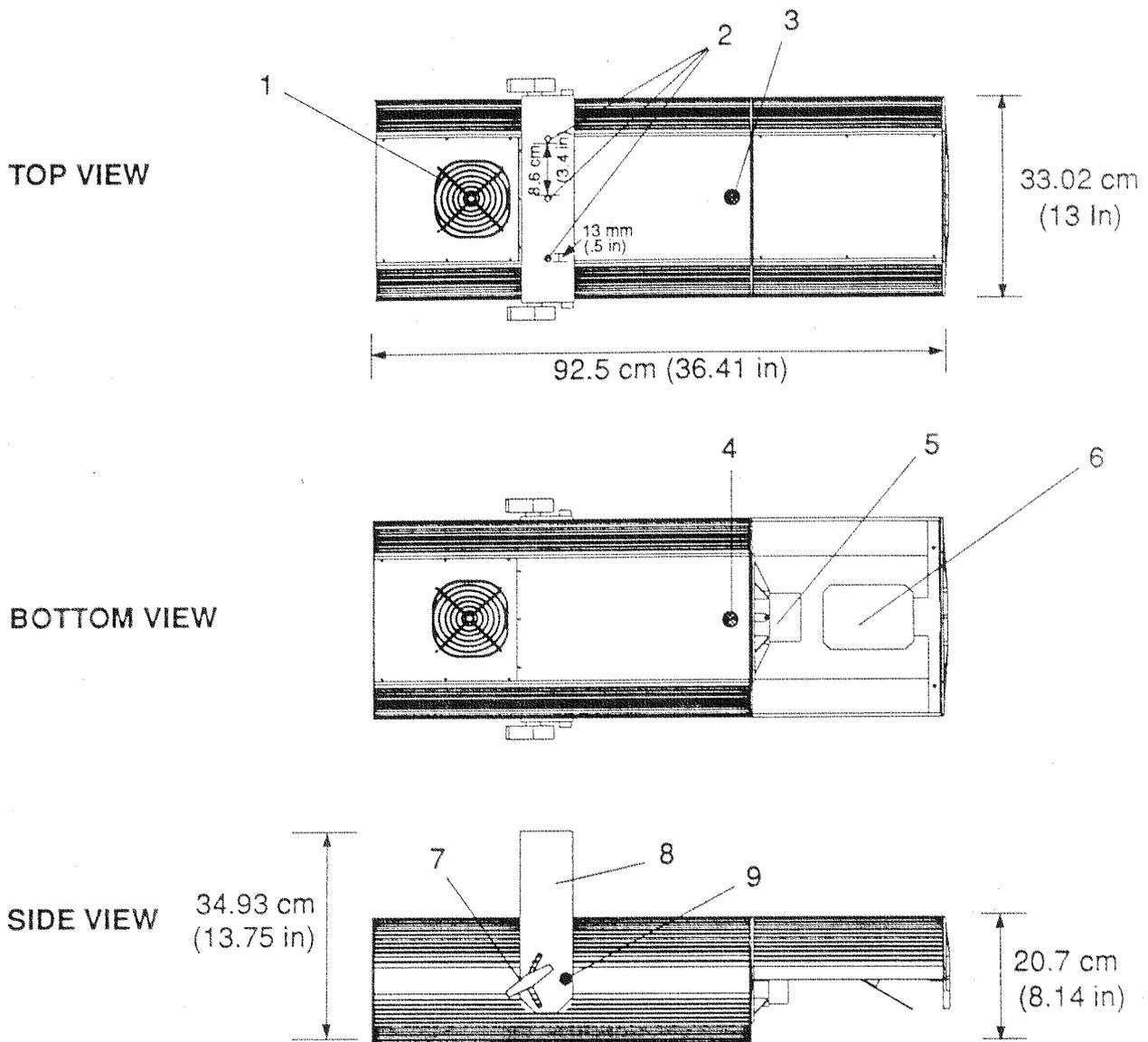
- **Color** 11 dichroic colors plus an open aperture for white on an indexed bi-directional wheel  
8 dual colors  
Maximum color change rate: 250 milliseconds
- **Gobo** 12 gobo patterns, two of which have dichroic filter chips for multi-colored special effects patterns, etched on an indexed bi-directional wheel
- **Iris** Variable iris for beam sizing
- **Gate** Variable speed gate for strobe and lamp dousing
- **Dimming** Full range dimming, fade-to-black, and cross-fades between fixtures
- **Lamp** 700 watt metal halide lamp  
1000 hour average rated lamp life  
High color temperature lamp: 5600°K
- **Pan** 170 degree mirror movement
- **Tilt** 110 degree mirror movement
- **Power Consumption** 10.0 amps @ 100V/60Hz  
8.5 amps @ 120V/60Hz  
4.5 amps @ 240V/60Hz
- **Voltage Selectable** 100V, 120V, 230V  
50Hz or 60Hz
- **Dimensions** 92.50 cm L x 33.02 cm W x 20.70 cm H  
(36.41 in L x 13.00 in W x 8.14 in H)  
Boxed: 112 cm L x 53.3 cm W x 43.2 cm H  
(44 in L x 21 in W x 17 in H)
- **Weight** 29.5 kgs (65 lbs)  
Boxed: 32 kgs (77 lbs)

- Astigmatism corrected lenses: 8, 12.5, or 16 degrees
- Precise beam positioning
- Variable speeds of mirror scan, gobo, and color change
- High resolution stepper motors
- Self-homing color, gobo pattern, and dark shutter indexers
- Self-diagnostics
- Front surface scanning mirrors
- DMX compatible
- XLR connectors
- Remote lamp turn-on
- High efficiency power supply
- LED indicators for fixture status
- Auto remote cooling system shutdown

*specifications subject to change without notice*

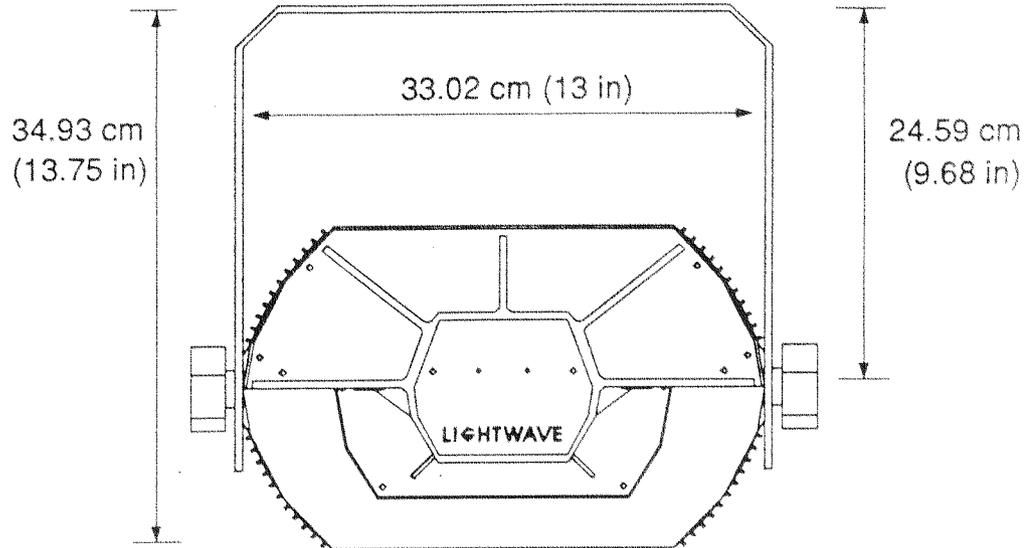


## Appendix B: Fixture Illustrations

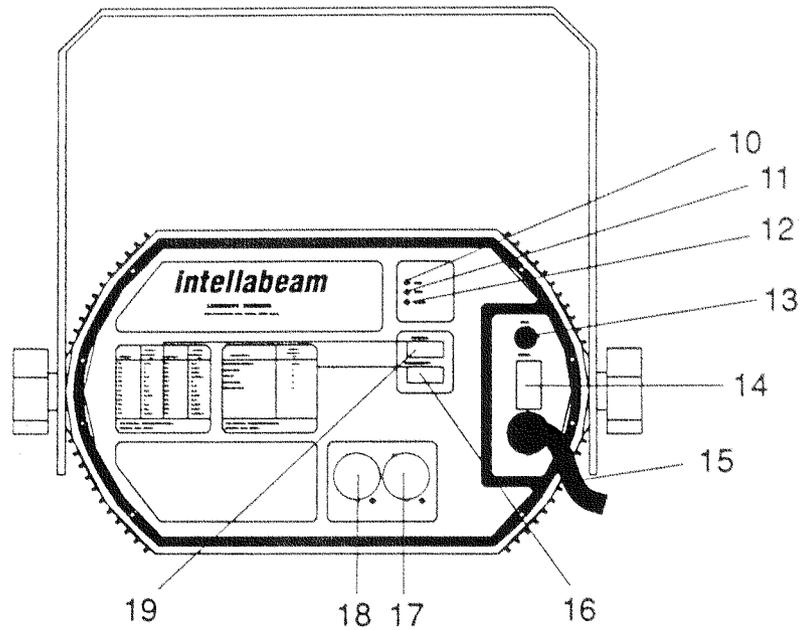


1. Cooling fan
2. Yoke mounting holes
3. Top access door thumbscrew
4. Bottom access door thumbscrew
5. Lens tube
6. Mirror
7. Clamping T-handle
8. Yoke
9. Allen cap screw

