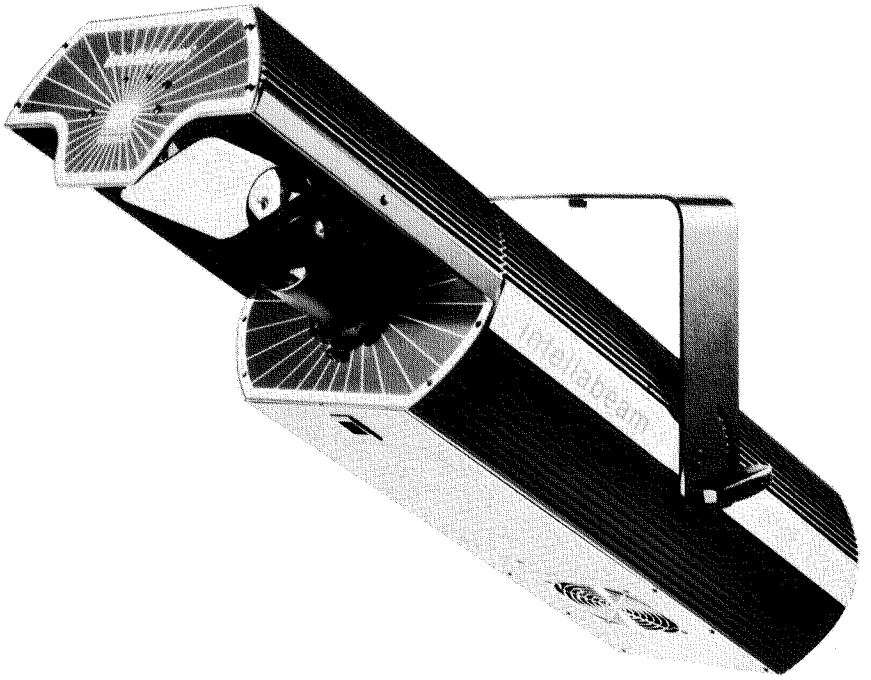
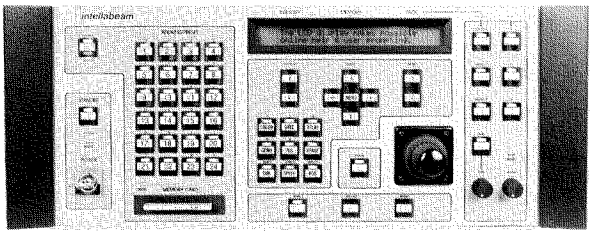
intellabeam® 700 HX System





User Manual

High End Systems, Inc.
2217 West Braker Lane
Austin, Texas USA

LIGHTWAVE RESEARCH®

P/N 60600001

intellabeam 700 HX System

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Austin, Texas USA

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Contents

Introduction

Congratulations on your purchase of the Lightwave Research© *intellabeam*® 700 HX System. The *intellabeam* 700 HX System provides designers and operators a versatile, fully integrated system with unprecedented brightness, speed, and accuracy for the creation of complex lighting cues and scenes.

Your microprocessor-based *intellabeam* Fixture responds to an extensive set of programming features called Constructs. You easily program (define) these Constructs through the Lightwave Research *intellabeam* Controller into simple or complex scenes. You can vary: the beam sizes with the iris, colors, gobo patterns, and light intensity. You also have variable speed programming for: motion, color, gobo, and strobe effects. The result is a lighting system that is ideal for theatrical applications, stage, studio, concert touring, and nightclubs.

The *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 memory space (with battery backup) of the controller. You can protect the stored show from unauthorized editing by simply removing the power keyswitch. You can also store and transfer shows on a removable Memory Card or by serial communications.

The building blocks of scenes (or looks) in the *intellabeam* Controller are called ***Pages.*** A Page is one static setting of all functions and fixtures. When you program a Page you specify one or more fixtures and their Constructs. The controller stores the Page's fixture Address and ***Construct*** (Color, Gobo, Gate, Iris, Dim, Speed, Crossfade, Delay, and Position) information in its internal memory space. This internal memory space is divided into nine ***Memories***. A Memory is a block of internal memory space consisting of 99 programmable Pages.

After you store 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 that you designate as a placeholder. This Page contains no Fixture Construct information; it marks the beginning or ending of a Sequence.

After you create a Sequence that 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 that you recall with a single Preset key press. You can then playback the Presets in any order you choose to form specific scenes.

About This Manual

This manual provides easy to follow procedures for setting up and using your *intellabeam* System. It includes nine chapters and four appendixes. First time users should begin this manual with Chapter 1, Site Planning.

Chapter 1 Site Planning and Precautions — read this section to obtain site planning information. For example, to determine the required voltages, data cable lengths, and truss loading for your *intellabeam* Fixture. Also be sure to read the cautions and warnings listed in this section.

Chapter 2 *intellabeam* Fixture Set Up and Assembly — explains how to set up and assemble your *intellabeam* Fixture. This includes unpacking and inspection, setting the fixture voltage (if required), installing the MSR 700 lamp, assembling the fixture, optimizing the lamp, and setting configuration switches.

Chapter 3 *intellabeam* Controller Set Up and Review — explains how to set up your *intellabeam* Controller. This includes setting controller voltage and frequency (if required); a description of the controller's Liquid Crystal Display (LCD), front panel keys, and rear panel connectors; and setting configuration switches. It also includes descriptions of all the programming Constructs (that is, Color, Gate, Position, and so on).

Chapter 4 Connecting Data Cables — explains how to connect the data cables between the controller and one or more fixtures. It also explains how to cable master/slave configurations where you can greatly expand the system.

Chapter 5 Operating the System — explains how to operate the *intellabeam* System from the *intellabeam* Controller. This includes: turning the system on and performing self-test, using the LCD window to navigate and explore menus, programming the system, using the built-in utilities, and playing back programs. Submaster control is also explained in this chapter.

Chapter 6 Remote Access and Control — explains how to use the remote access and control facility. This allows you to control the *intellabeam* Fixture through a remote control device, such as, a dimmer console or control desk.

Chapter 7 External Memory Storage and Transfer — explains how to perform external memory storage and transfer operations. This includes updating the operating system, and backing up and transferring programs through the removable Memory Card.

Chapter 8 General Maintenance and Troubleshooting — provides general maintenance and troubleshooting procedures.

Chapter 9 Warranty Information — provides warranty information.

Appendix A *intellabeam* Fixture Specifications

Appendix B *intellabeam* Fixture Illustrations

Appendix C *intellabeam* Controller specifications

Appendix D *intellabeam* Controller illustrations

Appendix E Binary Access Table — Use this table with remote access options.

Caution and Warning Symbols

The following two international symbols appear in margins throughout this user manual to highlight Caution and Warning messages.

Caution: This symbol appears adjacent to Caution messages. Not heeding these messages could result in damage to equipment.

Warning: This symbol appears adjacent to Warning messages. Not heeding these messages could result in serious personal injury.

Getting Help

High End Systems Service provides a help line should you encounter any problems during your installation or initial operation. Currently, service hours are 9 a.m. to 6 p.m.(Central), Monday through Friday. The numbers are:

Voice line: (512) 837-3063
Fax line: (512) 834-9195

Chapter 1
Site Planning and Precautions

Prior to mounting the *intellabeam*® System (fixture and controller) you should evaluate your site's electrical and structural characteristics.

Verify the input voltage that you are using for the *intellabeam* System. Is the voltage 100, 120, or 230 volts (you will set or verify the fixture and controller voltages in following Chapters)? Also, is the proper power distribution system in place? That is, ensure that the power cables are properly sized for their length and can safely handle the load; ensure that the circuit breakers are properly sized for the load. Refer to the following *Power Requirements* section for fixture and controller voltage requirements.

Also, consider the truss or apparatus where you are mounting or adding the fixtures. Is there enough support to mount the number of fixtures you are adding at 25.9kg (62 lb) per fixture? And don't forget to use the safety cables.

Determine the required data cable lengths from the controller to each fixture, and between fixtures. See *Data Cable Requirements* in this section for specifics.

Caution: Earth ground all fixtures for proper operation. Erratic operation may result from improperly grounded fixtures. Mount the fixture and controller in a location that is away from direct heat and protected from moisture.

Power Requirements

The *intellabeam* Fixture input power requirements are factory set to initial customer requests. The *intellabeam* Controller is factory set to 230 volts. However, requirements change from site to site, and therefore, you should verify or set the input voltage before plugging in equipment. Chapter 2 explains how to set the fixture voltage and Chapter 3 explains how to set the controller voltage.

Note: The rear fixture panel specifies the Factory Voltage Setting. If you move the fixture between sites you may need to change the settings. Therefore, if you are not absolutely sure of the voltage setting verify the voltage as explained in Chapter 2.

intellabeam Fixture

The *intellabeam* Fixture requires no dimming or switching circuits for operation. Table 1.1 lists the average current requirements per fixture at the specified voltages:

Table 1.1 intellabeam Fixture Current Requirements	
For voltage at:	Current is:
100 VAC, 50/60 Hz	10.0 amps
120 VAC, 50/60 Hz	8.5 amps
230 VAC, 50/60 Hz	4.0 amps

intellabeam Controller

You can easily set the input voltage to either 120 or 230 volts, 50 or 60 Hz. Table 1.2 lists the voltage and approximate current requirements for each controller:

Table 1.2 intellabeam Controller Current Requirements	
For voltage at:	Current is:
115 VAC (90 to 135)	300 milliamperes
230 VAC (180 to 270)	150 milliamperes

Data Cable Requirements

The *intellabeam* Fixture and Controller require standard 3-pin XLR connectors for data input and data output as Figure 1.1 shows.

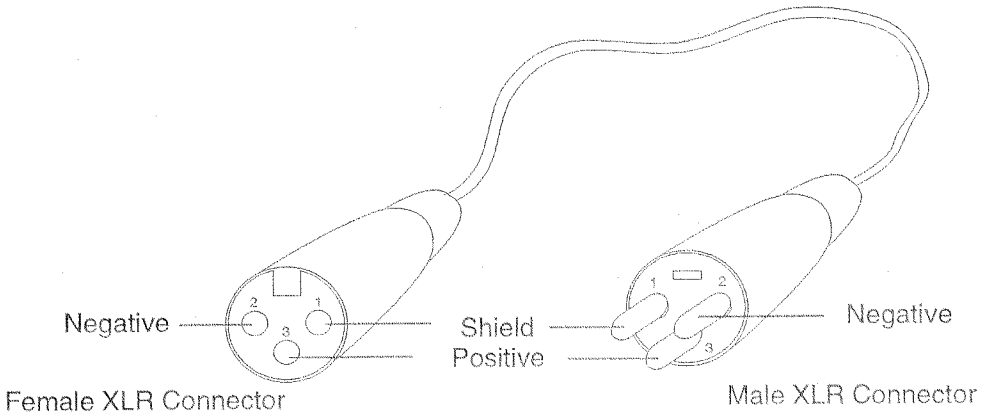


Figure 1. 1. Properly Constructed Data cable

You should construct data cables using shielded, two conductor cable with a male (pins) 3-pin XLR connector at one end and a female (sockets) 3-pin XLR connector on the other end. You can use microphone cables if the pin connections are correct; verify that the pin connections are the same as described in Table 1.3. You should test each

cable with a VOM for correct polarity and ensure that the negative and positive pins are not grounded or shorted to the shield. Also, ensure that pin 1 is shielded.

Note: The data cable length from the controller to the first fixture must be a minimum of 20 feet long. Thereafter, between fixtures, they can be as required for the installation.

Table 1.3 Data Cable Pin Connections
Pin 1 is the shield
Pin 2 is the data compliment (negative)
Pin 3 is the data true (positive)

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 erratic behavior.

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 25.9 kg (62 lb) using either one or two clamps. **Safety cables** are an important part of securely mounting the fixture and are ***highly recommended***.

Precautions

When you handle or work with the *intellabeam* System, please observe the following **warnings** and **cautions:**

Warnings

- The intellabeam 700 HX lamp produces ultraviolet radiation. Prolonged exposure to the unshielded lamp can cause skin and eye burns.
- Do not operate either the fixture or the controller near moisture of any kind to avoid electrical shock and reduce the risk of fire.
- Fuses must be replaced with the specified voltage and current ratings to further protect against fire.
- Do not operate this unit near flammable materials.
- Remove power before replacing the lamp.
- Never remove the top door of the fixture when the fixture lamp is on.

Cautions

- Please note and heed the Warning labels located on the outer panels or both the controller and the fixture.
- Ensure latches are securely fastened on both the top and bottom access doors of the fixture.
- The *intellabeam* System is not designed for residential use.
- These fixtures contain no user-serviceable parts other than normal preventative maintenance and lamp replacements as explained in this manual. Servicing must be conducted by the manufacturer or other qualified service personnel.

Chapter 2
intellabeam Fixture Set Up and Assembly

2

In Chapter 2 you:

- ❑ Unpack and inspect the fixture and controller contents
- ❑ Set fixture voltage (if required)
- ❑ Assemble the *intellabeam* fixture
- ❑ Set configuration and Address DIP switches as required

Unpacking the *intellabeam* System

In this section you unpack your *intellabeam* System and verify that it arrived complete and without any damage.

Saving the Shipping Materials

Do not discard the *intellabeam* Fixture or *intellabeam* Controller shipping cartons 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 cannot be accepted at the factory.

Inspecting the Contents

Your *intellabeam* System arrives in two shipping cartons. One carton contains the controller and its accessories, and the other contains the fixture and its accessories. Carefully unpack both cartons and inspect their contents for damage. If any of the items in the following lists are missing or damaged you must notify both the shipping agent and your sales agent immediately.

The controller carton contains the following items (refer to Figure 2.1):

- One Lightwave Research T-Shirt
- One *intellabeam* 700 HX System User Manual
- One book of *intellabeam* schematic drawings

- One *intellabeam* Backup Floppy Disk (51/4 inch) (inside manual)
- Two controller keys
- One Memory Card
- One blank bezel (use this bezel to optionally replace the "Iris" key when using this controller with only *trackspot* Fixtures)

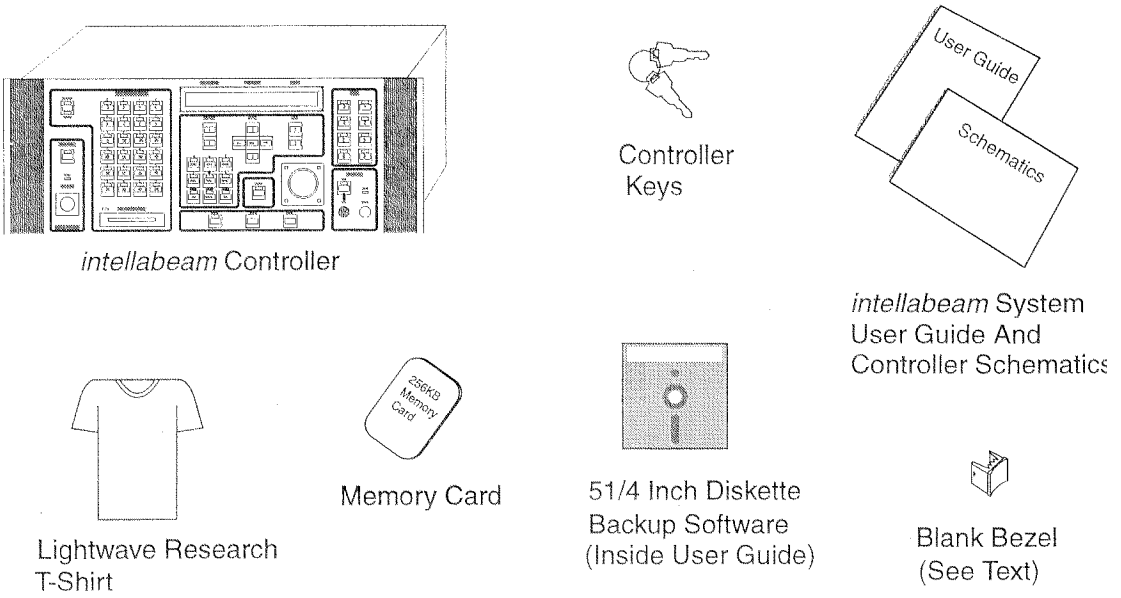


Figure 2.1. Identifying Contents of intellabeam Controller Carton

The fixture carton contains the following items (refer to Figure 2.2):

- One *intellabeam* 700 HX Fixture
- One MSR 700 lamp
- One yoke
- *intellabeam* 700 HX Initial setup instructions packet (installation and optimization instructions)
- Two 3/8 inch (3/8 x 16 x .50) allen cap screw bolts
- Two clamping T-handles

Note: The factory installs the two 3/8 inch allen cap screw bolts and the two clamping T-handles for shipping. You need to remove them in order to install the yoke. Refer to Figure 2.3.

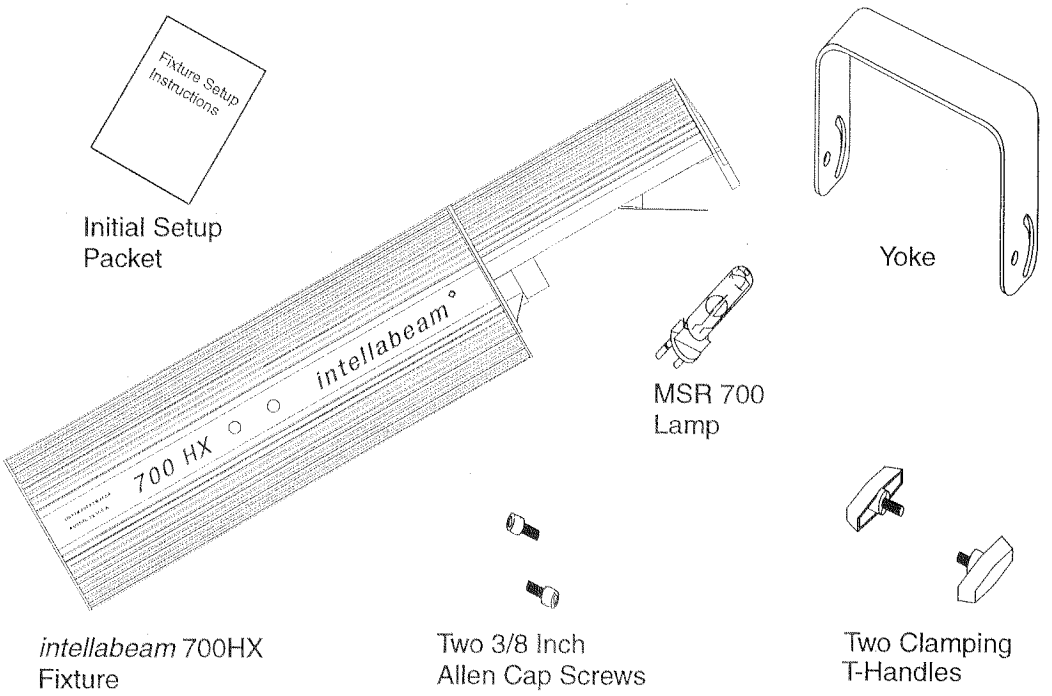
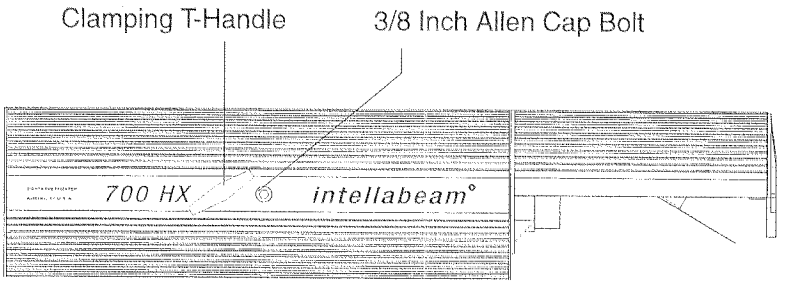


Figure 2.2. Identifying Contents of intellabeam Fixture Carton



Note: Remove T-Handle and 3/8 Inch Allen Cap Bolt form Both Sides of Fixture before Mounting Yoke.

Figure 2.3. intellabeam Fixture Shipping Configuration

Setting the *intellabeam* Fixture Voltage

The *intellabeam* fixture is factory set to customer requirements. Typically, in the U.S. it is 120 volts and in some environments, 208/240 volts. International installations are typically 100 and 240 volts. Normally, the factory setting is correct for your use. However, if you need to change the fixture's input voltage refer to the procedure in this section. Otherwise, proceed to the *Assemble the Fixture* section.

You can easily set the fixture to operate at 100, 120, or 230 volts, 50 or 60 Hertz, by changing jumpers on a quick disconnect terminal block within the fixture. However, before you change the voltage you first change the input fuse on the back panel of the fixture to match the voltage setting.

The voltage range for each setting is ± 10 percent as Table 2.1 shows.

Table 2.1: Voltage Ranges

For Voltage Setting:	The Voltage Range is:
100 Volts	90 to 110 Volts
120 Volts	108 to 132 Volts
230 Volts	207 to 253 Volts

Changing the *intellabeam* Fixture's Fuse

Caution: Do not apply power to the fixture until you have configured the fixture to operate at the required voltage and frequency.

To change the main fuse on the *intellabeam* Fixture's rear panel:

1. Referring to Table 2.2, locate the desired voltage setting in the left column and find the correct fuse size for the selected voltage in the right column.

Table 2.2: Selecting Fuse Size — 50 or 60 Hertz

For this Voltage Setting	Use this Fuse Rating
100 Volts	20 amps
120 Volts	12.5 amps
230 Volts	10 amps

Note: Ensure that you use only a type "FST", 5mm x 20 mm (.2 inch x .8 inch), 250 volt, time lag fuse of the correct value.

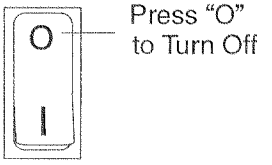
2. Remove power from the fixture and locate the fuse on the rear panel as shown in Figure 2.4.

3. Remove the fuse from the rear panel using a small screwdriver. Insert the screwdriver into the slot on the fuse cap, press in on the fuse cap, and turn it counterclockwise one quarter turn. The fuse cap pops out enough to grab hold. Pull the fuse cap containing the fuse all the way out.
4. Pull the fuse from the cap and replace it with the desired size from Table 2.2. Be careful not to loose the small spring inside the fuse cap.
5. Insert the new fuse and cap back into the rear panel fuse holder in the reverse order that you used to remove it (step 3). Next change the voltage jumper. Do not apply power until you change the voltage jumper to match the fuse.

Changing the Voltage Selection Jumpers

Use this procedures to change the fixture voltage setting. You must also change the fuse as explained in the previous section.

1. First, remove power from the fixture by pressing the power switch to the "Off" (press the O side of switch) position and then unplug the fixture. Refer to Figure 2.4 to locate the power switch.



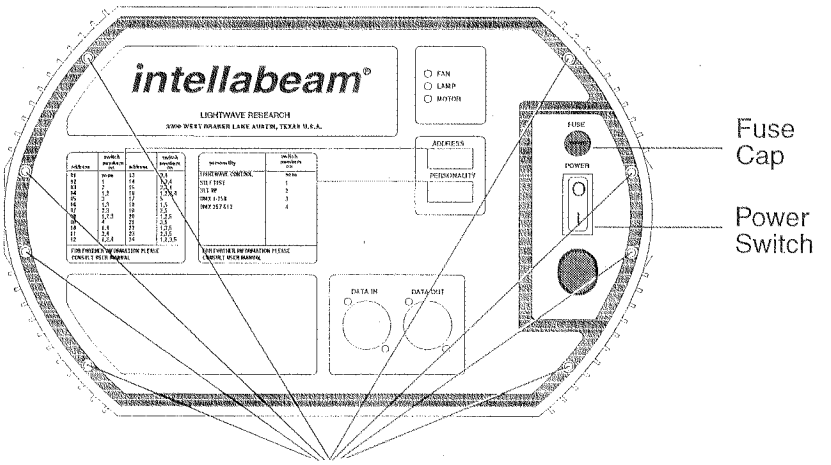


Figure 2.4. intellabeam Fixture Rear panel View

2. Next, you remove the fixture's rear panel. Remove the eight 9/64 inch allen head screws securing it to the fixture. Refer to Figure 2.4.
3. Carefully lower the rear panel out of the way, taking care not to strain the wiring harnesses.
4. Mounted just inside the fixture is the power supply printed circuit board. Locate the multi-pin "voltage select jumper block" connector on the lower right side of the circuit board as Figure 2.5 shows.

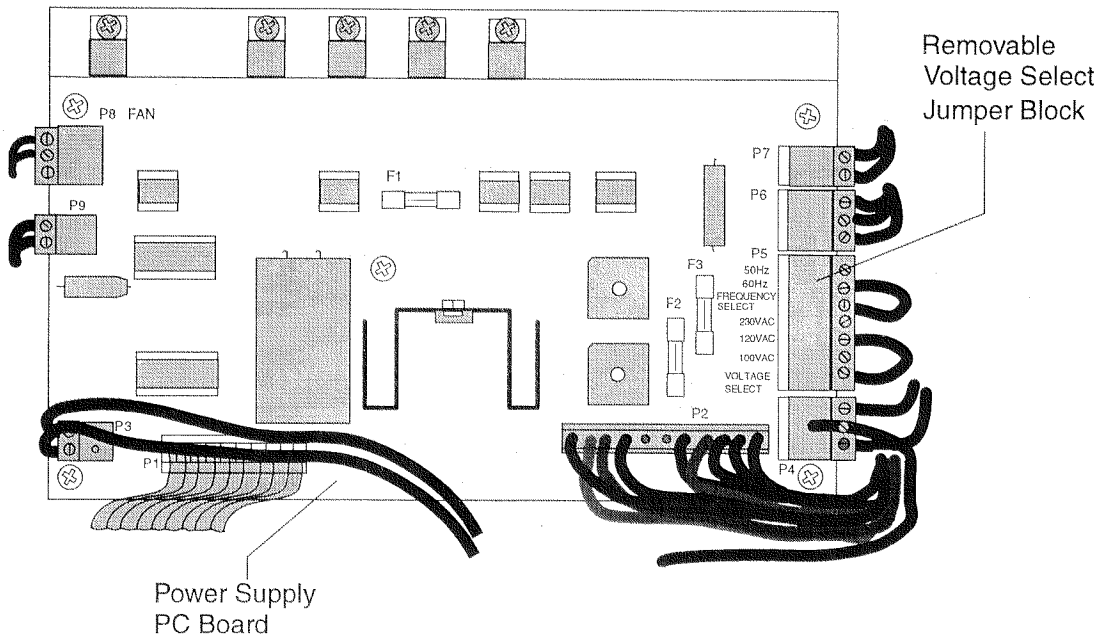


Figure 2.5. Power Supply Board and Voltage Select Jumper Block

5. Remove the mult-pin "voltage select jumper block" from the mating circuit board pins. Refer to Figure 2-6. The jumper wires are attached to the block and are removed with it. If the connector is tight, carefully lift up on each side of the connector in equally small amounts. Repeat this process until you can easily remove the connector. Alternately, you can change the jumpers while the jumper block remains attached to the power supply board.

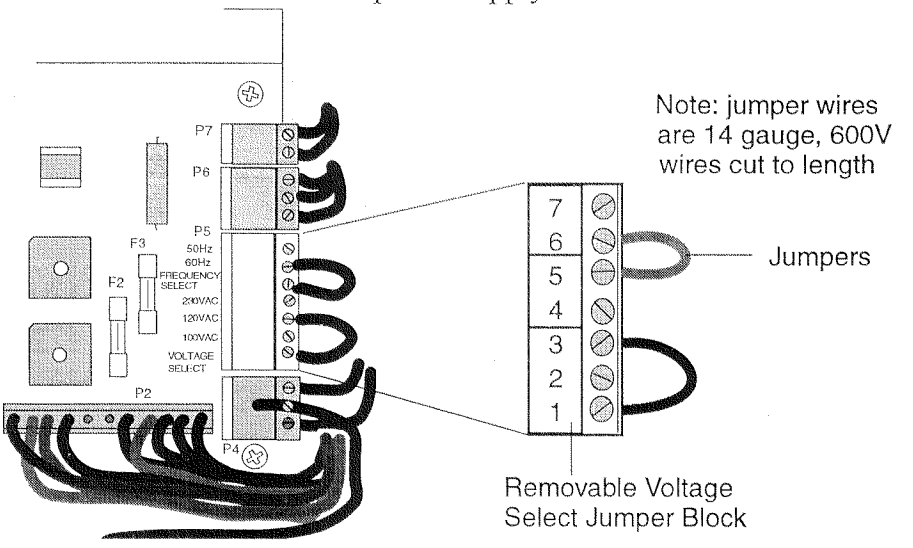


Figure 2.6. Removing Voltage Select Jumper Block

6. Using a small screwdriver, reconfigure the jumpers as required. Refer to Figure 2.7 for jumper configurations.

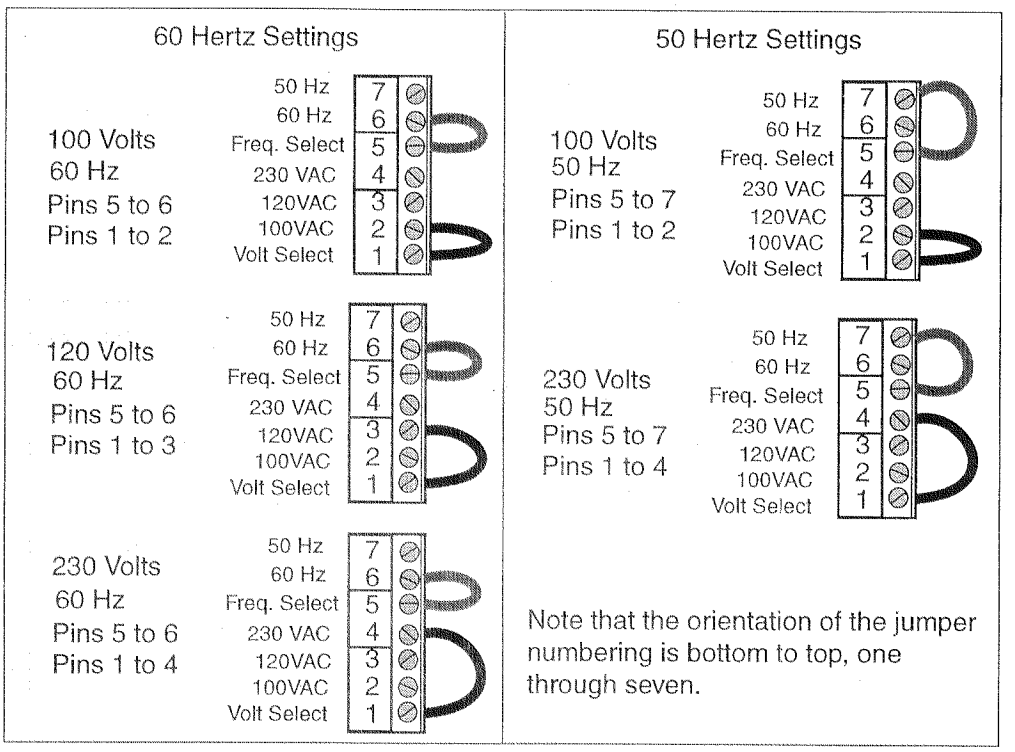


Figure 2.7. Configuring Voltage Selection Jumpers

7. When you are satisfied with your jumper connections, install the jumper block back on the mating circuit board pins. Be sure that the 7 circuit board pins align with the 7 holes in the jumper block. Push the connector until firmly seated on the circuit board.
8. Carefully raise the rear panel back in place and fasten with the eight 9/64 inch allen screws that you removed in step 2.

This completes the procedure on changing the voltage jumpers. Continue with the following *Assembling the Fixture* section.

Assembling the *intellabeam* Fixture

In this section you:

- ❑ Install the yoke and T-handles on the fixture
- ❑ Install the MSR 700 lamp inside the fixture
- ❑ Perform the important step of optimizing the lamp.

Attaching the Yoke

You will need. . . • 3/8 inch allen wrench

1. First, remove the two 3/8 inch allen cap screw bolts and the two clamping T-handles from the fixture (you may have done this in a previous section). Refer to Figure 2.8.

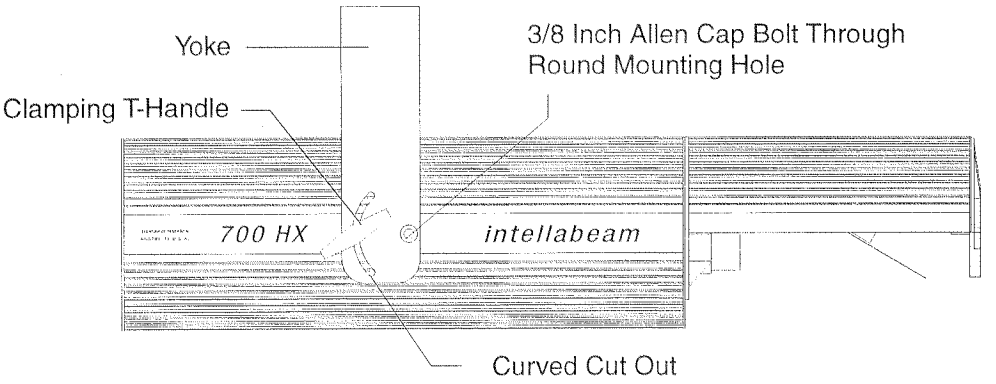


Figure 2.8. Installing the Yoke on intellabeam Fixture

2. Align the mounting holes on the yoke with those on the fixture as Figure 2.8 shows.
3. Insert the two 3/8 inch allen cap screw bolts through the round holes in each side of the yoke. Then, insert the two clamping T- handles into the slotted curved cut outs on side of the yoke.
4. Tighten the 3/8 inch allen cap screw bolts with a 3/8 inch allen wrench.

   The purpose of the clamping T-handles and cut outs is to position and lock the angle of the fixture. Therefore, you should not tighten them completely until the fixture is in place and positioned correctly.
5. On the top of each yoke are three, 13 mm (.5 inch) diameter, mounting holes which provide two different ways to mount the fixture. The three holes are spaced 86 mm (3.4 inch) apart. Refer to Figure 2.9. 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.

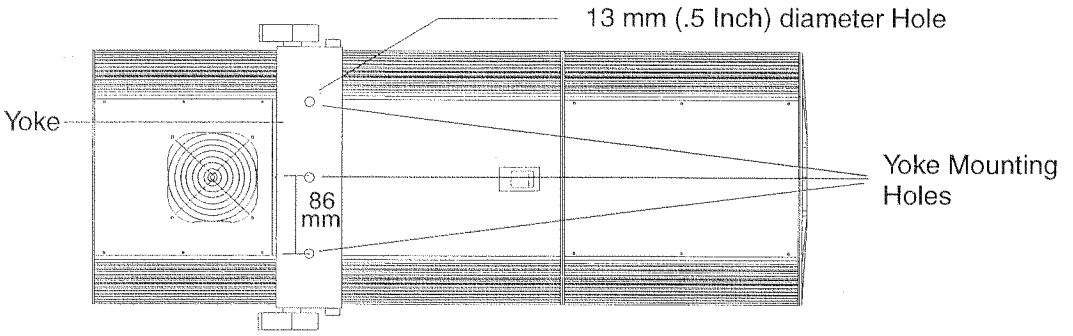


Figure 2.9. intellabeam Fixture — Top View

This complete attaching the yoke, T-handles, and 3/8 allen cap screws. Proceed to the following *Installing the MSR 700 Lamp* procedure.

Installing the MSR 700 Lamp

You will need . . .
• Protective eyewear • Protective gloves •MSR 700 lamp

Warning: Whenever you are working on or near the MSR 700 lamp, wear protective eyewear and clean protective gloves. The lamp is pressurized, therefore, there is a slight possibility that it may shatter. An operating unshielded lamp emits Ultraviolet and visible radiation which could damage eyes and skin. Any contact with dirt or oil from soiled gloves, skin, fingers, and so on, could create a hot spot on the lamp glass. This could cause premature lamp aging and damage. If the lamp is soiled in any way, carefully clean the cold lamp with an alcohol wipe.

To install the MSR 700 lamp:

1. Power off and unplug the fixture before performing any work inside the fixture.

2. Remove the top and bottom access doors from the fixture by sliding the thumb latch on each door towards the rear of the fixture and then lifting the door off. The doors are connected to the fixture by a safety strap. You can unclip the doors from the safety strap or leave them attached for this procedure. The doors are interchangeable. Refer to Figure 2.10.

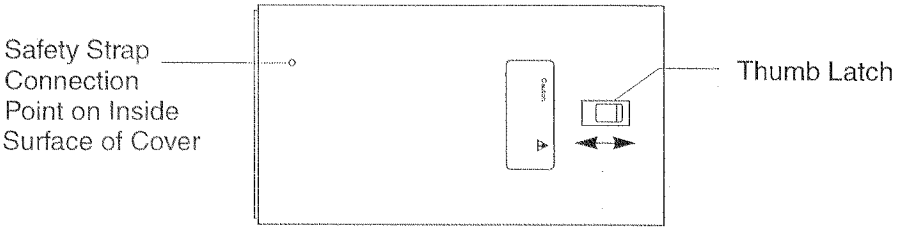


Figure 2.10. Top and Bottom Access Doors

3. Locate the three lamp adjustment screws on the underside of the fixture. Loosen the two outside adjustment screws and slide the lamp socket as far back as possible towards the back of the fixture. This provides the clearance to install the lamp. Refer to Figure 2.11.