**FRONT VIEW**



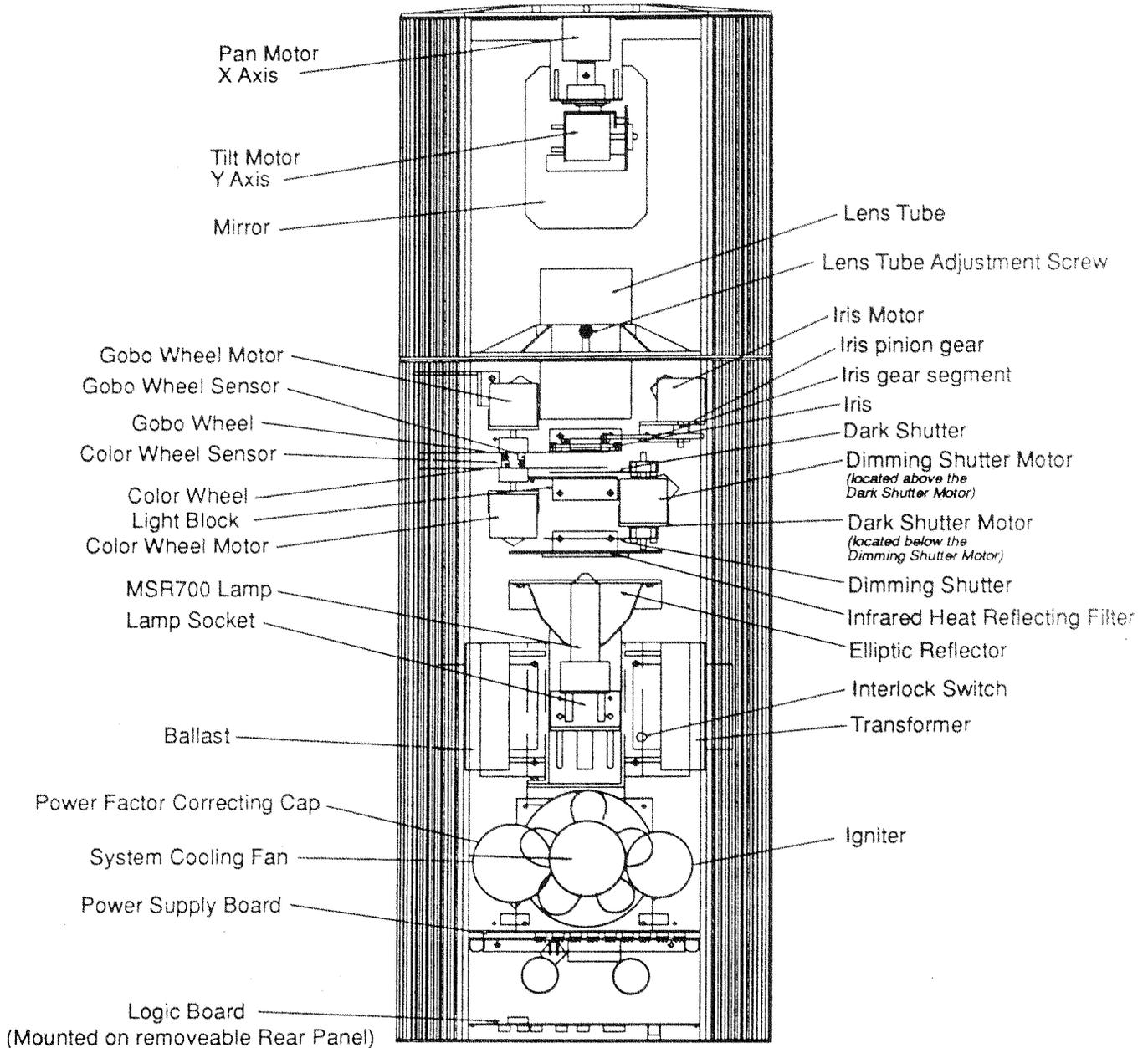
**REAR VIEW**



- 10. Fan indicator LED
- 11. Lamp indicator LED
- 12. Motor indicator LED
- 13. Fuse
- 14. Power switch

- 15. AC line cord
- 16. Personality DIP switch
- 17. Data 'Out' connection
- 18. Data 'In' connection
- 19. Address DIP switch

## INTERIOR VIEW



## Appendix C: Controller Specifications

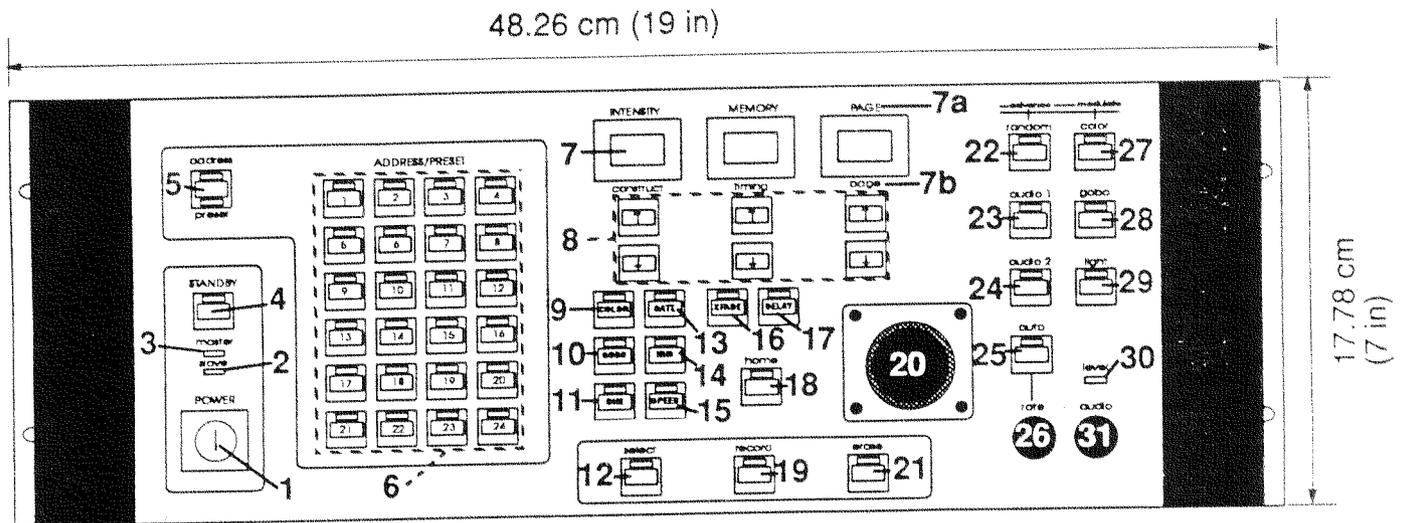
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- **Voltage selectable** 120/240V, 50/60Hz
- **Current** Fused at 1.5 A. (20mm X 5mm)
- **Dimensions** 17.78 cm H x 48.26 cm W x 26.85 cm D  
7.00 in H x 19.00 in W x 10.57 in D  
Boxed: 24.4 cm H x 53.8 cm W x 45.7 cm D
- **Weight** 7.2 kg (15.84 lbs)  
Boxed: 9.1 kg (20 lbs)
- Input voltage enable threshold: 3.5V DC
- Input voltage disable threshold: 1.5V DC
- Input voltage of +5V to +16V DC
- Remote enable/standby via 3.5mm (1/8") normally closed jack
- Remote fixture power enable
- Standard rack mount - 4 spaces
- 9 Memories
- 891 Programmable scenes
- Up to 1023 programmable presets
- Controls 24 channels - Master/Slave capabilities
- Edit and page copy functions
- Memory lock
- Remote analog control inputs - two 8-pin DIN sockets
- Fixture parameter viewing
- Fixture exclusion
- Professional inductive joystick

- Cross-fade functions
- Color modulate
- Gobo modulate
- Stereo audio inputs
- Timed delay factoring
- Individual fixture homing
- RS-232 serial port for external communication
- Locking key switch

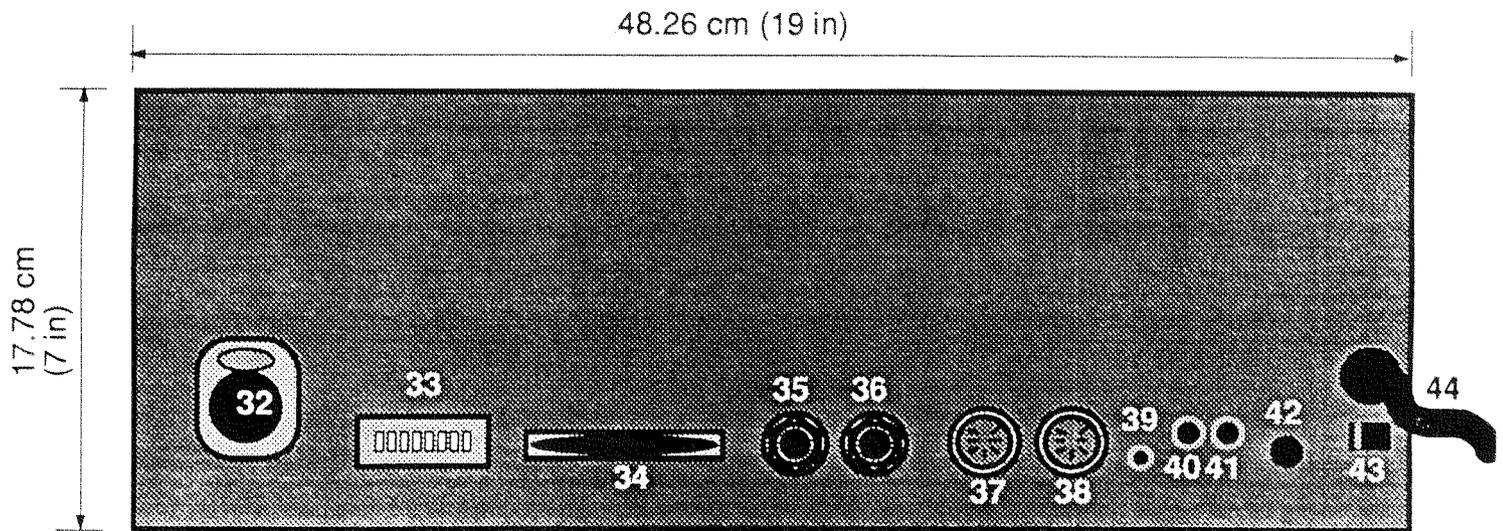
*specifications subject to change without notice*

## Appendix D: Controller Illustrations



Intellabeam Controller: Front Panel

- |                                              |                           |
|----------------------------------------------|---------------------------|
| 1. Power keyswitch                           | 15. Speed key             |
| 2. Slave mode indicator led                  | 16. X fade key            |
| 3. Master mode indicator                     | 17. Delay key             |
| 4. Standby key                               | 18. Home key              |
| 5. Address/Preset select key                 | 19. Record key            |
| 6. Address/Preset numbers                    | 20. Joystick              |
| 7. Display Windows                           | 21. Erase key             |
| 7a. I.M.P. display (Intensity, Memory, Page) | 22. Random Advance        |
| 7b. C.T.P. display (Construct, Timing, Page) | 23. Audio 1 Advance       |
| 8. Up/Down arrow keys                        | 24. Audio 2 Advance       |
| 9. Color key                                 | 25. Auto Advance          |
| 10. Gobo key                                 | 26. Rate knob             |
| 11. Dim key                                  | 27. Color Modulate        |
| 12. Select key                               | 28. Gobo Modulate         |
| 13. Gate key                                 | 29. Light Modulate        |
| 14. Iris key                                 | 30. Audio level indicator |
|                                              | 31. Audio knob            |



**Intellabeam Controller: Rear Panel**

- 32. Data link out
- 33. Personality DIP switch
- 34. RS-232 serial port
- 35. Master out
- 36. Slave in
- 37. Remote page select/Analog input connector (Channels 1-6)
- 38. Remote page select/Analog input connector (Channels 7-12)
- 39. Remote Standby/Enable
- 40. Left stereo/audio input
- 41. Right stereo/audio input
- 42. Fuse
- 43. Voltage select switch
- 44. Line cord



Preset Number	Preset Key	Preset Level	Analog Input Channel										Preset Number	Preset Key	Preset Level	Analog Input Channel									
			1	2	3	4	5	6	7	8	9	10				1	2	3	4	5	6	7	8	9	10
139	19	6	1	1	0	1	0	0	0	1	0	0	208	16	9	0	0	0	0	1	0	1	1	0	0
140	20	6	0	0	1	1	0	0	0	1	0	0	209	17	9	1	0	0	0	1	0	1	1	0	0
141	21	6	1	0	1	1	0	0	0	1	0	0	210	18	9	0	1	0	0	1	0	1	1	0	0
142	22	6	0	1	1	1	0	0	0	1	0	0	211	19	9	1	1	0	0	1	0	1	1	0	0
143	23	6	1	1	1	1	0	0	0	1	0	0	212	20	9	0	0	1	0	1	0	1	1	0	0
144	24	6	0	0	0	0	1	0	0	1	0	0	213	21	9	1	0	1	0	1	0	1	1	0	0
145	1	7	1	0	0	0	1	0	0	1	0	0	214	22	9	0	1	1	0	1	0	1	1	0	0
146	2	7	0	1	0	0	1	0	0	1	0	0	215	23	9	1	1	1	0	1	0	1	1	0	0
147	3	7	1	1	0	0	1	0	0	1	0	0	216	24	9	0	0	0	1	1	0	1	1	0	0
148	4	7	0	0	1	0	1	0	0	1	0	0	217	1	10	1	0	0	1	1	0	1	1	0	0
149	5	7	1	0	1	0	1	0	0	1	0	0	218	2	10	0	1	0	1	1	0	1	1	0	0
150	6	7	0	1	1	0	1	0	0	1	0	0	219	3	10	1	1	0	1	1	0	1	1	0	0
151	7	7	1	1	1	0	1	0	0	1	0	0	220	4	10	0	0	1	1	1	0	1	1	0	0
152	8	7	0	0	0	1	1	0	0	1	0	0	221	5	10	1	0	1	1	1	0	1	1	0	0
153	9	7	1	0	0	1	1	0	0	1	0	0	222	6	10	0	1	1	1	1	0	1	1	0	0
154	10	7	0	1	0	1	1	0	0	1	0	0	223	7	10	1	1	1	1	1	0	1	1	0	0
155	11	7	1	1	0	1	1	0	0	1	0	0	224	8	10	0	0	0	0	0	1	1	1	0	0
156	12	7	0	0	1	1	1	0	0	1	0	0	225	9	10	1	0	0	0	0	1	1	1	0	0
157	13	7	1	0	1	1	1	0	0	1	0	0	226	10	10	0	1	0	0	0	1	1	1	0	0
158	14	7	0	1	1	1	1	0	0	1	0	0	227	11	10	1	1	0	0	0	1	1	1	0	0
159	15	7	1	1	1	1	1	0	0	1	0	0	228	12	10	0	0	1	0	0	1	1	1	0	0
160	16	7	0	0	0	0	0	1	0	1	0	0	229	13	10	1	0	1	0	0	1	1	1	0	0
161	17	7	1	0	0	0	0	1	0	1	0	0	230	14	10	0	1	1	0	0	1	1	1	0	0
162	18	7	0	1	0	0	0	1	0	1	0	0	231	15	10	1	1	1	0	0	1	1	1	0	0
163	19	7	1	1	0	0	0	1	0	1	0	0	232	16	10	0	0	0	1	0	1	1	1	0	0
164	20	7	0	0	1	0	0	1	0	1	0	0	233	17	10	1	0	0	1	0	1	1	1	0	0
165	21	7	1	0	1	0	0	1	0	1	0	0	234	18	10	0	1	0	1	0	1	1	1	0	0
166	22	7	0	1	1	0	0	1	0	1	0	0	235	19	10	1	1	0	1	0	1	1	1	0	0
167	23	7	1	1	1	0	0	1	0	1	0	0	236	20	10	0	0	1	1	0	1	1	1	0	0
168	24	7	0	0	0	1	0	1	0	1	0	0	237	21	10	1	0	1	1	0	1	1	1	0	0
169	1	8	1	0	0	1	0	1	0	1	0	0	238	22	10	0	1	1	1	0	1	1	1	0	0
170	2	8	0	1	0	1	0	1	0	1	0	0	239	23	10	1	1	1	1	0	1	1	1	0	0
171	3	8	1	1	0	1	0	1	0	1	0	0	240	24	10	0	0	0	0	1	1	1	1	0	0
172	4	8	0	0	1	1	0	1	0	1	0	0	241	1	11	1	0	0	0	1	1	1	1	0	0
173	5	8	1	0	1	1	0	1	0	1	0	0	242	2	11	0	1	0	0	1	1	1	1	0	0
174	6	8	0	1	1	1	0	1	0	1	0	0	243	3	11	1	1	0	0	1	1	1	1	0	0
175	7	8	1	1	1	1	0	1	0	1	0	0	244	4	11	0	0	1	0	1	1	1	1	0	0
176	8	8	0	0	0	0	1	1	0	1	0	0	245	5	11	1	0	1	0	1	1	1	1	0	0
177	9	8	1	0	0	0	1	1	0	1	0	0	246	6	11	0	1	1	0	1	1	1	1	0	0
178	10	8	0	1	0	0	1	1	0	1	0	0	247	7	11	1	1	1	0	1	1	1	1	0	0
179	11	8	1	1	0	0	1	1	0	1	0	0	248	8	11	0	0	0	1	1	1	1	1	0	0
180	12	8	0	0	1	0	1	1	0	1	0	0	249	9	11	1	0	0	1	1	1	1	1	0	0
181	13	8	1	0	1	0	1	1	0	1	0	0	250	10	11	0	1	0	1	1	1	1	1	0	0
182	14	8	0	1	1	0	1	1	0	1	0	0	251	11	11	1	1	0	1	1	1	1	1	0	0
183	15	8	1	1	1	0	1	1	0	1	0	0	252	12	11	0	0	1	1	1	1	1	1	0	0
184	16	8	0	0	0	1	1	1	0	1	0	0	253	13	11	1	0	1	1	1	1	1	1	0	0
185	17	8	1	0	0	1	1	1	0	1	0	0	254	14	11	0	1	1	1	1	1	1	1	0	0
186	18	8	0	1	0	1	1	1	0	1	0	0	255	15	11	1	1	1	1	1	1	1	1	0	0
187	19	8	1	1	0	1	1	1	0	1	0	0	256	16	11	0	0	0	0	0	0	0	0	1	0
188	20	8	0	0	1	1	1	1	0	1	0	0	257	17	11	1	0	0	0	0	0	0	0	1	0
189	21	8	1	0	1	1	1	1	0	1	0	0	258	18	11	0	1	0	0	0	0	0	0	1	0
190	22	8	0	1	1	1	1	1	0	1	0	0	259	19	11	1	1	0	0	0	0	0	0	1	0
191	23	8	1	1	1	1	1	1	0	1	0	0	260	20	11	0	0	1	0	0	0	0	0	1	0
192	24	8	0	0	0	0	0	0	1	1	0	0	261	21	11	1	0	1	0	0	0	0	0	1	0
193	1	9	1	0	0	0	0	0	1	1	0	0	262	22	11	0	1	1	0	0	0	0	0	1	0
194	2	9	0	1	0	0	0	0	1	1	0	0	263	23	11	1	1	1	0	0	0	0	0	1	0
195	3	9	1	1	0	0	0	0	1	1	0	0	264	24	11	0	0	0	1	0	0	0	0	1	0
196	4	9	0	0	1	0	0	0	1	1	0	0	265	1	12	1	0	0	1	0	0	0	0	1	0
197	5	9	1	0	1	0	0	0	1	1	0	0	266	2	12	0	1	0	1	0	0	0	0	1	0
198	6	9	0	1	1	0	0	0	1	1	0	0	267	3	12	1	1	0	1	0	0	0	0	1	0
199	7	9	1	1	1	0	0	0	1	1	0	0	268	4	12	0	0	1	1	0	0	0	0	1	0
200	8	9	0	0	0	1	0	0	1	1	0	0	269	5	12	1	0	1	1	0	0	0	0	1	0
201	9	9	1	0	0	1	0	0	1	1	0	0	270	6	12	0	1	1	1	0	0	0	0	1	0
202	10	9	0	1	0	1	0	0	1	1	0	0	271	7	12	1	1	1	1	0	0	0	0	1	0
203	11	9	1	1	0	1	0	0	1	1	0	0	272	8	12	0	0	0	0	1	0	0	0	1	0
204	12	9	0	0	1	1	0	0	1	1	0	0	273	9	12	1	0	0	0	1	0	0	0	1	0
205	13	9	1	0	1	1	0	0	1	1	0	0	274	10	12	0	1	0	0	1	0	0	0	1	0
206	14	9	0	1	1	1	0	0	1	1	0	0	275	11	12	1	1	0	0	1	0	0	0	1	0
207	15	9	1	1	1	1	0	0	1	1	0	0	276	12	12	0	0	1	0	1	0	0	0	1	0