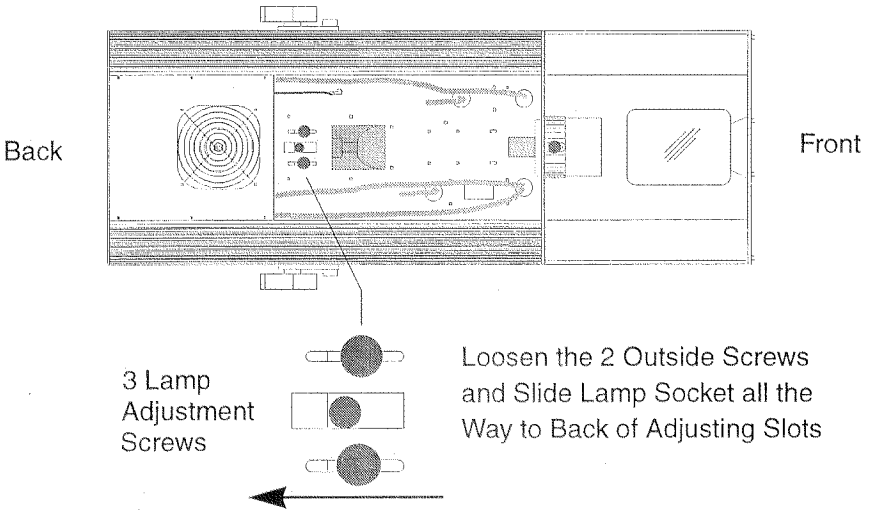


Figure 2.11. Underside Showing 3 Lamp Adjustment Screws

4. Position the fixture so you have easy access to the top side.
5. Next, remove the lamp, in its clear plastic container, from the package. Open the clear plastic container by carefully separating the package on the side with the seal. **Do not remove the lamp from its plastic bag yet. First, put on your protective gloves**. Now, remove the lamp from the plastic bag.
6. Holding on to the ceramic lamp base, gently lower the glass portion of the lamp into the reflector as Figure 2.12 view A shows. **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 premature lamp aging.**

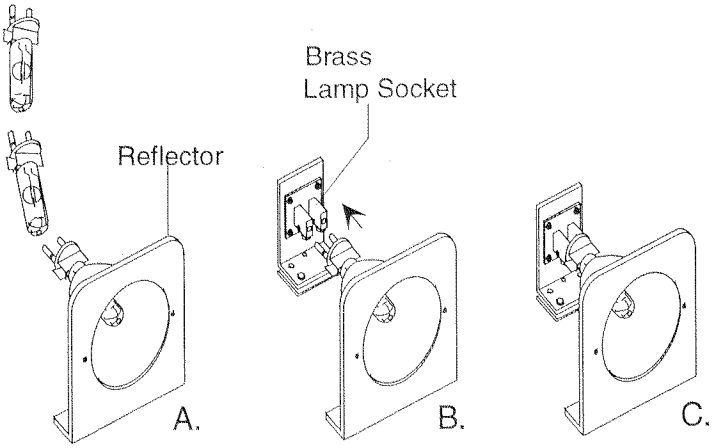


Figure 2.12. Installing Lamp into Lamp Socket Sequence

Note: If you accidentally touch the lamp to your skin, wipe the lamp clean with the sterile alcohol pad supplied with the lamp before applying power to the fixture.

7. Level the lamp in the reflector and guide the lamp into the socket as Figure 2.12 view B. shows.
8. Firmly press the lamp into the lamp socket until fully seated as Figure 2.12 view C. and Figure 2.13 steps 1, 2, and 3 show.

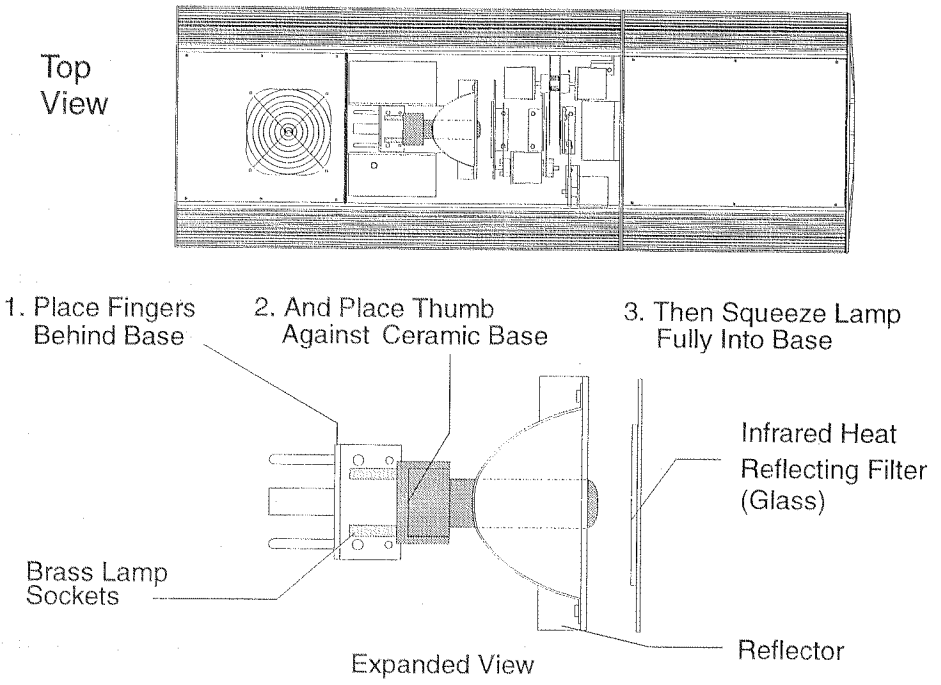


Figure 2.13. Completing Lamp Installation

Caution: The two brass lamp sockets have an adjusting screw on either the underside or top side of the socket. These are important factory set adjustments. Do not adjust these screws.

9. Connect the safety strap back to the top access door if previously removed. Then, replace the top access door to the fixture and secure it in place with the thumb latch.

   Do not replace the bottom access door at this time. You need access to the three lamp adjusting screws to optimize the lamp as explained in the next section, *Lamp Optimization.*

intellabeam Fixture Lamp Optimization

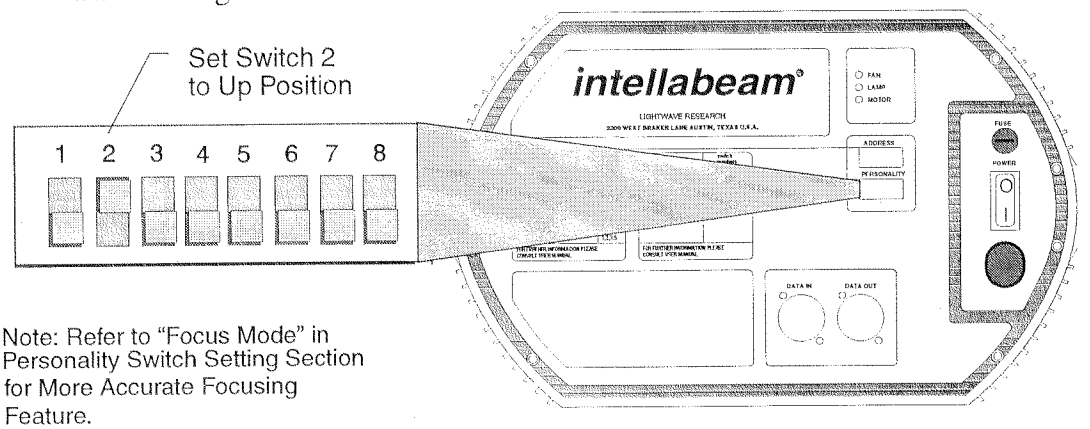
Caution: Never operate the intellabeam Fixture without first optimizing the lamp. Damage to the fixture will occur within moments of operation if the lamp is misaligned.

To optimize the lamp:

1. Enusre that the top access door is securely latched in place.

2. Ensure that the power switch on the rear panel is in the Off position (O). Then, plug the fixture's power cord into the electrical outlet.

3. Next, you place the *intellabeam* Fixture in "Set up" mode. You do this by setting Personality DIP Switch 2 to the "On" or up position. Make sure that all the remaining Personality DIP switches are in the "Off" or down position. Refer to Figure 2.14.



Note: Refer to "Focus Mode" in Personality Switch Setting Section for More Accurate Focusing Feature.

Figure 2.14. Placing intellabeam Fixture in Set Up Mode

4. Turn the fixture power On (I position) by pressing the power switch "I" side.

   The fixture performs its homing operation and strikes the lamp. During the homing operation you will hear several chattering sounds as the wheels, shutter, and mirror seek their home position, this is normal. If Switch 2 is set to "Off" the lamp will not strike.

5. Position the fixture so that the beam is pointing at a flat surface and that the beam has a round shape, not an oval.

   Hint: You circumstances predict how you position the fixture for optimization. However, one suggestion, prior to mounting the fixture on its truss, is to place the fixture on a table or bench with the mirror facing the ceiling. This provides easy access to the three adjusting screws and lens tube, and the flat ceiling provides a convenient flat surface for lamp optimization. If you use this procedure make sure that the cooling fan is not blocked; use two blocks to raise the fixture off the table.

6. Loosen the lens adjustment thumbscrew that holds the lens tube in place at the front of the fixture. Refer to Figure 2.15.

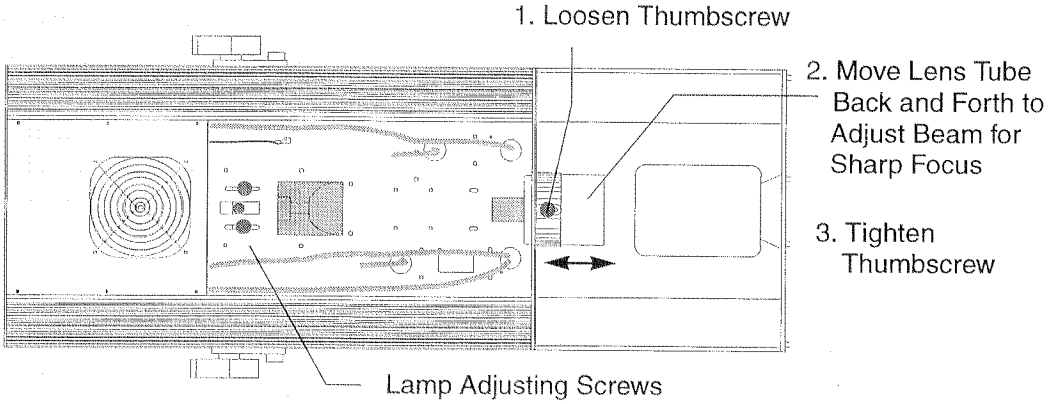


Figure 2.15. Focusing the Lens Tube

7. Then, adjust the lens focus by moving the lens tube back and forth to achieve a sharp beam focus on the illuminated surface. Tighten the lens adjustment screw. Refer to Figure 2.15. You will readjust the lens tube whenever you move the fixture from one location to another.
8. Next, locate the three lamp adjusting screws on the bottom of the fixture. These are the three screws that you previously loosened and moved to install the lamp. Refer to Figures 2.15 and 2.16.

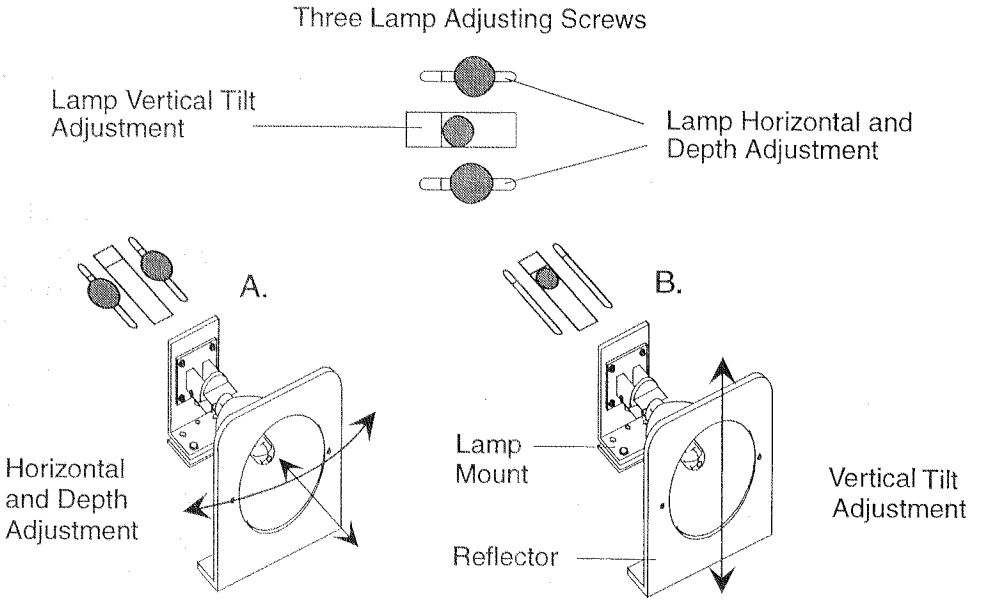


Figure 2.16. Lamp Optimizing Adjustments

You perform the lamp adjustment in two steps, a course adjustment of the three screws followed by a fine adjustment of the same three screws.

9. To perform the course adjustment loosen the two outer, large black, adjustment screws. Refer to Figure 2.16, view A. These two screws control the lamp mount's side to side and depth movement.

   Now, slide the lamp mount back and forth using the two adjustment screws until the beam is at its maximum brightness. Then, use these two adjustment screws too move the lamp mount from side to side for maximum brightness. Using a combination of depth and side to side movements you should be able to obtain an even brightness across the beam with the brightest (hot spot) point of light near the center of the beam. Tighten the two horizontal adjustment screws.

10. To complete the course adjustment you perform the vertical tilt adjustment. Loosen the smaller center black adjustment screw. Refer to Figure 2.16, view B. Now, using the lamp vertical tilt adjustment screw, adjust the height of the lamp until the beam is the brightest and even across the circle. Tighten the vertical adjustment screw.

11. To make the fine adjustment repeat steps 9 and 10. You should now have optimum lamp output.

12. Repeat steps 6 and 7 to refocus the lens tube to obtain a circle of light with the sharpest edge.

    After completing the optimization procedure, you will want to re-adjust the lens tube to produce a sharp-edged beam for mid-air projection. Depending on the trim height and application, the surface projection of the beam is usually out of focus. Ideally, adjust the lens tube after hanging the fixture at the actual trim height.

13. Set Personality Switch 2 to "Off" or down position; the shutter closes. Wait for fan cool down and then turn fixture power "Off".

Focusing suggestions:

For aerial viewing — you must focus the beam so that it appears "in focus" to the viewer. This procedure requires two people, one to focus the fixture and one to stand in the place of the viewer. The viewer gives directions to the focuser for adjusting the focus of the beam. The beam is not focused directly on the viewer, but at some point between the fixture and the viewer. This makes the majority of the beam appear to be aerially "in focus" to the viewer

For floor or screen viewing — position the beam at an average throw distance (in between the farthest and nearest point where it will be viewed) and adjust the lens tube until the circle of light is strong and even across the beam and has a sharp edge. You should re-focus the fixture each time it is moved.

This completes the lamp optimization procedure. Continue with the next section, *Setting intellabeam Personality DIP Switches.*

Setting *intellabeam* Personality DIP Switches

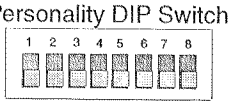
Locate the 8-position DIP switch labeled "PERSONALITY" on the rear panel of the fixture. These eight switches change the operating mode of the fixture. You configure these switches for testing, set up, and control of specialized parameters. Refer to Section 3, *Setting Up the intellabeam* Controller, to set the controller switches.

Setting the Fixture Personality DIP Switches

The purpose of the Personality DIP switch on the rear of the fixture is to configure the fixture for specific requirements. By turning particular switches On or Off, the fixture will respond in different ways. Setting all the switches to the "Off" position is the normal operating mode when using the fixture with the *intellabeam* Controller. Note that a switch is "On" in the up position and "Off" in the down position.

No Switches On: Normal Mode

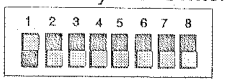
Personality DIP Switch



All switches are in the "off" position, the fixture operates in a normal manner under the control of the *intellabeam* Controller.

Switch 1: Self-Test

Personality DIP Switch



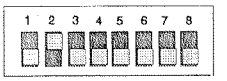
Use Switch 1 to activate the built-in self testing function. To enable, set Switch 1 "On" and then turn on fixture power. The self-test loops until you set Switch 1 "Off".

Switch 1 On – an internal self-diagnostic routine tests each function of the fixture. You do not require a controller for self-test. Thus, if the fixture passes self-test, suspect the cable or controller. Then, run the controller self-test. If the controller passes self-test, suspect the cable. When isolating data problems between fixtures suspect both fixtures and their cables. That is, the first fixture may not be able to pass data to the second fixture or the second fixture may not be able to receive data.

Switch 1 Off – This is the normal operation mode. Note that with Switch 1 on the fixture overrides the controller. During normal operation all three LEDs are On. If a lamp, fan, or motor fails during normal operation the associated lamp turns Off.

Switch 2 : Set-up Mode

Personality DIP Switch



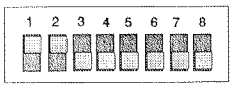
Use Switch 2 to set up and adjust the lamp after installation.

Switch 2 On – in the "On" position, the lamp strikes. This allows you to adjust and focus (optimize) the lamp without connecting the fixture to 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.

Switch 2 Off – in normal operation set this switch to the "off" position. Switch 2 on the fixture (Set-up Mode) overrides the functions of the controller.

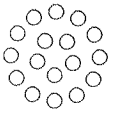
Switches 1 and 2: Focus Mode

Personality DIP Switch



Use Focus Mode to more accurately focus the beam using the multiple dot (drain) gobo pattern. Refer to the *intellabeam Fixture Lamp Optimization* section for the standard optimizing procedure.

Switches 1 and 2 On – fixture is in Focus Mode. In this mode the fixture emits a white beam through the multiple dot gobo pattern. To use Focus Mode, perform the *intellabeam Fixture Lamp Optimization* procedure except set Switches 1 and 2 "On" rather than only Switch 2.



Multiple Dot Gobo Pattern

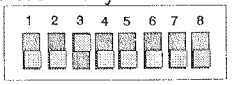
Switches 1 and 2 Off – This is the normal operation mode.

Switches 3, 4, 5, and 8: DMX-512 Control

Use these switches to configure the fixture for DMX-512 direct control rather than using the *intellabeam* Controller. Otherwise, leave these switches in their Off or down position. For additional information about using the DMX-512 protocol and for DMX-512 fixture Addressing tables, refer to the following *Controlling the intellabeam Fixture using USITT DMX-512 Protocol* section.

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

Personality DIP Switch

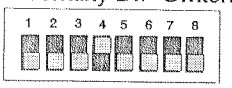


Switch 3 On – enables Channels 1 to 256 (Switch 4 enables Channels 257 to 512). In DMX-512 mode the Address switches have different meaning. Therefore, refer to Table 2.2 to set the DMX-512 Addresses for this fixture.

Switch 3 Off – This is the normal operating mode.

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

Personality DIP Switch

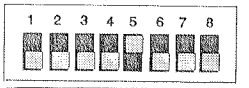


Switch 4 On – enables Channels 257 to 512 (Switch 3 enables Channels 1 to 256). In DMX-512 mode the Address switches have different meaning. Therefore, refer to Table 2.2 to set the DMX-512 Addresses for this fixture.

Switch 4 Off – This is the normal operating mode.

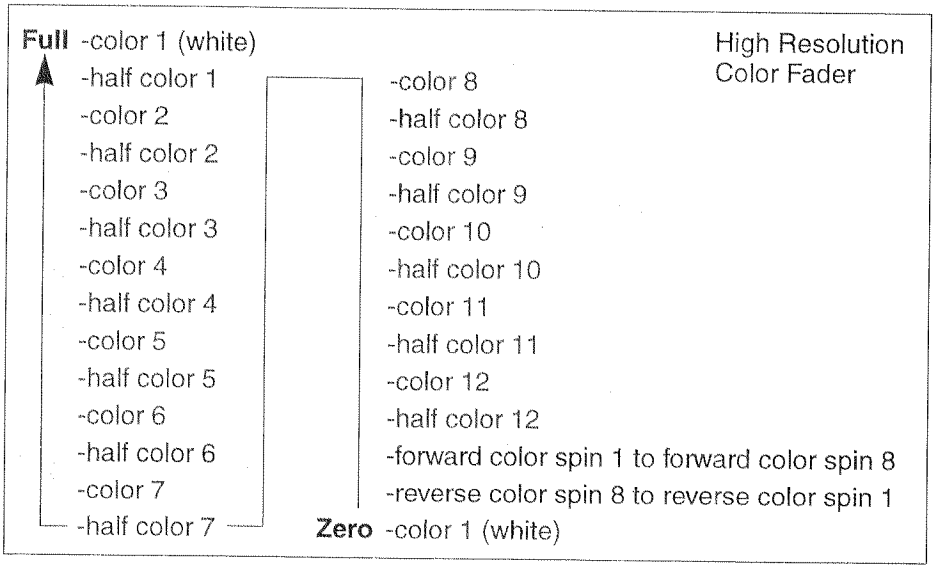
Switch 5: DMX-512 Control (High/Low Resolution)

Personality DIP Switch

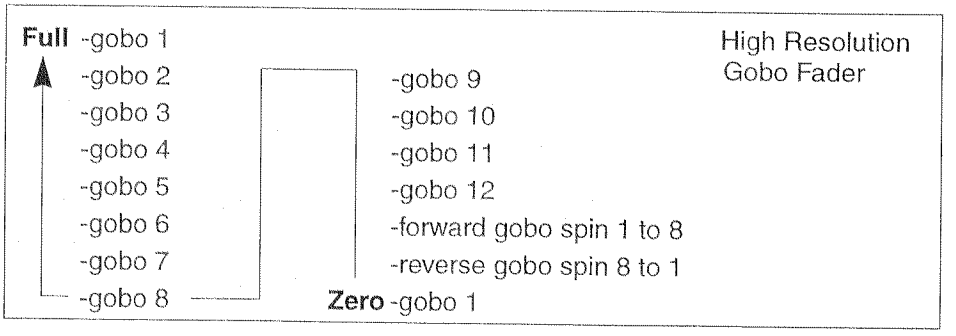


This switch allows you to control the fixture with High resolution DMX-512 Controllers that can access additional color and gobo effects.

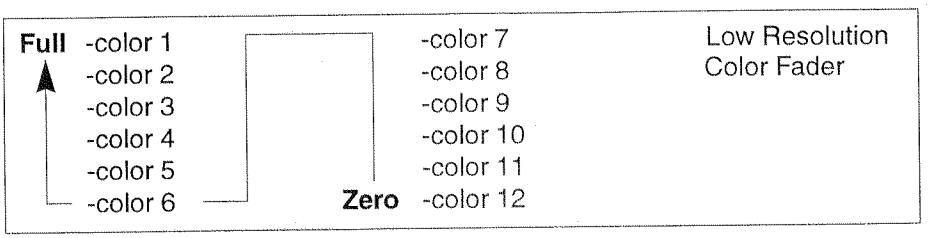
Switch 5 On = High Resolution – set this switch to "On" if you have a DMX-512 Controller capable of High resolution (accurate faders and/or direct numerical control). In High resolution mode the controller's **Color fader** accesses color effects from "zero to full" as follows:



In High resolution mode the controller's **Gobo fader** accesses gobo effects from "zero to full" as follows:

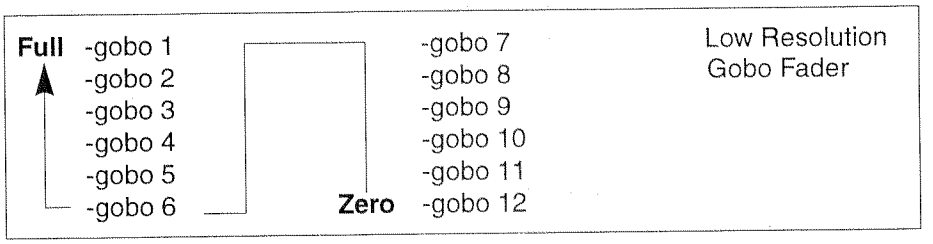


Switch 5 Off = Low Resolution – set this switch to "Off" for normal operation or if you have a Low resolution DMX-512 Controller. In Low resolution mode the **Color fader** accesses color effects from "zero to full" as follows:



You cannot access half colors, oscillating colors, or color spin effects in Low Resolution mode.

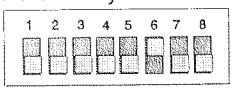
In Low resolution mode the **gobo fader** accesses color effects from "zero to full" as follows:



You cannot access gobo spin effects in Low resolution mode.

Switch 6: Mirror Image

Personality DIP Switch



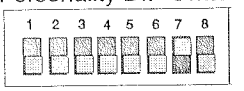
Use Switch 6 to invert the pan motor. This allows two opposing fixtures to respond to the joystick control in the same direction.

Switch 6 On – reverses pan motor movement

Switch 6 Off – This is the normal operating mode. The pan motor moves in its normal direction.

Switch 7: Color Effects

Personality DIP Switch



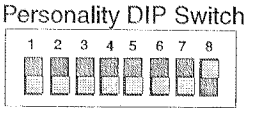
Use Switch 7 to determine how the fixture reacts to the color effects that you program through the *intellabeam* Controller's Color Key. That is, the fixture produces a beam that displays either two adjacent colors simultaneously as two half colors or oscillates between the two adjacent whole colors.

You easily program the desired color combinations into the intellabeam Controller through the front panel Color Key and LCD window menu. Chapter 3 explains this procedure in detail.

Switch 7 On – The fixture accesses half color positions, providing a split colored beam.

Switch 7 Off – This is the normal operating mode. The fixture oscillates between two adjacent colors, producing a color scanning effect.

Switch8: DMX-512 Control (Motor Speed Channel)



Use Switch 8 to configure the fixture for either 7 or 8 channel DMX-512 control. The eighth channel allows you to program the DMX-512 controller for fixture motor speed control. The motor speed determines the time it takes for the fixture's beam to move between programmed scenes.

Switch 8 On – the DMX-512 Controller has 8 channel control over this fixture. Refer to the *Controlling the intellabeam Fixture using USITT DMX-512 Protocol* s section for DMX-512 fixture Addressing.

Switch 8 Off – the DMX-512 Controller has 7 channel control over this fixture. This is also the normal mode when using the *intellabeam* Controller.

Setting *intellabeam* Fixture Address DIP Switches

During operation you select one or more fixtures from the *intellabeam* Controller by pressing Address keys on the controller's Address/Preset Keypad. In order for the controller to find the fixture when you press a key, the fixture must be set to the corresponding Address number (1-24). For example, when you press Address key number 4 on the controller, the controller selects fixture number 4. Therefore, you must assign a unique address to each fixture that corresponds to one of the 24 Address keys on the controller. You do this by setting DIP switches on the fixture's rear panel. Refer to Figure 2.17.

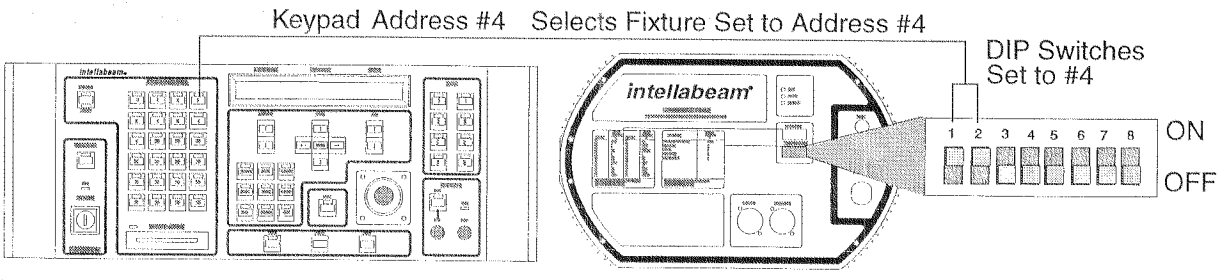


Figure 2.17. Setting intellabeam Fixture DIP Switches

Note: DMX-512 controlled fixtures use a different addressing scheme.

An address table is printed on the back of the fixture which shows the DIP switch settings for the 24 Addresses. The *intellabeam* Fixture address DIP switch settings are listed in Table 2.3.

Table 2.3: Fixture Address DIP Switches

For This Address #	Set These DIP Switches ON (Up)
01	none
02	1
03	2
04	1 and 2
05	3
06	1 and 3
07	2 and 3
08	1, 2, and 3
09	4
10	1 and 4
11	2 and 4
12	1, 2, and 4
13	3 and 4
14	1, 3, and 4
15	2, 3, and 4
16	1, 2,3, and 4
17	5
18	1 and 5
19	2 and 5
20	1, 2, and 5
21	3 and 5
22	1, 3, and 5
23	2, 3, and 5
24	1, 2, 3, and 5

This complete the *Setting intellabeam Personality DIP Switches* section. If you are controlling fixtures with a DMX-512 Controller continue with the next section. Otherwise, this completes Chapter 2. Continue with Chapter 3, *intellabeam Controller Set Up and Review.*

DMX-512 Control of the intellabeam Fixture

The *intellabeam* Fixture is compatible with USITT's[1] DMX-512[2]: 7, 8, 11, and 12 Channel digital transmission standard. The XLR interfacing cable is wired as listed in Table 2.4.

Table 2.4: DMX-512 to intellabeam Fixture Connector Wiring

DMX Controller Cable 5 Pin XLR Female	*intellabeam* Fixture "Data In" Cable 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	

DMX-512 7 and 8 Channel Protocol

To use the fixture in this mode you configure Personality DIP Switches 3, 4, 5, and 8 as explained in this section, listed in Table 2.5, and the previous *Setting intellabeam Personality DIP Switches* section.

The *intellabeam* Fixture requires either 7 or 8 consecutive dimmer channels starting with the base channel. The base channel is set by the fixture's rear panel Personality DIP switches.

To enable DMX operation, set either Switch 3 or Switch 4 to the "On" position. Which switch you set depends on the channels that you want to assign to this fixture. When Switch 3 is in the "On" position, you select base channels 1-256. When Switch 4 is in the "On" position, you select base channels 257-512.

Switch 8 on the fixture's Personality DIP switch determines whether you use 7 or 8 Channel mode. Set Switch 8 to "Off" for 7 Channel mode or set Switch 8 to "On" for 8 Channel mode. The channels are assigned in the following order:

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

Note: Refer back to the *Setting intellabeam Personality DIP Switches* section for details on setting Switches 3, 4, 5, and 8.

When you apply a valid DMX signal to the *intellabeam* Fixture, it powers up

1. USITT is United States Institute of Theater Technology.
2. DMX-512 is Digital Multiplexed (512 channels).

its lamp, motors, and fan. You can remove the DMX signal for up to one second without affecting the fixture. After one second without a signal, the fixture closes its shutter and goes dark. However, the lamp remains on for 30 seconds and the fan continues to run for three minutes.

To **Home** the *intellabeam* Fixtures when using the DMX-512 mode, remove the DMX signal for at least five seconds, but not more than 30 seconds. When you re-insert the signal, the fixtures 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 8 "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 8 "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.)

You set Personality DIP Switch 5 for High or Low resolution. High resolution is Switch 5 "ON" and Low resolution is Switch 5 "OFF". The **Color** and **Gobo** Channels depend on the setting of Personality Switch 5. That is, the Color and Gobo features in Low resolution are a subset of the features available in High resolution mode. The "Off" position accesses DMX low-resolution mode, and is intended to help users with small or coarse fader travel. The "On" position accesses DMX high-resolution mode, and is intended for users with more accurate faders or direct numerical control of each **Dim** Channel.

Table 2.5. DMX 7 and 8 Channel Personality Switch Settings

Personality DIP Switch	1	2	3	4	5	6	7	8
7 Channel DMX			On for Chan. 1-256	On for Chan. 256-512	Off			Off
8 Channel DMX (Includes Speed Channel)			On for Chan. 1-256	On for Chan. 256-512	Off			On
7 Channel DMX for High Resolution DMX Boards			On for Chan. 1-256	On for Chan. 256-512	On			Off
8 Channel DMX for High Resolution DMX Boards			On for Chan. 1-256	On for Chan. 256-512	On			On

Fixture Addressing in DMX Mode — The Addressing scheme in DMX mode is different than in normal Addressing mode, although you use the same switches for both modes.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 DMX Address DIP switch settings corresponding to the fixture Address numbers are outlined in the Tables 2.6 (7 channel) and 2.7 (8 channel) on the following pages.

Table 2.6 Addressing Fixtures in 7 Channel DMX-512 Mode

DMX Channel #'s	Set Fixture Address DIP Switches	For This *intellabeam* Fixture #	DMX Channel #'s	Set Fixture Address DIP Switches	For This *intellabeam* Fixture #	DMX Channel #'s	Set Fixture Address DIP Switches	For This *intellabeam* Fixture #
001 [257] 002 [258] 003 [259] 004 [260] 005 [261] 006 [262] 007 [263]	None	Fixture 1	050 [306] 051 [307] 052 [308] 053 [309] 054 [310] 055 [311] 056 [312]	1,5,6	Fixture 8	099 [355] 100 [356] 101 [357] 102 [358] 103 [359] 104 [360] 105 [361]	2,6,7	Fixture 15
008 [264] 009 [265] 010 [266] 011 [267] 012 [268] 013 [269] 014 [270]	1,2,3	Fixture 2	057 [313] 058 [314] 059 [315] 060 [316] 061 [317] 062 [318] 063 [319]	4,5,6	Fixture 9	106 [362] 107 [363] 108 [364] 109 [365] 110 [366] 111 [367] 112 [368]	1,4,6,7	Fixture 16
015 [271] 016 [272] 017 [273] 018 [274] 019 [275] 020 [276] 021 [277]	2,3,4	Fixture 3	064 [320] 065 [321] 066 [322] 067 [323] 068 [324] 069 [325] 070 [326]	1,2,3,4,5,6	Fixture 10	113 [369] 114 [370] 115 [371] 116 [372] 117 [373] 118 [374] 119 [375]	5,6,7	Fixture 17
022 [278] 023 [279] 024 [280] 025 [281] 026 [282] 027 [283] 028 [284]	1,3,5	Fixture 4	071 [327] 072 [328] 073 [329] 074 [330] 075 [331] 076 [332] 077 [333]	2,3,7	Fixture 11	120 [376] 121 [377] 122 [378] 123 [379] 124 [380] 125 [381] 126 [382]	1,2,3,5,6,7	Fixture 18
029 [285] 030 [286] 031 [287] 032 [288] 033 [289] 034 [290] 035 [291]	3,4,5	Fixture 5	078 [334] 079 [335] 080 [336] 081 [337] 082 [338] 083 [339] 084 [340]	1,3,4,7	Fixture 12	127 [383] 128 [384] 129 [385] 130 [386] 131 [387] 132 [388] 133 [389]	2,3,4,5,6,7	Fixture 19
036 [292] 037 [293] 038 [294] 039 [295] 040 [296] 041 [297] 042 [298]	1,2,6	Fixture 6	085 [341] 086 [342] 087 [343] 088 [344] 089 [345] 090 [346] 091 [347]	3,5,7	Fixture 13	134 [390] 135 [391] 136 [392] 137 [393] 138 [394] 139 [395] 140 [396]	1,3,8	Fixture 20
043 [299] 044 [300] 045 [301] 046 [302] 047 [303] 048 [304] 049 [305]	2,4,6	Fixture 7	092 [348] 093 [349] 094 [350] 095 [351] 096 [352] 097 [353] 098 [354]	1,2,4,5,7	Fixture 14	141 [397] 142 [398] 143 [399] 144 [400] 145 [401] 146 [402] 147 [403]	3,4,8	Fixture 21

Notes: 1. For DMX Channels 1 through 256, set *intellabeam* Fixture Personality DIP Switch 3 to "On".
2. For DMX Channels 257 through 512 (values in brackets "[ ]"), set *intellabeam* Fixture Personality DIP Switch 4 to "On".

Table 2.6 Addressing Fixtures in 7 Channel DMX-512 Mode (cont'd)

DMX Channel #'s	Set Fixture Address DIP Switches	For This *intellabeam* Fixture #
148 [404] 149 [405] 150 [406] 151 [407] 152 [408] 153 [409] 154 [410]	1,2,5,8	Fixture 22
155 [411] 156 [412] 157 [413] 158 [414] 159 [415] 160 [416] 161 [417]	2,4,5,8	Fixture 23
162 [418] 163 [419] 164 [420] 165 [421] 166 [422] 167 [423] 168 [424]	1,6,8	Fixture 24
169 [425] 170 [426] 171 [427] 172 [428] 173 [429] 174 [430] 175 [431]	4,6,8	Fixture 25
176 [432] 177 [433] 178 [434] 179 [435] 180 [436] 181 [437] 182 [438]	1,2,3,4,6,8	Fixture 26
183 [439] 184 [440] 185 [441] 186 [442] 187 [443] 188 [444] 189 [445]	2,3,5,6,8	Fixture 27
190 [446] 191 [447] 192 [448] 193 [449] 194 [450] 195 [451] 196 [452]	1,3,4,5,6,8	Fixture 28
197 [453] 198 [454] 199 [455] 200 [456] 201 [457] 202 [458] 203 [459]	3,7,8	Fixture 29
204 [460] 205 [461] 206 [462] 207 [463] 208 [464] 209 [465] 210 [466]	1,2,4,7,8	Fixture 30
211 [467] 212 [468] 213 [469] 214 [470] 215 [471] 216 [472] 217 [473]	2,5,7,8	Fixture 31
218 [474] 219 [475] 220 [476] 221 [477] 222 [478] 223 [479] 224 [480]	1,4,5,7,8	Fixture 32
225 [481] 226 [482] 227 [483] 228 [484] 229 [485] 230 486] 231 [487]	6,7,8	Fixture 33
232 [488] 233 [489] 234 [490] 235 [491] 236 [492] 237 [493] 238 [494]	1,2,3,6,7,8	Fixture 34
239 [495] 240 [496] 241 [497] 242 [498] 243 [499] 244 [500] 245 [501]	2,3,4,6,7,8	Fixture 35
246 [502] 247 [503] 248 [504] 249 [505] 250 [506] 251 [507] 252 [508]	1,3,5,6,7.8	Fixture 36
253 [509] 254 [510] 255 [511] 256 [512]		

Notes: 1. For DMX Channels 1 through 256, set *intellabeam* Fixture Personality DIP Switch 3 to "On".
2. For DMX Channels 257 through 512 (values in brackets "[ ]"), set *intellabeam* Fixture Personality DIP Switch 4 to "On".