Preset Number	Preset Key	Preset Level	Analog Input Channel										Preset Number	Preset Key	Preset Level	Analog Input Channel										
			1	2	3	4	5	6	7	8	9	10				1	2	3	4	5	6	7	8	9	10	
277	13	12	1	0	1	0	1	0	0	0	1	0	346	10	15	0	1	0	1	1	0	1	0	1	0	
278	14	12	0	1	1	0	1	0	0	0	1	0	347	11	15	1	1	0	1	1	0	1	0	1	0	
279	15	12	1	1	1	0	1	0	0	0	1	0	348	12	15	0	0	1	1	1	0	1	0	1	0	
280	16	12	0	0	0	1	1	0	0	0	1	0	349	13	15	1	0	1	1	1	0	1	0	1	0	
281	17	12	1	0	0	1	1	0	0	0	1	0	350	14	15	0	1	1	1	1	0	1	0	1	0	
282	18	12	0	1	0	1	1	0	0	0	1	0	351	15	15	1	1	1	1	1	0	1	0	1	0	
283	19	12	1	1	0	1	1	0	0	0	1	0	352	16	15	0	0	0	0	0	1	1	0	1	0	
284	20	12	0	0	1	1	1	0	0	0	1	0	353	17	15	1	0	0	0	0	1	1	0	1	0	
285	21	12	1	0	1	1	1	0	0	0	1	0	354	18	15	0	1	0	0	0	1	1	0	1	0	
286	22	12	0	1	1	1	1	0	0	0	1	0	355	19	15	1	1	0	0	0	1	1	0	1	0	
287	23	12	1	1	1	1	1	0	0	0	1	0	356	20	15	0	0	1	0	0	1	1	0	1	0	
288	24	12	0	0	0	0	0	1	0	0	1	0	357	21	15	1	0	1	0	0	1	1	0	1	0	
289	1	13	1	0	0	0	0	1	0	0	1	0	358	22	15	0	1	1	0	0	1	1	0	1	0	
290	2	13	0	1	0	0	0	1	0	0	1	0	359	23	15	1	1	1	0	0	1	1	0	1	0	
291	3	13	1	1	0	0	0	1	0	0	1	0	360	24	15	0	0	0	1	0	1	1	0	1	0	
292	4	13	0	0	1	0	0	1	0	0	1	0	361	1	16	1	0	0	1	0	1	1	0	1	0	
293	5	13	1	0	1	0	0	1	0	0	1	0	362	2	16	0	1	0	1	0	1	1	0	1	0	
294	6	13	0	1	1	0	0	1	0	0	1	0	363	3	16	1	1	0	1	0	1	1	0	1	0	
295	7	13	1	1	1	0	0	1	0	0	1	0	364	4	16	0	0	1	1	0	1	1	0	1	0	
296	8	13	0	0	0	1	0	1	0	0	1	0	365	5	16	1	0	1	1	0	1	1	0	1	0	
297	9	13	1	0	0	1	0	1	0	0	1	0	366	6	16	0	1	1	1	0	1	1	0	1	0	
298	10	13	0	1	0	1	0	1	0	0	1	0	367	7	16	1	1	1	1	0	1	1	0	1	0	
299	11	13	1	1	0	1	0	1	0	0	1	0	368	8	16	0	0	0	0	1	1	1	0	1	0	
300	12	13	0	0	1	1	0	1	0	0	1	0	369	9	16	1	0	0	0	1	1	1	0	1	0	
301	13	13	1	0	1	1	0	1	0	0	1	0	370	10	16	0	1	0	0	1	1	1	0	1	0	
302	14	13	0	1	1	1	0	1	0	0	1	0	371	11	16	1	1	0	0	1	1	1	0	1	0	
303	15	13	1	1	1	1	0	1	0	0	1	0	372	12	16	0	0	1	0	1	1	1	0	1	0	
304	16	13	0	0	0	0	1	1	0	0	1	0	373	13	16	1	0	1	0	1	1	1	0	1	0	
305	17	13	1	0	0	0	1	1	0	0	1	0	374	14	16	0	1	1	0	1	1	1	0	1	0	
306	18	13	0	1	0	0	1	1	0	0	1	0	375	15	16	1	1	1	0	1	1	1	0	1	0	
307	19	13	1	1	0	0	1	1	0	0	1	0	376	16	16	0	0	0	1	1	1	1	0	1	0	
308	20	13	0	0	1	0	1	1	0	0	1	0	377	17	16	1	0	0	1	1	1	1	0	1	0	
309	21	13	1	0	1	0	1	1	0	0	1	0	378	18	16	0	1	0	1	1	1	1	0	1	0	
310	22	13	0	1	1	0	1	1	0	0	1	0	379	19	16	1	1	0	1	1	1	1	0	1	0	
311	23	13	1	1	1	0	1	1	0	0	1	0	380	20	16	0	0	1	1	1	1	1	0	1	0	
312	24	13	0	0	0	1	1	1	0	0	1	0	381	21	16	1	0	1	1	1	1	1	0	1	0	
313	1	14	1	0	0	1	1	1	0	0	1	0	382	22	16	0	1	1	1	1	1	1	0	1	0	
314	2	14	0	1	0	1	1	1	0	0	1	0	383	23	16	1	1	1	1	1	1	1	0	1	0	
315	3	14	1	1	0	1	1	1	0	0	1	0	384	24	16	0	0	0	0	0	0	0	1	1	0	
316	4	14	0	0	1	1	1	1	0	0	1	0	385	1	17	1	0	0	0	0	0	0	0	1	1	0
317	5	14	1	0	1	1	1	1	0	0	1	0	386	2	17	0	1	0	0	0	0	0	0	1	1	0
318	6	14	0	1	1	1	1	1	0	0	1	0	387	3	17	1	1	0	0	0	0	0	0	1	1	0
319	7	14	1	1	1	1	1	1	0	0	1	0	388	4	17	0	0	1	0	0	0	0	0	1	1	0
320	8	14	0	0	0	0	0	0	1	0	1	0	389	5	17	1	0	1	0	0	0	0	0	1	1	0
321	9	14	1	0	0	0	0	0	1	0	1	0	390	6	17	0	1	1	0	0	0	0	0	1	1	0
322	10	14	0	1	0	0	0	0	1	0	1	0	391	7	17	1	1	1	0	0	0	0	0	1	1	0
323	11	14	1	1	0	0	0	0	1	0	1	0	392	8	17	0	0	0	1	0	0	0	0	1	1	0
324	12	14	0	0	1	0	0	0	1	0	1	0	393	9	17	1	0	0	1	0	0	0	0	1	1	0
325	13	14	1	0	1	0	0	0	1	0	1	0	394	10	17	0	1	0	1	0	0	0	0	1	1	0
326	14	14	0	1	1	0	0	0	1	0	1	0	395	11	17	1	1	0	1	0	0	0	0	1	1	0
327	15	14	1	1	1	0	0	0	1	0	1	0	396	12	17	0	0	1	1	0	0	0	0	1	1	0
328	16	14	0	0	0	1	0	0	1	0	1	0	397	13	17	1	0	1	1	0	0	0	0	1	1	0
329	17	14	1	0	0	1	0	0	1	0	1	0	398	14	17	0	1	1	1	0	0	0	0	1	1	0
330	18	14	0	1	0	1	0	0	1	0	1	0	399	15	17	1	1	1	1	0	0	0	0	1	1	0
331	19	14	1	1	0	1	0	0	1	0	1	0	400	16	17	0	0	0	0	1	0	0	0	1	1	0
332	20	14	0	0	1	1	0	0	1	0	1	0	401	17	17	1	0	0	0	1	0	0	0	1	1	0
333	21	14	1	0	1	1	0	0	1	0	1	0	402	18	17	0	1	0	0	1	0	0	0	1	1	0
334	22	14	0	1	1	1	0	0	1	0	1	0	403	19	17	1	1	0	0	1	0	0	0	1	1	0
335	23	14	1	1	1	1	0	0	1	0	1	0	404	20	17	0	0	1	0	1	0	0	0	1	1	0
336	24	14	0	0	0	0	1	0	1	0	1	0	405	21	17	1	0	1	0	1	0	0	0	1	1	0
337	1	15	1	0	0	0	1	0	1	0	1	0	406	22	17	0	1	1	0	1	0	0	0	1	1	0
338	2	15	0	1	0	0	1	0	1	0	1	0	407	23	17	1	1	1	0	1	0	0	0	1	1	0
339	3	15	1	1	0	0	1	0	1	0	1	0	408	24	17	0	0	0	1	1	0	0	0	1	1	0
340	4	15	0	0	1	0	1	0	1	0	1	0	409	1	18	1	0	0	1	1	0	0	0	1	1	0
341	5	15	1	0	1	0	1	0	1	0	1	0	410	2	18	0	1	0	1	1	0	0	0	1	1	0
342	6	15	0	1	1	0	1	0	1	0	1	0	411	3	18	1	1	0	1	1	0	0	0	1	1	0
343	7	15	1	1	1	0	1	0	1	0	1	0	412	4	18	0	0	1	1	1	0	0	0	1	1	0
344	8	15	0	0	0	1	1	0	1	0	1	0	413	5	18	1	0	1	1	1	0	0	0	1	1	0
345	9	15	1	0	0	1	1	0	1	0	1	0	414	6	18	0	1	1	1	1	0	0	0	1	1	0

Preset Number	Preset Key	Preset Level	Analog Input Channel										Preset Number	Preset Key	Preset Level	Analog Input Channel									
			1	2	3	4	5	6	7	8	9	10				1	2	3	4	5	6	7	8	9	10
415	7	18	1	1	1	1	1	0	0	1	1	0	484	4	21	0	0	1	0	0	1	1	1	1	0
416	8	18	0	0	0	0	0	1	0	1	1	0	485	5	21	1	0	1	0	0	1	1	1	1	0
417	9	18	1	0	0	0	0	1	0	1	1	0	486	6	21	0	1	1	0	0	1	1	1	1	0
418	10	18	0	1	0	0	0	1	0	1	1	0	487	7	21	1	1	1	0	0	1	1	1	1	0
419	11	18	1	1	0	0	0	1	0	1	1	0	488	8	21	0	0	0	1	0	1	1	1	1	0
420	12	18	0	0	1	0	0	1	0	1	1	0	489	9	21	1	0	0	1	0	1	1	1	1	0
421	13	18	1	0	1	0	0	1	0	1	1	0	490	10	21	0	1	0	1	0	1	1	1	1	0
422	14	18	0	1	1	0	0	1	0	1	1	0	491	11	21	1	1	0	1	0	1	1	1	1	0
423	15	18	1	1	1	0	0	1	0	1	1	0	492	12	21	0	0	1	1	0	1	1	1	1	0
424	16	18	0	0	0	1	0	1	0	1	1	0	493	13	21	1	0	1	1	0	1	1	1	1	0
425	17	18	1	0	0	1	0	1	0	1	1	0	494	14	21	0	1	1	1	0	1	1	1	1	0
426	18	18	0	1	0	1	0	1	0	1	1	0	495	15	21	1	1	1	1	0	1	1	1	1	0
427	19	18	1	1	0	1	0	1	0	1	1	0	496	16	21	0	0	0	0	1	1	1	1	1	0
428	20	18	0	0	1	1	0	1	0	1	1	0	497	17	21	1	0	0	0	1	1	1	1	1	0
429	21	18	1	0	1	1	0	1	0	1	1	0	498	18	21	0	1	0	0	1	1	1	1	1	0
430	22	18	0	1	1	1	0	1	0	1	1	0	499	19	21	1	1	0	0	1	1	1	1	1	0
431	23	18	1	1	1	1	0	1	0	1	1	0	500	20	21	0	0	1	0	1	1	1	1	1	0
432	24	18	0	0	0	0	1	1	0	1	1	0	501	21	21	1	0	1	0	1	1	1	1	1	0
433	1	19	1	0	0	0	1	1	0	1	1	0	502	22	21	0	1	1	0	1	1	1	1	1	0
434	2	19	0	1	0	0	1	1	0	1	1	0	503	23	21	1	1	1	0	1	1	1	1	1	0
435	3	19	1	1	0	0	1	1	0	1	1	0	504	24	21	0	0	0	1	1	1	1	1	1	0
436	4	19	0	0	1	0	1	1	0	1	1	0	505	1	22	1	0	0	1	1	1	1	1	1	0
437	5	19	1	0	1	0	1	1	0	1	1	0	506	2	22	0	1	0	1	1	1	1	1	1	0
438	6	19	0	1	1	0	1	1	0	1	1	0	507	3	22	1	1	0	1	1	1	1	1	1	0
439	7	19	1	1	1	0	1	1	0	1	1	0	508	4	22	0	0	1	1	1	1	1	1	1	0
440	8	19	0	0	0	1	1	1	0	1	1	0	509	5	22	1	0	1	1	1	1	1	1	1	0
441	9	19	1	0	0	1	1	1	0	1	1	0	510	6	22	0	1	1	1	1	1	1	1	1	0
442	10	19	0	1	0	1	1	1	0	1	1	0	511	7	22	1	1	1	1	1	1	1	1	1	0
443	11	19	1	1	0	1	1	1	0	1	1	0	512	8	22	0	0	0	0	0	0	0	0	0	1
444	12	19	0	0	1	1	1	1	0	1	1	0	513	9	22	1	0	0	0	0	0	0	0	0	1
445	13	19	1	0	1	1	1	1	0	1	1	0	514	10	22	0	1	0	0	0	0	0	0	0	1
446	14	19	0	1	1	1	1	1	0	1	1	0	515	11	22	1	1	0	0	0	0	0	0	0	1
447	15	19	1	1	1	1	1	1	0	1	1	0	516	12	22	0	0	1	0	0	0	0	0	0	1
448	16	19	0	0	0	0	0	0	1	1	1	0	517	13	22	1	0	1	0	0	0	0	0	0	1
449	17	19	1	0	0	0	0	0	1	1	1	0	518	14	22	0	1	1	0	0	0	0	0	0	1
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452	20	19	0	0	1	0	0	0	1	1	1	0	521	17	22	1	0	0	1	0	0	0	0	0	1
453	21	19	1	0	1	0	0	0	1	1	1	0	522	18	22	0	1	0	1	0	0	0	0	0	1
454	22	19	0	1	1	0	0	0	1	1	1	0	523	19	22	1	1	0	1	0	0	0	0	0	1
455	23	19	1	1	1	0	0	0	1	1	1	0	524	20	22	0	0	1	1	0	0	0	0	0	1
456	24	19	0	0	0	1	0	0	1	1	1	0	525	21	22	1	0	1	1	0	0	0	0	0	1
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458	2	20	0	1	0	1	0	0	1	1	1	0	527	23	22	1	1	1	1	0	0	0	0	0	1
459	3	20	1	1	0	1	0	0	1	1	1	0	528	24	22	0	0	0	0	1	0	0	0	0	1
460	4	20	0	0	1	1	0	0	1	1	1	0	529	1	23	1	0	0	0	1	0	0	0	0	1
461	5	20	1	0	1	1	0	0	1	1	1	0	530	2	23	0	1	0	0	1	0	0	0	0	1
462	6	20	0	1	1	1	0	0	1	1	1	0	531	3	23	1	1	0	0	1	0	0	0	0	1
463	7	20	1	1	1	1	0	0	1	1	1	0	532	4	23	0	0	1	0	1	0	0	0	0	1
464	8	20	0	0	0	0	1	0	1	1	1	0	533	5	23	1	0	1	0	1	0	0	0	0	1
465	9	20	1	0	0	0	1	0	1	1	1	0	534	6	23	0	1	1	0	1	0	0	0	0	1
466	10	20	0	1	0	0	1	0	1	1	1	0	535	7	23	1	1	1	0	1	0	0	0	0	1
467	11	20	1	1	0	0	1	0	1	1	1	0	536	8	23	0	0	0	1	1	0	0	0	0	1
468	12	20	0	0	1	0	1	0	1	1	1	0	537	9	23	1	0	0	1	1	0	0	0	0	1
469	13	20	1	0	1	0	1	0	1	1	1	0	538	10	23	0	1	0	1	1	0	0	0	0	1
470	14	20	0	1	1	0	1	0	1	1	1	0	539	11	23	1	1	0	1	1	0	0	0	0	1
471	15	20	1	1	1	0	1	0	1	1	1	0	540	12	23	0	0	1	1	1	0	0	0	0	1
472	16	20	0	0	0	1	1	0	1	1	1	0	541	13	23	1	0	1	1	1	0	0	0	0	1
473	17	20	1	0	0	1	1	0	1	1	1	0	542	14	23	0	1	1	1	1	0	0	0	0	1
474	18	20	0	1	0	1	1	0	1	1	1	0	543	15	23	1	1	1	1	1	0	0	0	0	1
475	19	20	1	1	0	1	1	0	1	1	1	0	544	16	23	0	0	0	0	0	1	0	0	0	1
476	20	20	0	0	1	1	1	0	1	1	1	0	545	17	23	1	0	0	0	0	1	0	0	0	1
477	21	20	1	0	1	1	1	0	1	1	1	0	546	18	23	0	1	0	0	0	1	0	0	0	1
478	22	20	0	1	1	1	1	0	1	1	1	0	547	19	23	1	1	0	0	0	1	0	0	0	1
479	23	20	1	1	1	1	1	0	1	1	1	0	548	20	23	0	0	1	0	0	1	0	0	0	1
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481	1	21	1	0	0	0	0	1	1	1	1	0	550	22	23	0	1	1	0	0	1	0	0	0	1
482	2	21	0	1	0	0	0	1	1	1	1	0	551	23	23	1	1	1	0	0	1	0	0	0	1
483	3	21	1	1	0	0	0	1	1	1	1	0	552	24	23	0	0	0	1	0	1	0	0	0	1