Table 2.7 Addressing Fixtures in 8 Channel DMX-512 Mode

DMX Channel #'s	Set Fixture Address DIP Switches	For This *intellabeam* Fixture #	DMX Channel #'s	Set Fixture Address DIP Switches	For This *intellabeam* Fixture #	DMX Channel #'s	Set Fixture Address DIP Switches	For This *intellabeam* Fixture #
001 [257] 002 [258] 003 [259] 004 [260] 005 [261] 006 [262] 007 [263] 008 [264]	None	Fixture 1	049 [305] 050 [306] 051 [307] 052 [308] 053 [309] 054 [310] 055 [311] 056 [312]	5,6	Fixture 7	097 [353] 098 [354] 099 [355] 100 [356] 101 [357] 102 [358] 103 [359] 104 [360]	6,7	Fixture 13
009 [265] 010 [266] 011 [267] 012 [268] 013 [269] 014 [270] 015 [271] 016 [272]	4	Fixture 2	057 [313] 058 [314] 059 [315] 060 [316] 061 [317] 062 [318] 063 [319] 064 [320]	4,5,6	Fixture 8	105 [361] 106 [362] 107 [363] 108 [364] 109 [365] 110 [366] 111 [367] 112 [368]	4,6,7	Fixture 14
017 [273] 018 [274] 019 [275] 020 [276] 021 [277] 022 [278] 023 [279] 024 [280]	5	Fixture 3	065 [321] 066 [322] 067 [323] 068 [324] 069 [325] 070 [326] 071 [327] 072 [328]	7	Fixture 9	113 [369] 114 [370] 115 [371] 116 [372] 117 [373] 118 [374] 119 [375] 120 [376]	5,6,7	Fixture 15
025 [281] 026 [282] 027 [283] 028 [284] 029 [285] 030 [286] 031 [287] 032 [288]	4,5	Fixture 4	073 [329] 074 [330] 075 [331] 076 [332] 077 [333] 078 [334] 079 [335] 080 [336]	4,7	Fixture 10	121 [377] 122 [378] 123 [379] 124 [380] 125 [381] 126 [382] 127 [383] 128 [384]	4,5,6,7	Fixture 16
033 [289] 034 [290] 035 [291] 036 [292] 037 [293] 038 [294] 039 [295] 040 [296]	6	Fixture 5	081 [337] 082 [338] 083 [339] 084 [340] 085 [341] 086 [342] 087 [343] 088 [344]	5,7	Fixture 11	129 [385] 130 [386] 131 [387] 132 [388] 133 [389] 134 [390] 135 [391] 136 [392]	8	Fixture 17
041 [297] 042 [298] 043 [299] 044 [300] 045 [301] 046 [302] 047 [303] 048 [304]	4,6	Fixture 6	089 [345] 090 [346] 091 [347] 092 [348] 093 [349] 094 [350] 095 [351] 096 [352]\	4,5,7	Fixture 12	137 [393] 138 [394] 139 [395] 140 [396] 141 [397] 142 [398] 143 [399] 144 [400]	4,8	Fixture 18

Notes: 1. For DMX Channels 1 through 256, set *intellabeam* Fixture Personality DIP Switch 3 to "On".
2. For DMX Channels 257 through 512 (values in brackets "[ ]"), set *intellabeam* Fixture Personality DIP Switch 4 to "On".

Table 2.7 Addressing Fixtures in 8 Channel DMX-512 Mode (cont'd)

DMX Channel #'s	Set Fixture Address DIP Switches	For This *intellabeam* Fixture #	DMX Channel #'s	Set Fixture Address DIP Switches	For This *intellabeam* Fixture #	DMX Channel #'s	Set Fixture Address DIP Switches	For This *intellabeam* Fixture #
145 [401] 146 [402] 147 [403] 148 [404] 149 [405] 150 [406] 151 [407] 152 [408]	5,8	Fixture 19	185 [441] 186 [442] 187 [443] 188 [444] 189 [445] 190 [446] 191 [447] 192 [448]	4,5,6,8	Fixture 24	225 [481] 226 [482] 227 [483] 228 [484] 229 [485] 230 486] 231 [487] 232 [488]	6,7,8	Fixture 29
151 [409] 152 [410] 155 [411] 156 [412] 157 [413] 158 [414] 159 [415] 160 [416]	4,5,8	Fixture 20	193 [449] 194 [450] 195 [451] 196 [452] 197 [453] 198 [454] 199 [455] 200 [456]	7,8	Fixture 25	233 [489] 234 [490] 235 [491] 236 [492] 237 [493] 238 [494] 239 [495] 240 [496]	4,6,7,8	Fixture 30
161 [417] 162 [418] 163 [419] 164 [420] 165 [421] 166 [422] 167 [423] 168 [424]	6,8	Fixture 21	201 [457] 202 [458] 203 [459] 204 [460] 205 [461] 206 [462] 207 [463] 208 [464]	4,7,8	Fixture 26	241 [497] 242 [498] 243 [499] 244 [500] 245 [501] 246 [502] 247 [503] 248 [504]	5,6,7,8	Fixture 31
169 [425] 170 [426] 171 [427] 172 [428] 173 [429] 174 [430] 175 [431] 176 [432]	4,6,8	Fixture 22	209 [465] 210 [466] 211 [467] 212 [468] 213 [469] 214 [470] 215 [471] 216 [472]	5,7,8	Fixture 27	249 [505] 250 [506] 251 [507] 252 [508] 253 [509] 254 [510] 255 [511] 256 [512]	4,5,6,7.8	Fixture 32
177 [433] 178 [434] 179 [435] 180 [436] 181 [437] 182 [438] 183 [439] 184 [440]	5,6,8	Fixture 23	217 [473] 218 [474] 219 [475] 220 [476] 221 [477] 222 [478] 223 [479] 224 [480]	4,5,7,8	Fixture 28			

Notes: 1. For DMX Channels 1 through 256, set *intellabeam* Fixture Personality DIP Switch 3 to "On".
2. For DMX Channels 257 through 512 (values in brackets "[ ]"), set *intellabeam* Fixture Personality DIP Switch 4 to "On".

Extended DMX-512 11 and 12 Channel Protocol

In addition to the 7 and 8 Channel support, the *intellabeam* Fixture supports an 11 and 12 channel implementation of the USITT DMX-512 protocol. This Extended DMX protocol is intended for use only with an intelligent control system, and not for direct control from an analog fader or voltage source. Several values in this protocol are bit encoded, and therefore, not suited for direct live control from traditional theatrical controls. It is recommended that you first read and understand the previous section: *DMX-512 7 and 8 Channel Protocol* for basic DMX operation.

The Extended DMX mode is selected using Personality DIP switches on the *intellabeam* Fixture. In addition to the Switches 3,4,5, and 8 that you set in 7 and 8 channel DMX operation, Extended DMX mode adds Switch 6. Table 2.8 shows the Personality Switch configurations for all the DMX modes.

Table 2.8. DMX Mode Personality Switch Settings

Personality DIP Switch	1	2	3	4	5	6	7	8
7 Channel DMX			On for Chan. 1-256	On for Chan. 256-512	Off	Off		Off
8 Channel DMX (Includes Speed Channel)			On for Chan. 1-256	On for Chan. 256-512	Off	Off		On
7 Channel DMX for High Resolution DMX Boards			On for Chan. 1-256	On for Chan. 256-512	On	Off		Off
8 Channel DMX for High Resolution DMX Boards			On for Chan. 1-256	On for Chan. 256-512	On	Off		On
11 Channel Extended DMX (No Checksum)			On for Chan. 1-256	On for Chan. 256-512	On	On		Off
12 Channel Extended DMX (With Checksum)			On for Chan. 1-256	On for Chan. 256-512	On	On		On

Each channel in the 7 and 8 Channel DMX-512 protocol contains a byte of information. For example, pan, tilt, color, and so on, each contain one byte of information (one byte equals 8 bits). This mapping of one channel per byte changes somewhat in 11 and 12 channel mode. That is, Pan and Tilt each contain a second byte of information and two new channels are added, Extended byte and Checksum. Thus, the 12 channels are mapped as follows:

1. Pan – high byte, MSB
2. Pan – low byte, LSB
3. Tilt – high byte, MSB
4. Tilt – low byte, LSB
5. Color – one byte
6. Gobo – one byte
7. Shutter – one byte
8. Dim – one byte
9. Iris – one byte
10. Speed – one byte
11. Extra byte – one byte
12. Checksum – one byte

MSB = Most Significant Byte
LSB = Least Significant Byte

Channels 1 and 2 — Pan High, MSB and Pan Low, LSB

These first two channels are combined to form a 16 bit value for pan position. The full range of 0 - 65535 (0 - FFFFh (hexadecimal)) uses 32768 (8000h) as the center position. Scaling to fixture resolution occurs in the fixture.

Channels 2 and 3 — Tilt High, MSB and Tilt Low, LSB

These next two channels are combined to form a 16 bit value for tilt position. The full range of 0-65535 (0-FFFFh) uses 32768 (8000h) as the center position. Scaling to fixture resolution occurs in the fixture.

Channel 5 — Color

The Color Channel is bit encoded as shown in the following diagram. This is identical to the Color Channel of the *intellabeam* Fixture protocol.

```
00shcccc     cccc    =  COLOR number (0-11d), 0 = color number 1
                     s  =     speed of gobo changes
                              0  =     fastest possible speed
                              1  =     proportional to mspeed
                     h  =     half colors or color oscillations.
                              0  =     normal colors
                              1  =     halfway between color and
                                       color+1 or oscillating between
                                       two colors as set on fixture.
             -or-
01d00rrr     rrrr    =  COLOR spin rate (0-7),0 = rate 1
                     d  =     direction of spin
                              0  =     forward
                              1  =     reverse
```

Channel 6 — Gobo

The Gobo Channel is bit encoded as shown in the following diagram. This is identical to the Gobo Channel of the *intellabeam* Fixture protocol.

```
00s0gggg     gggg    =  GOBO number (0 - 11d), 0 = gobo number 1
                     s  =      speed of gobo changes
                               0     =     fastest possible speed
                               1     =     proportional to mspeed
             -or-

01d00rrr     rrrr    =  GOBO spin rate (0-7),  0 = rate 1
                     d  =      direction of spin
                               0     =     forward
                               1     =     reverse
```

Channel 7 — Shutter

The Shutter Channel is bit encoded as shown in the following diagram. This is identical to the Shutter Channel of the *intellabeam* Fixture protocol.

0000000s	s	=	SHUTTER position (0 or 1) 0 = closed 1 = open
	-or-		
01000rrr	rrrr	=	SHUTTER strobe rate (0-7), 0 = rate 1

Channel 8 — Dim

The Dim Channel is a full range 8 bit value. Blackout is at 0, Full output is at 255 (FFh)

Channel 9 — Iris

The Iris Channel is a full range 8 bit value. Minimum iris is at 0, Full open iris is at 255 (FFh)

Channel 10 — Speed

The speed channel is a full range 8 bit value. The function is as shown in the following diagram.

```
zero to full =
      automatic speed control (as in 7 chan mode)
      slowest speed (longest time)
      .
      .
      fastest speed (shortest time)
```

Values between 95% and 99% are best for editing or continuous control, such as, cross fades or trackballs.

Channel 11 — Extra byte

The Extra byte Channel is bit encoded as shown in the following diagram. This is identical to the Extra byte of the *intellabeam* Fixture protocol except that the high bit is set. This is to help prevent accidental homing and shutdown due to any possible "bobble" on idle channels which are supposed to be set to a zero value.


```
1000rrsh        EXTRA byte
                s       =  shutdown bit
                           1 =   shutdown fixture
                h       =  home bit
                           1 =   home fixture on 0 to 1 transition.
                                 To home: set to 1 for one or more
                                 packets, then reset to 0.
                           r =   reserved for future use.
                                 Must be reset to 0.
```

Channel 12 Checksum

The checksum is the 8 bit LSB of the arithmetic sum of the 8 bit values of channels 1 through 11. That is, add the first 11 channels, and divide by 256. The remainder of the division is the checksum.

Chapter 3
intellabeam Controller Set Up and Review

In Chapter 3 you:

- ❑ set the controller's voltage and frequency (if required)
- ❑ review the controller's LCD window, front panel, and rear panel. This includes descriptions of all the controller's programming Constructs
- ❑ set configuration switches
- ❑ are presented with information about using the controller with *trackspot* fixtures.

Setting *intellabeam* Controller Voltage and Frequency

The *intellabeam* controller is factory set to the 230 volt setting for 180 to 270 volt operation. The frequency is factory set to 50 Hertz. The typical U.S. voltage setting is 120 volts and in some environments, 208/240 volt; the frequency is always 60Hz in the U.S. unless operated from special equipment, for example, a 50Hz motor generator. International installations are typically 240 volts at 50Hz and 100 volts at 50/60 Hz. If you need to change the controller's input voltage and frequency refer to the procedures in this section. Otherwise, proceed to the *Review of the intellabeam Controller* section.

Setting *intellabeam* Controller Voltage

You can easily set the input voltage to either the 115 or 230 volt setting. Use the 115 volt setting if your voltage range is 90 to 135 volts. Use the 230 volt setting if your voltage range is 180 to 270 volts. Table 3.1 lists the voltage and approximate current requirements for each controller setting:

Table 3.1 intellabeam Controller Current Requirements

For voltage set at:	Current is:
115 VAC (90 - 135)	300 milliamperes
230 VAC (180 - 270)	150 milliamperes

To change or verify the controller's input voltage setting, locate the voltage selection switch on the rear panel; it is under the AC input power cord as Figure 3.1 shows.

Then, set 115 or 230 volts as follows:

115 volts (90-135 volts) – slide the switch to the left position with the tip of a small screwdriver or similar device; notice that 115 appears inside the switch opening.

230 volts (180-270 volts) – slide the switch to the right position with the tip of a small screwdriver; notice that 230 appears inside the switch opening.

Caution: Do not plug a controller set to 115 volts into a 230 voltage source. Permanent damage will occur.

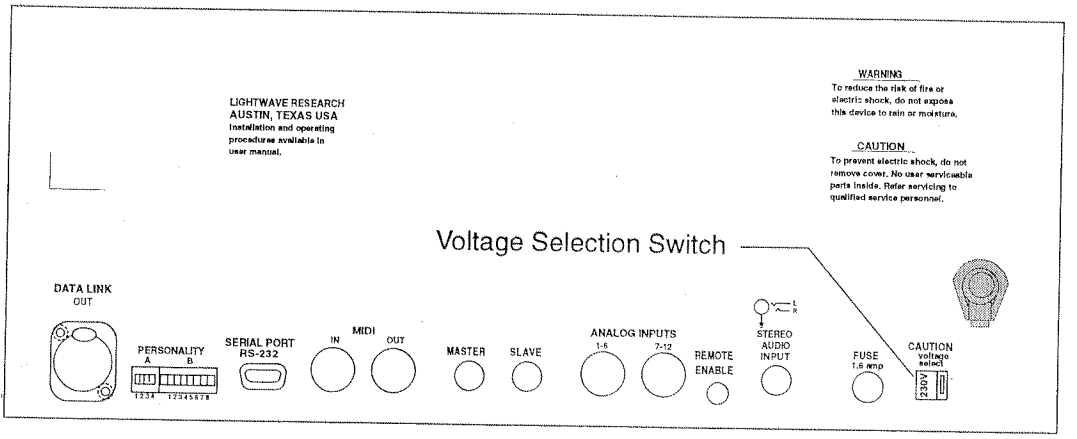


Figure 3.1. Setting Controller Voltage

This completes setting or verifying the *intellabeam* Controller's voltage.

Setting *intellabeam* Controller Frequency

You easily set or verify the frequency for the controller's input voltage to either 50 or 60 Hertz by setting a DIP switch on the rear panel. There are two Personality DIP switches on the rear panel labeled A (4 switches) and B (8 switches). DIP Switch A is currently not used. On Switch B: set Switch 2 to the "Up" (ON) position for 50 Hz, or set Switch 2 to the "Down" (OFF) position for 60 Hz. Refer to Figure 3.2.

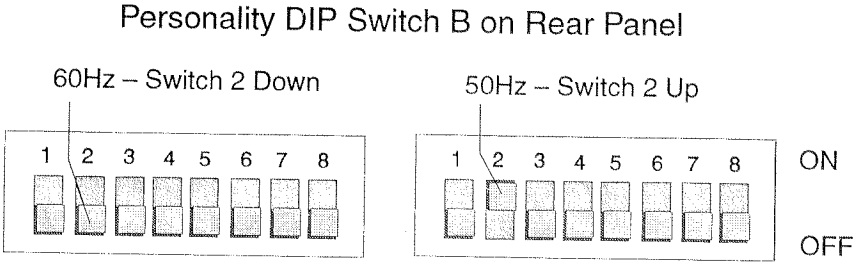


Figure 3.2. Setting Controller Frequency

This completes setting or verifying the *intellabeam* Controller's frequency.

Review of the *intellabeam* Controller

This section describes:

- ❑ the front panel components. Components include: keys, indicators, joystick, LCD window menu items, and switches. This includes the nine primary Construct keys and the eight User programmable keys.
- ❑ the LCD window selectable Constructs. These are the 11 menu selectable Constructs that include the nine primary Constructs assigned to keys.
- ❑ the rear panel components. That is, DIP switches and input/output connectors.

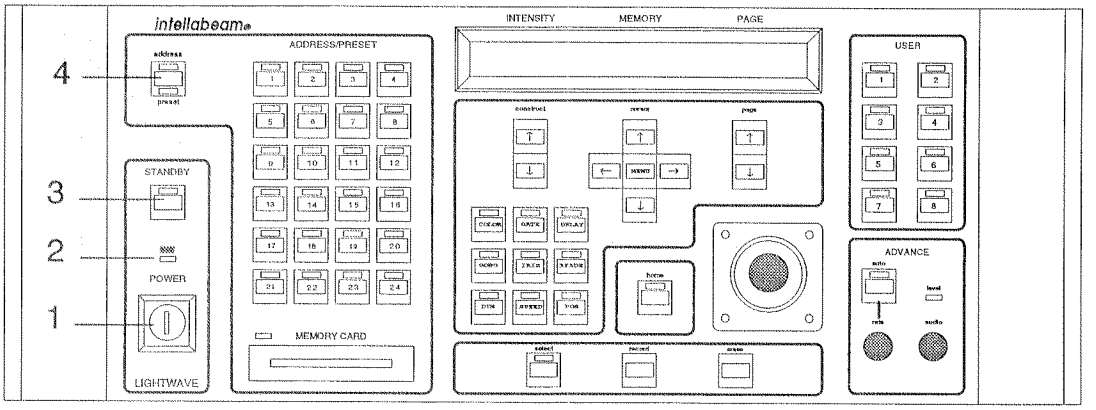


Figure 3.3. intellabeam Controller Front Panel

Front Panel Descriptions

1. Power Keyswitch

This switch activates the controller's power and enables any connected fixtures. The key-type switch provides protection from unauthorized users.

2. Slave Mode Indicator LED

This Light Emitting Diode (LED) indicates the Master/Slave state of the controller as determined by Personality DIP Switch B (located on the rear panel). When Switch 1 is "On" (up) the controller is in Slave mode and the LED lights. You can only use the front panel of a Slave controller for programming; playback functions are disabled. When Switch 1 is "Off" (down) the controller is in Master mode and the LED is off. A controller designated as a Master controls the playback of all connected Slaved controllers.

3. Standby Key

Press this key to close the light Gates of all connected fixtures. The controller defaults to Standby Mode when it is initially powered up.

4. Address/Preset Select Key

Press this key to toggle the Address/Preset keypad between the Address and Preset modes. The corresponding LED (Address or Preset) lights to indicate the currently selected mode.

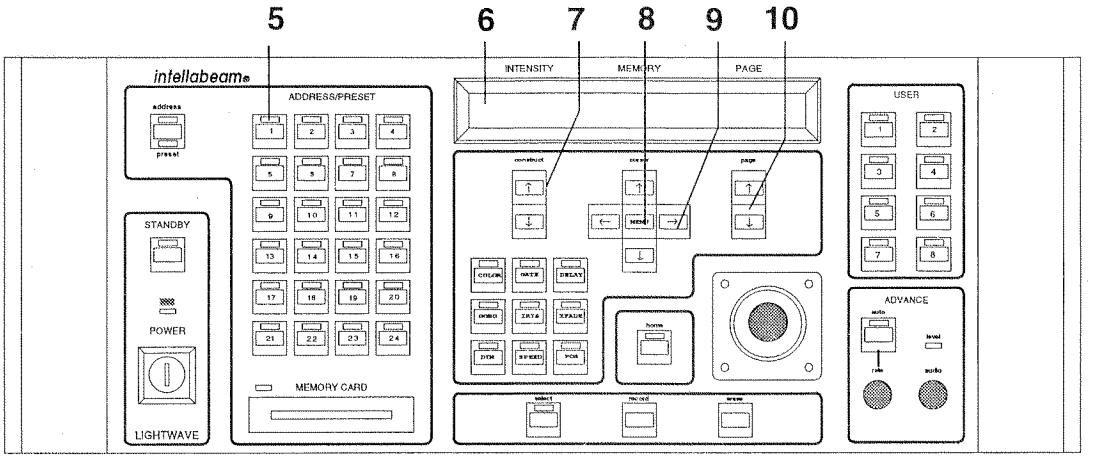


Figure 3.4. intellabeam Controller Front Panel (continued)

5. Address/Preset Keypad and LEDs

Each of the keypad's 24 keys has an LED that provide visual confirmation of active Addresses and Presets.

- In **Address mode** (the default mode), these keys correspond to the 24 fixture Addresses. You use the 24 ADDRESS keys to select an Address or range of Addresses for programming, editing, or viewing parameters. In Address mode you directly program the selected fixtures. However, you can save (record the programming steps) the program as a Preset (Preset mode) for later recall.
- In **Preset mode**, these keys correspond to 24 user programmed 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.

6. LCD (Liquid Crystal Display) Window

This window displays information about the current mode of the controller. That is, the controller is in either IMP (Intensity, Memory, Page) mode or in Menu mode. The default controller mode is the IMP mode.

IMP Mode: This is the main system operations mode. You do everything in this mode except the configuration and utility operations performed in MENU mode. In IMP mode, the LCD window shows the current level of the Master Dim setting, the current Memory number, and the current Page number. You program, playback programs, and monitor the system in this mode. You also perform Address and Preset mode operations under IMP mode. The MENU key toggles the controller between the IMP mode and the Menu mode.

- **Intensity Display**: indicates the current intensity setting for all Addresses. In IMP mode Intensity is used as a master dimming function. Pressing the CONSTRUCT Up and Down Arrow keys below the Intensity Display, you simultaneously adjust the brightness of all the fixtures. Value "0" represents full dim and value "99" represents full brightness.

- **Memory Display**: indicates the current Memory (1 to 9). Press the CURSOR Up and Down Arrow keys below this display to change the Memory number. Memory items 1-all and 9-all are used for the Automatic All-Memory Playback feature.
- **Page Display**: indicates the current Page number (1 to 99). Press the PAGE Up and Down Arrow keys below this display to change the Page number.

When you program Pages in IMP mode, you select from the 11 Constructs. Nine of the 11 Constructs are assigned to keys; all 11 are available through the LCD window. Some Construct examples are: Color, Gate, Position, and so on. In practice, all Constructs are selectable from the menu. The menu Constructs are described in this section following the front panel descriptions. The 11 Constructs are: Gate, Dim, Color, Cspeed, Gobo, Gspeed, Iris, Position, Speed, Xfade, and Delay.

Menu Mode: Use Menu mode to define many characteristics of the controller and to provide shortcut methods for some controller functions. When the controller is in Menu mode, the LCD Window shows the available menu selections: HELP, BACKUP, SUBMASTERS, and SETUP. The MENU key toggles the controller between the IMP mode and the Menu mode.

7. Construct (Up/Down Arrow) Keys

All fixture Constructs, Color, Gate, Speed, and so on, are edited in IMP mode. First, you press the SELECT key, then one or more ADDRESS keys. Then, use the Up/Down Arrow keys to change the value of the selected Address parameter. Press and hold either arrow key to accelerate to the limits of each parameter. Let up momentarily at end of limit to enter special function. All settings "wrap-around" in either direction.

8. Menu Key

This key toggles the controller between IMP mode and Menu mode. When the controller is in IMP mode, the LCD window shows the Intensity of the current Master Dim setting, the current Memory, and the current Page number. When the controller is in the Menu mode, the LCD Window shows the available menu selections: HELP, BACKUP, SUBMASTERS, and SETUP.

9. Cursor Up/Down Left/Right Arrow Keys

In **Menu** mode, use the CURSOR Left and Right Arrow keys: to make a selection from the Main Menu and submenu items, to access the possible choices available for each submenu item, and to make a selection from the menu items when programming Address/Preset parameters. In **IMP** mode use the CURSOR Up and Down keys to change the number of the current Memory.

10. Page Up/Down Arrow Keys

In IMP mode, these keys change the current Page number (from 1 to 99). Press and hold either PAGE Arrow key to wrap the Page numbers around in both directions.

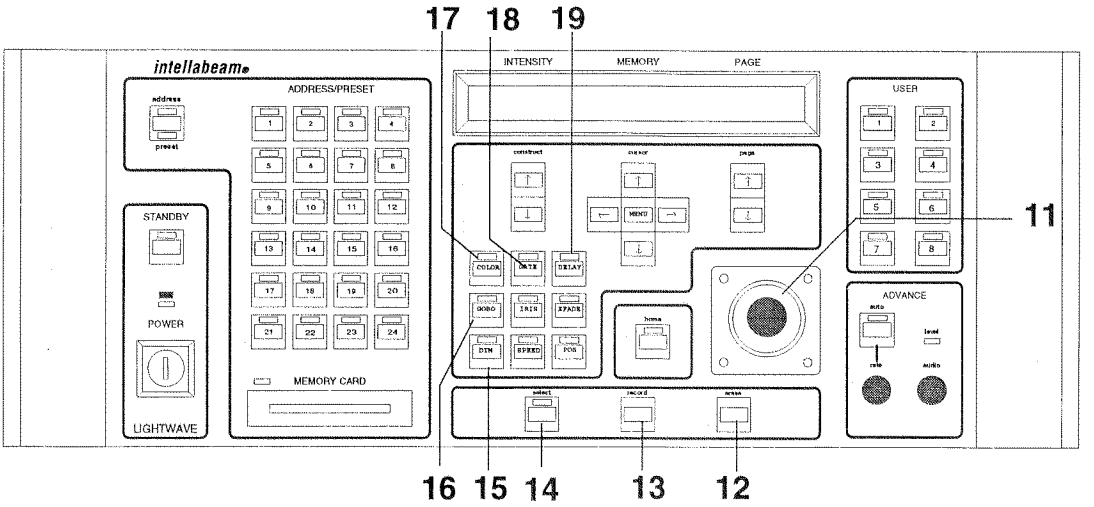


Figure 3.5. intellabeam Controller Front Panel (continued)

11. Joystick

Use the joystick to position the beams of selected fixtures during beam programming. The farther the joystick is moved off its center axis, the farther and faster the beam moves. A slight tap on the joystick produces a similar small movement of the beam. If you move it a small amount in any direction, the beam moves slowly until you release the joystick.

12. Erase Key

Use this key to edit Page or Preset Memory. In Address mode, press the ERASE key once to reset all parameters in the current Page to their default values. Press the ERASE key twice in succession to mark the current Page number as a Non-Initialized page. This signals the beginning or end of a loop or sequence (explained in Chapter 5). It is also used to upload memory from a personal computer, from another *intellabeam* Controller, and for other special functions (explained in Chapter 7). The ERASE key is used in conjunction with other keys, such as, the SELECT and RECORD keys for certain operations.

13. Record Key

In Address mode, press the RECORD key to record the current Pages (scenes) for the selected Addresses (fixtures). In Preset mode, press the RECORD key to assign a program to any of 24 PRESET keys. You also use the RECORD key to download Memory from a controller to a personal computer or to another *intellabeam* Controller.

14. Select Key

Use this key for programming, editing, and manual control of selected fixtures. Press this key and then the desired Address keys whose parameters you want to modify and/or store. Also use this key when selecting a Page or a loop of Pages in a Memory that you want to store as a Preset. For information on programming the controller refer to *Chapter 5, Operating the System.*

15. Dim Key

Use this key to set the intensity level for all selected Addresses. When the DIM key LED is illuminated, the second (parameter) line of the LCD window shows the current intensity value, from 0 (dark) to 99 (maximum bright) percent. Press the CONSTRUCT Up/Down Arrow keys to select the desired Dim setting. You use the DIM key with the XFADE key to set the fixture crossfade time. You can alternately select the Dim Construct from the LCD window.

16. Gobo Key

Use this key to set the gobo patterns for all selected Addresses. When the GOBO key LED is illuminated, the second (parameter) line of the LCD window shows the current gobo pattern value. You can select from: 12 gobo patterns, eight forward gobo spin speeds, eight reverse gobo spin speeds, 12 slow scans (oscillations), and 12 fast scans (oscillations). Press the Construct Up/Down Arrow keys to select the desired pattern or spin speed. You can alternately select the Gobo Construct from the LCD window. See Gspeed Construct.

17. Color Key

Use this key to set the colors, color effects, or spin speeds for the selected Addresses. When the COLOR key LED is illuminated, the second (parameter) line of the LCD window shows the current color, color effect, or spin value. There are 12 colors (11 plus white), 12 half-color effects, eight forward color spin speeds, eight reverse color spin speeds, 12 half-color fast scan effects (oscillations), and 12 half-color medium scan effects (oscillations). Press the Construct Up/Down arrow keys to select the desired color, color effect, or spins speed.You can display the 12 color effects as either half colors or oscillating colors. See Cspeed Construct.

18. Gate Key

Use this key to open or close the gates of selected Addresses. When selected, the GATE key LED illuminates and the current gate status is shown on the second line of the Construct menu, OPEN or CLOSED. In addition to either opening or closing the gate, there are eight strobe speeds available. Press the Construct Up/Down Arrow keys to select the gate setting that you want to program.

19. Delay Key

Use this key to set the amount of time that you want the controller to pause 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, it ignores the Delay setting. There is a hold function located after 99 seconds. If you select "Delay: hold", the sequence or loop runs once and then holds until you press the Page Up Arrow key. Delay and Xfade are Page wide parameters; that is, the delay times affect all Addresses on one Page. When the DELAY key LED is illuminated, the current delay time is shown in the second line of the LCD window. The delay setting can range from one tenth of a second to 99 seconds or infinite hold.

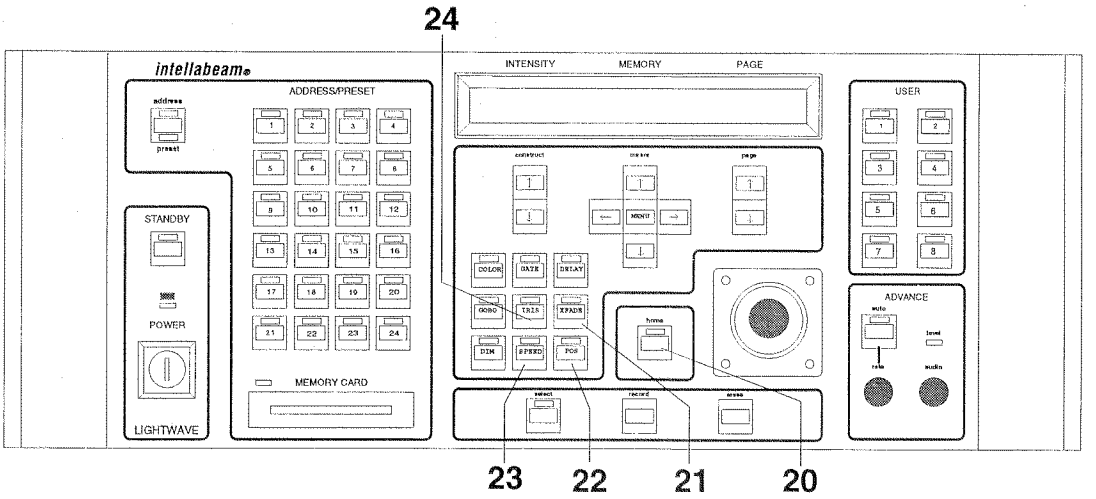


Figure 3.6. intellabeam Controller Front Panel (continued)

20. Home Key

Use this key in IMP mode to close the dark shutter and reset the selected fixtures. Resetting the fixture consists of striking the lamp (if it is not already on); and initializing the pan and tilt positions, Gate, Color wheel, and Gobo wheel to their home position. If a fixture fails to strike upon initial power up, or if it douses itself during operation, you should home it. Each time the controller is powered up, all fixtures receive a homing signal.

When you press the HOME key, its LED flashes for 10 seconds. The LCD window prompts you to select the Addresses of the fixtures that you want to home; press the ADDRESS keys of the Addresses to home. The HOME and ADDRESS key LEDs flash for 10 seconds during the homing procedure and then turn off. Once Homed, the fixtures join the sequence that is running and open their light Gates.

21. Xfade Key

Use this key to set the intensity (dimming) and iris size crossfade time as the controller advances from the previous Page into the current Page. Xfade and Delay are Page wide Constructs, that is, the crossfade and delay time affect all the Addresses on one Page. The second line in the LCD window displays the current Xfade value, ranging from 0.1 second to 99 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.

22. Position Key

Use this key to position the beam pattern for the selected Addresses. You can set the position manually using the joystick or by selecting one of 99 user programmable position Presets. Refer to the *Position Memory* section in Chapter 5.

Position with Joystick: Press the SELECT key and one or more ADDRESS keys. Move the joystick to the desired position. If the beam does not follow the joystick the Address is assigned to a Position Preset. If the current Page is assigned to a Position Preset (the second line in the LCD windows shows: Position Preset #),

then: 1) Press the POS key. 2) Use the Construct Up/Down Arrow keys and select "JOYSTICK" from the LCD window. 3) Press the RECORD key. 4) Now, move the joystick to position the fixture as desired.

Position with Presets: You program Position Presets in Memory 9 (Position Memory), Pages 1 to 99. Select any page from 1 to 99, then position the pattern with the joystick and press the RECORD key. For example, when you record a position in Page 1 in Memory 9 it becomes Position Preset 1, Page 2 is Preset 2, and so on through Page 99. Chapter 5 provides details on all these operations.

To program a Position Preset: 1.) Select an unused Position Preset Page, 1 to 99, in Memory 9. 2.) Select Addresses to position. 3.) Then, use the joystick to position the fixtures. 4.) Press the RECORD key to record the Page.

To assign a Position Preset to an Address: 1.) Select the Addresses that you want to assign to a Position Preset in the same fashion as when programming any Constructs for an Address. 2.) Press the POS key. 3.) Use the Construct Up and Down Arrow keys to select the number of the desired Position Preset. The selected fixtures move to the position previously programmed for the Preset. 4.) Press the RECORD key.

23. Speed Key

Use this key to set the pan and tilt speed for the 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 key LED is illuminated, the current speed setting of the selected fixture is shown on the second line of the LCD window. There are 99 speed settings. Value "1" is the slowest movement, and value "99" is the fastest movement.

The speed setting is a function of time to destination. That is, all fixtures that have the same speed values move together, regardless of the distance traveled. For example, if one fixture is only moving one foot and another is moving ten feet, they start and stop at the same time, provided they are programmed with the same speed setting. The fixture with the longest distance to travel moves faster than the other, but they arrive at their respective positions at the same time.

24. Iris Key

Use this key to set the diameter of the iris which in turn controls the beam diameter for the selected Addresses. When the IRIS key LED is illuminated, the current Iris settings for the selected fixtures is shown on the second line in the LCD window. Press the Construct Up/Down Arrow keys to set the Iris from 1 to 9. One is the smallest opening and 99 is full open.

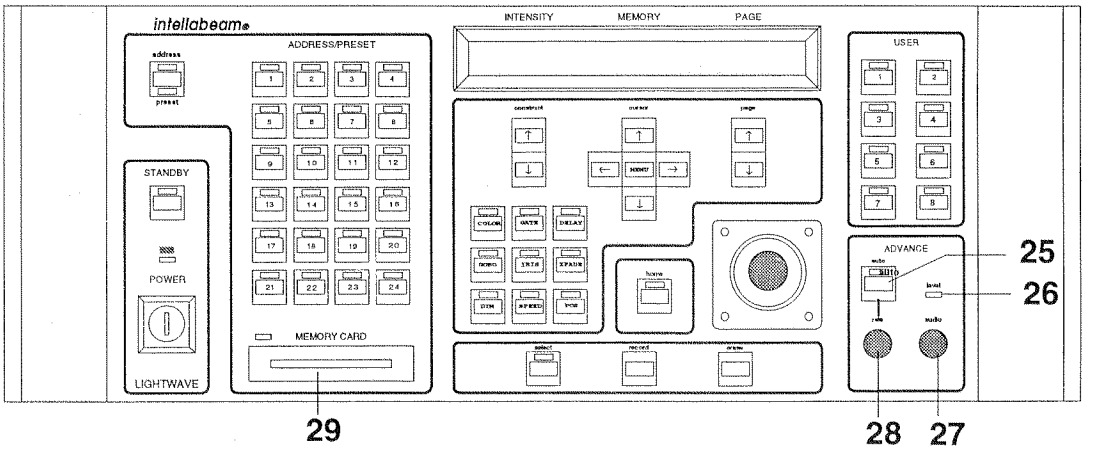


Figure 3.7. intellabeam Controller Front Panel (continued)

25. Auto Advance Key

When this key is pressed, the controller advances Pages 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 the Auto mode, the delay time programmed into a Page is added to rate of advancement set by the RATE knob. Programmed delay times are completed before Page advancement regardless of the RATE knob setting.

26. Audio Level Indicator LED

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

27. Audio Knob

Use this knob to adjust the controller's sensitivity to the musical information for Audio Advance functions and Effects functions. When the knob is turned all the way to the right it is most sensitive.

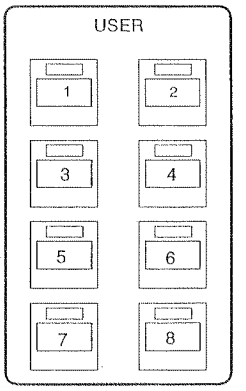
28. Rate Knob

Use this knob to regulate the speed of Page changes in the Auto Advance 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, provided that no delays have been programmed. When a delay is encountered, the knob's time setting is added to the delay time. The maximum advance rate is 0.1 seconds per Page when the knob is turned completely clockwise.

29. Memory Card Slot

Insert a Memory Card (PCMCIA RAM) into this slot to: store a copy of the controller's operating system, to install an updated version of the operating system, or to store the User RAM (programmable memory - light show).

User Programmable Keys



8 USER Keys

The *intellabeam* Controller includes eight user programmable keys that you can custom program as "macros". A macro is a recording of key presses that you assign to one of these eight User keys. Then, when you press that User key the sequence is played back in exactly the same order that you recorded it. For example, you may want to use a macro to override the currently running program to change certain colors or to randomize certain fixtures. The factory programs USER keys 1 through 6 as described in this section. USER keys 7 and 8 are undefined. However, you can custom program any or all of the eight keys to perform other functions that better suit your needs or purposes. Refer to the *Programming User Keys* section in Chapter 5 to program these eight keys. USER keys 1 to 8 are factory programmed as explained in the following.

Advanced Keys

Use pre-programmed USER keys 1 to 3 to select the method of sequencing Memory Pages.

User 1 – Random Advance Key

Random Advance 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 ADVANCE key, including Manual Advance, Audio Advance, and Auto Advance. In the Random Advance mode, only initialized Pages are played back; the Pages that are played back are not selected from non-initialized Pages.

User 2 – Audio 1 Advance Key (Change with Beat)

Press this key to put the controller in Audio1 mode.When the controller is in Audio 1 Mode, the Pages of the current sequence or Preset change with the beat of the audio input and ignores any programmed Delay settings. When the Audio 1 mode is engaged, the LED indicator above the AUDIO 1 key 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.

User 3 – Audio 2 Advance Key (Halt with Beat)

Press this key to put the controller in Audio 2 mode. When the controller is in Audio 2 Mode, the Pages of the current sequence or Preset halt with every beat of the audio input. The controller ignores any programmed Delay settings. When the Audio 2 mode is engaged, the LED indicator above the AUDIO 2 key 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.

Effect Section

Use pre-programmed USER keys 4 to 6 to override and change the parameter settings of all active fixtures with the audio signal.

User 4 – Effect 1 Key (Color Modulate)

The default effect setting for this key is Color Modulate. Select this key to change the color of all active fixtures when the controller 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. When you deselect this key, the color returns to program control.

User 5 – Effect 2 Key (Gobo Modulate)

The default effect setting for this key is Gobo Modulate. Select this key to change the gobo pattern for 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. When you deselect this key, the gobo returns to program control.

User 6 – Effect 3 Key (Light Modulate)

The default effect setting for this key is Light Modulate which 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. When you deselect this key, the dimming returns to program control.

User 7 – Undefined Key

This key is not defined.

User 8 – Undefined Key

This key is not defined.

Selecting Constructs from the LCD Window.

Nine of the 11 most often used Constructs are assigned to front panel keys, they are: Color, Gate, Delay, Gobo, Iris, Xfade, Dim, Speed, and Pos (position). Although these Constructs are assigned to keys, you can also select them from LCD window menu items. The tenth and eleventh Constructs, Cspeed (Color Speed) and Gspeed (Gobo speed), are only available through LCD window menu items.

The menu items appear in the LCD window after you press the SELECT key and one or more ADDRESS keys. The name of the active item is capitalized with GATE the first item. Notice that the GATE key LED is also active. To scroll through the menu items use the Cursor Left and Right Arrow keys. From GATE, you can only go to the right. Notice as you scroll through the menu items that the active item is capitalized. Also notice that when you select a menu item that is assigned to a key, the key also illuminates. You can select any Construct key and proceed from there with the Cursor keys as a convenience. The 11 menu items are: Gate, Dim, Color, Cspeed, Gobo, Gspeed, Iris, Position, Speed, Xfade, and Delay. The Cspeed and Gspeed Constructs are explained in this section. Refer to the nine Construct keys in the previous front panel section for their descriptions.

The second line of the LCD window displays the current value for the selected menu item. Use the CURSOR Up/Down Arrow keys to select parameters for the active Construct. For example, GATE displays CLOSED. To open the gate, press the CONSTRUCT Up Arrow key and the second line now displays OPEN. Press the RECORD key to make the change permanent.

Cspeed (Color Speed)

Use this Construct to define whether the fixture's color pattern changes at mirror movement speed or at full speed. Mirror movement speed changes colors at mirror speed. Full speed changes at the same rate as the position movement speed; this is determined by the SPEED key setting.

Gspeed

Use this Construct to define whether the fixture's gobo pattern changes at mirror movement speed or at full speed. Mirror movement speed changes gobos at mirror speed. Full speed changes at the same rate as the position movement speed; this is determined by the SPEED key setting.

To define Cspeed or Gspeed:

1. Press the SELECT key, the SELECT key LED flashes.
2. Press the ADDRESS keys for all the desired Addresses where you want to apply this feature. The LCD window displays the available Constructs on the top line.

3. Press the MENU Right Arrow key three times to select Cspeed or four times to select Gspeed. Notice that Cspeed or Gspeed appears in all capital letters. Also notice that the second line in the LCD window displays the parameters for the selected menu item. The available parameters are:

   Cspeed: –color change at mirror speed
   –color change at full speed
   Gspeed: –gobo change at mirror speed
   –gobo change at full speed

4. Next, press the CONSTRUCT Up/Down Arrow keys as required to select the desired parameter.
5. Press the RECORD key to complete the operation.

Rear Panel Descriptions

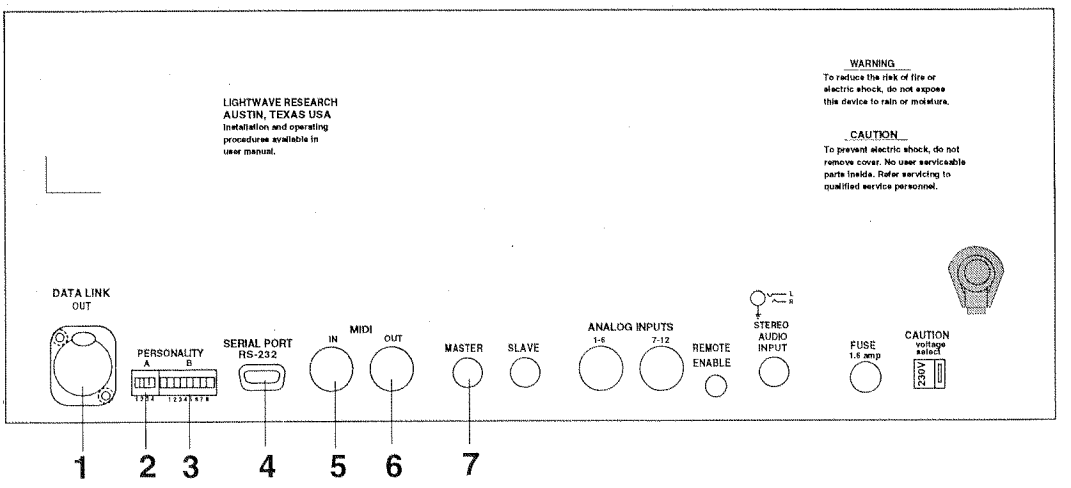


Figure 3.8. intellabeam Controller rear Panel

1. Data Link Out

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

2. Personality DIP Switch A

DIP Switch A is reserved for future use. Keep all switches set to the off position. This will prevent any possible conflicts in the event that any future software updates may assign functions for DIP switch A's switches.

3. Personality DIP Switch B

DIP Switch B defines the controller's mode of operation. To turn a switch "On", put it in the up position. To turn a switch "Off", put it in the down position.

Table 3.2 Personality DIP Switch B Settings	
Switch 1 – On = Slave Mode	Switch 1 – Off = Master Mode
Switch 2 – On = 50 Hertz	Switch 2 – Off = 60 Hertz
Switch 3 – On = Preset Access	Switch 3 – Off = Page Access
Switch 4 – On = 400 Protocol	Switch 4 – Off = 700 Protocol.
Switch 5 – On = Binary Preset Access	Switch 5 – Off = 12 Level Preset Access
Switch 6 – On = Independent Mode	Switch 6 – Off = Dependent Mode
Switch 7 – Not Used, set to Off	Switch 7 – Not Used, set to Off
Switch 8 – Not Used, set to Off	Switch 8 – Not Used, set to Off

Note: To use Binary Preset Access, Switches 3 and 5 must both be On.
To use 12 Level Preset Access only, Switch 3 must be On.

4. RS-232 Serial Port

The RS-232 Serial Port on the *intellabeam* Controller is a standard PC/AT 9 pin serial port. Use this serial port to transfer Memory data in and out of the controller. The primary purpose of data transfer is to backup program data to a computer floppy diskette for safe keeping or to load a controller's Memory from a backup disk or from another controller. The controller is capable of communicating through the serial port with any computer that can run a communications package, however, a software program for IBM PC's and compatibles is provided with this manual for convenience. You can also use this port 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. Refer to Section 7, *External Memory Storage and Transfer*, for more information about data transfer and storage.

5. MIDI In Port

This is where the MIDI input signal enters the controller. The *intellabeam* Controller features standard MIDI connections. The controller supports MIDI Show Control "GO" command (Protocol) and MIDI System Exclusive Backup. The MIDI Cue numbers are one-for-one with the *intellabeam* Controller's Preset numbers. The *intellabeam* Controller will only accept whole Cue numbers. For example, if you have a Cue numbered 101.5, the *intellabeam* Controller will call up Cue (Preset) number 101. The *intellabeam* Controller supports Cue (Preset) numbers 1-1024.

6. MIDI Out Port

This is where the MIDI output signal exits the controller. The MIDI OUT port is switchable between OUT and THRU. OUT is the default. When you are using the RS-232 port, MIDI OUT functions as a MIDI THRU.

7. Master Out Port

The master out port is a 6 mm (1/4 in) stereo jack that you use to link a Master controller to a Slave controller. Use this feature to expand the system to more than 24 Addresses. By properly setting the Personality DIP switches on the rear panel of the controllers, you can designate one controller as the Master and one or more as the Slaves. Then by linking the controllers together with a shielded, two

conductor data cable made with two 6 mm (1/4in) stereo jack connectors (male to male), you can operate all Slave controllers from the Master controller. Personality DIP Switch 1 Off = Master Mode.

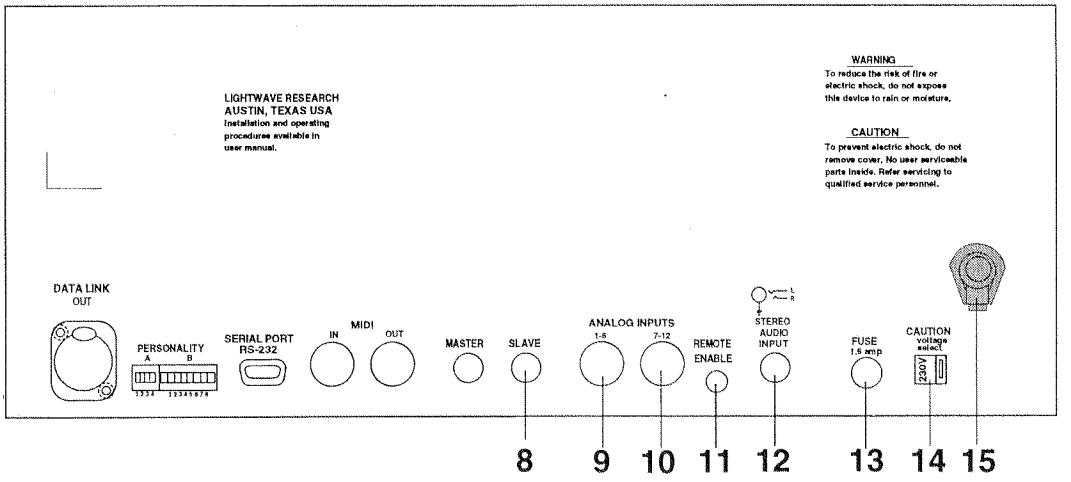


Figure 3.9. intellabeam Controller rear Panel (continued)

8. Slave In Port

The slave in port is a 6 mm (1/4 in) stereo jack that you use to link a Slave controller to the Master controller or to other Slave controllers. Use this feature to expand the system to more than 24 Addresses. By properly setting the Personality DIP switches on the rear panel of the controllers, you can designate one controller as 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), you can operate all Slave controllers from the Master. Personality DIP Switch 1 - On = Slave Mode.

9. Analog Input Connector (Channels 1-6)

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

10. Analog Input Connector (Channels 7-12)

The Analog Input connector is a locking 8-pin DIN connector (Channels 7-12) that enables the remote recall of Memory Pages or Presets using an analog control device, such as, a dimmer console or touch panel. Refer to Section 6, *Remote Access and Control*, for more information.

11. Remote Enable

Use the Remote Enable signal to control (enable/disable) the Standby mode from a remote location. The 3.5 mm (1/8") mini phone jack input requires 0 volts DC input for Standby mode and 5 volts DC (minimum) to 16 volts DC (maximum) to enable the controller. Refer to Section 6 for operation.

12. Stereo Audio Input

The 6mm (1/4inch) Stereo Audio Input jack accepts a line level audio signal to trigger audio effects, such as, Audio Advance, Color, and Light Modulate. The sensitivity of the audio effects is controlled from the front panel of the controller using the Audio knob.

13. Fuse

This fuse is a 5 mm (.195 in) x 20 mm (.78 in), 1.5 amp slow blow fuse.

14. Voltage Select

Use this switch to select between 115 volts AC and 230 volts 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. Refer to a previous section in this chapter for instructions on setting this switch. Refer to Section 2, *Set Up and Assembly,* for information about changing the fixture's voltage.

15. AC Line Cord

The AC line cord is the main input power supply for the controller.

This completes the *Review of the intellabeam Controller* section. The next section explains how to configure controller switches. Setting the switches will complete the installation.

Configuring *the intellabeam* Controller DIP Switches

To complete the controller installation, you configure the Personality DIP switches as required, although all switches in the "Off" position is the normal operating mode. Then, depending on your installation, you mount the controller. For some installations, it may be easier to first connect the cables to the rear panel and then mount the controller in a console.

After you set the switches mount the controller away from any sources of heat or moisture. If you are using audio effects, connect a suitable line-level stereo audio feed to the Stereo Audio Input jack on the rear panel. Connect all the data cables between the controller and all fixtures; refer to Chapter 4 for information on connecting data cables.

Located on the rear panel of the controller are two DIP (dual in-line package) switches labeled Personality A and B. Switch A is currently not used, ensure all switches are "Off" or down on this switch.

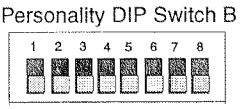
The eight switches on DIP Switch B are used for testing, set up, and control. You must set them properly, as explained in this section, before powering up the system.

Configuring Personality DIP Switch B

The purpose of Personality DIP Switch B on the rear panel of the controller is to configure the controller for specific requirements. By setting 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.

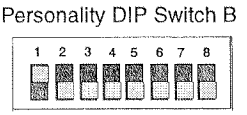
Note: A switch is **"ON"** in the **up** position and **"OFF"** in the **down** position.

No Switches On: Normal Mode



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

Switch 1: Master/Slave Mode



Switch 1 configures the Master/Slave capability. The system is expandable beyond the first 24 addresses by linking multiple controllers together via the Master/Slave ports.

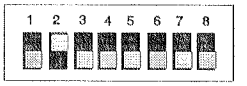
Switch 1 On – the controller operates in **Slave mode**. The controller can be connected to and run by another controller (set as Master) via the 6mm (1/4 in) Slave plug located on the rear panel of the controller. The Slave LED indicator located above the Power key switch is lit when in Slave mode.

The slaved controller retains its programming and editing functions, but can not play back any programs. All Standby, Advance, and Modulate settings of the slaved controller are determined by the Master controller. The accessible function keys on the Slaved controllers are POWER, HOME, SELECT, RECORD, ERASE, and Construct keys.

Switch 1 Off – the controller functions as a **Master controller**. The Slave LED indicator will be "Off" indicating Master mode. All front panel keys function normally. When a controller is in Master mode, it dictates the mode of playback for all controllers that are slaved to it.

Switch 2: Time Base

Personality DIP Switch B



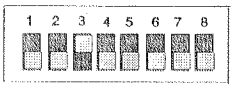
Switch 2 sets the controller's frequency to 50 or 60 Hertz. It is important to properly set this switch. The controller senses this frequency as part of its internal timing circuits.

Switch 2 On – the controller operates at 50 Hertz.

Switch 2 Off – the controller operates at 60 Hertz

Switch 3: Page or Preset Access

Personality DIP Switch B



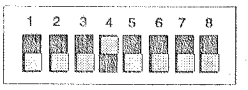
Switch 3 sets up how the controller responds to the Analog Inputs port. It responds to either Pages or Presets as follows:

Switch 3 On – the controller is in Preset Level Mode. In Preset Level Mode, the Analog Inputs port shift the controller to different **Preset levels**.

Switch 3 Off – the controller is in the Page Access mode. In Page Access Mode, the Analog Inputs port access the **Pages** in memory (default setting).

Switch 4: 700 HX/MSR 400 Control

Personality DIP Switch B



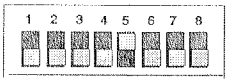
Switch 4 configures the controller to output either the 700 HX protocol or the MSR 400 protocol.

Switch 4 On – the controller is in MSR 400 mode.

Switch 4 Off – the controller is in 700 HX mode.

Switch 5: Binary Preset Access

Personality DIP Switch B

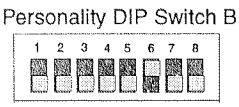


Switch 5 On – the controller accesses Preset numbers in a binary fashion (the controller must first be in Preset Access Mode, therefore, **DIP Switch 3 must also be in the "ON" position.**). It uses the first 10 of the 12 Analog Input channels in binary combinations to provide remote access to 1024 different Presets. The remaining two Analog Input channels control Blackout and Standby respectively. Channel 11 puts the controller in Blackout mode. Blackout closes the fixtures' shutters, but leaves everything else running. Channel 12 functions just like the STANDBY key on the controller. If the controller is in Standby, Channel 12 takes it out of

Standby. The fixtures go back to whatever they were doing before the controller was put in Standby mode. Chapter 6 provides additional information on using this feature.

Switch 5 Off – the controller accesses Preset numbers on 12 levels. In the Twelve Level Preset Access mode, each channel can activate one of 12 levels of 24 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.

Switch 6: Independent/Dependent Presets Mode



Switch 6 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.

Switch 6 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 the intensity setting is not recalled, intensity is recorded with Presets for compatibility with Dependent Presets mode. Slaved controllers' modulation effects respond to the audio input of each individual controller. Sequencing (Auto, Audio 1 and 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.

Switch 6 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:

Switches 7 and 8 are not used and should be set to "Off."

This completes setting the Personality switches. If you are using this controller with *trackspot* fixtures read the next section. Otherwise this complete Chapter 3. Continue with Chapter 4. It explains how to connect (cable) the *intellabeam* Controller to one or more fixtures.

Using *intellabeam* Controller with *trackspot* Fixtures

You can control your trackspot fixtures using the *intellabeam* Controller. You can also mix *intellabeam* Fixtures with *trackspot* Fixtures on the same controller, however, the *trackspots* must be on different Addresses than the *intellabeams*. Refer to Chapter 5 for Addressing information. Any connected *trackspots* will ignore Iris Constructs since *trackspots* do not have Iris control. All the other *intellabeam* Constructs work on the *trackspot*.

If you control only *trackspots* with the *intellabeam* Controller, a blank replacement bezel is supplied with the controller that you can use to replace the IRIS key bezel. Replacing the bezel is only to avoid confusion when programming the *trackspot*. Thus, it is up to the discretion of the programmer whether or not to replace the Iris bezel with the blank bezel.

Note: if you are controlling both *intellabeams* and *trackspots* do not replace the IRIS key with the blank bezel.

To replace the IRIS key bezel with the blank bezel:

1. Grab behind the two outside diagonal corners of the black bezel with the finger nails from your index fingers and pull straight out from the front panel. Alternately, grab the sides of the bezel using a pair of long nose pliers. Be careful not to crush the bezel with the pliers.

2. The remaining grey "Iris" button must also be removed or the blank bezel will engage the key when installed. Using the long nose pliers carefully grab the button and pull straight out from the panel.

3. Slide the blank bezel into the opening left by the old bezel and Iris button.

This completes Chapter 3. Continue with Chapter 4. It explains how to connect (cable) the *intellabeam* Controller to one or more fixtures.

Chapter 4
Connecting Data Cables

Data Cable Connections: General Information

Both the *intellabeam* Fixture and controller require standard 3-pin XLR connectors for data input and data output. Construct the data cables 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).

You can use microphone cables if the pin connections are correct (the same as described above). You should construct or purchase all of your cables (one cable for each fixture) as described in Chapter 1 before you attempt to set up the *intellabeam* System.

The *intellabeam* Controller DATA LINK OUT connector is a female (sockets) connector located on the rear panel of the controller as Figure 4.1 shows. This is where you make the cable connections to the fixtures.

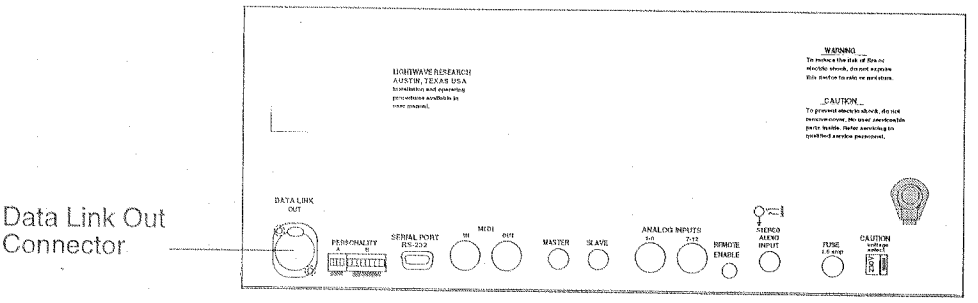


Figure 4.1. intellabeam Controller Rear Panel

The *intellabeam* Fixture DATA IN connector is a male (pins) connector located on the rear panel of the fixture near the bottom center of the panel as Figure 4.2 shows. The DATA OUT connector is a female connector located to the right of the DATA IN connector as Figure 4.2 shows.

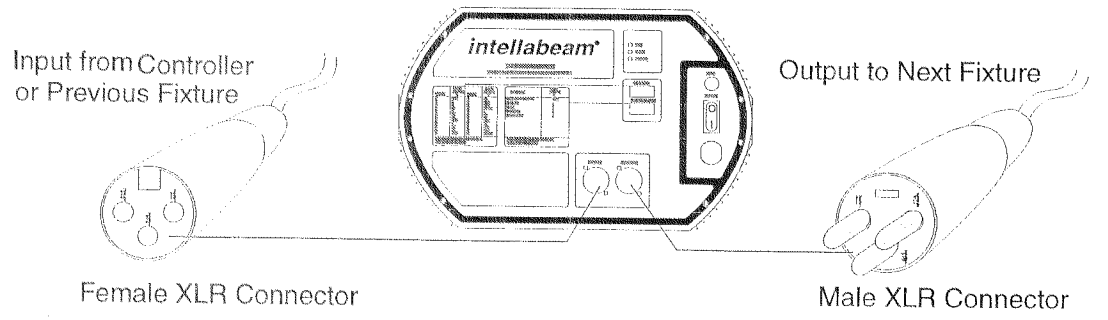


Figure 4. 2. intellabeam Fixture Rear Panel Connections

Daisy Chain Method of Connecting the Data Cables

Use this procedure to daisy chain connect up to 24 fixtures to a single *intellabeam* Controller. Daisy chain is a term that simply means to connect the output of one fixture to the input of the next fixture, and so on. This is the easiest method to connect fixtures to a controller.

You will need . . . one data cable for each fixture

1. Plug the male end (pins) of a data cable into the Data Link Out connector on the rear panel of the controller. Refer to Figure 4.3.
2. Then, plug the female end (sockets) of the data cable into the Data In (male) connector of the first fixture. Refer to Figure 4.3.

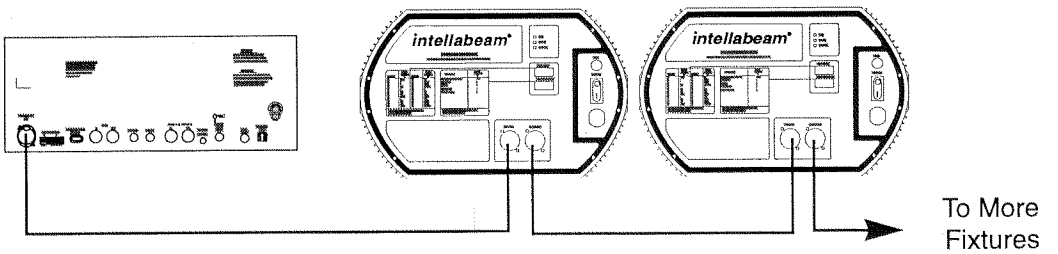


Figure 4. 3. Connecting Cables Using the Daisy Chain Method

3. To connect additional fixtures, connect the Data Out connection (female XLR) of the first fixture (from step 2) to the Data In connection (male XLR) of the second fixture. Then continue connecting fixture in this same manner until all fixtures are connected (up to 128 fixtures, but some must share the same channels (Addresses)).

Although not recommended, experienced users can connect the data cables in parallel using up to two XLR "Y" cables. If you use more than two "Y" cables the signal strength can deteriorate to unreliable levels. Note that the daisy-chain method is easier to troubleshoot and insures proper signal strength for larger systems. Refer to Figure 4.4 for sample "Y" cable connections.

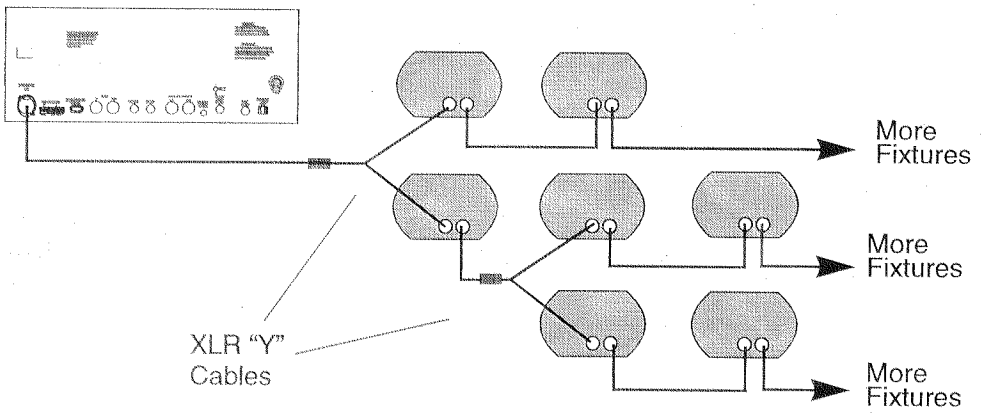


Figure 4. 4. Connecting Fixtures with XLR "Y" Cables

Serial Data Distributor Method

A Lightwave Research Serial Data Distributor is the preferred way 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. Refer to Figure 4.5.

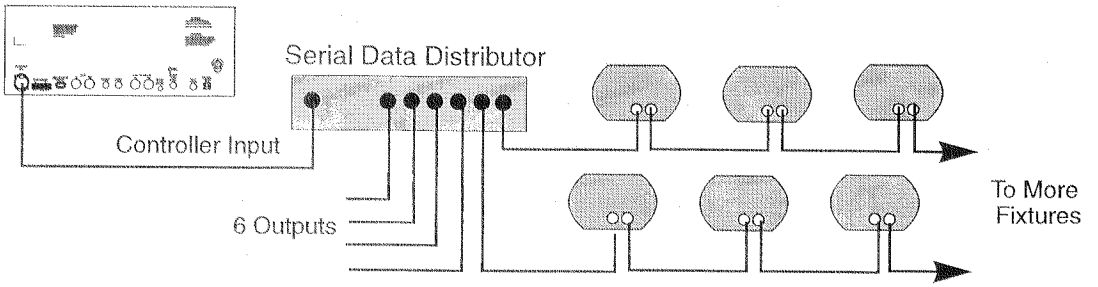


Figure 4. 5. Connecting Cables Using Serial Data Distributor

Master/Slave Configuration

Twenty-four Addresses are available on an *intellabeam* Controller that controls 24 fixtures or 24 sets of fixtures. If you assign several fixtures to the same Address, they will all share the same Constructs (Color, Gobo, Iris, Speed, and so on) and they will all move in response to the joystick when you select their Address.

You can practically expand an *intellabeam* System 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.

You can slave controllers together to include any multiple of 24 increments of control. Each fixture or set of fixtures is Addressed as 1 to 24, corresponding to the Address/Preset keypad on each controller. Refer to Figure 4.6.

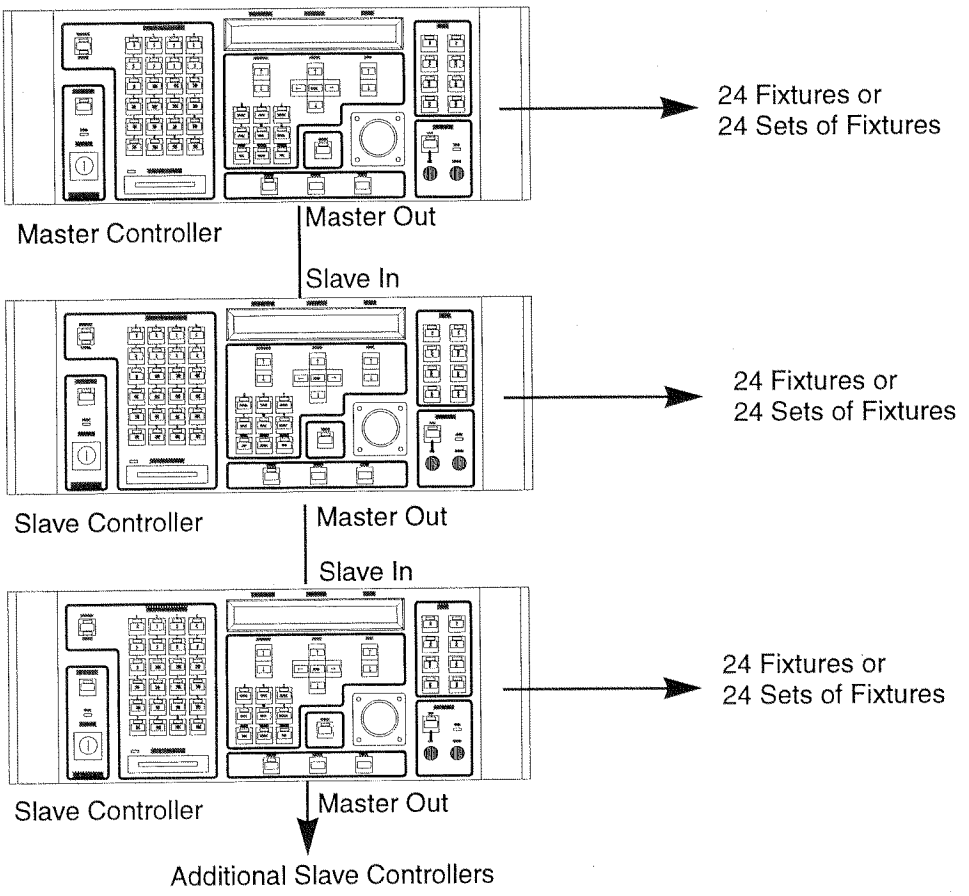


Figure 4. 6. Slaved intellabeam Controllers

Connect one or more controllers in Slave Mode

1. Set Personality DIP Switch 1 on the rear panel of the controller to the "On" or up position.

   The Slaved controllers retain their programming and editing functions, but do not play back any programs. The Master controller determines all Standby, Advance and Modulate settings of the Slaved controllers. The only Slave controller function keys that you can access are: Power, Home, Select, Record, Standby, Erase, and Constructs. In Slave mode the Slave LED is "On".

2. Run a stereo cable (with a 6 mm (1/4 in) 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.

3. To slave more than one controller to a single Master controller, continue running cables from one controller to the next, as described in step 2, in a daisy chain fashion. The Master and Slave ports on the *intellabeam* Controller are wired in parallel. This allows you to connect from either port of the Master controller to either port of the Slave controller(s). Refer to Figure 4.7.)

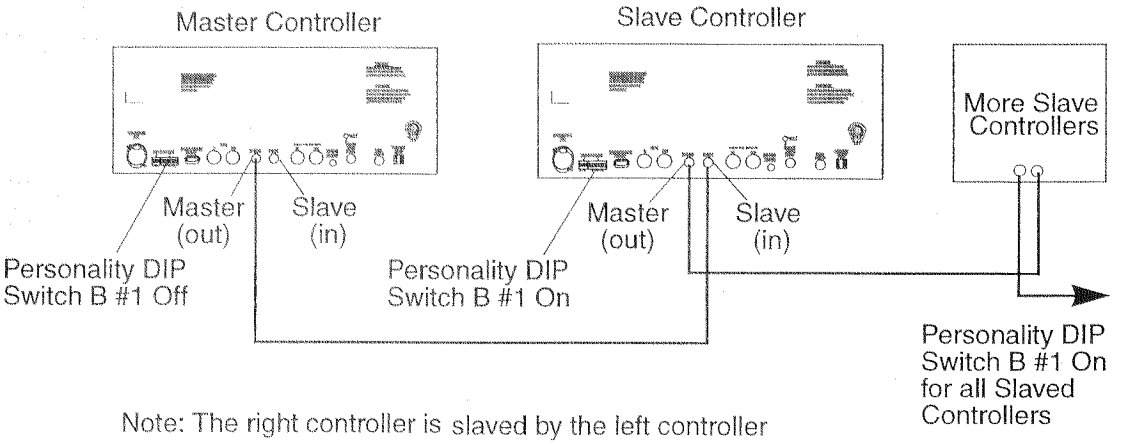


Figure 4. 7. Connecting Cables in Master/Slave Configuration

Programming a system in the Master/Slave Configuration

You must program each controller from its own front panel; thus, each controller must be in Master mode during programming. You control playback only from the Master controller once you slave the controllers; thus all Slaved controllers will respond to the front panel of the Master controller in any playback mode. All of the LED indicators of the Slave controllers, including Standby, Auto, Audio 1 and 2, and Effects 1, 2, and 3 will mimic the LED indicators on the front panel of the Master controller. If User Definable keys perform a common function, such as, Standby, then the Slave will also mimic them. The only control functions that are retained by the Slave controllers are Power, Address, Home, Select, Record, Erase, and Constructs.

MIDI In and Out ports

The *intellabeam* Controller features standard MIDI connectors. The controller supports MIDI Show Control "GO" command (Protocol) and MIDI System Exclusive Backup. The MIDI Cue numbers are one-for-one with the *intellabeam* Controller's Preset numbers. The *intellabeam* Controller only accepts whole Cue numbers. For example, if you have a Cue numbered 101.5, the *intellabeam* Controller calls up Cue (Preset) number 101. The *intellabeam* Controller supports Cue (Preset) numbers 1-1024.

The MIDI IN port is where the MIDI signal enters the controller. The MIDI OUT port is where the MIDI signal exits the controller. The MIDI OUT port is switchable between OUT and THRU. OUT is the default. When you use the RS-232 port, MIDI OUT functions as a MIDI THRU. Refer to Figure 4.8.

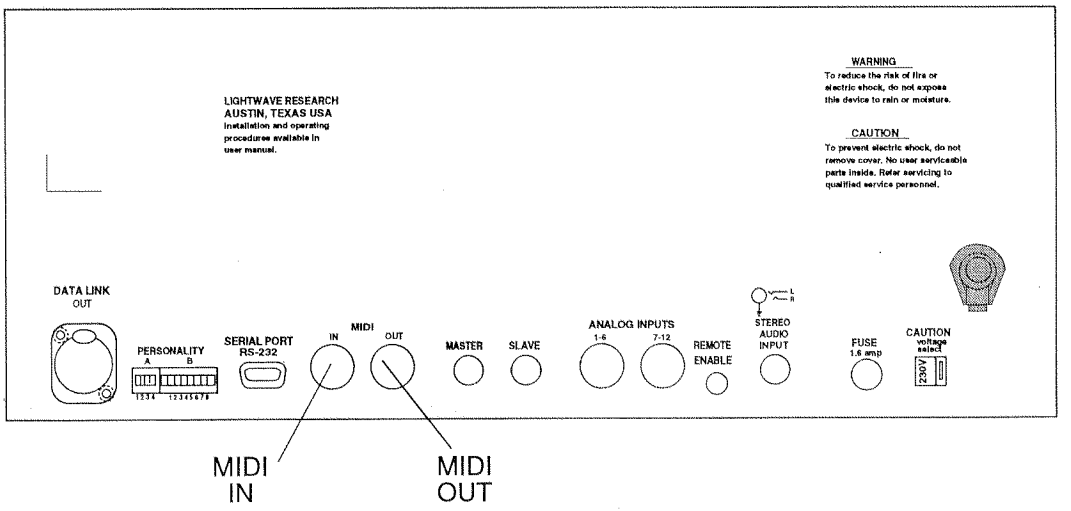


Figure 4. 8. Location of MIDI IN/OUT Ports

Chapter 5
Operating the System

In this section you:

- ❑ power up the *intellabeam* System and "home" all connected fixtures
- ❑ learn about the *intellabeam* Controller's Menu and IMP modes
- ❑ perform Menu mode operations (help, backup, submasters, and setup)
- ❑ learn system programming concepts and controller Address/Preset concepts
- ❑ record scenes, loops, and presets
- ❑ program User keys 1 through 8
- ❑ copy, edit, and erase pages
- ❑ playback scenes, loops, and presets
- ❑ perform the controller's monitoring and master dim functions

Initial Power Up

In this section you power up the system and home connected fixtures.

Turning On the Controller

Your *intellabeam* System should be completely and properly set up. You should be familiar with the controller's front panel operation, if not, refer back to *Chapter 3.* All of the fixtures should be assembled, optimized, tested, hung, and their Personality and Address DIP switches should be correctly set; refer back to *Chapter 2* for instructions. All of the data cables should be constructed, tested, run, and connected properly; refer back to *Chapter 4.* All of the fixtures and the controllers should be connected to appropriate power sources; refer back to *Chapters 1, 2, and 3* for instructions.

Perform the following steps to power up the *intellabeam* System:

1. Turn on power to all fixtures connected to the *intellabeam* Controller. To turn on fixture power, press the "I" side of the fixture's Power switch. You will hear a brief clatter sound from each fixture as it performs homing operations and the fan will operate for about three minutes.
2. Insert the controller key into the front panel Power keyswitch and turn the key clockwise. The LCD window briefly shows the Boot version number and all LEDs briefly flash. In a moment the Standby, Address, and any initialized or programmed Address/Preset LEDs light.
3. If there is a Memory Card inserted into the Memory Card slot that contains Operating System data, the LCD window displays a message that asks you whether or not you want to replace the controller's Operating System with the Operating System saved on the Memory Card. Follow the instructions in the LCD window to proceed. Refer to *Chapter 7* for Memory Card functions.

4. If there is no Memory Card inserted, or if you do not respond to the prompt in the LCD window within 10 seconds, the controller performs a self test. The LCD window displays: "Checking memory 1-9, Please wait." as it runs the self-test. The test counts up through the Memories from 1 to 9 slowly and then again quickly.
5. The LCD window displays the IMP (Intensity, Memory, and Page) mode parameters: "Intensity:99 Memory:1 Page:1." IMP mode is explained in detail later in this chapter.

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.

6. At the same time, the controller remotely powers up all connected fixtures. Each fixture turns on its lamp and fan and then performs a homing operation.

   Homing a fixture strikes the lamp; turns on the cooling fan; sets the Color and Gobo wheels; and sets the Gate (shutter), Dim, and mirror (pan and tilt) to their home (default) positions. You will hear a brief chatter sound while the stepper motors are performing their homing operation. If everything checks out, the fixture idles with the Gate closed, quietly waiting for its next command. If it fails to home or strike the lamp check the LED indicators on the rear panel of the fixture and refer to *Chapter 8, General Maintenance & Troubleshooting*.

   Note: The lamp and fan in each fixture turn on: 1) upon initial power up with data signal present or DIP Switch 2 (or 1 and 2) "On", 2) upon receiving a Home command, or 3) upon coming out of fixture Lockout. Once the lamp is switched off, the fan continues to operate for a period of three minutes, then it automatically shuts off.

The *intellabeam* Controller and all connected fixtures should now be turned on and homed. Continue with the *intellabeam* Controller Modes section. The following *Homing Fixtures from intellabeam Controller* section explains how to manually home a fixture at any time from the controller's front panel.

Homing Fixtures from *the intellabeam* Controller

When you perform a homing operation on a fixture, you cause the fixture to close its light gate, strike its lamp and fan (if off), and return the Color wheel, Gobo wheel, Gate, Dim, and mirror (pan and tilt) to their home positions.