Preset Number	Preset Key	Preset Level	Analog Input Channel										Preset Number	Preset Key	Preset Level	Analog Input Channel												
			1	2	3	4	5	6	7	8	9	10				1	2	3	4	5	6	7	8	9	10			
553	1	24	1	0	0	1	0	1	0	0	0	0	1	622	22	26	0	1	1	1	0	1	1	0	0	1		
554	2	24	0	1	0	1	0	1	0	0	0	0	1	623	23	26	1	1	1	1	0	1	1	1	0	0	1	
555	3	24	1	1	0	1	0	1	0	0	0	0	1	624	24	26	0	0	0	0	1	1	1	1	0	0	1	
556	4	24	0	0	1	1	0	1	0	0	0	0	1	625	1	27	1	0	0	0	1	1	1	1	0	0	1	
557	5	24	1	0	1	1	0	1	0	0	0	0	1	626	2	27	0	1	0	0	1	1	1	1	0	0	1	
558	6	24	0	1	1	1	0	1	0	0	0	0	1	627	3	27	1	1	0	0	1	1	1	1	0	0	1	
559	7	24	1	1	1	1	0	1	0	0	0	0	1	628	4	27	0	0	1	0	1	1	1	1	0	0	1	
560	8	24	0	0	0	0	1	1	0	0	0	0	1	629	5	27	1	0	1	0	1	1	1	1	0	0	1	
561	9	24	1	0	0	0	1	1	0	0	0	0	1	630	6	27	0	1	1	0	1	1	1	1	0	0	1	
562	10	24	0	1	0	0	1	1	0	0	0	0	1	631	7	27	1	1	1	0	1	1	1	1	0	0	1	
563	11	24	1	1	0	0	1	1	0	0	0	0	1	632	8	27	0	0	0	1	1	1	1	1	0	0	1	
564	12	24	0	0	1	0	1	1	0	0	0	0	1	633	9	27	1	0	0	1	1	1	1	1	0	0	1	
565	13	24	1	0	1	0	1	1	0	0	0	0	1	634	10	27	0	1	0	1	1	1	1	1	0	0	1	
566	14	24	0	1	1	0	1	1	0	0	0	0	1	635	11	27	1	1	0	1	1	1	1	1	0	0	1	
567	15	24	1	1	1	0	1	1	0	0	0	0	1	636	12	27	0	0	1	1	1	1	1	1	0	0	1	
568	16	24	0	0	0	1	1	1	0	0	0	0	1	637	13	27	1	0	1	1	1	1	1	1	0	0	1	
569	17	24	1	0	0	1	1	1	0	0	0	0	1	638	14	27	0	1	1	1	1	1	1	1	0	0	1	
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571	19	24	1	1	0	1	1	1	0	0	0	0	1	640	16	27	0	0	0	0	0	0	0	0	1	0	1	
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573	21	24	1	0	1	1	1	1	0	0	0	0	1	642	18	27	0	1	0	0	0	0	0	0	1	0	1	
574	22	24	0	1	1	1	1	1	0	0	0	0	1	643	19	27	1	1	0	0	0	0	0	0	1	0	1	
575	23	24	1	1	1	1	1	1	0	0	0	0	1	644	20	27	0	0	1	0	0	0	0	0	1	0	1	
576	24	24	0	0	0	0	0	0	1	0	0	0	1	645	21	27	1	0	1	0	0	0	0	0	1	0	1	
577	1	25	1	0	0	0	0	0	1	0	0	0	1	646	22	27	0	1	1	0	0	0	0	0	1	0	1	
578	2	25	0	1	0	0	0	0	1	0	0	0	1	647	23	27	1	1	1	0	0	0	0	0	1	0	1	
579	3	25	1	1	0	0	0	0	1	0	0	0	1	648	24	27	0	0	0	1	0	0	0	0	1	0	1	
580	4	25	0	0	1	0	0	0	1	0	0	0	1	649	1	28	1	0	0	1	0	0	0	0	1	0	1	
581	5	25	1	0	1	0	0	0	1	0	0	0	1	650	2	28	0	1	0	1	0	0	0	0	1	0	1	
582	6	25	0	1	1	0	0	0	1	0	0	0	1	651	3	28	1	1	0	1	0	0	0	0	1	0	1	
583	7	25	1	1	1	0	0	0	1	0	0	0	1	652	4	28	0	0	1	1	0	0	0	0	1	0	1	
584	8	25	0	0	0	1	0	0	1	0	0	0	1	653	5	28	1	0	1	1	0	0	0	0	1	0	1	
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586	10	25	0	1	0	1	0	0	1	0	0	0	1	655	7	28	1	1	1	1	0	0	0	0	1	0	1	
587	11	25	1	1	0	1	0	0	1	0	0	0	1	656	8	28	0	0	0	0	1	0	0	0	1	0	1	
588	12	25	0	0	1	1	0	0	1	0	0	0	1	657	9	28	1	0	0	0	1	0	0	0	1	0	1	
589	13	25	1	0	1	1	0	0	1	0	0	0	1	658	10	28	0	1	0	0	1	0	0	0	1	0	1	
590	14	25	0	1	1	1	0	0	1	0	0	0	1	659	11	28	1	1	0	0	1	0	0	0	1	0	1	
591	15	25	1	1	1	1	0	0	1	0	0	0	1	660	12	28	0	0	1	0	1	0	0	0	1	0	1	
592	16	25	0	0	0	0	1	0	1	0	0	0	1	661	13	28	1	0	1	0	1	0	0	0	1	0	1	
593	17	25	1	0	0	0	1	0	1	0	0	0	1	662	14	28	0	1	1	0	1	0	0	0	1	0	1	
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595	19	25	1	1	0	0	1	0	1	0	0	0	1	664	16	28	0	0	0	1	1	0	0	0	1	0	1	
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601	1	26	1	0	0	1	1	0	1	0	0	0	1	670	22	28	0	1	1	1	1	0	0	0	1	0	1	
602	2	26	0	1	0	1	1	0	1	0	0	0	1	671	23	28	1	1	1	1	1	0	0	0	1	0	1	
603	3	26	1	1	0	1	1	0	1	0	0	0	1	672	24	28	0	0	0	0	0	1	0	1	0	1	0	1
604	4	26	0	0	1	1	1	0	1	0	0	0	1	673	1	29	1	0	0	0	0	0	1	0	1	0	1	
605	5	26	1	0	1	1	1	0	1	0	0	0	1	674	2	29	0	1	0	0	0	1	0	1	0	1	0	1
606	6	26	0	1	1	1	1	0	1	0	0	0	1	675	3	29	1	1	0	0	0	1	0	1	0	1	0	1
607	7	26	1	1	1	1	1	0	1	0	0	0	1	676	4	29	0	0	1	0	0	1	0	1	0	1	0	1
608	8	26	0	0	0	0	0	1	1	0	0	0	1	677	5	29	1	0	1	0	0	1	0	1	0	1	0	1
609	9	26	1	0	0	0	0	1	1	0	0	0	1	678	6	29	0	1	1	0	0	1	0	1	0	1	0	1
610	10	26	0	1	0	0	0	1	1	0	0	0	1	679	7	29	1	1	1	0	0	1	0	1	0	1	0	1
611	11	26	1	1	0	0	0	1	1	0	0	0	1	680	8	29	0	0	0	1	0	1	0	1	0	1	0	1
612	12	26	0	0	1	0	0	1	1	0	0	0	1	681	9	29	1	0	0	1	0	1	0	1	0	1	0	1
613	13	26	1	0	1	0	0	1	1	0	0	0	1	682	10	29	0	1	0	1	0	1	0	1	0	1	0	1
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615	15	26	1	1	1	0	0	1	1	0	0	0	1	684	12	29	0	0	1	1	0	1	0	1	0	1	0	1
616	16	26	0	0	0	1	0	1	1	0	0	0	1	685	13	29	1	0	1	1	0	1	0	1	0	1	0	1
617	17	26	1	0	0	1	0	1	1	0	0	0	1	686	14	29	0	1	1	1	0	1	0	1	0	1	0	1
618	18	26	0	1	0	1	0	1	1	0	0	0	1	687	15	29	1	1	1	1	0	1	0	1	0	1	0	1
619	19	26	1	1	0	1	0	1	1	0	0	0	1	688	16	29	0	0										