To home one or more fixtures (in Address or Preset mode):

1. At any time, press the HOME key on the *intellabeam* Controller's front panel. The HOME key LED flashes for 10 seconds.
2. While the HOME key LED is flashing, press the ADDRESS keys of the fixtures that you want to home.
3. The HOME and selected ADDRESS key LEDs now flash for another 10 seconds while the fixtures are performing their homing operation. Then, the LEDs turn off signaling the end of the homing operation.

Homing a fixture strikes the lamp, turns on the cooling fan, and sets the Color wheel, sets the Gobo wheel, and Gate to their home (default) positions. You will hear a brief chatter sound during the homing operation. If everything checks out, the fixture idles with the Gate closed, quietly waiting for its next command. If it fails to Home or strike the lamp check the LED indicators on the rear panel of the fixture and refer to *Chapter 8, General Maintenance & Troubleshooting*.

4. Once homed, the fixtures join the sequence running and open their light gates.

intellabeam Controller Top Level Modes

The *intellabeam* Controller operates in either Menu or IMP mode.

- **Menu mode** – you perform setup and house keeping operations, such as, backups and configuring edit/copy operations. You also assign submasters, as required, in this mode. All other controller functions are performed in IMP mode. Menu mode is seldom used when compared to IMP mode usage.
- **IMP (Intensity, Memory, and Page) mode** – this is the normal system operating mode. In this mode you program and playback scenes and chases. You also monitor the parameters of any connected fixture and control the master dim for all fixtures. You learn about IMP mode in the *Programming* section.

Menu Mode Features	IMP Mode Features
– Help	– Address Mode Programming
– Backup	– Position Memory Programming
– Submasters	– Preset Mode Programming
– Setup	– Copy/Edit/Erase Operations
	– Playback Operations
	– Monitor Operations
	– Master Dim Operations

Menu Mode

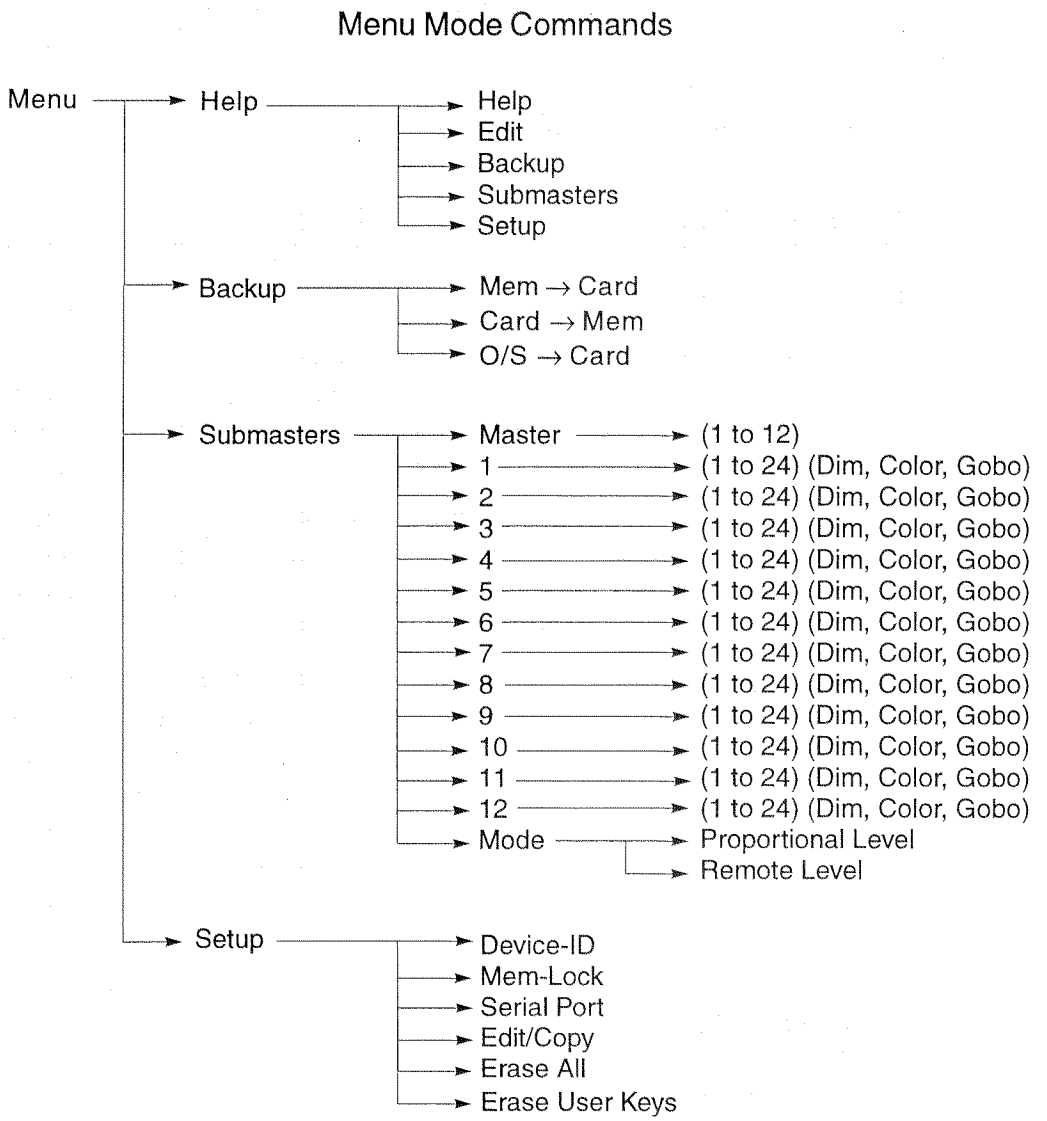
This section explains how to navigate and use the Menu mode submenus.

How to get around in Menu Mode

In Menu mode you can back up the controller's Memory in several different ways and assign submasters. The Setup command in the Menu mode allows you to set the Device ID for Show Control and select which Memories you want to lock out.

Note: Any sequence or Preset which is playing back continues while the controller is in Menu mode.

The following diagram maps out all of the Menu mode commands available through the LCD window.



To access the Menu mode:

1. Press the MENU key. The LCD windows displays the Main menu showing all the submenus as Figure 5.1 shows.

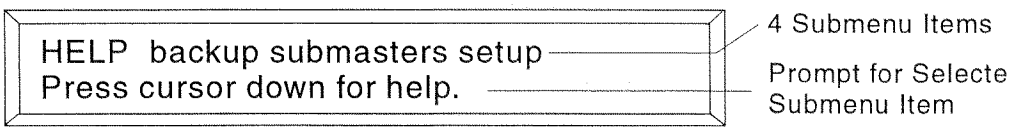


Figure 5.1. Main Menu

Notice that all the submenus are listed only in the top row. The second row provides the prompts or values for the selected submenu item. To select a submenu item from the Main menu, press the CURSOR Left or Right Arrow key. The four menu CURSOR keys surround the MENU key. Notice that each time you press the CURSOR Left or Right Arrow key a different menu item changes. Also notice that the letters in the name of the selected submenu item are capitalized or, in some cases, an item is enclosed in square brackets "[ ]". Figure 5.1 shows HELP as the default item and that you press the CURSOR Down Arrow to display the help messages. Remember that capital letters, bracketed letters, or numbers indicate *selected* menu item.

2. Select any item in the Main menu by pressing the CURSOR Right Arrow key next to the MENU key. You can only go right from the Help submenu.
3. After you select the submenu item that you want to alter, press the CURSOR Down Arrow key under the MENU key to view the selections.
4. Use the CONSTRUCT Up and Down Arrow keys to change the values if any are assigned to the submenu item. The CONSTRUCT keys are located to the left of the CURSOR keys below the LCD window. For example, in the Setup submenu, you configure any Device ID number between 1 and 223. To change the value of this number, press the CONSTRUCT Up and Down Arrow keys.
5. Return to the Main menu by pressing the CURSOR Up Arrow key.
6. To exit Menu mode and return to IMP mode, press the MENU key.

Using Menu Mode Submenus

In this section you learn how to perform the operations related to each of the following submenu items:

- Help
- Backup
- Submaster
- Setup

Help

The Help menu displays information about each of the submenu items.

1. Press the MENU key to display the menu items.
2. Then, you use the CURSOR Left or Right Arrow key to select items from the display except for the first menu item. Since Help is the first menu item it is already displayed in all capital letters. The second line of the LCD window prompts: "Press cursor down for help."

```
HELP backup submasters setup
Press cursor down for help.
```

3. Press the CURSOR Down key. A submenu appears similar to the Main menu, except "edit" is added to the list of submenus.

```
HELP edit backup submasters setup
Press cursor down for help on help.
```

4. Use the CURSOR Left and Right Arrow keys to select the submenu item that you want for additional help. The second line of the LCD window prompts: "Press cursor down for help on (submenu name)."
5. Press the CURSOR Down Arrow key to read the help screens. Follow the instructions in the LCD window to continue.
6. Press the MENU key at any time to exit help.

Backup

Select the Backup submenu to:

- save the *intellabeam* Controller's internal User RAM to a removable Memory Card.
- load (update) the *intellabeam* Controller's internal User RAM from a Memory Card.
- transfer the *intellabeam* Controller's operating system to another controller.

Chapter 7 provides detailed procedures on performing all the Memory Card backup and transfer operations.

Submasters

A submaster is an analog, 0-10 volt, control board that lets you remotely adjust, in real time, the dim, color, and gobo Construct parameters for selected fixtures. The remote analog control board is connected to the *intellabeam* Controller through the Analog Inputs connectors on the rear panel of the controller. You can define up to 12 submasters through the LCD window Setup feature. Refer to Figure 5.2.

Although you assign the twelve Analog Inputs (1-6 and 7-12) as submasters, they are normally used as Page Select or Binary Presets depending on the controller's DIP Switch B settings. The controller supports mixing submasters with Binary Presets, however, it is recommended that you assign submasters from the top down in order (for example, Channels 12, 11, 10, and so on) to simplify the Binary Preset addressing scheme which begins with the least significant bit (for example, Channels 1, 2, 3, and so on). Refer to *Chapter 6, Remote Access and Control* and *Appendix E* for additional information on Page Select and Binary Presets.

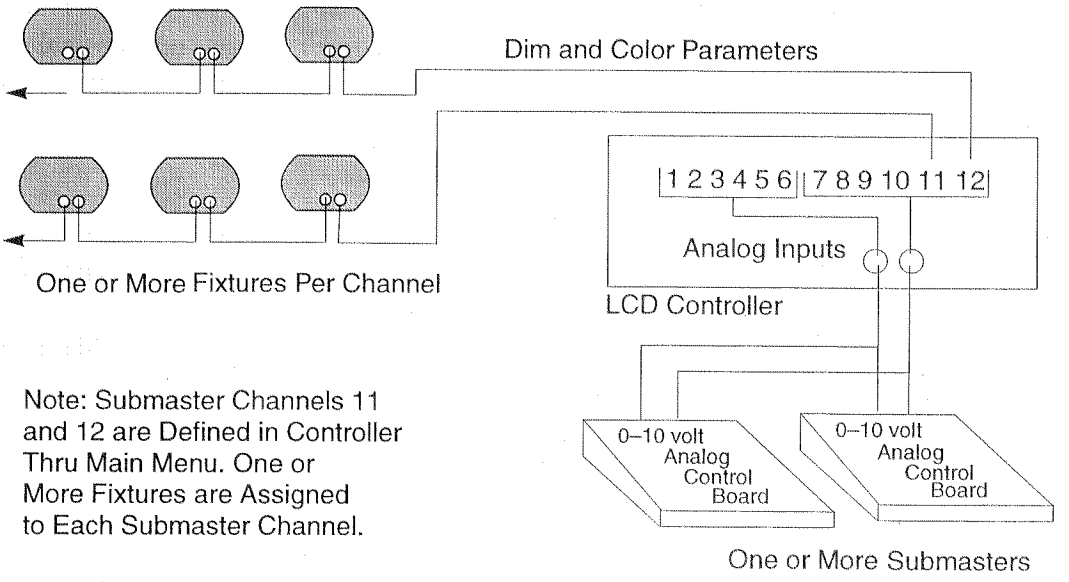


Figure 5.2. Submaster Concept

The *intellabeam* Controller's Analog Inputs are true 0-10 volt analog values that you can assign as submasters. The submasters operate at the level *above* the fixtures and control the overall level of the fixtures on top of what was already programmed. That is, the submaster control *overrides* the controller programming.

There are two submaster modes available that you define through the SUBMASTER menu: Proportional level mode or Remote level mode.

Proportional Level Mode — This mode provides traditional submaster control. The submaster value is multiplied by the programmed fixture value. That is, if the recorded dim value for the selected fixture is at 50 percent and a submaster is at 50 percent, then the fixture realizes 25 percent dimming; .50 times .50 equals .25. If there are two or more submasters then the submaster with the higher setting has control. For example, assume you have decided to assign 2 submasters to one fixture. You set submaster 1 at 20 percent dim, set submaster 2 at 50 percent dim, and program the fixture at 50 percent. Between the 20 percent submaster and the 50 percent submaster, the 50 percent submaster has control because the 50 percent value overrides the 20 percent value. Now, the 50 percent submaster level proportionally affects the fixture's 50 percent programmed dim level, for a final output of 25 percent dim level. That is, the final output will be 50 percent of 50 percent for the dim level of the fixture. The submaster would have to be set at 100 percent for the fixture to operate as programmed.

Remote Level Mode — In this mode the device with the higher level has control of the dimming. That is, *higher takes precedence*. For example, if you program the fixture for 50 percent and the submaster at 60 percent, then the submaster has control. However, if you program the fixture for 50 percent and the submaster at 50 percent, then there is no change until one device drops below 50 percent.

Submasters can control fixture dimming level, color, and gobo. The default selection is dim level. Color and gobo submaster assignments change a fixtures color and gobo with the movement of a fader on your remote analog controller. For more information about assigning submasters refer to *Assigning Fixtures to a Submaster* later in this section.

Assign a Channel for Master Dim

When you assign a channel to the Master dim level it has priority over the other channels. The channel you select for the Master cannot also function as a Submaster. For example, if you select channel 1 for the Master dim, then you cannot assign any fixtures to Submaster 1.

Note: When the Master dim is assigned to a channel, the *intellabeam* Controller no longer functions as the Master dim control. Hence, the Intensity setting numbers do not change when you press the CONSTRUCT Up/Down Arrows keys. The Master dim level is controlled by another device on the assigned channel.

To assign a channel to a Master dim level:

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow key twice to select submasters from the Main menu. SUBMASTER is capitalized when selected.

```
help  backup  SUBMASTERS  setup
Press cursor down for submaster function
```

3. Press the CURSOR Down Arrow key to view the submaster submenu. The first line of the LCD window displays: "[Master] 1 2 3 4 5 6 7 8 9 10 11 12 MODE." These indicate the Master dim, the twelve assignable submasters, and the Mode selection.

```
[MASTER] 1  2  3  4  5  6  7  8  9  10  11  12  MODE
No  channel  assigned  to  master  dim
```

4. The second line of the LCD window displays the status of the Master dim setting. If there is no channel assigned to the Master dim, the second line of the LCD window displays: "No channel assigned to master dim."
5. Use the CONSTRUCT Up and Down Arrow keys to select a channel for master dim. Remember that the channel you assign to Master dim cannot also be assigned as a submaster.
6. After you set the channel for Master dim, you can assign submaster channels while the controller is in the submaster submenu. You do this by pressing the CURSOR Left and Right Arrow keys, or you can return to the Main menu by pressing the CURSOR Up Arrow key.

Assign Fixtures to a Submaster

To have a particular submaster control the dimming or color of a particular fixture (or fixtures), you have to assign that fixture (or fixtures) to that submaster. There are 12 submasters available (only eleven are available if you have assigned one channel to master dim).

To assign a fixture to a submaster:

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow key twice to select "submasters" from the Main menu. SUBMASTER is capitalized when selected.

   ```
   help  backup  SUBMASTERS  setup
   Press cursor down for submaster function
   ```

3. Press the CURSOR Down Arrow key to view the submaster submenu. The first line of the LCD window displays: "[Master] 1 2 3 4 5 6 7 8 9 10 11 12 MODE." These indicate the Master dim, the twelve assignable submasters, and the Mode selection.

   ```
   [MASTER] 1  2  3  4  5  6  7  8  9  10  11  12  MODE
   No channel assigned to master dim
   ```

4. From the Submaster submenu, you can select the submaster in which you want to assign fixtures. Press the Cursor Right or Left arrow keys to select the number of the submaster to which you want to assign fixtures.
5. When you have selected a submaster, the second line of the LCD window displays: "Use A/P keys to assign submaster (x)." Notice that the brackets move from MASTER to the selected submaster on the top line.

   ```
   Master [1] 2  3  4  5  6  7  8  9  10  11  12  MODE
   Use A/P keys to assign submaster  1
   ```

6. Press the Address/Preset (A/P) keys of the fixtures that you want assigned to that submaster. The fixtures' LEDs light to indicate that they are assigned to that submaster. For example, to assign fixture 5 to submaster 1: Press the number 5 A/P key and confirm that its LED illuminates.

   You can assign anything from none to all of the fixtures to each of the submasters. It is acceptable to assign a fixture to more than one submaster. The higher submaster dim setting has priority over the other submasters. That is, the submaster that assigns a higher dimming value to the fixture overrules the other submaster value that is assigned to that same fixture.
7. If you want a submaster to control color or gobo instead of dimming level, press the COLOR or GOBO key now.
8. After you have selected the fixtures for one submaster, you can assign other submaster channels while the controller is in the Submaster submenu in the same manner, or you can return to the Main menu by pressing the CURSOR Up Arrow key.

Setup

In Setup mode you:

- ❑ set the controller's Device ID for Show Control operation
- ❑ lock out Memory to prevent inadvertent editing
- ❑ set the controller to use either the RS-232 serial port or the MIDI port
- ❑ configure the Copy command parameters
- ❑ erase all of User Memory
- ❑ erase User keys (restore)

Set Device ID

The Device ID uniquely identifies the controller and any other devices that respond to a Show Control signal (for example: theater boards, hoist controllers, and so on). The Device ID has different meaning depending on which show control mode you use, Lightwave Show Control or MIDI Show Control.

In Lightwave Show Control mode, ID = 0 means that the device responds to any ID. For example, even if you were to send out Device ID=7, the controller with Device ID=0 would respond. Device ID= 0 is the default setting.

MIDI Show Control uses Device ID= 127 (7Fh) instead of ID = 0 to tell a device to respond to any signal.

To set the Device ID:

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow key three times to select setup from the Main menu. The word SETUP appears in all capital letters when selected.

   ```
   help backup submasters SETUP
   Press cursor down for setup functions.
   ```

3. Press the CURSOR Down Arrow key to access the setup submenus. The LCD window displays the options: device-id, mem-lock, serial port, edit/copy, and erase all. Notice the right pointing arrow in the LCD window indicating to scroll in this direction for more items.

   ```
   DEVICE–ID  mem–lock  serial port  edit/cop→
   Device ID =   0
   ```

4. Since Device–ID is the first menu item it is already selected and displayed in all capital letters. The second line of the LCD window prompts: "Device ID = 0."
5. Press the CONSTRUCT Up and Down Arrow keys to change the value of the device-id for this particular *intellabeam* Controller. Values range from 0 to 223.
6. Press the CURSOR Left or Right Arrow keys to select another Setup submenu item, or press the CURSOR Up Arrow key to return to the Main menu.

Set Memory Locks

Use the Memory Lock function to lock out a Memory so that it cannot be edited without first being unlocked.

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow key three times to select **setup** from the Main menu. The word SETUP appears in all capital letters when selected.

```
help backup submasters SETUP
Press cursor down for setup functions.
```

3. Press the CURSOR Down Arrow key to access the **setup** submenus. The LCD window displays the options: **device-id, mem-lock, serial port, edit/copy, and erase all.** Notice the right pointing arrow in the LCD window indicating to scroll in this direction for more items.

```
DEVICE-ID mem-lock serial port edit/cop→
Device ID = 0
```

4. Press the CURSOR Right Arrow key once to select **mem-lock.** The words MEM-LOCK appear in all capital letters when selected.

```
device-id MEM-LOCK serial port edit/cop→
Use A/P keys 1-9, 0ff = locked
```

5. The second line of the LCD window displays: "Use A/P keys 1-9, off=locked."
6. Press the A/P keys of the Memories that you want to lock out and thus prevent unwanted editing. The LEDs for each Memory (1-9) turn "Off" when you press its A/P key. When the LED is "Off" the Memory is locked.
7. Press CURSOR Left or Right arrow keys to select another Setup submenu item, or press the CURSOR Up Arrow key to return to the Main menu.

Serial Port

Use the Serial Port function to set the controller to use either its RS-232 serial port or the MIDI ports.

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow key three times to select **setup** from the Main menu. The word SETUP appears in all capital letters when selected.

```
help backup submasters SETUP
Press cursor down for setup functions.
```

3. Press the CURSOR Down Arrow key to access the **setup** submenus. The LCD window displays the options: device-id, mem-lock, serial port, edit copy, and erase all. Notice the right pointing arrow in the LCD window indicating to scroll in this direction for more items.

```
DEVICE–ID  mem–lock  serial port  edit/cop→
Device ID =   0
```

4. Press the CURSOR Right Arrow key twice to select serial port. The words SERIAL PORT appears in all capital letters when selected.

```
device–id  mem–lock  SERIAL PORT  edit/cop→
Use RS-232 for Lightwave Backup/Control
```

5. Depending on the current setting of the controller, the second line of the LCD window displays: "Use RS-232 for Lightwave Backup/Control" or "Use MIDI Show Control and Sysex Backup."
6. Press the CONSTRUCT Up or Down Arrow keys to change the selection between MIDI or RS-232.
7. Press CURSOR Left or Right Arrow keys to select another Setup submenu. Press the CURSOR Up Arrow key to return to the main menu.

Edit/Copy

Use the Edit/Copy menu item to modify how you use the Copy command. The Edit/Copy function itself does not perform any copying functions. The Copy command, which allows you to copy Address and Page parameters, is explained later in this section. You define the operation of this feature through the Setup menu.

The Edit/Copy menu item determines whether the Copy command copies all of the Constructs from one fixture to another or whether no Constructs are copied from one fixture to another. The default setting of the controller is "Share all Constructs until selected."

If "Share all constructs until selected" appears in the second line of the LCD window, the copy command copies all of a fixture's parameter constructs to the fixture you have selected to "copy to." If you do not want to copy all of these Constructs, you must select the particular Construct that you **do** want to copy by pressing its respective parameter key until the LED indicator above that key lights. Only the Constructs you select are copied.

If "Don't share all constructs until selected" appears in the second line of the LCD window, the copy command does not automatically copy all of a fixture's Constructs to the fixture you have selected to "copy to." You select which Constructs you want to copy by pressing their respective parameter keys. When the LED indicator above a Construct key is on, the parameter settings of that Construct is copied.

To define the Edit/Copy feature:

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow key three times to select setup from the Main menu. The word SETUP appears in all capital letters when selected.

```
help backup submasters SETUP
Press cursor down for setup functions.
```

3. Press the CURSOR Down Arrow key to access the setup submenus. The LCD window displays the options: device-id, mem-lock, serial port, edit/copy, and erase all. Notice the right pointing arrow in the LCD window indicating to scroll in this direction for more items.

```
DEVICE–ID mem–lock serial port edit/cop→
Device ID = 0
```

4. Press the CURSOR Right Arrow key three times to select the edit/copy item. The words EDIT/COPY appears in all capital letters when selected. Notice this time that the LCD window shows a left pointing arrow indicating that the menu items shifted to the left to display EDIT/COPY.

```
←em–lock serial port EDIT/COPY erase all
Share all constructs until selected
```

5. Depending on the current setting of the controller, the second line of the LCD window displays: "Share all constructs until selected" or "Don't share all constructs until selected."
6. Press the CONSTRUCT Up or Down Arrow keys to change the selection between Share or Don't share.
7. Press CURSOR Left or Right Arrow keys to select another Setup submenu item, or press the CURSOR Up Arrow key to return to the main menu.

Erase All

The Erase All function provides a quick way to clear all of User Memory. This operations clears everything, but the Operating System. You may want to temporarily backup User Memory to a Memory Card before you Erase All.

To execute the Erase All feature:

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow key three times to select setup from the Main menu. The word SETUP appears in all capital letters when selected.

```
help backup submasters SETUP
Press cursor down for setup functions.
```

3. Press the CURSOR Down Arrow key to access the setup submenus. The LCD window displays the options: device-id, mem-lock, serial port, edit/copy, and erase all. Notice the right pointing arrow in the LCD window indicating to scroll in this direction for more items.

```
DEVICE–ID mem–lock serial port edit/cop→
Device ID = 0
```

4. Press the CURSOR Right Arrow key four times to select the **erase all** item. The words ERASE ALL appears in all capital letters when selected. Notice this time that the LCD window shows a left pointing arrow indicating that the menu items shifted to the left to display ERASE ALL. The second line in the LCD window displays: "Hold SELECT, press ERASE to clear memory."

```
←em–lock  serial port  edit/copy ERASE ALL
Hold SELECT, press ERASE to clear memory
```

5. Press and hold the SELECT key and then press the ERASE key. Do not release the SELECT key. The second line in the LCD window now displays: "ERASE again to confirm, SELECT to cancel."

```
←em–lock  serial port  edit/copy ERASE ALL
ERASE again to confirm, SELECT to cancel
```

6. To complete the erase operation, while still holding the SELECT key, press the ERASE key again. The LCD window first displays: "ERASING... Memory: 1-9". Then it displays: "The controller will now restart...". The system performs a normal power-on restart.

Erase User Keys

The Erase User keys function allows you to erase or restore User keys 1 through 8 to their pre-programmed values. That is, Random, Audio 1, Audio 2, Color, gobo, and dim modulate. You would perform this operation to restore the keys to their original values when you no longer need the macros. Note that when you perform this operation that keys 1 to 6 are returned to their pre-programmed values and keys 7 and 8 are erased.

To erase all eight User keys:

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow key three times to select **setup** from the Main menu. The word SETUP appears in all capital letters when selected.

```
help  backup  submasters  SETUP
Press cursor down for setup functions.
```

3. Press the CURSOR Down Arrow key to access the **setup** submenu. The LCD window displays the options: **device-id, mem-lock, serial port, edit/copy, erase all and erase user.** Notice the right pointing arrow in the LCD window indicating to scroll in this direction for more items.

```
DEVICE–ID  mem–lock  serial port  edit/cop→
Device ID =   0
```

4. Press the CURSOR Right Arrow key five times to select the **erase user** item. The words ERASE USER appears in all capital letters when selected. Notice this time that the LCD window shows a left pointing arrow indicating that the menu items shifted to the left to display ERASE USER.

The second line in the LCD window displays: "Hold SELECT & ERASE to clear user keys."

←serial port edit/copy erase all ERASE USER
Hold SELECT & ERASE to clear user keys

5. Press and hold the SELECT key and then press the ERASE key. Do not release the SELECT key. The second line in the LCD window now displays: "ERASE again to confirm, SELECT to cancel."

←serial port edit/copy erase all ERASE USER
ERASE again to confirm, SELECT to cancel

6. To complete the erase operation, while still holding the SELECT key, press the ERASE key again. The LCD window displays: "ERASING... USER KEYS".

Programming

The *intellabeam* Controller has nine separate Memories, each containing 99 Pages. This provides a total of 891 Pages of storage in the controller's memory. You can program each Page individually, in a sequence, or in loops. A Page (traditionally called a scene) consists of Constructs (Color, Gate, Delay, Xfade, Position, Speed, and so on) that you define for up to 24 fixture Addresses and their modifications. You program the controller in IMP mode.

IMP mode provides you with two programming modes, Address and Preset:

Address Mode: In Address mode you directly program one or more fixtures by entering Construct parameters directly into Memories and Pages and then record these parameters. You then playback the information by manually selecting the Memories and Pages or automatically by selecting the AUTO (auto advance) key.

Preset Mode: In Preset mode you save a program that you created in Address mode as a Preset program and assign it a keypad number. You then recall the program at any time by its assigned keypad number.

Note: If you are not familiar with the *intellabeam* Controller's Constructs read or review *Chapter 3* before programming the controller.

Address Mode Programming

There are 24 Addresses available on the *intellabeam* Controller that control 24 fixtures. You can assign more than one fixture to an Address, thus configure up to 24 sets of fixtures. If several fixtures are assigned to the same Address, they all share the same Constructs and they all move at the same time in response to the joystick when you select their Addresses.

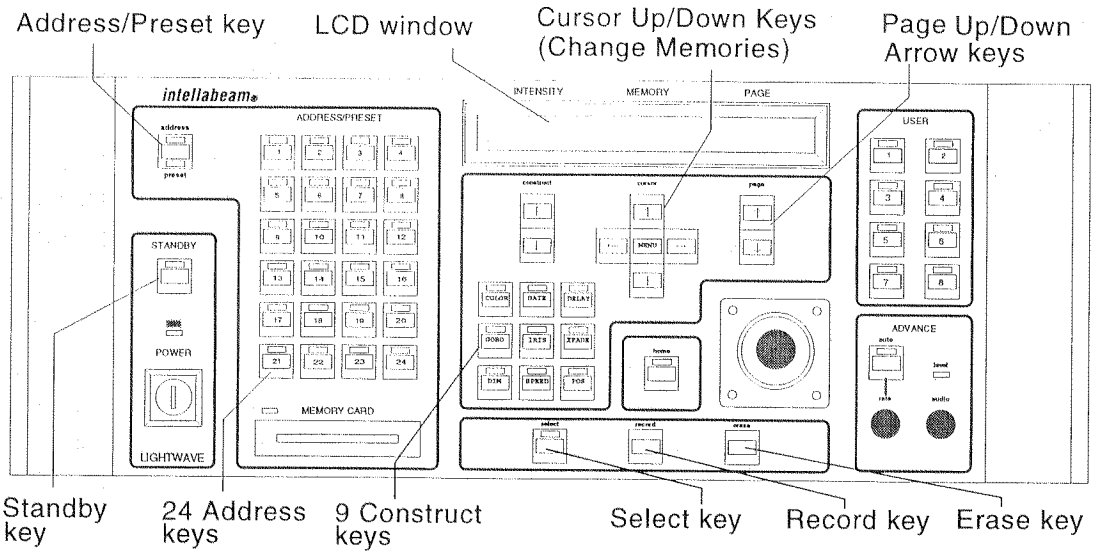
A Page consists of the Construct parameters and positions for up to 24 fixture Addresses and their modifications. You can compare a single Page to a "scene" in traditional lighting desk nomenclature. An individual Page can be as simple as a single fixture, in plain white light, shooting straight out, or as complicated as multiple fixtures with completely different colors and patterns moving everywhere.

You playback these Pages 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 as follows:

The Four-Step Method to Create a Page

- To begin Programming, **make sure you are in IMP (Intensity, Memory, Page) mode.** If the LCD window does not show the current Intensity, Memory and Page setting, the controller is in Menu mode. Press the MENU key to exit Menu mode. In IMP mode, you access the Memory and Page where you begin programming.
- Make sure you are in Address mode (the LED under the ADDRESS key will be lit if you are in Address mode.). If you are not in Address mode, press the ADDRESS/PRESET 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. Refer to Figure 5.3.
- Use the CURSOR Up/Down Arrow keys to select the Memory and the PAGE Up/Down keys to select the Page where you want to begin programming. For example, Memory 1, Page1, or Memory 3, Page 4.

1. Press the SELECT key. The SELECT key LED flashes. Ensure that the Standby lamp is out. Refer to Figure 5.3.
2. Next, select one or more fixture Addresses that you want to program by pressing their respective controller ADDRESS keys.
3. Set the Construct parameters by pressing the desired Construct key. Use the CONSTRUCT Up/Down Arrow keys to set the Construct parameters for the selected Addresses. Refer to *Chapter 3* for information about Construct parameters. Repeat this step for each Construct parameter that you want to change or define.
4. Press the RECORD key. The LCD window indicates recording. To playback the Page refer to the *Playback* section later in this chapter.



Note: 9 prime Construct keys are on the front panel. Select remaining Constructs through the LCD window.

Figure 5.3. intellabeam Controller Front Pane l

Selecting a Block of Addresses

To select a block or range of Addresses, simultaneously press both the highest and lowest numbered ADDRESS keys of the desired range. All Addresses from the lowest numbered key to the highest numbered key that you press are selected. For example, to select Addresses 1 through 8, press keys 1 and 8 at the same time.

Editing Construct Parameters

You edit Constructs whenever you want to change the existing parameters for a program. For example, you want to change colors, gobos, delay, and so on for one or more fixtures. You edit Construct parameters in IMP mode. In this mode, you set the Intensity (Master Dim), select the Memory to use, and select the Page within the Memory to program. From this mode, you program and edit your light show.

To edit fixture Constructs:

1. Place the controller in IMP mode. If the controller is in Menu mode, press the MENU key to exit Menu mode and enter IMP mode.

Intensity: 99	Memory: 1	Page: 1

2. Press the SELECT key.

   The LCD window displays: "Select fixtures to edit using A/P keys, or press SELECT to exit."

Select fixtures to edit using A/P keys, or press SELECT to exit.

3. Press the appropriately numbered keys on the Address/Preset keypad to select the fixtures that you want to edit. The 24 ADDRESS keys corresponding to the fixtures with the same Address. That is, ADDRESS key 1 corresponds to the fixture Addressed as 1, ADDRESS key 2 corresponds to the fixture Addressed as 2, and so on.

   The Construct menu appears in the LCD window. There are 11 Constructs available through the LCD window menu: Color, Gate, Delay, Gobo, Iris, Xfade, Dim, Speed, Pos, Cspeed, and Gspeed. The first nine Constructs are also accessible through keys.

   Refer to *Chapter 3* for details on Constructs and their parameters.

4. To select a Construct, press the CURSOR Right or Left arrow keys until the menu item that you want to edit is capitalized. If the Construct is assigned to a key you can press the individual Construct key. Notice that the name of the Construct key you press becomes capitalized in the LCD window.
5. To edit the Construct's parameter, that is change its value, press the CONSTRUCT Up and Down arrow keys. These keys are located just to the left of the MENU key under the LCD window.
6. Press the RECORD key to save your changes. Press the SELECT key to cancel the operation. The controller then returns to IMP mode.

Creating and Running Loops

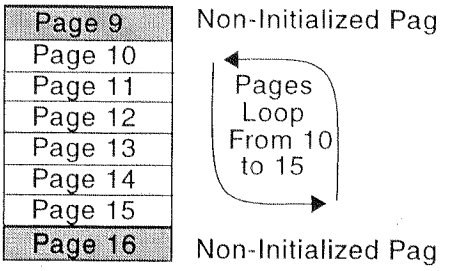
A loop is a sequence of Pages that runs continuously until you stop it. For example, you may have created a sequence in Pages 5 and 6 that moves the beam from position A to position B, changes gobo patterns from a "splash" to a "star", and then changes colors from red to green. You now want to continuously run these two pages in a loop.

To continuously run a sequence of Pages in a loop you must bracket the Pages that you want to include in the loop with two Non-Initialized Pages. In the previous example, you would make Pages 4 and 7 Non-Initialized pages. Then, when you run the loop, it would run continuously from Pages 5 through 6.

Creating a Non-Initialized Page

A Non-Initialized Page acts as a "placeholder" to indicate the beginning and end of a chase or loop. To create a Non-Initialized Page you perform a double erase operation to the Page.

The controller automatically places a Non-Initialized "Page" before Page 1 and after Page 99. However, if you want to program a Loop from Page 10 to Page 15 you would make Pages 9 and 16 Non-Initialized Pages in order for Pages 10 through 15 to perform as a Loop.



To create a Non-Initialized (un-initialize) Page:

1. Select the first or beginning Page that you want to "Non-Initialize." Use the PAGE Up/Down keys to select the Page. Use the CURSOR Up/Down keys to select the Memory.
2. Press the SELECT key to select the Page. The SELECT key LED flashes. Disregard the LCD window display for this step.
3. Press the ERASE key once. The LCD window displays: "Press ERASE to un-initialize M:x (x=current memory #) P:x (x=current page #) or press SELECT to exit."

Press ERASE to un-initialize M: x P: x or press SELECT to exit.

4. Press the ERASE key a second time to un-initialize the page. In a moment the controller returns to IMP Mode.

   Repeat steps 1 to 4 for the second or ending Non-Initialize page.

Note: When you press any A/P key while the controller is on a Non-Initialized Page the LCD window displays:" This page is not initialized."

This completes the Non-Initialize page operation.

Running a Loop

With the loop created and bracketed with Non-Initialized Pages you can now run the loop.

To run a loop:

1. Use the PAGE Up/Down keys to display in the LCD window any Page in the loop.
2. Then, press the AUTO key located over the RATE knob. The auto LED lights and the loop runs beginning from the Page you set in the LCD window.
3. The controller advances the Pages at the rate you set with the RATE knob. Adjust the knob clockwise to run the loop faster and counterclockwise to run the loop slower. Note that any delay times you program increase the Page advance rate.

Position Memory (Position Preset)

The *intellabeam* Controller has a time-saving feature called Position Memory (commonly called "Position Preset"). Position Memory allows a Page to refer to another Page for pan and tilt position information. This allows *many* Pages to use the same pan and tilt position information from another single Page. When that one reference Page is altered, all Pages that refer to it reflect the change. **Memory 9 is the Memory designated as "Position Memory."** You can program all 99 Pages of Memory 9 as position preset Pages. Note that you can still use all Pages not used as Position Memory as regular Memory Pages.

The following scenario is a typical example of Position Memory: A show is programmed for a specific focus (that is, lead singer - down stage center, drummer - up stage center, keyboard player - stage left). In Memory 9, Page 1 is programmed with all fixtures directed towards the lead singer. Since this position is stored in Page 1of Memory 9, it is referred to as "position number one" or "position one." Similarly, positions two and three for the drummer and keyboard player are programmed into Memory 9, Pages 2 and 3 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. You can now easily adjust the positions of the fixtures by position number instead of by joystick movement on each individual Page.

Position Memory provides for a simple process where you can quickly update a show when it moves from one venue to another. At each venue the fixtures may be mounted in different positions and the stage and trusses may be arranged differently. In the above example, only Pages 1, 2, and 3 of Memory 9 need to be changed in order to update the whole show. All Pages with positions 1, 2, and 3 will be adjusted automatically.

Creating Position Reference Pages in Memory 9

The Pages in Memory 9 where you record position information become Position Preset Pages 1 to 99. Do not confuse "Position Presets" with "Preset mode" programming covered in a following section.

1. Select a Page in Memory 9. The Page number you select in Memory 9 becomes the reference Position Preset number (1 to 99) when you complete this procedure. Use the CURSOR Up/Down keys to select Memory 9 and PAGE Up/Down keys to select a Page.
2. Press the SELECT key, the SELECT key LED flashes.
3. Press the ADDRESS keys of all the fixtures that you want to include in this Position Preset. To select all Addresses press keys 1 and 24 together.
4. Use the joystick to position the fixtures on a reference point (for example, lead singer - center and front.)
5. Press the RECORD key. The position information for this Position Preset is now recorded. The assigned Position Preset number is the same number as

the Page you selected in step 1. For example, if you selected Memory 9, Page 5, in step 1, then when you apply this Position Preset at a later time, it will be Position Preset 5.

Using the Position Reference Pages in Memory 9

1. Select the Memory and Page that you want to program.
2. Press the SELECT key, the SELECT key LED flashes.
3. Press the ADDRESS keys for the fixtures that you want to reference to the Position Presets recorded in the Position Memory Page in Memory 9.
4. Press the POS (Position) key and the LCD window now displays either "JOYSTICK", or "POSITION: PRESET 1- 99" for Position Preset numbers which refer to positions in Memory 9. If the display shows "JOYSTICK," it means that the position of this fixture is determined by the positioning of the joystick on the **current** Page and that no Position Preset in Memory 9 is referenced.
5. Use the CONSTRUCT Up/Down arrow keys to select the desired Position Preset number in Memory 9 that you want to reference.
6. Press the RECORD key.

   The fixtures that you selected in step 3 now use the position information recorded in the Position Preset reference Page in Memory 9. Any time you change the position of the Addresses on the Position Preset reference Pages in Memory 9, the Pages that refer to that Page for position will also change.

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. Use Address Unlock to return the fixture to normal operation. Locked Addresses are returned to unlocked position at controller power up.

To lockout an Address:

1. Press and hold for 30 seconds the ADDRESS key of the Address that you want to lock out. The LCD window displays the current parameter settings for that Address while you hold in the ADDRESS key.

Dim	Clr	Gbo	Gat	Irs	Spd	Pos	Xfd	Dly	Pag
99	1	1	CL	99	99	JS	0.1	0.0	1

2. After 30 seconds the bottom line in the LCD window displays: "Address x is locked out." The lamp of the locked out fixture turns off.

```
Dim Clr Gbo Gat Irs Spd Pos Xfd Dly Pag
 Address x is locked out
```

Note: Anytime you press an unlocked ADDRESS key, the LCD window displays the abbreviated parameter titles and their values.

Address Unlock

You can return any locked out Addresses to normal operation by using the same procedure that locks out an Address. Also, all Addresses are returned to their un-locked settings upon power up of the controller. The LCD window displays: "Address x is locked out."when you select a locked Address.

To unlock a locked Address (fixture):

1. Press and hold the locked out ADDRESS key for 30 seconds.
2. The settings programmed for that Address appear in the LCD window. The lamps of the fixtures turn on when unlocked. The Address is now unlocked.

Preset Mode Programming

A Preset is a recording of a programmed Page or sequence of Pages that you create in Address mode. This recording is then assigned a Preset number that you use when you want to recall the program. Thus, Presets allow you to immediately recall a programmed Page or sequence of Pages. Presets store all of the Construct parameters, Advance, and Effect settings that were programmed with a Page or sequence of Pages. You can change the Advance and Effect settings during the Preset recording process. The Page Advance rate is stored with each Preset. These Advance, and Effect settings can also be adjusted during the playback of a Preset. The Audio level is independent of the Presets. Preset can hold either a single Page (a static scene) or a group of consecutive Pages (a chase or loop) that advances automatically.

Presets are selected by front panel access, using the 24 PRESET keys. In addition, the *emulator* Controller is capable of storing up to 1023 Presets by using a remote analog input device.

Note: If you lock out any Memories you also lock out Presets from those Memories.

Recording A One Page Preset (Scene)

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 as does a Loop of Pages.

To record a one Page Preset:

1. Select the Memory and Page that you want to record as a Preset. You must have previously recorded the Page in Address mode.

2. Select Preset mode by pressing the ADDRESS/PRESET key. The Address LED turns "off" and the Preset LED turns "on".
3. Press the SELECT key.
4. Press the numbered Preset key (1 to 24) where you want to store the Page as a Preset. The ADDRESS keys become Preset keys in Preset mode.
5. Press the RECORD key. You can now recall this Preset by the PRESET key number you assigned in step 4.

Recording A Sequence (Loop or Chase) as a Preset

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 in audio playback mode. A Loop is a group of consecutive Pages bound by a Non-initialized Page before the group of consecutive Pages and a Non-initialized Page after the group of consecutive Pages. Refer to *Creating a Non-initialized Page* earlier in this section if you are not familiar with this concept.

To record a sequence or loop as a Preset:

1. Use the PAGE Up/Down Arrow keys and select any Page within the loop that you want to record as a Preset.
2. With the controller in Address mode, press the AUTO key. The Pages start advancing, playing back the loop at the rate set by the RATE knob.
3. Press the ADDRESS/PRESET key to change the controller from Address Mode to Preset Mode. The Preset LED below the ADDRESS/PRESET key lights to indicate that the controller is in Preset Mode.
4. Press the SELECT key. The SELECT key LED flashes and the LCD window displays: "Select preset to edit using A/P keys, or press SELECT to exit."

Select preset to edit using A/P keys, or press SELECT to exit.

5. Press the PRESET key (1 to 24) on the front panel where you want to store the Loop.
6. Adjust the Advance, Rate, and Effect settings if required; these settings are recorded as part of the Preset. Whenever you playback a Preset, the Preset advances through its Pages according to the Advance, Rate, and Effect settings you set when you recorded the Preset.
7. Press the RECORD key. You have now recorded a Loop as a Preset.

   If you ever want to change the Advance, Rate, or Effect settings during the Preset playback, you can do so manually while the Preset is playing. These manual adjustments do not permanently change the way the Preset plays back. The Preset returns to the settings that you defined when you recorded the Preset.

   Note: To revert back to the original Preset rate after manually adjusting the rate, press the PRESET key again.

Programming a Preset in Twelve Level Preset Access Mode

Twelve Level Preset Access is a way of expanding the number of available Presets from 24 (that is, the 24 Preset buttons on the front panel of the *intellabeam* Controller) to 288 by using an auxiliary controller. Programming in Twelve Level Preset Access is similar to programming Presets with the *intellabeam* Controller with one exception; one of the twelve Analog Inputs on the rear of the *intellabeam* Controller must be activated during programming. Before beginning, make sure the *intellabeam* Controller is configured for Twelve Level Preset Access by setting Personality DIP Switch B on the rear of the *intellabeam* Controller to Switch 3 "On." Also, make sure an analog controller is correctly patched to the Analog Inputs connector on the rear of the controller. Refer to *Twelve Level Preset Access* in Chapter 6 for additional information.

To program a Preset using Twelve Level Preset Access:

1. Put the controller in Preset mode by pressing the ADDRESS/PRESET key until the Preset LED lights.
2. Press the PAGE Up/Down Arrow key to select any Page within the loop that you want to record as a Preset.
3. Press the AUTO key. The Pages start advancing, playing back the loop.
4. Press the SELECT key. The SELECT key LED flashes.
5. Activate the 0-10 volt analog input channel where you want to store the desired Preset. For example, to program the first level of 24 Presets, turn on channel one on the auxiliary controller. To program the second level of 24 Presets (25 to 48), turn on channel two on the auxiliary controller, and so on through the 12 levels. Twelve levels times 24 equals the maximum 288 presets.

   Note: The table in Appendix E contains a time saving list of Preset numbers, keys, and levels.
6. Press the PRESET key number (1-24) on the front panel where you want to store the Preset. You can now adjust the Advance, Rate, and Effect settings. These settings are recorded as part of the Preset. Whenever you playback a Preset, the Preset advances through its Pages according to the Advance, Rate, and Effect settings you set when you recorded the Preset. However, if you ever want to change any of the Advance or Effect parameters when playing back a Preset, you can do so manually while the Preset is playing. These manual adjustments do not permanently change the Preset. It automatically reverts back to the initial settings as recorded.
7. Press the RECORD key. The Select LED stops flashing and the Preset is now recorded.

Recalling a Preset in Twelve Level Preset Access Mode

To recall the Preset, press the ADDRESS/PRESET key, the PRESET key LED lights. This puts the *intellabeam* Controller in the Preset mode. Turn on the channel on the auxiliary controller where you recorded the Preset. On the *intellabeam* Controller press the PRESET key number of the Preset you wish to recall.

Programming a Preset in Binary Preset Access Mode

Binary Preset Access is a way of expanding the number of available Presets from 24 (the 24 Preset buttons on the front panel of the *intellabeam* controller) to 1023 by using an auxiliary controller.

Programming in Binary Preset Access is similar to programming Presets as usual with the *intellabeam* Controller with one exception; any combination of the first 10 of the 12 Analog Inputs on the rear of the *intellabeam* Controller must be activated during programming. Before you begin, ensure that the controller is configured for Binary Preset Access by setting Personality DIP Switch B on the rear of the controller to: Switches 3 and 5 "On." Also, make sure an analog controller is correctly patched to the Analog Inputs connector on the rear of the *intellabeam* Controller. Refer to *Binary Preset Access* in Chapter 6.

To program a Preset using Binary Preset Access:

1. Select Preset mode by pressing the ADDRESS/PRESET key; the Preset LED lights.
2. Use the PAGE Up/Down Arrow keys to select any Page in the loop of Pages that you want to record as a Preset.
3. Press the AUTO key. The Pages start advancing, playing back the loop.
4. Press the SELECT key. The SELECT key LED flashes.
5. Press a numbered PRESET key on the front panel of the *intellabeam* Controller. The PRESET key that you press is not important; this action only alerts the controller that you are about to record Presets. You can now adjust the Advance, Rate, and Effect settings. These settings are recorded as part of the Preset. Whenever you playback a Preset, the Preset advances through its Pages according to the Advance, Rate, and Effect settings that you set when you recorded the Preset. However, if you want to change any of the Advance or Effect parameters while playing back a Preset, you can do it manually. These manual override operations do not permanently change the Preset.
6. Activate any combination of the first 10 of 12, 0-10 volt, input channels. This unique combination of activate and non-activate channels can be represented as a binary number with 10 digits where the Preset is stored.

   Appendix E provides a chart listing the Analog Input Channel values for all 1023 channels. For example, you may store Preset 1 as the binary

equivalent of 1(1000000000). This is channel 1 "On" and channels 2 to 10 "Off." Preset number 948 is stored as the binary equivalent of 948 (0010110111), which is channels 3,5,6,8,9, and 10 "On" and channels 1, 2, 4, and 7 "OFF.".

7. Press the RECORD key. The SELECT key LED stops flashing and one of the PRESET key LED's on the front panel lights up indicating that you recorded a Preset. The LED that lights is not necessarily the one that you pressed, but the one corresponding to the remainder (long division) of the decimal equivalent of the binary Preset number divided by 24. In the above example, decimal Preset number 948 divided by 24 is 39 with a remainder of 12 which causes the LED for Preset key number 12 to light up.

Recalling a Preset in Binary Preset Access Mode

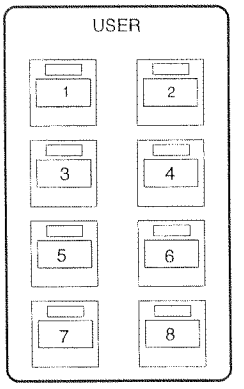
To recall the Preset, press the ADDRESS/PRESET key, the PRESET key LED lights. This puts the *intellabeam* Controller in the Preset mode. On the auxiliary controller, turn on the channel for the recorded Preset that you want to recall.

User Definable Keys 1 Through 8

This section explains how to record, playback, and edit the eight front panel USER keys. This section also explains how to abort a USER key playback operation. USER Keys 1 to 6 are factory programmed for common usage of these keys, that is, Random advance, Audio 1 advance, Audio 2 advance, and Color, Gobo, and Light Effects. However, you can easily record your own macros using these eight keys to suit your special purposes as explained in this section. If you record macros with any of the USER keys, you can still access the pre-programmed functions through the USER key *function* menu operation. Refer to Chapter 3 for details on the pre-programmed functions. Refer to the SETUP submenu earlier in this chapter on how you can easily restore the eight keys back to the factory pre-programmed values.

User keys 1 through 8 are factory programmed as follows:

User 1 – Random (time) Advance Key
User 3 – Audio Advance 1 Key
User 5 – Audio Advance 2 key
User 2 – Effect 1 Color Modulate Key
User 4 – Effect 2 Gobo Modulate Key
User 6 – Effect 3 Dim Modulate Key
User 7 – Undefined (not programmed)
User 8 – Undefined (not programmed)



User Key States

When you press a USER key one of three states occur depending on how long you press and hold the key.

1. Press and hold the selected USER key in for up to 1 second to playback the macro assigned to the key.
2. Press and hold the selected USER key in for 2 to 3 seconds to enter the Edit menu where you can abort, playback, record, or perform one of the pre-programmed functions.
3. Press and hold the selected USER key in for 3 seconds or more to abort the Playback of the User Key macro.

Playback User Key Macros

Follow this procedure to playback a macro assigned to USER keys 1 to 8.

- Simply press and release the desired USER key within 1 second and the macro begins playing back.

You can also playback macros through the USER Key EDIT menu.

Edit User Keys

The Edit state provides a submenu where you are provided with an alternate method to abort and playback macros. More importantly though, this is where you record (create) the USER key macros. This is also where you can activate the pre-programmed special effects (Random adavance, Audio advance/halt, color, gobo, and Dim) without performing the restore (erase) procedure. Thus, you can define all six USER keys and still have access to the original pre-programmed special effect functions.

To enter the EDIT state:

1. Press and hold the desired USER key from 2 to 3 seconds. If you exceed 3 seconds you enter the Abort state. The LCD window displays the EDIT menu:

EDIT Menu

```
ABORT playback record function
Press cursor down to abort macro play
```

The top line lists the available item that you can perform from this menu. When you select menu items with the CURSOR Right/Left Arrow keys the menu items change to capital letters.The bottom line prompts you with the required action to perform the selected menu item. It will usually request that you press the CURSOR Down Arrow key to continue.

2. Then, go to the following section associated to the menu item that you want to perform. For example, to record a macro go to the following *Record User Key Macros* section.

Abort Playing Macro

Select this menu item to abort the currently running macro. This operation has the same effect as pressing the USER key for more 3 seconds or more.

To perform an abort operation:

- Since abort is the first item in the EDIT menu it is selected by default. Then, just press the CURSOR Down Arrow key and the macro aborts.

Playback Macros

Select this item to playback macros from within the EDIT menu. Otherwise, you playback macros by just pressing the appropriate USER key.

To playback macros from the EDIT menu:

1. From the EDIT menu press the CURSOR Right Arrow key once to select playback. Playback changes to capital letters.
2. Then, press the CURSOR Down Arrow key to play the macro assigned to the USER key that you pressed to enter the EDIT menu.

Record User Key Macros

You can program any one or all of these eight keys as desired. When you record a macro and assign it to a USER key, you cannot then use the key to recall its pre-programmed function. However, you can still recall the pre-programmed function through the EDIT menu *function* item; see the following section. When you decide to restore the pre-programmed values remember that the controller restores the six pre-programmed keys.

A macro is a recording of key presses that you assign to one of the six USER keys. Then, you simply press the USER key once to playback the macro.

To record a macro for the selected USER key:

1. From the EDIT menu press the CURSOR Right Arrow key twice to select record. Record changes to capital letters.

Note: when you complete your macro key presses you will reenter the EDIT menu again to stop the macro recorder.

2. Next, press the CURSOR Down Arrow key to open the macro recorder.
3. Now, every key press you make is recorded in this macro. The macro accepts up to 256 key presses.
4. When you have completed your macro press the same USER key again that you started with to re-open the EDIT menu. That is, the USER key that you want to assign to this macro. This time the EDIT menu displays stop recording rather that recording.

5. Press the CURSOR Right Arrow twice to select the stop recording item.
6. Then, press the CURSOR Down Arrow key to complete the operation.

Activate Random, Audio, and Effects Functions

The last item in the EDIT menu is function. This feature allows you to access the six pre-programmed functions originally assigned to USER keys 1 to 6. This is useful if you want to enable a special effect, but the key is now assigned to a macro.

To enable Color modulate, Gobo modulate, Dim modulate Audio advance (Audio 1), Audio halt (Audio 2), or Random through the EDIT menu function item:

1. From the EDIT menu press the CURSOR Right Arrow key three times to select function. Function changes to capital letters.
2. Then, press the CURSOR Down Arrow key to enter the FUNCTION submenu. The LCD window displays:

```
COLOR gobo dim audio1 audio2 random
Press cursor down to enable color mod
```

   Notice that the top line displays the FUNCTION submenu. The bottom line prompts you to press the CURSOR Down Arrow key to perform the selected menu item. When you select menu items with the CURSOR Right/Left Arrow keys the menu items change to capital letters.
3. Select the desired effect with the CURSOR Left/Right Arrow keys. When the selected item is in capital letters press the CURSOR Down Arrow key to enable the effect.

Copying

The *intellabeam* Controller records all parameters that you program. Therefore, it is easy to repeat certain parts of the controller's Memory by copying parameters.

The copying function of the controller allows you to copy:

- certain parameters of an Address to another Address or range of 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.

Note: You can modify the way the controller copies information from one Address to another through the Setup menu. The Edit/Copy menu item controls whether the initial "copy" command copies all of the Constructs from one fixture to another or whether no Constructs are copied from one fixture to another until you select specific Constructs. The default setting of the controller is "Share all constructs until selected." Refer back to the *Edit/Copy* feature described in the Setup section.

Page Copy

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

To copy the contents of one Page to another Page:

1. First, ensure you are in IMP mode, the ADDRESS LED is lit on the ADDRESS/PRESET key, and that the SELECT key LED is **not** lit or flashing. Select the Page (source) that you want to copy using the PAGE Up/Down Arrow keys.
2. Press the SELECT key. The LCD window displays: "Select fixtures to edit using A/P keys, or press SELECT to exit."

Select fixtures to edit using A/P keys, or press SELECT to exit.

3. Select the Memory and Page (destination) where you want to copy the contents of the current page. Press the CURSOR Up/Down Arrow keys to change the Memory number. Press the PAGE Up/Down Arrow keys to change the Page number. When you press the CURSOR or PAGE key for the first time, the LCD window shows the source Memory and Page fields. The destination Memory and Page fields follow your key presses.

Copy M: x P: x to M: x P: x Press RECORD to save, SELECT to exit.

4. Press the RECORD key. The Page copy is complete. The controller returns to IMP mode. You can repeat this procedure as often as you wish.

Block Copy

Use Block copy when you want to repeat multiple consecutive Pages. This function can save time when you want to repeat multiple chases with slight parameter changes each time the chase repeats.

To copy a block of Pages to the same or another Memory:

1. Use the PAGE Up/Down Arrow keys and select any Page within the group of Pages that you want to copy.
2. Press the SELECT key. The LCD window displays: "Select fixtures to edit using A/P keys, or press SELECT to exit."

Select fixtures to edit using A/P keys, or press SELECT to exit.

3. Press the AUTO key, located just to the right of the joystick. The LCD window displays: "COPY FROM M: x P: x thru M: -- P: -- to M: -- P: -- "

Copy	From M: x P: x	to M:— P:—
	thru M:— P:—	

4. Select the Memory and first Page of the block of Pages you want to copy. Press the CURSOR Up/Down Arrow keys to change the Memory number. Press the PAGE Up/Down Arrow keys to change the Page number. Notice the "From" prompt in the LCD window displays the beginning Memory and Page values as you enter them.
5. Press the AUTO key again. Select the last Page of the block of Pages you want to copy. Press the PAGE Up/Down Arrow keys to change the Page number. Notice the "thru" prompt in the LCD window displays the ending Memory and Page values as you enter them.
6. Press the AUTO key a third time. Select the first Page of the destination block of Pages you wish to copy. Press the CURSOR Up/Down Arrow keys to change the Memory number. Press the PAGE Up/Down Arrow keys to change the Page number. Notice the "to" prompt in the LCD window displays the destination Memory and Page values as you enter them.
7. **(Optional Step)** Pressing the CONSTRUCT Up/Down Arrow keys at this point toggles the controller between Copy and **Copy Reverse**. Copy Reverse reverses the sequence of Pages that you are copying.
8. Press the RECORD key. The SELECT key LED turns "Off" and the controller returns to IMP mode.

Address Parameter Copy

Once you program an Address, you can copy some or all of the parameter settings to other Addresses on the same Page or onto another Page. This saves time when you want many fixtures on a Page or within a Loop of Pages to have the same or similar settings.

Copy Construct Parameters From One Address to Another Address on the Same Page

1. Press the SELECT key. The LCD window displays: "Select fixtures to edit using A/P keys, or press SELECT to exit."
2. Select the Address containing the source Construct parameters that you want to copy.
3. Then, select the Construct parameters in the source Address that you want to copy by pressing the appropriate front panel Construct keys. Also, any Constructs that were edited through the LCD window menus are copied. If you do not select any Construct parameters to copy, then either: 1) all Constructs are copied, or 2) no Constructs are copied

depending on how you defined the Edit/Copy function through the Setup menu.

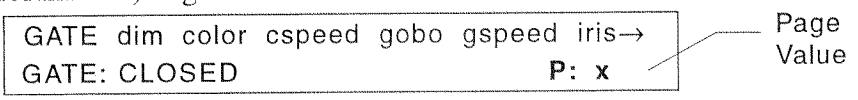
4. Select one or more destination ADDRESS keys to receive the Construct parameters from the source Address.
5. Press the RECORD key to save the changes or press the SELECT key to discard changes.

Copy Selected Addresses From One Page to Another Page

1. Press the SELECT key. The LCD window displays: "Select fixtures to edit using A/P keys, or press SELECT to exit."

   ```
   Select fixtures to edit using A/P keys,
        or press SELECT to exit.
   ```

2. Select the source Addresses you want to copy. Remember the Page number containing these Addresses.
3. Press the PAGE Up/Down Arrow keys to select the destination Page to receive the selected Addresses. As you press the PAGE key the destination Page value is displayed on the right side of the LCD window. All parameters (whether selected or not) from the source Addresses are copied to the destination Page. Only the selected parameters of the selected Addresses are copied to the new (destination) Page.

4. Press the RECORD key to save changes or press the SELECT key to discard changes.

Editing Pages

When you edit a Page that you previously programmed, one or more Address LEDs are typically lit, indicating that the gates of these fixtures are open. If you select the Gate Construct of a programmed fixture, you will notice that the second line of the LCD window shows that the gate is open. Modifying the Addresses on a Page can be accomplished in the same fashion as programming previously un-programmed fixtures.

To edit a previously programmed Page:

1. To change the programming of certain Addresses on a Page you must be in IMP (Intensity, Memory, Page) mode. If you are not in IMP mode, press the MENU key to return to IMP mode.
2. Use the CURSOR and PAGE Up/Down Arrow keys to select the Memory and Page that you want to edit.

3. Press the SELECT key. The SELECT key LED flashes. The LCD window displays: "Select fixtures to edit using A/P keys, or press SELECT to exit."

Select fixtures to edit using A/P keys, or press SELECT to exit.

4. Select one or more Addresses that you want to edit by pressing the desired ADDRESS keys in the Address/Preset area on the controller.
5. The SELECT key LED and the LEDs on all the selected ADDRESS keys flash.
6. Then, edit all of the desired Constructs (color, dim, gate, gobo, position, delay, and so on) for the selected Addresses by pressing each CONSTRUCT key (or select from LCD window items) and then set the Construct parameters with the CONSTRUCT Up/Down Arrow keys.
7. To save all of the new parameter settings, press the RECORD key. To cancel the operation press the SELECT key.

Erasing Pages and Creating Blackout Pages

You may want to erase a Page when there is undesirable or old Pages in Memory. It is often best to clear out these Pages to prevent confusion in future programming. Otherwise, you can record over the old Pages. An erased Page is still an Initialized Page; it acts as a "placeholder" Page in a loop of Pages. Therefore, use this feature to create Blackout pages.

Note: To prevent inadvertent erasing of Presets, you cannot directly erase Pages used as Presets. You record over existing Presets to change them.

1. Select the Page you wish to delete using the PAGE Up/Down Arrow keys.
2. Press the SELECT key. The LCD window displays: "Select fixtures to edit using A/P keys, or press SELECT to exit."

Select fixtures to edit using A/P keys, or press SELECT to exit.

3. Press the ERASE key once. The LCD window displays: "Press ERASE to un-initialize M:x P:x, or press SELECT to exit."

Press ERASE to un-initialize M: x P: x or press SELECT to exit.

4. **Do not press the ERASE key** again as stated in the LCD window, instead press the RECORD key. The LCD window briefly displays: "Recording." The controller then returns to the IMP mode. All of the parameter settings are set back to the default settings.

   Note: if you inadvertently press the ERASE key a second time you create an Un-initialized Page rather than an erased or Blackout Page. To re-initialize the Page, record any fixture Construct in the Page.

Memory Lock/Unlock

You can protect entire Memories from unauthorized editing or programming.

To lock a Memory:

1. Press the MENU key.
2. Press the CURSOR Right Arrow key three times to select setup. SETUP is capitalized when selected.
3. Press the CURSOR Down Arrow key.
4. Select mem-lock from the SETUP menu by pressing the CURSOR Right Arrow key once. MEM-LOCK is capitalized when selected. The second line of the LCD window displays: "Use A/P keys 1-9, off=locked."

```
device-id  MEM-LOCK  serial port  edit/cop→
Use A/P keys 1-9, off = locked
```

5. The LEDs above ADDRESS/PRESET keys 1-9 are lit (unless a Memory is already locked out).
6. Press the ADDRESS/PRESET key (1-9) corresponding to the number of the Memory that you want to lock out. When the LED above the key goes out the Memory is locked.
7. Press the MENU key to exit back to IMP mode.

To unlock a locked memory:

1. Perform steps 1 through 5 in the previous "To lock a Memory" procedure.
2. Then, press the ADDRESS/PRESET key (1-9) corresponding to the number of the Memory you want to unlock. The LEDs on locked Memories are off. The LED above the ADDRESS/PRESET key turns on when you unlock the Memory.
3. Press the MENU key to exit back to IMP mode.

A locked Memory is protected from all Erase and Record functions. If someone tries to access a protected Memory, the LCD window displays: "Memory x is locked out." Where x equals the locked Memory.

```
LOCKOUT. . .     Memory: x          Page: x
          Memory  x  is locked out
```

When program data is crossloaded between controllers or downloaded from a computer and 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 1, 2, and 3 from controller A to controller B, while keeping Memories 4 through 9 on controller B the way they are, you need to lock Memories 4 through 9 on controller B before the program data is transferred. Refer to Chapter 7, *External Memory Storage and Transfer,* for a complete description of the Memory transfer procedures.

Caution: loading controller User Memory from a Memory Card replaces all of the controller's User Memory, *including* locked Memories.

Playback

You can playback a program manually or automatically. Programs consist of single Pages, a sequence of Pages, a loop (chase) of Pages, or a Preset. You can also playback all Pages of all Memories in sequence.

Playing Single Pages —You playback single Pages manually by simply selecting the Memory with the CURSOR Up/Down keys and the Page with the PAGE Up/Down keys. The moment you select the Page it performs the operations recorded in the Page.

Manually playing a sequence of Pages — You can play a sequence of Pages manually. Play them manually by selecting the Memory and first Page in the sequence and then keep "bumping" the Page Up/Down keys to proceed through the sequence.

Automatically playing a sequence of Pages — To play a sequence automatically, select the first Page in the sequence and then press the AUTO key. The sequence will play from the current Page until it finds a Non-Initialized Page. If there is no Non-Initialized Page, then the sequence will wrap at Page 99 and continue with Page 1 running continuously until you deselect the AUTO key; the sequence stays in the same Memory. If there is a Non-Initialized Page anywhere in the Memory other than 0 and 99, the sequence will act like a loop or chase and loop back to Page 1.

Playing a loop — You playback a loop automatically. A loop has a Non-Initialized Page as its first and last page. You select any Page in the loop and then press the AUTO key; the loop runs continuously. When it encounters the ending Non-Initialized Page it loops back to the beginning Non-Initialized Page and continues until you deselect the AUTO key.

Playing a Preset — You playback a Preset in a similar fashion as a loop. That is, when you select a Preset it runs continuously until you select another Preset or exit Preset mode.

Varying Playback rate — To vary the playback rate during Auto mode adjust the RATE knob under the AUTO KEY; clockwise is faster, counterclockwise is slower. If you have a delay programmed into the Page it is added to the time set by the RATE knob adjustment.

Auto mode also provides several audio input override effects where you can advance or halt Pages according to the program information. You can also change fixture colors and light intensity according to the program information.

Page Playback - Manual Advance

To manually playback the Pages within a Memory:

1. If the controller is in Standby mode, remove the controller from Standby by pressing the STANDBY key; the STANDBY key LED turns "Off".

Note: When the controller exits Standby it immediately plays the Page currently displayed in the LCD window.

2. Then, use the PAGE Up/Down Arrow keys to select any Page that you want to Playback. The fixtures change their settings immediately according to what is recorded on each Page. The controller advances one Page at a time each time you press either the PAGE Up or Down Arrow keys.
3. If you press and hold either the PAGE Up or Down Arrow key, the Pages change quickly until 1 or 99 is reached. If you release and press the PAGE Up/Down Arrow key again, the process repeats.

Page Playback - Auto Mode

To automatically playback Pages within a Memory:

1. If the controller is in Standby mode, remove the controller from Standby by pressing the STANDBY key; the STANDBY key LED turns "Off".

   Note: When the controller exits Standby it immediately plays the Page currently displayed in the LCD window.

2. Select the starting Page within the loop (although you can start from any Page within the loop). Press the AUTO key, it is located to the right of the joystick. As soon as you press the AUTO key the controller begins to playback all of the Pages within the current Memory until it encounters a Non-Initialized Page. When it encounters a Non-Initialized Page it loops back to the starting Non-Initialized Page in the loop and continues with the first programmed Page after the Non-Initialized Page. The controller runs continuously sequencing through the loop until you deselect the AUTO key.
3. To vary the playback rate (speed) turn the RATE knob, located just below the AUTO key. Turn the RATE knob clockwise to speed the playback rate or counterclockwise to slow the playback rate. The RATE knob adds to the Delay time programmed into each Page.

Live Control of Fixtures During Auto Playback

During a playback you may want to have "live" control (override) over the Constructs of one or more fixtures. For example, an activity occurs that you want to track with a "free spot". You could quickly select a fixture to use as a spot and manually control it with the joystick. To have "live" control of one or more fixtures:

1. Press the SELECT key. The SELECT key LED flashes.
2. Select the numbers of one or more fixtures that you want to manually control by pressing their corresponding ADDRESS keys on the controller. You now have "live" control over the selected fixtures. You can change (override) any of the fixtures' Constructs, however, you cannot record the changes made during "live" control.

3. To return from "live" control press the SELECT key. The SELECT key LED stops flashing. The selected fixtures return to their original programmed settings and join the Sequence running.

Audio Input Playback Modes

You can use a musical source to control *intellabeam* auto playback through five *intellabeam* playback modes. Plug your musical source into the 6 mm (1/4 inch) Stereo Audio Input jack on the *intellabeam* Controller's rear panel. Although the input jack is a stereo connector, the controller accepts a monaural input on one of the stereo connections. Then, follow the directions as explained for the applicable mode: Audio 1, Audio 2, Effect 1, Effect 2, and Effect 3. The five keys associated to these modes are labeled USER keys 2 through 6 as explained in the following. USER 1 Key is used for the Random Advance feature.

Audio 1: Press USER 3 key; its LED lights. This Auto playback method ***advances***
USER 3 ***Pages with the amplitude of the musical information.*** You can adjust the strength of the audio input signal by using the AUDIO (level) 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 the AUDIO knob counterclockwise to decease signal strength and clockwise to increase signal strength. Full counterclockwise is "off" and full clockwise is maximum signal.

Audio 2: Press USER 5 key; its LED lights. This Auto playback method ***halts the***
USER 5 ***advance of Pages with the amplitude of the musical information.*** You can adjust the strength of the audio input signal by using the AUDIO (level) 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 the AUDIO knob counterclockwise to decease signal strength and clockwise to increase signal strength. Full counterclockwise is "off" and full clockwise is maximum signal.

Effect 1: Color Modulate: Press USER 2 key to implement this feature; its LED
USER 2 lights. The color modulate effect instructs all active fixtures to begin changing colors from their current settings with the *beat* of the audio input signal. The color modulate effect overrides the Color program information. You can adjust the strength of the audio input signal by using the AUDIO (level) 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 the AUDIO knob counterclockwise to decease signal strength and clockwise to increase signal strength. Full counterclockwise is "off" and full clockwise is maximum signal.

Effect 2: Gobo Modulate: Press USER 4 key to implement this feature; its LED
USER 4 lights. The gobo modulate effect instructs all active fixtures to begin changing gobos from their current settings with the *beat* of the audio input signal. The size modulate effect overrides the size program

information. You can adjust the strength of the audio input signal by using the AUDIO (level) 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 the AUDIO knob counterclockwise to decease signal strength and clockwise to increase signal strength. Full counterclockwise is "off" and full clockwise is maximum signal.

Effect 3: Light Modulate: Press USER 6 key to implement this feature; its LED
USER 6 lights. The Light Modulate effect causes the light intensity of all active fixtures to follow the amplitude of the audio input. When the light modulate effect is engaged, all fixtures are dimmed to their minimum intensity level until it senses an audio input. You can adjust the strength of the audio input signal by using the AUDIO (level) 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 the audio knob counterclockwise to decease signal strength and clockwise to increase signal strength. Full counterclockwise is "Off" and full clockwise is maximum signal.

Preset Playback

Presets store a Page or group of Pages and their Advance, Effect, Master dim, and RATE knob settings. However, you can alter the Advance and Effect controls by implementing "live" control over the Preset playback. Any changes made to the Advance and Effect selections during Preset playback will not affect the Advance and Effect selections stored in the Preset Memory. When you playback a Preset, it continues to playback indefinitely until another Preset is selected or you exit Preset mode. You playback Presets in the same manner as playing back a loop of Pages within a Memory.

To Playback a Preset:

1. Press the ADDRESS/PRESET key to select Preset mode. The Preset LED lights. The controller is now in Preset Mode.
2. Select the number of the Preset that you want to play back by pressing the corresponding key on the ADDRESS/PRESET keypad. The Preset immediately begins to playback and runs continuously. Refer to the previous *Programming a Preset in Twelve Level Preset Access Mode* section for information on selecting Presets in this mode.
3. If you want to change to another Preset during the currently running Preset, select another Preset. To quit Preset playback press the ADDRESS/PRESET key and exit back to Address mode. The currently running Preset stops at the Page that is active when you press the ADDRESS key. Back in Address mode the LCD window displays the Preset mode Page that was active when you returned to Address mode.

Note: When you return from Preset mode to Address mode the rate remains at the Preset level. Turn the RATE knob slightly in either direction to reestablish the existing Address mode rate.

Automatic All-Memory Playback

The *intellabeam* Controller can automatically sequence through (playback) all 99 Pages in all nine Memories.

To perform an all-Memory playback:

Press the Menu CURSOR Up/Down Arrow key until the LCD window "Memory:" field displays either: 1-all or 9-all.

The Initialized Pages in Memory 1 begin sequencing according to the Advance and Rate setting. When the controller completes playing back Memory 1's highest Initialized Page, the controller advances to Memory 2, and plays back all of its Initialized Pages. This playback process continues through Memory 9, Page 99. When all Pages in Memory 9 playback the operation wraps around and continues with Memory 1 and runs continuously until you disable All-Memory playback.

Each Memory number will be followed by "-all" as the Memories playback.

To disable All-Memory Sequencing:

Press the CURSOR Up/Down Arrow key until "-all" no longer appears as part of the Memory value in the LCD window.

Controller Address Monitoring

You can instantly inspect the Address Construct parameters at any time while in IMP mode. To inspect the Construct parameters just press and hold any ADDRESS key. A summary of the parameters for that Address is displayed in the LCD window. The top line identifies the Constructs as Figure 5.1 show; the bottom line provides the parameter value (not shown). The Gate field displays "Cl" for closed and "Opn" for open. The Position field displays "JS" for joystick or the defined preset number. For detailed information about Constructs refer to Chapter 3.

If an Address is locked out, the bottom line displays the message:

"Address xx is locked out."

While holding the Address key, you can step through Memories and Pages and observe the Address values change to the new Memory and Page values.

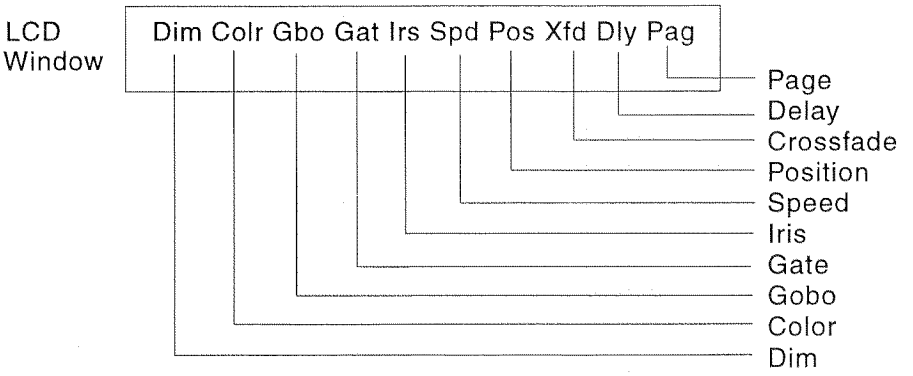


Figure 5.1. Address Summary Construct Fields

Master Dim

You can easily perform Master Dim operation from the front panel that affect all fixtures. The Intensity field displays the current state of the Master Dim. The default value is "99" which equates to full bright. The "0" value equates to off or full dark (off). To adjust the Master Dim press the CONSTRUCT Up or Down key. Notice that the dim value in the Intensity field follows the CONSTRUCT Up/Down keys similar to using a fader control. Press and hold the CONSTRUCT Up/Down key to quickly change the dimming value.

Chapter 6
Remote Access and Control

Remote Analog Access

You can use a remote control device, such as, a dimmer console or a control desk to remotely access the *intellabeam* Controller's Memory as long as the voltages are within the specified limits. Twelve channels are required to control 99 pages of a selected memory, or up to 1024 presets.

The controlling device connects to the Analog Inputs 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 volts dc, and the maximum safe voltage input is 16 volts dc.

There are two types of remote access; Page Access and Preset Access. Set Switch 3 of Personality DIP Switch B on the rear panel of the controller to select either 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 Switch 5 of Personality DIP Switch B determines whether to access Presets through binary combinations of the input channels, or whether each input corresponds to one of 12 levels of 24 presets. (Switch 5 "Off" = Preset Level Access; Switch 5 "On" = Binary Preset Access.)