Preset Number	Preset Key	Preset Level	Analog Input Channel										Preset Number	Preset Key	Preset Level	Analog Input Channel									
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691	19	29	1	1	0	0	1	1	0	1	0	1	760	16	32	0	0	0	1	1	1	1	1	0	1
692	20	29	0	0	1	0	1	1	0	1	0	1	761	17	32	1	0	0	1	1	1	1	1	0	1
693	21	29	1	0	1	0	1	1	0	1	0	1	762	18	32	0	1	0	1	1	1	1	1	0	1
694	22	29	0	1	1	0	1	1	0	1	0	1	763	19	32	1	1	0	1	1	1	1	1	0	1
695	23	29	1	1	1	0	1	1	0	1	0	1	764	20	32	0	0	1	1	1	1	1	1	0	1
696	24	29	0	0	0	1	1	1	0	1	0	1	765	21	32	1	0	1	1	1	1	1	1	0	1
697	1	30	1	0	0	1	1	1	0	1	0	1	766	22	32	0	1	1	1	1	1	1	1	0	1
698	2	30	0	1	0	1	1	1	0	1	0	1	767	23	32	1	1	1	1	1	1	1	1	0	1
699	3	30	1	1	0	1	1	1	0	1	0	1	768	24	32	0	0	0	0	0	0	0	0	1	1
700	4	30	0	0	1	1	1	1	0	1	0	1	769	1	33	1	0	0	0	0	0	0	0	1	1
701	5	30	1	0	1	1	1	1	0	1	0	1	770	2	33	0	1	0	0	0	0	0	0	1	1
702	6	30	0	1	1	1	1	1	0	1	0	1	771	3	33	1	1	0	0	0	0	0	0	1	1
703	7	30	1	1	1	1	1	1	0	1	0	1	772	4	33	0	0	1	0	0	0	0	0	1	1
704	8	30	0	0	0	0	0	0	1	1	0	1	773	5	33	1	0	1	0	0	0	0	0	1	1
705	9	30	1	0	0	0	0	0	1	1	0	1	774	6	33	0	1	1	0	0	0	0	0	1	1
706	10	30	0	1	0	0	0	0	1	1	0	1	775	7	33	1	1	1	0	0	0	0	0	1	1
707	11	30	1	1	0	0	0	0	1	1	0	1	776	8	33	0	0	0	1	0	0	0	0	1	1
708	12	30	0	0	1	0	0	0	1	1	0	1	777	9	33	1	0	0	1	0	0	0	0	1	1
709	13	30	1	0	1	0	0	0	1	1	0	1	778	10	33	0	1	0	1	0	0	0	0	1	1
710	14	30	0	1	1	0	0	0	1	1	0	1	779	11	33	1	1	0	1	0	0	0	0	1	1
711	15	30	1	1	1	0	0	0	1	1	0	1	780	12	33	0	0	1	1	0	0	0	0	1	1
712	16	30	0	0	0	1	0	0	1	1	0	1	781	13	33	1	0	1	1	0	0	0	0	1	1
713	17	30	1	0	0	1	0	0	1	1	0	1	782	14	33	0	1	1	1	0	0	0	0	1	1
714	18	30	0	1	0	1	0	0	1	1	0	1	783	15	33	1	1	1	1	0	0	0	0	1	1
715	19	30	1	1	0	1	0	0	1	1	0	1	784	16	33	0	0	0	0	1	0	0	0	1	1
716	20	30	0	0	1	1	0	0	1	1	0	1	785	17	33	1	0	0	0	1	0	0	0	1	1
717	21	30	1	0	1	1	0	0	1	1	0	1	786	18	33	0	1	0	0	1	0	0	0	1	1
718	22	30	0	1	1	1	0	0	1	1	0	1	787	19	33	1	1	0	0	1	0	0	0	1	1
719	23	30	1	1	1	1	0	0	1	1	0	1	788	20	33	0	0	1	0	1	0	0	0	1	1
720	24	30	0	0	0	0	1	0	1	1	0	1	789	21	33	1	0	1	0	1	0	0	0	1	1
721	1	31	1	0	0	0	1	0	1	1	0	1	790	22	33	0	1	1	0	1	0	0	0	1	1
722	2	31	0	1	0	0	1	0	1	1	0	1	791	23	33	1	1	1	0	1	0	0	0	1	1
723	3	31	1	1	0	0	1	0	1	1	0	1	792	24	33	0	0	0	1	1	0	0	0	1	1
724	4	31	0	0	1	0	1	0	1	1	0	1	793	1	34	1	0	0	1	1	0	0	0	1	1
725	5	31	1	0	1	0	1	0	1	1	0	1	794	2	34	0	1	0	1	1	0	0	0	1	1
726	6	31	0	1	1	0	1	0	1	1	0	1	795	3	34	1	1	0	1	1	0	0	0	1	1
727	7	31	1	1	1	0	1	0	1	1	0	1	796	4	34	0	0	1	1	1	0	0	0	1	1
728	8	31	0	0	0	1	1	0	1	1	0	1	797	5	34	1	0	1	1	1	0	0	0	1	1
729	9	31	1	0	0	1	1	0	1	1	0	1	798	6	34	0	1	1	1	1	0	0	0	1	1
730	10	31	0	1	0	1	1	0	1	1	0	1	799	7	34	1	1	1	1	1	0	0	0	1	1
731	11	31	1	1	0	1	1	0	1	1	0	1	800	8	34	0	0	0	0	0	1	0	0	1	1
732	12	31	0	0	1	1	1	0	1	1	0	1	801	9	34	1	0	0	0	0	1	0	0	1	1
733	13	31	1	0	1	1	1	0	1	1	0	1	802	10	34	0	1	0	0	0	1	0	0	1	1
734	14	31	0	1	1	1	1	0	1	1	0	1	803	11	34	1	1	0	0	0	1	0	0	1	1
735	15	31	1	1	1	1	1	0	1	1	0	1	804	12	34	0	0	1	0	0	1	0	0	1	1
736	16	31	0	0	0	0	0	1	1	1	0	1	805	13	34	1	0	1	0	0	1	0	0	1	1
737	17	31	1	0	0	0	0	1	1	1	0	1	806	14	34	0	1	1	0	0	1	0	0	1	1
738	18	31	0	1	0	0	0	1	1	1	0	1	807	15	34	1	1	1	0	0	1	0	0	1	1
739	19	31	1	1	0	0	0	1	1	1	0	1	808	16	34	0	0	0	1	0	1	0	0	1	1
740	20	31	0	0	1	0	0	1	1	1	0	1	809	17	34	1	0	0	1	0	1	0	0	1	1
741	21	31	1	0	1	0	0	1	1	1	0	1	810	18	34	0	1	0	1	0	1	0	0	1	1
742	22	31	0	1	1	0	0	1	1	1	0	1	811	19	34	1	1	0	1	0	1	0	0	1	1
743	23	31	1	1	1	0	0	1	1	1	0	1	812	20	34	0	0	1	1	0	1	0	0	1	1
744	24	31	0	0	0	1	0	1	1	1	0	1	813	21	34	1	0	1	1	0	1	0	0	1	1
745	1	32	1	0	0	1	0	1	1	1	0	1	814	22	34	0	1	1	1	0	1	0	0	1	1
746	2	32	0	1	0	1	0	1	1	1	0	1	815	23	34	1	1	1	1	0	1	0	0	1	1
747	3	32	1	1	0	1	0	1	1	1	0	1	816	24	34	0	0	0	0	1	1	0	0	1	1
748	4	32	0	0	1	1	0	1	1	1	0	1	817	1	35	1	0	0	0	1	1	0	0	1	1
749	5	32	1	0	1	1	0	1	1	1	0	1	818	2	35	0	1	0	0	1	1	0	0	1	1
750	6	32	0	1	1	1	0	1	1	1	0	1	819	3	35	1	1	0	0	1	1	0	0	1	1
751	7	32	1	1	1	1	0	1	1	1	0	1	820	4	35	0	0	1	0	1	1	0	0	1	1
752	8	32	0	0	0	0	1	1	1	1	0	1	821	5	35	1	0	1	0	1	1	0	0	1	1
753	9	32	1	0	0	0	1	1	1	1	0	1	822	6	35	0	1	1	0	1	1	0	0	1	1
754	10	32	0	1	0	0	1	1	1	1	0	1	823	7	35	1	1	1	0	1	1	0	0	1	1
755	11	32	1	1	0	0	1	1	1	1	0	1	824	8	35	0	0	0	1	1	1	0	0	1	1
756	12	32	0	0	1	0	1	1	1	1	0	1	825	9	35	1	0	0	1	1	1	0	0	1	1
757	13	32	1	0	1	0	1	1	1	1	0	1	826	10	35	0	1	0	1	1	1	0	0	1	1
758	14	32	0	1	1	0	1	1	1	1	0	1	827	11	35	1	1	0	1	1	1	0	0	1	1
759	15	32	1	1	1	0	1	1	1	1	0	1	828	12	35	0	0	1	1	1	1	0	0	1	1