In Page Access mode, the Analog Inputs on the rear panel of the controller have priority over the front panel of the controller. An active Analog Input channel prevents any subsequent change of Page numbers or Presets via the controller's front panel until the active input channel is de-activated. However, in Preset Access mode, you can have the Analog Input channels and the controller front panel active at the same time.

You can use the Analog Inputs with the controller in or out of the Standby mode:

In Standby Mode – If the controller is in Standby mode, the Analog Input signal overrides the Standby mode. The STANDBY key LED begins to flash, indicating that it is receiving a higher priority signal. As long as the analog signal is active, the STANDBY key LED continues to flash. When the analog signal is de-activated, the controller returns to the Standby mode. Only the Remote Enable input can override the analog signal. You can use the Remote Enable feature with the controller in or out of the Standby mode.

Out of Standby Mode – If the controller is not in the Standby mode, the Analog Input signal takes control of the front panel. When the input port is de-activated, the controller resumes normal operation.

Note: a flashing STANDBY key LED indicates that the controller is under control of the Analog Inputs.

Figure 6.1 and Table 6.1 identify the pin numbers and channel assignments for the Analog Inputs on the rear panel of the controller.

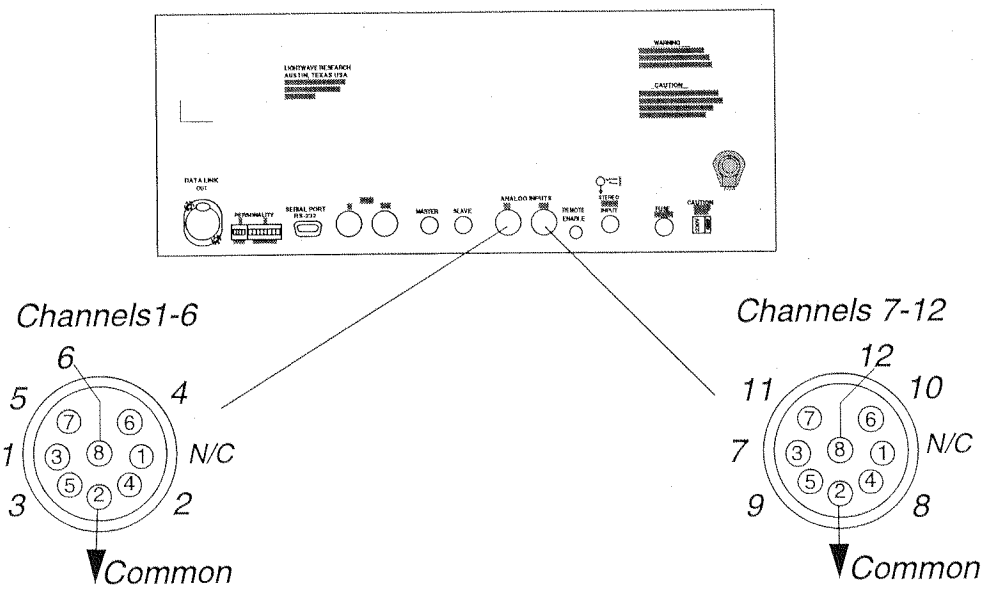


Figure 6.1. Pinouts for Analog Input Connectors

Table 6.5. Analog Input Channel Assignments

Channel Numbers		Din Connector Pin Assignments
Channels 1-6	Channels 7-12	–
1	7	3
2	8	4
3	9	5
4	10	6
5	11	7
6	12	8
Common	Common	2
Not Used	Not Used	1

Remote Page Access

The Remote Access feature allows you to remotely call up Pages from within the Memory that you first select on the controller's front panel. You cannot remotely select or change Memories.

To use Remote Page Access Mode:

1. Connect your auxiliary controller as described previously in this chapter. Set Switch 3 of Personality DIP Switch B on the rear panel of the *intellabeam* Controller to "Off".
2. Then, from the controller's front panel select the Memory containing the Pages that you want to remotely access. Use the CURSOR Up/Down keys (surrounding the MENU key).
3. From your auxiliary controller perform the applicable procedure, a through c, to select the desired Page. Table 6.2 summarizes the channel functions.
   a. Analog Input Channels 1 through 12 correspond directly to Pages 1 through 12. Thus, if you remotely activate Channel 1, you call up Page 1 on the *intellabeam* Controller, Channel 2 calls up Page 2, and so on.
   b. If you simultaneously turn on any combination of two Channels on your auxiliary controller, you call up the Page number corresponding to the combination of the two Channel numbers. The lowest channel number is first and the highest channel number second. For example, if you simultaneously activate Channels 1 and 2, you call up Page 12 on the *intellabeam* Controller. If you activate Channels 3 and 7, you call up Page 37.
   c. Channels 10, 11, and 12, correspond to the matching Page numbers and are also used as special function keys as follows:
      - Channel 10 is a ten-times multiplier. That means that when you activate Channel 10, it multiplies any other active channel by 10 and calls up the resulting Page number. For example, if you activate Channels 5 and 10, you call up Page 50.
      - Channel 11 is a number doubler. It causes the doubling of any other active Channel to use as a second digit before calling up the Page number. For example, if you activate Channels 2 and 11, you call up Page 22.
      - Channel 12 is a number inverter. For example, if you activate Channels 2, 4, and 12, you call up Page 42 rather than Page 24.

   Note: If you try to simultaneously activate more than two of the input Channels, 1 through 9, you will only select the lowest two. The Advance, Effect, and Memory selection features remain fully active when the controller is in the Remote Access mode.

Table 6.6. Remote Page Access Channel Function

Channels 1-12	Directly Access Pages 1-12
Channels 10-12	Directly Access Pages 10-12 as listed in the above entry. It also performs the special functions listed in the following 3 entries.
Channel 10	This is a ten times multiplier for Channels 2-9 to allow access to Pages 20, 30, 40, 50, 60, 70, 80, and 90
Channel 11	This is a number doubler for Channels 2-9 to allow access to Channels 22, 33, 44, 55, 66, 77, 88, and 99
Channel 12	This is number inverter for Channels 2-9 to invert the order of the two lowest Channels activated simultaneously. For example 23 becomes 32

Remote Preset Access

To use the Remote Preset Access Mode:

Connect your auxiliary controller as described previously in this section. Set Switch 3 of Personality DIP Switch B on the rear panel of the *intellabeam* Controller to "On". Also, set Switch 5 "Off" to select Twelve Level Preset Access or set Switch 5 "On" to select Binary Preset Access.

- In **Twelve Level Preset Access** mode, you can use each channel to activate a different level of 24 Presets, but you still call up the actual Presets from the Address/Preset keypad on the controller. Twelve levels times 24 Presets equals 288 Presets.
- In the **Binary Preset Access** mode, you have 10 Analog Input Channels that you use as 10 binary digits to select 1024 combinations that correspond to 1024 Presets. This mode offers the greatest flexibility for total remote, "hands off" control.

  Note: Refer to *Appendix E* for the Binary Access Table which provides helpful conversion information.

Twelve Level Preset Access

In the Twelve Level Preset Access mode there are 12 levels of 24 Presets for a total of 288 Presets available. Levels 1 to 12 corresponds to Analog Inputs 1 to 12. Thus, you access each level of 24 Presets by activating the corresponding Analog

Input channel. For example, you call up Level 1 by activating Analog Input Channel 1. You call up Level 2 by activating Channel 2, and so on. The Analog Input signal that you use to activate a level of Presets can be a momentary or a latching signal. If you do not use the Analog Inputs, then the controller defaults to Level 1 and uses the 24 Presets stored in Level 1. Remember to set Switch 3 "On" and Switch 5 to "Off" to enable this mode.

Once you activate the appropriate Analog Input channel, you can call up the desired Preset by pressing ADDRESS/PRESET keys 1 through 24 on the controller's front panel.

The selected Preset continues to playback until you:

1. press another PRESET key
2. change to another Preset level by changing the Analog Input
3. place the controller is Standby mode.

To program Presets in the twelve level preset access mode refer to *Programming a Preset in Binary Preset Access Mode* in Chapter 5.

Binary Preset Access

In the Binary Preset Access mode you have 1024 Presets available by using combinations of the first 10 Analog Input channels. Channels 11 and 12 are reserved for Master Blackout and Remote Enable, respectively. For example, you call up Preset 3 by activating Analog Input Channels 1 and 2 or call up Preset 386 by activating Analog Input Channels 2, 8, and 9. Combining Analog Input Channels in this manner is very similar to counting in binary, hence the term, "binary preset access." Remember to set Switches 3 and 5 to "On" to enable this mode. Appendix E provides a Table that lists all the Binary Preset Access combinations. This table converts the decimal number to the binary code.

The Analog Input signal that you use to activate a Preset can be a momentary or a latching signal.

The selected Preset continues to playback until you:

1. press another PRESET key
2. change to another Preset by changing the Analog Input
3. place the controller is Standby mode.

To program presets in the binary preset access mode refer to *Programming in Binary Preset Access Mode* in Chapter 5.

The controller supports mixing Binary Presets with Submasters, however, it is recommended that you assign submasters from the top down in order (for example, Channels 12, 11, 10, and so on) to simplify the Binary Preset addressing scheme which begins with the least significant bit (for example, Channels 1, 2, 3, and so on). Refer to the *Submasters* section in Chapter 5.

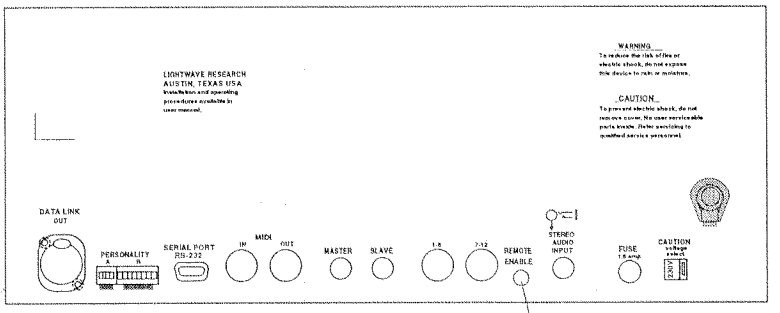
Preset Playback from a Computer

There are several computer programs available that you can use to exchange serial data between a computer and a controller. One such data transfer programs is Lightwave Research's Show Control. These data transfer programs are designed to allow you to organize and playback one or more controller's Presets from a laptop or desktop computer. It is possible to link several *intellabeam* Controllers to one computer and playback their Presets. To do this, the computer must identify each controller separately. Each controller must be assigned a unique I.D. number. Refer to Chapter 5, *Operating the System,* for instructions on setting the controller I.D. number.

Remote Enable

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

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



Remote Enable Mini-phone jack

Figure 6.2. Remote Enable Mini-phone Jack

Chapter 7
External Memory Storage and Transfer

This section explains:

- ❑ how to use the Memory Card to replace the operating system (O/S)
- ❑ how to use the Memory Card to backup the User RAM area
- ❑ how to use the Memory Card to transfer the operating system
- ❑ how to backup (upload and download) User RAM with a personal computer
- ❑ how to crossload (copy) Memory between two controllers

General Information

The *intellabeam* Controller contains a self-recharging NiCad battery to ensure Memory information is retained during power down or power failure.

In addition, the *intellabeam* Controller provides several ways to insure against data loss:

- You can save the controller's Memory (also referred to as "User RAM") and the controller's operating system to 256KB PCMCIA[1] cards. The PCMCIA cards are referred to as Memory or RAM Cards in this manual. One Memory Card card holds either the contents of a controller's User RAM or a controller's O/S, but not both. The controller's Memory Card operation provides you with a simple way to update an *intellabeam* Controller's operating system without having to replace the EPROM. Although it is still an alternative to update the operating system by replacing the EPROM.
- If you have a laptop or desktop computer with a PCMCIA drive, you can insert a Memory Cards into the drive and then transfer a binary image of the controller's O/S or User RAM directly to the computer's hard drive. The Memory card format used with the *intellabeam* Controller is not DOS compatible. Consult your computer's user manual for information on data transfer.
- You can backup the controller's User RAM to a high-density floppy diskette or hard drive. Data transfer software is provided with each *intellabeam* Controller. However, you can use most commercially available communications programs if desired.
- You can connect a RS-232 "null modem" cable between two controllers and crossload or copy the memory contents from one controller to the other.

1. PCMCIA — Personal Computer Memory Card International Association. Also known as T.C. — thin card.

Using a Memory Card to Replace the Operating System (O/S)

This section explains how to:

- ❑ replace or update your operating system from a Memory Card
- ❑ install an operating system to an erased Memory from a Memory Card

Note: When you are not transferring information with your Memory Cards write protect them to avoid inadvertent data corruption. To write protect the Memory Card slide the small write protect switch, on the end (edge) of the card, to the right with the tip of a pen or similar device.

Updating the O/S

You will want to replace or update your *intellabeam* Controller's Operating System (O/S) when you receive an updated O/S on a Memory Card from your dealer, distributor, manufacturer, or another controller. In some circumstances you may want to replace the O/S of the *intellabeam* Controller with an older version of the O/S or with the current version of the O/S. To update your O/S using a Memory Card:

1. First, turn "Off" the controller's power with the front panel Power keyswitch.
2. Then, insert the Memory Card, with the newer O/S version, into the Memory Card slot on the front panel.
3. Next, turn the Power keyswitch to "On" to restore controller power.

   The LCD window briefly shows the controller's Boot Version number and then displays: "Reinstall upgrade version of O/S, ERASE to install or SELECT to cancel." If the Memory Card contains the same O/S version as the controller, then the LCD window displays: "Reinstall Same version of O/S".

Reinstall upgrade version of O/S ERASE to install or SELECT to cancel

   The controller waits 12 seconds for you to respond. If you do not press either the ERASE key or the SELECT key, the controller continues with its self testing function with the existing O/S.
4. Press the ERASE key to install the newer version of the O/S. The LCD window displays: " Replace O/S? Are you sure?, ERASE to install or SELECT to cancel."

Replace O/S Are you sure? ERASE to install or SELECT to cancel

5. Press the ERASE key again to continue with the copy operation. Otherwise, press the SELECT Key to cancel the operation. If you press the ERASE key, the LCD window displays: "Erasing the flash ROM. DO NOT interrupt!". It then displays: Copying ramcard to flash ROM Do NOT interrupt."

ERASING flash ROM DO NOT Interrupt!

Copying ramcard to flash ROM. Do NOT interrupt!

When the copying is finished the LCD window displays: "Copy complete. Turn power off, remove ramcard, and power on to continue."

Copy complete. Turn power off, remove ram card, and power on to continue.

6. As stated in the LCD window, turn power "Off", remove the RAM card, and then turn power back "On" to continue with the updated O/S.

Replacing a Deleted O/S from a Memory Card

You can save a copy of the *intellabeam* Controller's O/S on a Memory Card in case of an inadvertent erasure of the Memory. However, it is a rare occurrence where the controller can loose the O/S. Therefore, this procedure is included only for completeness. If this condition ever occurs, you can then easily replace the O/S from a Memory Card using this procedure.

1. First, turn "Off" the controller's power with the front panel Power keyswitch.
2. Then, insert the Memory Card, with the saved O/S version, into the Memory Card slot on the front panel.
3. Next, turn the Power keyswitch to "On" to restore controller power.

   The LCD window briefly displays the controller's Boot Version number.
4. The LCD window then displays: "No O/S installed." and prompts you to: "Install new O/S? ERASE to install or SELECT to cancel."

No O/S installed. Install new O/S? ERASE to install or SELECT to cancel

5. Press ERASE to install the O/S. The LCD window displays: "Replace O/S? Are you sure?, ERASE to install or SELECT to cancel."

Replace O/S Are you sure? ERASE to install or SELECT to cancel

6. Press ERASE again to continue with the copy operation. Otherwise, press the SELECT key to cancel the operation. If you press the ERASE key the LCD window displays: "Erasing the flash ROM. Do not interrupt! Copying ramcard to Flash ROM do NOT interrupt."

ERASING flash ROM DO NOT Interrupt!

Copying ramcard to flash ROM. Do NOT interrupt!

When the copying is finished the LCD window displays: "Copy complete. Turn power off, remove ramcard, and power on to continue."

Copy complete. Turn power off, remove ram card, and power on to continue.

7. Turn power "Off", remove the RAM card, turn power back "On".

Caution: Do not turn controller power off while the Memory Card is transferring information. If you want to repeat the operation wait until it is completed and then turn power off.

Backup User RAM to Memory Card

This section explains how to:

- ❑ copy the controller's User Memory to a Memory Card
- ❑ load or restore the controller's User Memory from a Memory Card

Note: When you are not transferring information with a Memory Card write protect it to avoid inadvertent data corruption. To write protect the Memory Card slide the small write protect switch, on the end (edge) of the card, to the right with the tip of a pen or similar device.

Save Controller User RAM to Memory Card

User RAM is the Memory area where you store programming information. Use this procedure to save the User RAM area of the controller to a removable Memory Card. You can then use the Memory Card to transfer this User Memory to another controller or to backup this controller. You can also save the O/S (operating system) RAM area through another submenu item.

To save User Ram to a Memory Card:

1. Insert a Memory Card into the Memory Card slot on the *intellabeam* Controller's front panel. If you forget, you are prompted to do so when you select the desired backup mode.
2. Press the MENU key to display the menu items.
3. Press the CURSOR Right Arrow keys once to select "backup" from the Main menu. The word BACKUP appears in all capital letters to confirm selection.

```
help  BACKUP  submasters  setup
Press cursor down for help.
```

4. Press the CURSOR Down Arrow key to view the possible selections: Memory to Card, Card to Memory, or O/S to Card.
5. Since Memory to Card is the first menu entry it is already selected by default. Notice that "MEM->CARD" is displayed in all capital letters.

```
MEM→CARD  card→mem  o/s→card
Press RECORD to save
```

A message is displayed in the LCD window: "Press RECORD to save."If there is no card in the Memory Card slot, the LCD window displays: "Card is not inserted." You can, at this point, insert a Memory Card and the LCD window then displays: "Press RECORD to save." If the Memory Card's write protect switch is turned on, the LCD window displays: "Card is locked." You

can unlock the card without removing it from the controller. To unlock the card: 1) locate the small switch on the end of the card, 2) use a pointed object (such as a pen) to push the switch to the opposite direction from where it is now. When the card is unlocked, the LCD window displays: "Press RECORD to save."

6. Press the RECORD key on the front panel.

   The LCD window displays: "Are you sure?".

   ```
   MEM→CARD  card→mem  o/s→card
   Are you sure?  RECORD=save, SELECT=cancel
   ```

   If you want to cancel the backup operation at this time press the SELECT key. Otherwise, press the RECORD key again if you are sure that you want to save the Memory and complete this backup operation.

   You can also escape the record to card process by pressing the CURSOR Up Arrow key. This returns the controller to the Main menu.

Load User RAM from Memory Card to Controller

Use this procedure to load (or restore) the User RAM area of the controller from a Memory Card. User RAM is the Memory area where you store programming information. You can also load (or update) the O/S (operating system) RAM area through another submenu item.

To load User Ram from a Memory Card:

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow keys once to select "backup" from the main menu. The word BACKUP appears in all capital letters.

   ```
   help  BACKUP  submasters  setup
   Press cursor down for help.
   ```

3. Press the CURSOR Down Arrow key to view the possible selections: Memory to Card, Card to Memory, or O/S to Card.
4. To load the Memory from the RAM card to the controller's Memory, press the CURSOR Right Arrow key once to select "CARD->MEM."

   ```
   mem←card  CARD→MEM  o/s→card
   Press ERASE to load
   ```

   The LCD window displays: "Press ERASE to load."

5. Press the ERASE key if you are sure that this is the Memory Card that contains the programs that you want to load into the controller.

   The LCD window displays: "Are you sure?"

   ```
   mem←card  CARD→MEM  o/s→card
   Are you sure? ERASE=load, SELECT=cancel
   ```

6. Press the ERASE key again to begin the load operation.

   If you want to cancel the load operation press the SELECT key. The controller returns to the Backup menu with "CARD->MEM" as the selected menu item. Otherwise, press the ERASE key again if you are sure that you want to load the Memory and complete this backup operation.

   You can also escape the load from card process by pressing the cursor up arrow key. This returns the controller to the main menu.

Transfer Controller O/S to Memory Card

The *intellabeam* Controller is designed to make Operating System software updates quick and easy to install. If you have an *intellabeam* Controller with a newer software version, you can easily transfer its Operating System (O/S) to any other *intellabeam* Controller with an older version of the O/S. To do this, you first copy the new version of the O/S onto a Memory Card. Then, copy the O/S from the card to the memory of the controller you want to update.

To transfer the Operating System software to a Memory Card:

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow key once to select "backup" from the Main menu. The word BACKUP appears in all capital letters.

   ```
   help BACKUP submasters setup
   Press cursor down for help.
   ```

3. Press the CURSOR Down Arrow key to view the possible selections.
4. To save the controller's Operating System to the Memory Card, press the CURSOR Right Arrow key twice to select "O/S->CARD."

   ```
   mem—card card—mem O/S→CARD
   Press RECORD to copy O/S
   ```

   The LCD window displays: "Press RECORD to copy O/S."
5. Press the RECORD key if you are sure that you want to save the controller's O/S to this Memory Card. This replaces the Memory Card's current contents with the O/S from the controller's flash ROM.

   The LCD window displays: "Are you sure?"

   ```
   mem—card card→mem O/S→CARD
   Are you sure? RECORD=save, SELECT=cancel
   ```

   Press the RECORD key to begin the recording operation. The recording process only takes a couple of seconds to record the O/S onto the card.

   Press the SELECT key if you want to cancel the recording operation. If so, the controller returns to the Backup menu with "O/S->CARD" as the selected menu item.

   You can also escape the recording operation by pressing the CURSOR Up Arrow key. This returns you to the controller's Main menu.

Transfer Memory Card O/S to Controller

To restore or update the Operating System from a Memory Card:

1. First turn "Off" controller's power with the front panel Power keyswitch.
2. Insert the Memory Card containing the Operating System into the Memory Card slot on the front panel.
3. Turn the Power keyswitch "On" to restore power to the controller.
4. The LCD window briefly shows the controller's Boot Version number and then displays: "Reinstall same version of O/S, ERASE to install or SELECT to cancel." If the Memory Card contains a newer O/S version than currently in the controller, then the LCD window displays: "Reinstall upgrade version of O/S".

Reinstall same version of O/S ERASE to install or SELECT to cancel

   or if this is an upgrade, the LCD window displays:

Reinstall upgrade version of O/S ERASE to install or SELECT to cancel

   If you do not respond to this prompt within approximately 12 seconds the controller continues with self test assuming you do not want to perform this operation.
5. Press the ERASE key to install the O/S or press the SELECT key to cancel the operation. The LCD window displays: " Replace O/S? Are you sure?, ERASE to install or SELECT to cancel."

Replace O/S Are you sure? ERASE to install or SELECT to cancel

6. Press the ERASE key again to continue with the copy operation. Otherwise, press the SELECT Key to cancel the operation. If you press the ERASE key, the LCD window displays: "Erasing the flash ROM. DO NOT interrupt!". It then displays: Copying ramcard to flash ROM Do NOT interrupt."

ERASING flash ROM DO NOT Interrupt!

Copying ramcard to flash ROM. Do NOT interrupt!

   When the copying is finished the LCD window displays: "Copy complete. Turn power off, remove ramcard, and power on to continue."

Copy complete. Turn power off, remove ram card, and power on to continue.

7. As stated in the LCD window, turn power "Off", remove the RAM card, and then turn power back "On" to continue with the updated O/S.

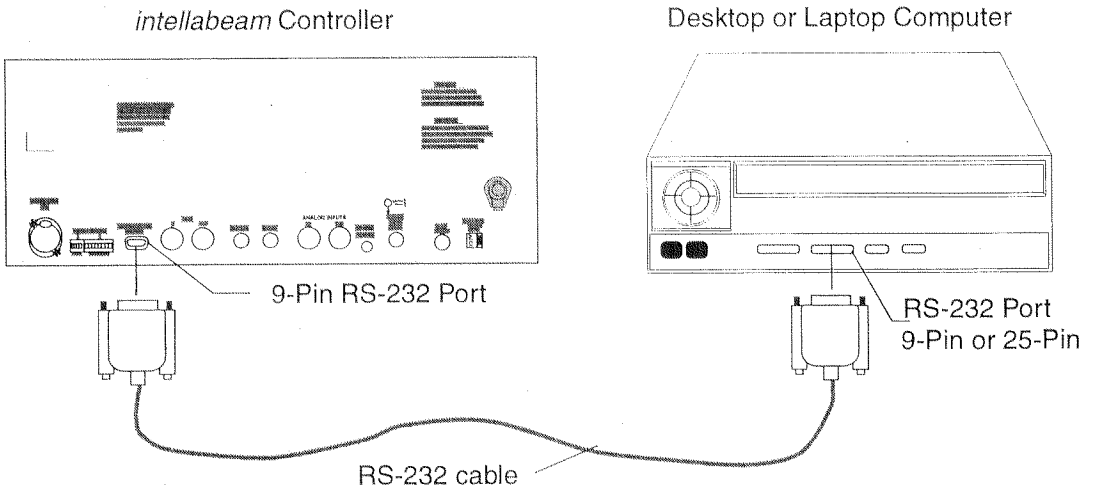
Caution: Do not turn controller power off while the Memory Card is transferring information. If you want to repeat the restore operation wait until it is completed and then turn power off.

Backup User RAM to a Personal Computer

You can use an IBM AT ™, IBM AT compatible, or Macintosh® computer with an RS-232 serial port to backup the *intellabeam* Controller's Memory to the computer's hard disk or floppy diskette. You need a 1.2MByte floppy drive to load the *intellabeam* Backup program. To backup the controller's User RAM you need a drive with at least 550KBytes of free space. This can be a hard disk or a 720Kbyte floppy disk drive or larger (that is, a 1.2MB or 1.44MB drive). Typically, 720KB and 1.44 MB drives are 3.5 inches and the 1.2MB drive is 5.25 inches.

An IBM AT compatible communications program is provided with the *intellabeam* Controller to perform this operation or you can use most commercially available communications programs capable of ASCII file transfer. If you are using a Macintosh computer obtain a commercially available communications programs capable of ASCII file transfer, such as, White Knight. A section at the end of this chapter outlines the White Knight setup procedure.

To connect your computer to the *intellabeam* Controller, connect one end of an RS-232 serial cable to the RS-232 Serial port on the rear panel of the *intellabeam* Controller and the other end to the RS-232 Serial port on the rear panel of the computer. The RS-232 Serial port on the *intellabeam* Controller requires a 9-pin connector. Nine pin to 25 pin adapters are readily available if you only have 25-pin cables. Refer to Figure 7.1.



Note: Use a 9-Pin to 25-Pin Adapter if Cable only has 25-Pin Connectors.

Figure 7.1. intellabeam Controller Backup to Computer

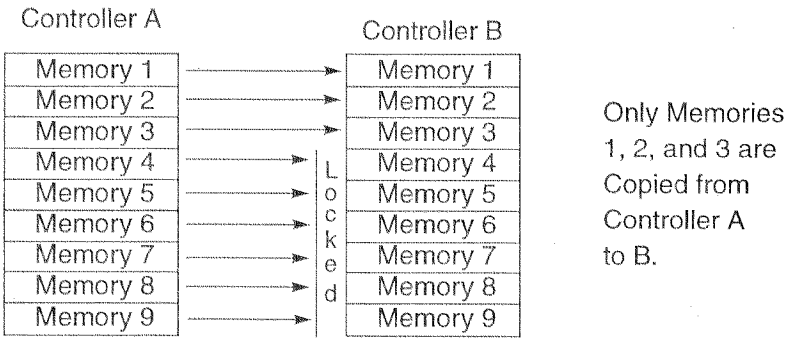
Inside the front cover of this manual is a 5.25 inch diskette that contains the Lightwave Research Backup communication program. Use this program to transfer the controller's memory between a desktop or laptop computer.

Note: You should make a backup copy of the floppy diskette provided with the *intellabeam* Controller. Then, use the backup copy to run the program. If your computer uses 3.5 inch diskettes copy the 5.25 inch diskette to a 3.5 inch diskette.

Memory Transfers Involving Locked Memories

When you *crossload* program data between two controllers or *download* data from a computer to a controller, the data will *not* overwrite existing data in locked Memories. However, this is not the case when using Memory Cards.

For example, if you want to copy Memories 1, 2, and 3 on controller A to controller B while keeping Memories 4 through 9 on controller B unchanged, you need to lock Memories 4 through 9 and unlock Memories 1, 2, and 3 on controller B before you transfer the program data. The result of the data transfer is that controller B's Memories 1, 2, and 3 are replaced by controller A's Memories 1, 2, and 3. Memories 4 through 9 on controller B are not replaced by controller A's Memories 4 through 9.



You can transfer a locked Memory, but not overwrite it. For example, if Memories 1, 2, and 3 on controller A are locked memories, you can still copy them to controller B as long as Memories 1, 2, and 3 on controller B were unlocked.

Caution: loading User Memory from a Memory Card will replace *all* of the controller's User Memory, including locked memories.

Set Up for Computer Memory Transfers

You first perform the steps in this section before you can perform either the ***Download*** or ***Upload*** procedures in following sections.

1. Put the controller in Standby mode by pressing the STANDBY key, the STANDBY key LED lights. This readies the controller for the Memory transfer.
2. To begin the program, boot up the computer and insert the *intellabeam* Backup diskette into floppy drive A or B.

3. From the DOS prompt, select the floppy drive with the diskette and type in the following applicable command and press the ENTER key:

   a: ibb [ENTER] or **b: ibb [ENTER]**

   The program loads and displays the title "Lightwave Research Backup and the current Version number," followed by the menu as Figure 7.2 shows:

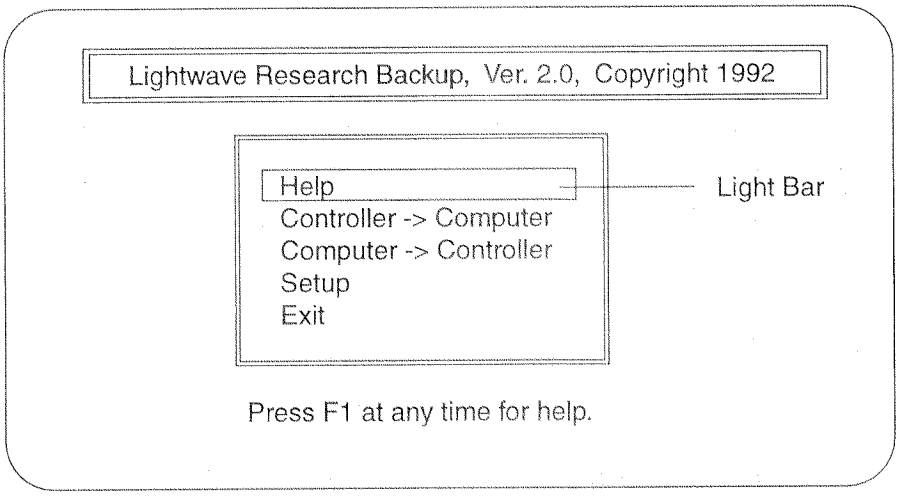


Figure 7.2. Lightwave Research Backup Program – Opening Screen

4. Select an entry from the menu by moving the light bar with the keyboard Up/Down Arrow keys until the proper line is highlighted. Select "Help" for complete program instructions and for help on Menu items. Then, press the ENTER key to confirm the selection.
5. The program then provides instructions on how to proceed.

Downloading Memory (Controller to Computer)

Note: To cancel the transfer of data at any time during the downloading process, press the SELECT key on the front panel of the controller. The downloading process takes approximately 15 minutes.

To download the controller's Memory to the computer:

1. Perform steps 1 through 3 in the previous section: *Set Up for Computer Memory Transfer* section.
2. Then, use the keyboard Arrow keys and select the "Controller -> Computer" option from the backup program menu and press the ENTER key.
3. The program then prompts you for a "file name" and displays the current path as Figure 7.3 shows. To create a new backup file select the "New File" entry by pressing the ENTER key. To change drives use the keyboard Arrow keys and select the "Change Drive" entry and press the ENTER key. To go up one level

in your current path use the keyboard Arrow keys and select the "Previous Directory" entry and press the ENTER key.

Select the "NEW FILE" item. A pop up window appears prompting you to enter a file name. Enter a "file name" and press the ENTER key.

Note: Your current path is the drive and directory/subdirectory where you are currently working. For example, C:\BACKUP\EM\TMPFILE.EXT shows that the file TMPFILE.EXT is in the EM subdirectory, which is under the BACKUP directory on Drive C:. If you switched to the Previous Directory, you would then be looking at files in C:\BACKUP rather than C:\BACKUP\EM. File names cannot contain more than eight characters and can optionally have a three character extension. For example, the file EMCONT.BAK has six characters in the name (EMCONT) and three characters in the extension (BAK).

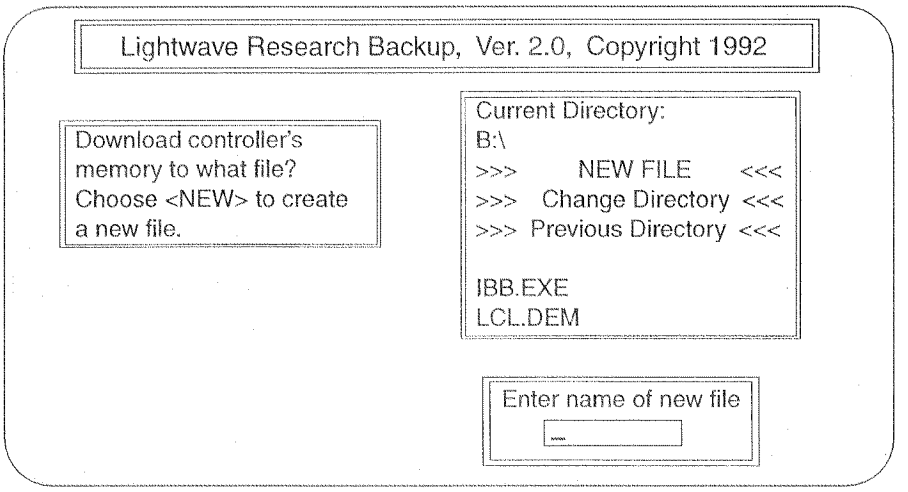


Figure 7.3. Select File Name to Download

4. A window appears verifying the operation and prompts you to press the "Y" key on the computer's keyboard to send the file. Press the "Y" key.

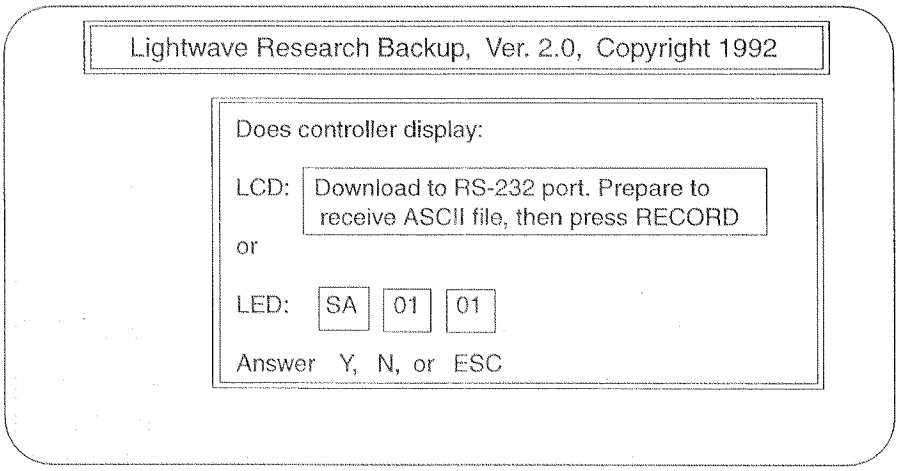


Figure 7.4. Download Confirmation Display

5. Press and hold the Record key on the controller for approximately 10 seconds or until the LCD window on the controller displays: "Download to RS-232 port. Prepare to receive ASCII file, then press RECORD."

```
Download to RS-232 port. Prepare to
receive ASCII file, then press RECORD
```

6. Press the RECORD key again and the transfer begins downloading data to the computer. Refer to Figure 7.5.

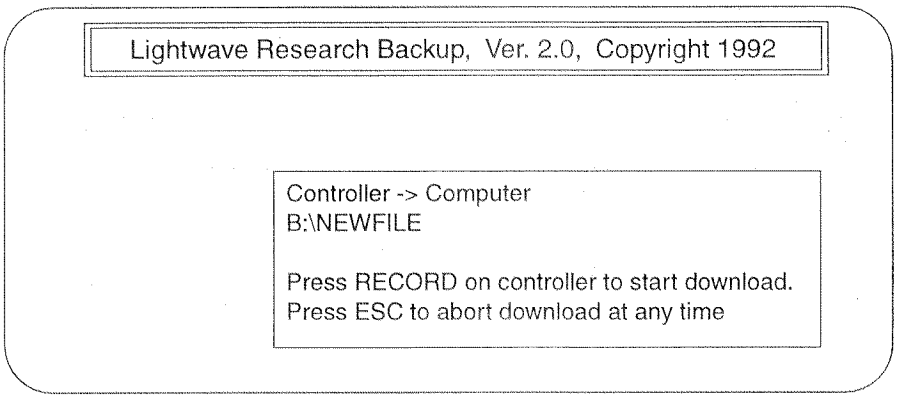


Figure 7.5. Start Downloading from Controller to Computer

The controller's LCD window displays the Memory and Page numbers as it downloads the information to a file on the computer's disk.

```
Download to RS-232 port.
sending M: 1   P: 1
```

7. After saving all 9 Memories (891 pages), the program then prompts you to terminate the transfer at the computer keyboard by pressing the ENTER key. Refer to Figure 7.6.

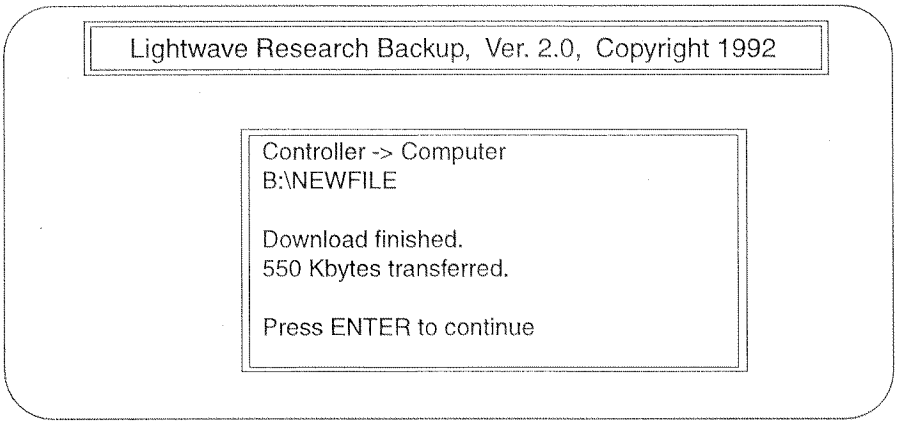


Figure 7.6. Complete Download to Computer Operation

8. Press the ENTER key to complete the operation. The opening screen appears. Select EXIT and press the ENTER key twice to exit the program. The controller performs a Memory initialization and returns to normal operation in IMP mode.