Preset Number	Preset Key	Preset Level	Analog Input Channel										Preset Number	Preset Key	Preset Level	Analog Input Channel									
			1	2	3	4	5	6	7	8	9	10				1	2	3	4	5	6	7	8	9	10
829	13	35	1	0	1	1	1	1	0	0	1	1	898	10	38	0	1	0	0	0	0	0	1	1	1
830	14	35	0	1	1	1	1	1	0	0	1	1	899	11	38	1	1	0	0	0	0	0	1	1	1
831	15	35	1	1	1	1	1	1	0	0	1	1	900	12	38	0	0	1	0	0	0	0	1	1	1
832	16	35	0	0	0	0	0	0	1	0	1	1	901	13	38	1	0	1	0	0	0	0	1	1	1
833	17	35	1	0	0	0	0	0	1	0	1	1	902	14	38	0	1	1	0	0	0	0	1	1	1
834	18	35	0	1	0	0	0	0	1	0	1	1	903	15	38	1	1	1	0	0	0	0	1	1	1
835	19	35	1	1	0	0	0	0	1	0	1	1	904	16	38	0	0	0	1	0	0	0	1	1	1
836	20	35	0	0	1	0	0	0	1	0	1	1	905	17	38	1	0	0	1	0	0	0	1	1	1
837	21	35	1	0	1	0	0	0	1	0	1	1	906	18	38	0	1	0	1	0	0	0	1	1	1
838	22	35	0	1	1	0	0	0	1	0	1	1	907	19	38	1	1	0	1	0	0	0	1	1	1
839	23	35	1	1	1	0	0	0	1	0	1	1	908	20	38	0	0	1	1	0	0	0	1	1	1
840	24	35	0	0	0	1	0	0	1	0	1	1	909	21	38	1	0	1	1	0	0	0	1	1	1
841	1	36	1	0	0	1	0	0	1	0	1	1	910	22	38	0	1	1	1	0	0	0	1	1	1
842	2	36	0	1	0	1	0	0	1	0	1	1	911	23	38	1	1	1	1	0	0	0	1	1	1
843	3	36	1	1	0	1	0	0	1	0	1	1	912	24	38	0	0	0	0	1	0	0	1	1	1
844	4	36	0	0	1	1	0	0	1	0	1	1	913	1	39	1	0	0	0	1	0	0	1	1	1
845	5	36	1	0	1	1	0	0	1	0	1	1	914	2	39	0	1	0	0	1	0	0	1	1	1
846	6	36	0	1	1	1	0	0	1	0	1	1	915	3	39	1	1	0	0	1	0	0	1	1	1
847	7	36	1	1	1	1	0	0	1	0	1	1	916	4	39	0	0	1	0	1	0	0	1	1	1
848	8	36	0	0	0	0	1	0	1	0	1	1	917	5	39	1	0	1	0	1	0	0	1	1	1
849	9	36	1	0	0	0	1	0	1	0	1	1	918	6	39	0	1	1	0	1	0	0	1	1	1
850	10	36	0	1	0	0	1	0	1	0	1	1	919	7	39	1	1	1	0	1	0	0	1	1	1
851	11	36	1	1	0	0	1	0	1	0	1	1	920	8	39	0	0	0	1	1	0	0	1	1	1
852	12	36	0	0	1	0	1	0	1	0	1	1	921	9	39	1	0	0	1	1	0	0	1	1	1
853	13	36	1	0	1	0	1	0	1	0	1	1	922	10	39	0	1	0	1	1	0	0	1	1	1
854	14	36	0	1	1	0	1	0	1	0	1	1	923	11	39	1	1	0	1	1	0	0	1	1	1
855	15	36	1	1	1	0	1	0	1	0	1	1	924	12	39	0	0	1	1	1	0	0	1	1	1
856	16	36	0	0	0	1	1	0	1	0	1	1	925	13	39	1	0	1	1	1	0	0	1	1	1
857	17	36	1	0	0	1	1	0	1	0	1	1	926	14	39	0	1	1	1	1	0	0	1	1	1
858	18	36	0	1	0	1	1	0	1	0	1	1	927	15	39	1	1	1	1	1	0	0	1	1	1
859	19	36	1	1	0	1	1	0	1	0	1	1	928	16	39	0	0	0	0	0	1	0	1	1	1
860	20	36	0	0	1	1	1	0	1	0	1	1	929	17	39	1	0	0	0	0	1	0	1	1	1
861	21	36	1	0	1	1	1	0	1	0	1	1	930	18	39	0	1	0	0	0	1	0	1	1	1
862	22	36	0	1	1	1	1	0	1	0	1	1	931	19	39	1	1	0	0	0	1	0	1	1	1
863	23	36	1	1	1	1	1	0	1	0	1	1	932	20	39	0	0	1	0	0	1	0	1	1	1
864	24	36	0	0	0	0	0	1	1	0	1	1	933	21	39	1	0	1	0	0	1	0	1	1	1
865	1	37	1	0	0	0	0	1	1	0	1	1	934	22	39	0	1	1	0	0	1	0	1	1	1
866	2	37	0	1	0	0	0	1	1	0	1	1	935	23	39	1	1	1	0	0	1	0	1	1	1
867	3	37	1	1	0	0	0	1	1	0	1	1	936	24	39	0	0	0	1	0	1	0	1	1	1
868	4	37	0	0	1	0	0	1	1	0	1	1	937	1	40	1	0	0	1	0	1	0	1	1	1
869	5	37	1	0	1	0	0	1	1	0	1	1	938	2	40	0	1	0	1	0	1	0	1	1	1
870	6	37	0	1	1	0	0	1	1	0	1	1	939	3	40	1	1	0	1	0	1	0	1	1	1
871	7	37	1	1	1	0	0	1	1	0	1	1	940	4	40	0	0	1	1	0	1	0	1	1	1
872	8	37	0	0	0	1	0	1	1	0	1	1	941	5	40	1	0	1	1	0	1	0	1	1	1
873	9	37	1	0	0	1	0	1	1	0	1	1	942	6	40	0	1	1	1	0	1	0	1	1	1
874	10	37	0	1	0	1	0	1	1	0	1	1	943	7	40	1	1	1	1	0	1	0	1	1	1
875	11	37	1	1	0	1	0	1	1	0	1	1	944	8	40	0	0	0	0	1	1	0	1	1	1
876	12	37	0	0	1	1	0	1	1	0	1	1	945	9	40	1	0	0	0	1	1	0	1	1	1
877	13	37	1	0	1	1	0	1	1	0	1	1	946	10	40	0	1	0	0	1	1	0	1	1	1
878	14	37	0	1	1	1	0	1	1	0	1	1	947	11	40	1	1	0	0	1	1	0	1	1	1
879	15	37	1	1	1	1	0	1	1	0	1	1	948	12	40	0	0	1	0	1	1	0	1	1	1
880	16	37	0	0	0	0	1	1	1	0	1	1	949	13	40	1	0	1	0	1	1	0	1	1	1
881	17	37	1	0	0	0	1	1	1	0	1	1	950	14	40	0	1	1	0	1	1	0	1	1	1
882	18	37	0	1	0	0	1	1	1	0	1	1	951	15	40	1	1	1	0	1	1	0	1	1	1
883	19	37	1	1	0	0	1	1	1	0	1	1	952	16	40	0	0	0	1	1	1	0	1	1	1
884	20	37	0	0	1	0	1	1	1	0	1	1	953	17	40	1	0	0	1	1	1	0	1	1	1
885	21	37	1	0	1	0	1	1	1	0	1	1	954	18	40	0	1	0	1	1	1	0	1	1	1
886	22	37	0	1	1	0	1	1	1	0	1	1	955	19	40	1	1	0	1	1	1	0	1	1	1
887	23	37	1	1	1	0	1	1	1	0	1	1	956	20	40	0	0	1	1	1	1	0	1	1	1
888	24	37	0	0	0	1	1	1	1	0	1	1	957	21	40	1	0	1	1	1	1	0	1	1	1
889	1	38	1	0	0	1	1	1	1	0	1	1	958	22	40	0	1	1	1	1	1	0	1	1	1
890	2	38	0	1	0	1	1	1	1	0	1	1	959	23	40	1	1	1	1	1	1	0	1	1	1
891	3	38	1	1	0	1	1	1	1	0	1	1	960	24	40	0	0	0	0	0	0	1	1	1	1
892	4	38	0	0	1	1	1	1	1	0	1	1	961	1	41	1	0	0	0	0	0	1	1	1	1
893	5	38	1	0	1	1	1	1	1	0	1	1	962	2	41	0	1	0	0	0	0	1	1	1	1
894	6	38	0	1	1	1	1	1	1	0	1	1	963	3	41	1	1	0	0	0	0	1	1	1	1
895	7	38	1	1	1	1	1	1	1	0	1	1	964	4	41	0	0	1	0	0	0	1	1	1	1
896	8	38	0	0	0	0	0	0	0	1	1	1	965	5	41	1	0	1	0	0	0	1	1	1	1
897	9	38	1	0	0	0	0	0	0	1	1	1	966	6	41	0	1	1	0	0	0	1	1	1	1

Preset Number	Preset Key	Preset Level	Analog Input Channel									
			1	2	3	4	5	6	7	8	9	10
967	7	41	1	1	1	0	0	0	1	1	1	1
968	8	41	0	0	0	1	0	0	1	1	1	1
969	9	41	1	0	0	1	0	0	1	1	1	1
970	10	41	0	1	0	1	0	0	1	1	1	1
971	11	41	1	1	0	1	0	0	1	1	1	1
972	12	41	0	0	1	1	0	0	1	1	1	1
973	13	41	1	0	1	1	0	0	1	1	1	1
974	14	41	0	1	1	1	0	0	1	1	1	1
975	15	41	1	1	1	1	0	0	1	1	1	1
976	16	41	0	0	0	0	1	0	1	1	1	1
977	17	41	1	0	0	0	1	0	1	1	1	1
978	18	41	0	1	0	0	1	0	1	1	1	1
979	19	41	1	1	0	0	1	0	1	1	1	1
980	20	41	0	0	1	0	1	0	1	1	1	1
981	21	41	1	0	1	0	1	0	1	1	1	1
982	22	41	0	1	1	0	1	0	1	1	1	1
983	23	41	1	1	1	0	1	0	1	1	1	1
984	24	41	0	0	0	1	1	0	1	1	1	1
985	1	42	1	0	0	1	1	0	1	1	1	1
986	2	42	0	1	0	1	1	0	1	1	1	1
987	3	42	1	1	0	1	1	0	1	1	1	1
988	4	42	0	0	1	1	1	0	1	1	1	1
989	5	42	1	0	1	1	1	0	1	1	1	1
990	6	42	0	1	1	1	1	0	1	1	1	1
991	7	42	1	1	1	1	1	0	1	1	1	1
992	8	42	0	0	0	0	0	1	1	1	1	1
993	9	42	1	0	0	0	0	1	1	1	1	1
994	10	42	0	1	0	0	0	1	1	1	1	1
995	11	42	1	1	0	0	0	1	1	1	1	1
996	12	42	0	0	1	0	0	1	1	1	1	1
997	13	42	1	0	1	0	0	1	1	1	1	1
998	14	42	0	1	1	0	0	1	1	1	1	1
999	15	42	1	1	1	0	0	1	1	1	1	1
1000	16	42	0	0	0	1	0	1	1	1	1	1
1001	17	42	1	0	0	1	0	1	1	1	1	1
1002	18	42	0	1	0	1	0	1	1	1	1	1
1003	19	42	1	1	0	1	0	1	1	1	1	1
1004	20	42	0	0	1	1	0	1	1	1	1	1
1005	21	42	1	0	1	1	0	1	1	1	1	1
1006	22	42	0	1	1	1	0	1	1	1	1	1
1007	23	42	1	1	1	1	0	1	1	1	1	1
1008	24	42	0	0	0	0	1	1	1	1	1	1
1009	1	43	1	0	0	0	1	1	1	1	1	1
1010	2	43	0	1	0	0	1	1	1	1	1	1
1011	3	43	1	1	0	0	1	1	1	1	1	1
1012	4	43	0	0	1	0	1	1	1	1	1	1
1013	5	43	1	0	1	0	1	1	1	1	1	1
1014	6	43	0	1	1	0	1	1	1	1	1	1
1015	7	43	1	1	1	0	1	1	1	1	1	1
1016	8	43	0	0	0	1	1	1	1	1	1	1
1017	9	43	1	0	0	1	1	1	1	1	1	1
1018	10	43	0	1	0	1	1	1	1	1	1	1
1019	11	43	1	1	0	1	1	1	1	1	1	1
1020	12	43	0	0	1	1	1	1	1	1	1	1
1021	13	43	1	0	1	1	1	1	1	1	1	1
1022	14	43	0	1	1	1	1	1	1	1	1	1
1023	15	43	1	1	1	1	1	1	1	1	1	1