Upon completion of the Memory transfer, all Memory data is downloaded to the computer's hard disk or diskette. The transfer has no effect on the controller's original data.

Uploading Memory (Computer to Controller)

Note: To cancel the transfer of data at any time during the uploading process, press the Select key on the front panel of the controller. The uploading process takes approximately 15 minutes.

To upload or restore a file from the computer to the controller's Memory:

1. Perform the steps 1 to 3 described previously in "*Set up for Computer Memory Transfers*" section to display the opening screen.
2. Press and hold the ERASE key on the *intellabeam* Controller for approximately 10 seconds. The LCD window displays: "Upload from RS-232 port. Send file Now, press SELECT when done." The controller is now ready to receive the file.

   ```
   Upload to RS-232 port.
   Send file Now, press SELECT when done.
   ```

3. Select the "Computer -> Controller option from the backup program opening menu using the keyboard Up/Down Arrow keys. The program then displays the current path and available files to upload similar to Figure 7.7. To change drives select the "Change Drive" entry and press the ENTER key. To go up one level in your current path select the "Previous Directory" entry and press the ENTER key.

   Select a "file name" using the keyboard Up/Down Arrow keys and then press the ENTER key.

   Note: Your current path is the drive and directory/subdirectory where you are currently working. For example, C:\BACKUP\EM\TMPFILE.EXT shows that the file TMPFILE.EXT is in the EM subdirectory, which is under the BACKUP directory on Drive C:. If you switched to the previous directory, you would then be looking at files in C:\BACKUP rather than C:\BACKUP\EM. File names cannot contain more than eight characters and can optionally have a three character extension. For example, the file EMCONT.BAK has six characters in the name (EMCONT) and three characters in the extension (BAK).

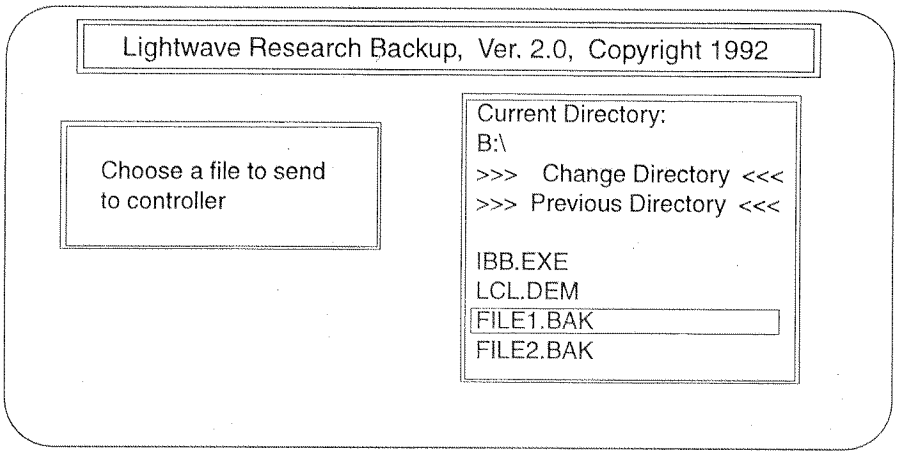


Figure 7.7. Select File Name to Upload

4. A window appears verifying the operation and prompts you to press the "Y" key on the computer's keyboard when ready to send the file as Figure 7.8 shows.

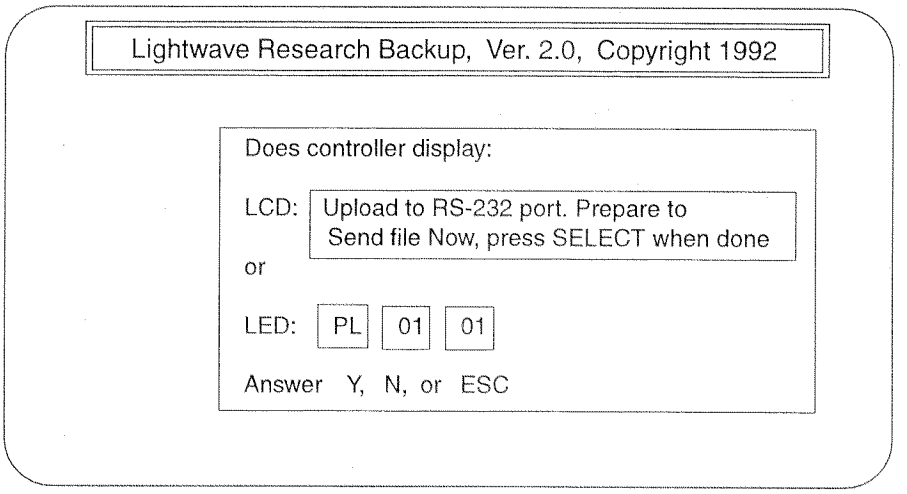


Figure 7.8. Upload Confirmation Display

5. Another window appears showing you the file name that you selected to upload to the controller. Press the ENTER key to start uploading the file. Refer to Figure 7.9.

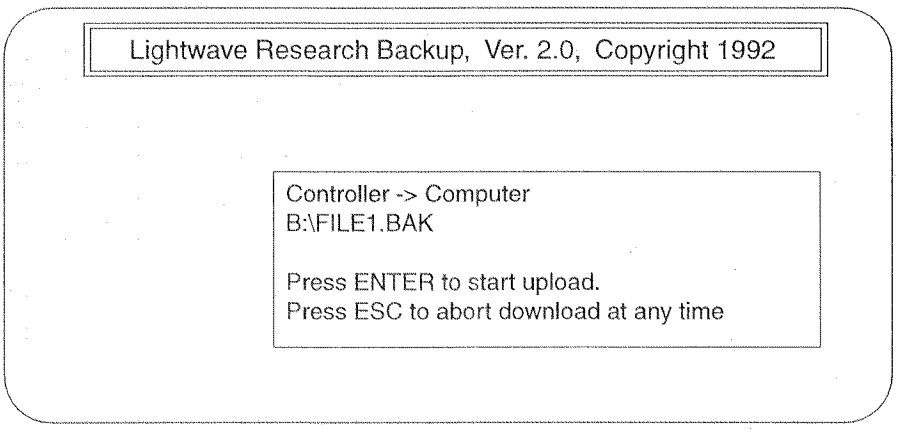


Figure 7.9. Start Uploading from Controller to Computer

As the computer transfers the file to the controller, the Memory and Page values in the LCD window count up.

```
Upload to RS-232 port.
receiving M: 1   P:  1
```

When the transfer is complete, the display shows Memory 9, Page 99. The controller now contains the data from the transfer operation. The computer displays the termination screen as Figure 7.10 shows.

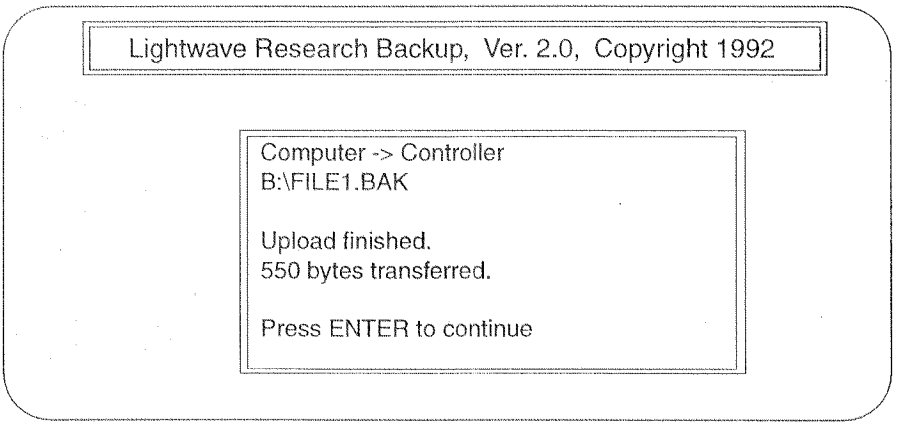


Figure 7.10. Complete Upload to Computer Operation

6. Press the ENTER key to complete the operation. The opening screen appears. Select EXIT and press the ENTER key twice to exit the program.

   The controller performs a Memory initialization and returns to normal operation in IMP mode.

   Upon completion of the Memory transfer, all Memory data is uploaded to the controller.

Crossloading Between Controllers

Use this procedure to directly crossload (copy) the Memory contents from one controller to another controller. You do this by connecting an RS-232 "null modem" cable between the two controllers. A null modem RS-232 cable is similar to straight through RS-232 cable except that some of the wires are crossed wired to complete the protocol requirements. For example, the receive and transmit signals are cross in the cable. Refer to Figure 7.11.

The null-modem cable has a male RS-232 connector on both ends and only requires three wires connected in the following fashion: pin 2 to pin 3, pin 3 to pin 2, and pin 5 to pin 5. Refer to Table 7.1.

Table 7.1 RS-232 Null Modem Cable Pinouts

Connector A	Connector B
Pin 2	Pin 2
Pin 3	Pin 3
Pin 5	Pin 5

To crossload from Controller A to Controller B:

1. Put the controllers in the Standby mode by pressing the STANDBY keys on both controllers to initiate a Memory transfer.
2. Connect the "null modem" cable between the two RS-232 ports on the back of the controllers. Refer to Figure 7.11.

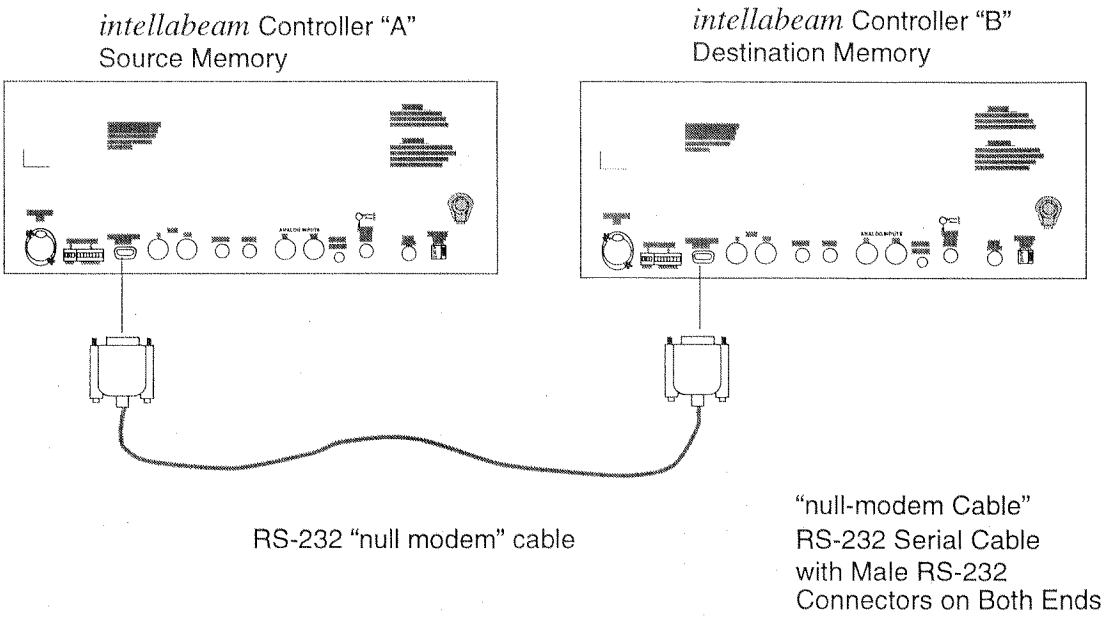


Figure 7.11. Crossloading Memory Between Controllers

3. First, put Controller B in the destination (receive) mode by pressing and holding the RECORD key for about 10 seconds. The display reads "Download to RS-232 port. Prepare to receive ASCII file, then press RECORD."

Download to RS-232 port. Prepare to receive ASCII file, then press RECORD

4. Then, put Controller A in the source (send) mode by pressing and holding the ERASE key for about 10 second, the LCD window displays: "Upload from RS-232 port. Send file Now, press SELECT when done."

Upload from RS-232 port. Send file Now, press SELECT when done.

5. Press the RECORD key of Controller B to begin the transfer. The LCD window on Controller B displays: "Download to RS-232 port. sending M: (1-9) P: (1-99)."

Download to RS-232 port. sending M: 1 P: 1

6. Press the SELECT key at any time to halt the procedure.
7. When the transfer is complete the LCD window on Controller A displays the Memory and Page counts as: M9 and P 99. Controller B now contains a copy of Controller A's Memory.
8. Controller A returns to IMP mode when done and Controller B performs a Memory initialization and return to normal operation in IMP mode.
9. Remove the RS-232 "null mode" cable from Controllers A and B.

   The transfer has no effect on Controller A's original data. Upon completion of the Memory transfer, all Memory data is uploaded to Controller B.

Backing Up Lightwave Controllers with a Macintosh® Computer

Macintosh computer users can backup up the *intellabeam* Controller's Memories to disk using a shareware program, such as, Red Ryder or a commercial program, such as, White Knight. You will also need a Mac-to-modem cable to interface your computer to the *intellabeam* Controller's RS-232 serial port. Set your communication program to 9600 baud, 8 data bits, No parity bit, 1 stop bit. Send and receive data as a Text (Ascii) file. Also, ensure that you have 550Kbytes of free space available on your disk to store the controller's Memory

White Knight Back Up Procedure

Use this procedure to download/upload the *intellabeam* Controller's Memory with the White Knight communications software.

To download the emulator Controller's Memory to the Mac computer:

1. Connect the Mac-to-modem cable to the Mac's modem port (the one with the telephone icon), and to the RS-232 serial port on rear panel of the *intellabeam* Controller.

2. Start the White Knight program on the Mac.
3. Set the serial port (command-U) for:
   - Serial Port: Modem (Telephone Icon)
   - Baud rate: 9600
   - Parity: Ignore (none)
   - Databits: 8
   - Stopbits: 1
   - Duplex: Full
   - Turn off hardware handshaking if enabled.
4. Set the Emulation Options (command-OE) for:
   - Terminal Emulation: VT100
   - Use Filter: both OFF
5. Press and hold the RECORD key on the *intellabeam* Controller for approximately 10 seconds or until the LCD window on the controller displays: "Download to RS-232 port. Prepare to receive ASCII file, then press RECORD."

   Download to RS-232 port. Prepare to receive ASCII file, then press RECORD

   The following message appears on the Mac screen:

   Save from controller to PC.
   Set PC to receive, then press RECORD to begin.
   Press SELECT to quit anytime.

6. Select File Capture New (command-FN) and assign a name for the file to be saved.
7. Press the RECORD key on the *intellabeam* Controller, this starts the transfer.
8. When the *intellabeam* Controller is finished, Select: File Capture Close (command-FC) to end the file.

To upload or restore the file from the Mac back to the *emulator* Controller:

1. Set up White Knight as in steps 1-4 above.
2. Press and hold the ERASE key on the *intellabeam* Controller for approximately 10 seconds or until the LCD window displays: "Upload from RS-232 port. Send file Now, press SELECT when done." The controller is now ready to receive the file.

   Upload to RS-232 port.
   Send file Now, press SELECT when done.

The following message should appear on the mac screen:

> Restore to controller from PC.
> Send data to controller now.
> Press SELECT to quit anytime.

3. Select Send Text File (command-Y) and select the file name that you used to save the data in step 6 above.
4. Within 10 seconds, the *intellabeam* Controller's LCD display begin to count up. When it stops (about 10-15 minutes) press the SELECT key on the *intellabeam* Controller to complete the transfer.

Chapter 8
General Maintenance And Troubleshooting

This chapter explains:

- ❑ fixture and controller external cleaning procedures
- ❑ fixture internal cleaning procedures
- ❑ how to replace user serviceable parts
- ❑ basic troubleshooting procedures

General Maintenance and Cleaning

You should clean your *intellabeam* System and perform maintenance on a regular basis to maintain performance and reliability. For example, perform the cleaning operations described in this chapter when you change the lamp or every other lamp change. Dust and dirt can accumulate and cause overheating or malfunctions. Before doing any work on the *intellabeam* System, make sure that you turn power off to the fixture and the controller.

Cleaning the Outer Surfaces

- Unplug the controller and each fixture that you want to clean. Then, wipe them off with a soft cloth or tissue, or use a small vacuum to remove the built-up dust and dirt. Vacuum dirt from the cooling fan air inlet/outlet; do not use a blower to clean the fan, this will force dirt into the fixture.
- To clean the fixture's lens and mirror, apply a small amount of a mild glass cleaning solution to a clean, soft cloth or tissue (lint free). Gently wipe the lens and mirror surfaces with the cloth.
- If the controller is in an environment susceptible to moisture, take care to prevent any fluids from entering the switches on the faceplate. Clean the front panel with a mild cleaner and soft cloth.

Cleaning the Internal Components

Caution: Although there is a safety-interlock that removes power to the lamp socket when you remove the top cover, it is recommended that you disconnect fixture power before opening any access door to clean the internal components. This prevents possible electrical shock or accidental exposure to ultraviolet radiation. Also be sure to wear protective eyewear and gloves when working near an unshielded lamp. Avoid touching the lamp with bare skin. Dirt and oils from skin can greatly reduce lamp life. Also be sure to let the fixture cool sufficiently (10 to 15 minutes) before attempting maintenance.

Remove the top access door from the fixture by sliding the door thumb latch towards the rear of the fixture and then lifting the door off. The door is connected to the fixture by a safety strap. You can unclip the doors from the safety strap or leave them attached for this procedure. Refer to Figure 8.1.

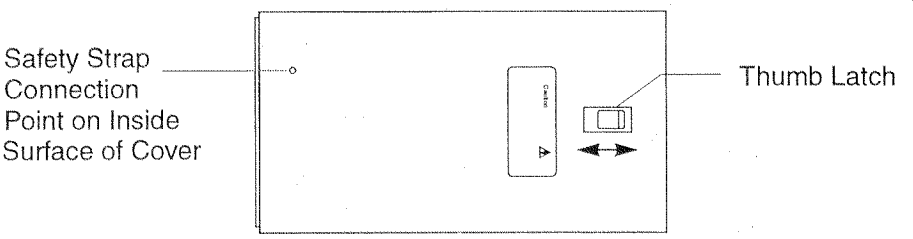


Figure 8.1. intellabeam Fixture Top Cover

With the top access door removed you have access to: the lamp, stepper motors, reflector, infrared heat reflector filter, Iris, Color wheel, Gobo wheel, Dimming shutter, and Gate wheel. Refer to Figure 8.2.

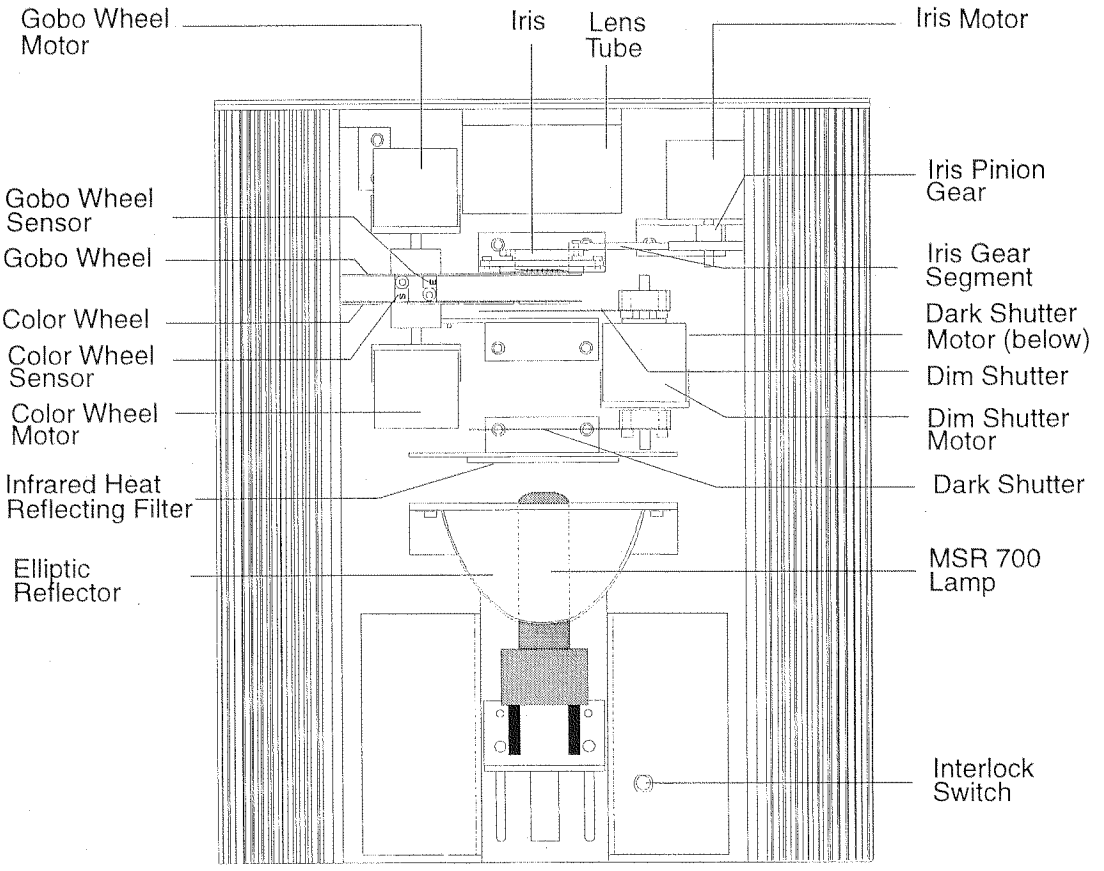


Figure 8.2. intellabeam Fixture Inside View

Cleaning Motors, Reflector, Dark Shutter, Infrared Filter and Iris

The stepper motors, Elliptic reflector, Dark shutter, Infrared Heat filter, and Iris should be cleaned with a very soft dusting brush or a low pressure compressed air source to remove any accumulated dirt or dust. You can clean the Infrared Heat Reflecting Filter with a mild quality glass cleaner.

Caution: Take special care when cleaning around the Iris. It is made of a very thin, delicate metal that can be easily damaged. Refer to Figure 8.2

Cleaning the Color and Gobo Wheels

Use this procedure to remove and clean the Color and Gobo wheels.

To remove the Color and Gobo wheels, you will need an extra long 8 mm (5/16 inch) wrench. The wrench handle should be at least 15 cm (6 in) long. 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.

1. The wheel is held in place by two 8 mm (5/16 inch) screws. Loosen, but do not remove, the two 8 mm (5/16 inch) screws on the inner side of the wheel.
2. Note the wheel orientation before you remove it. That is, which side faces forward or rearward or the orientation of the keyholes in relation to the slot. Then, slide the wheel down to the large part of keyhole and carefully lift from the screw heads. Take care not to bend the wheel during removal.
3. Clean the wheel with a mild foam glass cleaner and a soft cloth. Ensure homing slot is clean of dust and dirt.
4. Orient the wheel in the same direction as when you removed it. Re-install the wheel by inserting it into its sensor and then sliding it over its mounting screws. Ensure that you position the wheel all the way into the slot part of the keyhole as Figure 8.3 shows.
5. Re-tighten the two screws that hold the wheel in place.
6. Replace the top access door or continue with your maintenance.

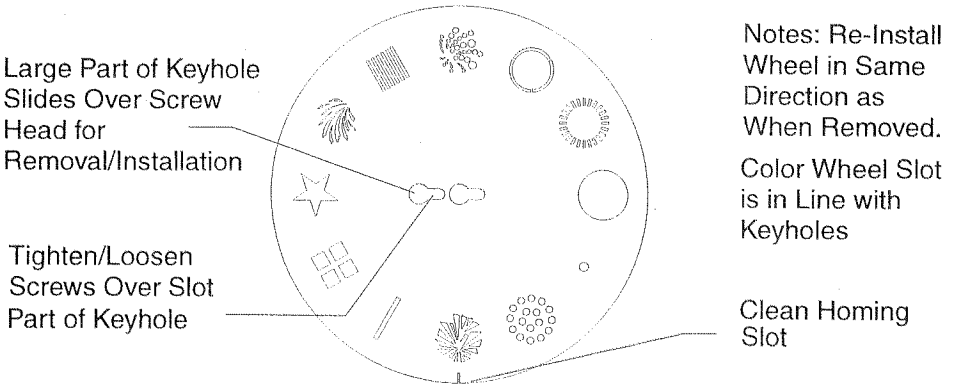


Figure 8.3. Wheel Mounting Slots and Orientation

Cleaning 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 Color and Gobo 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, you remove the sensor plate and clean the optical sensors.

1. Remove the bottom access door from the fixture by sliding the door thumb latch towards the rear of the fixture and then lifting the door off. The door is connected to the fixture by a safety strap. You can unclip the doors from the safety strap or leave them attached for this procedure. Refer to Figure 8.1.
2. Locate the two screws that hold the sensor plate in place. Refer to Figure 8.4. Remove the two screws and note the orientation of the sensor plate. You must re-install the plate in the same direction.

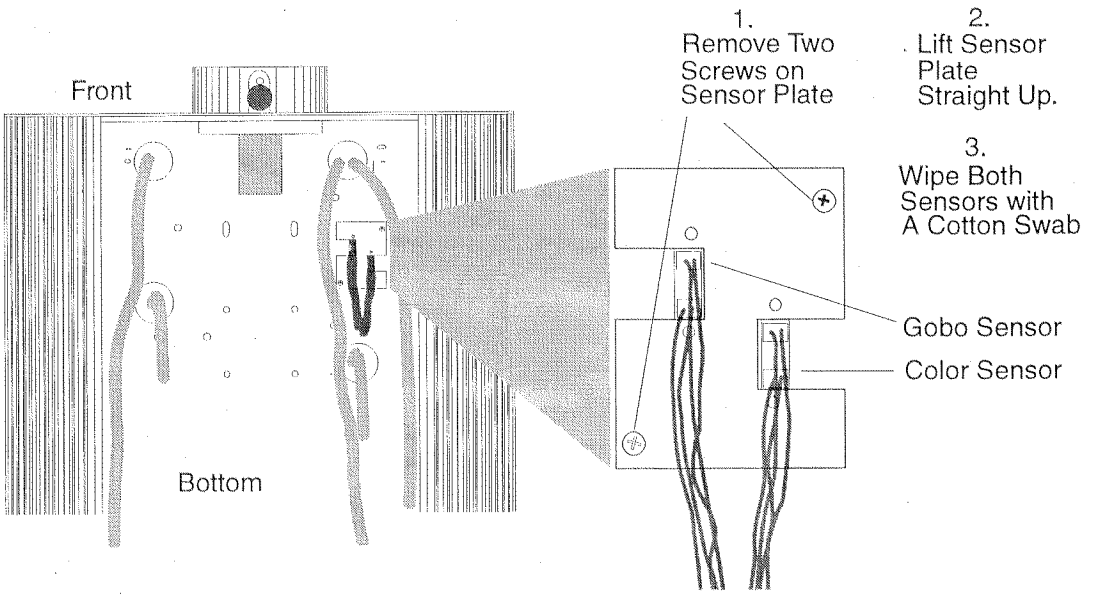
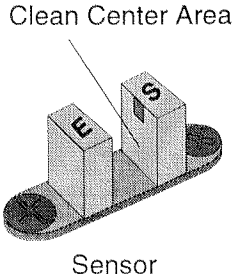


Figure 8.4. Cleaning the Sensor Plate

3. Lift the sensor plate straight up to clear the Color and Gobo wheels.
4. Gently wipe the sensors with a cotton swab.
5. Re-install the sensor plate, and tighten the two screws that hold it in place.
6. Replace the bottom access door.



Replacing Parts

This section explains how to replace user serviceable parts within the fixture.

Lamp Replacement

Follow this lamp procedure if you are sure that the lamp needs replacement. Otherwise, refer to the *Troubleshooting and Repair* section to determine that a non striking lamp is not just a symptom of another problem.

Caution: always remove power and allow the lamp to cool for 10 to 15 minutes before attempting to replace or re-strike the lamp.

To replace the lamp:

Read through the following four steps before performing step 1.

1. Refer to the *Installing the MSR 700 Lamp* section in Chapter 2 section and perform steps 1 through 4 under "To install the MSR 700 lamp:"
2. When you complete step 4, remove the old lamp from the lamp socket and properly dispose of it. Use extreme care when removing the old lamp that you do not break the Infrared Heat Reflecting Filter glass. Refer to Figure 2.13 in Chapter 2. You can temporarily insert a piece of cardboard or similar material between the reflector and filter and then remove the lamp from the socket. Then discard the cardboard.
3. Then, continue with step 5 to install the new lamp.
4. After you install the lamp, you must optimize the lamp as explained in the *intellabeam Fixture Lamp Optimization* section in Chapter 2.

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 lamp life is dependent upon the operating lamp hours and the number of times that the lamp is cycled 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. Refer to Chapter 2 for instructions on how to install the MSR 700 lamp.

Replacing the Gobo and Color Wheels

Use the procedure provided in the previous *Cleaning the Color and Gobo Wheels* section to replace the Color and Gobo wheels with the following exceptions.

In step 3, where it describes cleaning the wheel, instead substitute the old wheel with the replacement wheel. Then continue with step 4. Remember to position the new wheel in the same orientation as the old wheel if they are the same. If the replacement wheel is different, then orient the wheel so that the open hole is to the right with the slot at the bottom.

Replacing the Optical Sensors

The optical sensors are mounted to the fixture below the Color and Gobo wheels. They electronically sense the small notches on the edge of the wheels in order to keep track of the "home" positions of the wheels.

If you suspect a failing sensor, first try cleaning the sensor as explained in the *Cleaning Optical Sensors* section before replacing it. Replacing the sensors requires that you remove the lower air intake vent and rear panel. You also remove and insert the sensor wires into split wire conduit from the sensor to the printed circuit board (PCB) mounted to the rear panel. At the PCB you change two connectors.

To replace the sensor:

1. First, remove power from the fixture by pressing the power switch to the "Off" (press the O side of switch) position and then unplug the fixture. Refer to Figure 8.5 to locate the power switch.

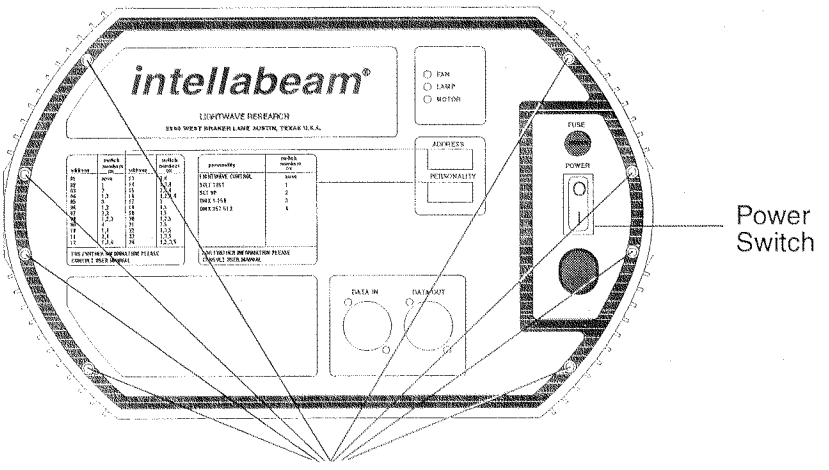


Figure 8.5. intellabeam Fixture Rear panel View

2. Next, you remove the fixture's rear panel. Remove the eight 9/64 inch allen head screws securing it to the fixture. Refer to Figure 8.5.
3. Carefully lower the rear panel out of the way, taking care not to strain the wiring harnesses. At this time you might want to leave two screws threaded two or three turns to temporarily hold the rear panel in place.

   Mounted to the inside of the rear panel is the logic printed circuit board where you will later make the sensor connections.
4. Then, turn the fixture over and remove the bottom access door from the fixture by sliding the door thumb latch towards the rear of the fixture and then lifting the door off. The door is connected to the fixture by a safety strap. Unclip the doors from the safety strap and set aside. Refer to Figure 8.1.

5. Next, remove the bottom air inlet panel. The panel is held in place by six 9.5mm (3/8 inch) long, 6-32 screws. These Phillips pan screws have "B" point ends to help prevent stripping. Remove the six screws and set the panel aside. Refer to Figure 8.6.

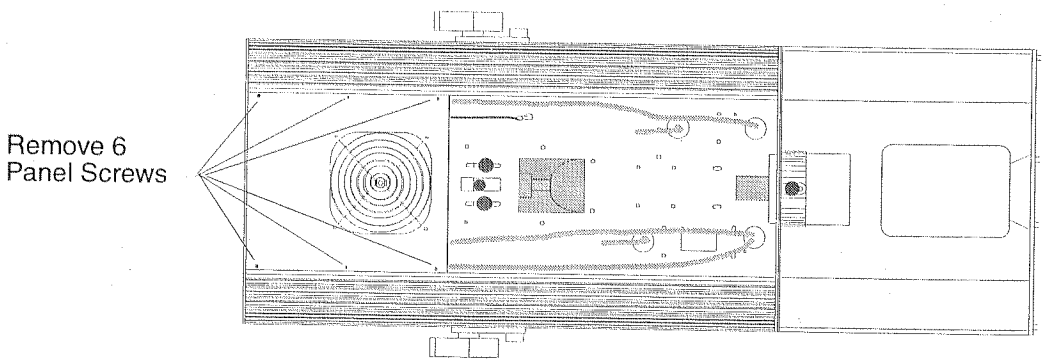


Figure 8.6. Removing Bottom Air Inlet Panel

6. Locate the two screws that hold the sensor plate in place. Refer to Figure 8.4. Remove the two screws and note the orientation of the sensor plate. You must re-install the plate in the same direction. Notice in Figure 8.7 that the gobo sensor is number 3 and closer to the front than the color sensor.

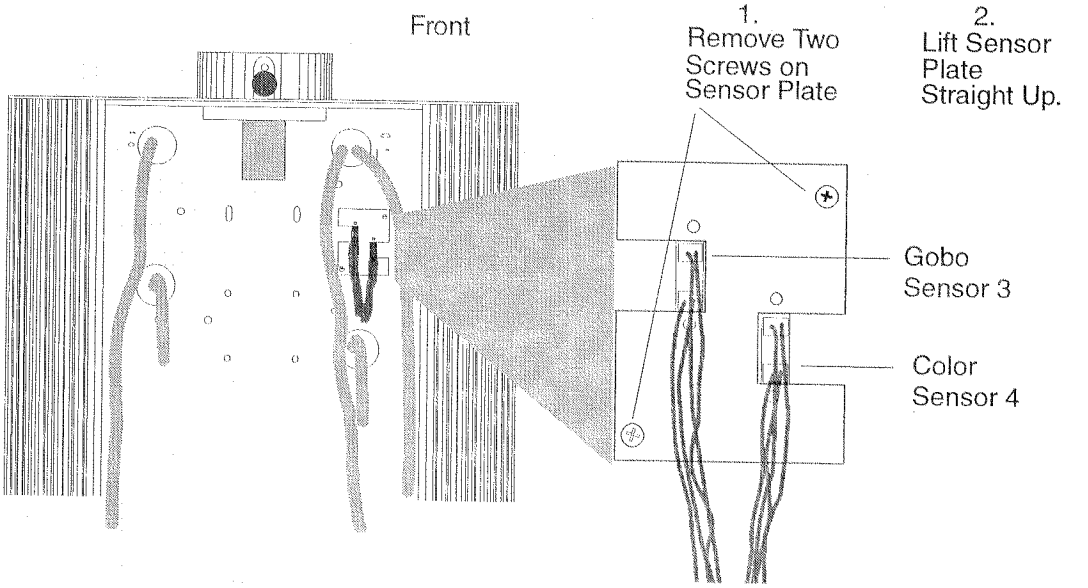


Figure 8.7. Removing the Sensor Assembly

7. Next, unplug the Sensor 3 and Sensor 4 connectors from the logic PCB mounted to the rear panel. Refer to Figure 8.8.

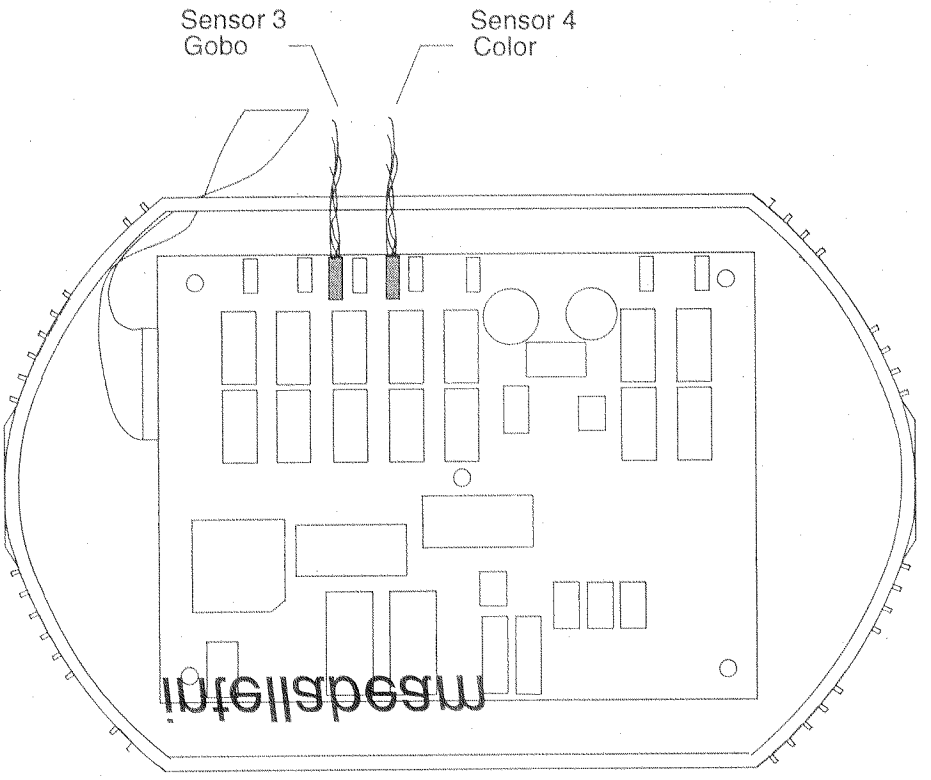


Figure 8.8. Removing Sensor Connectors from Logic PCB

8. Next, you remove the Sensor assembly, wiring, and connectors from the fixture. Refer to Figure 8.9. First cut any tie wraps along the wire conduit containing the sensor wires. Then, beginning from the connector end of the Sensor wiring harness (rear panel), pull the split wire conduit containing the two connectors through the grommet. As you pull the conduit out of the grommet, carefully push the connectors through the grommet one at a time.

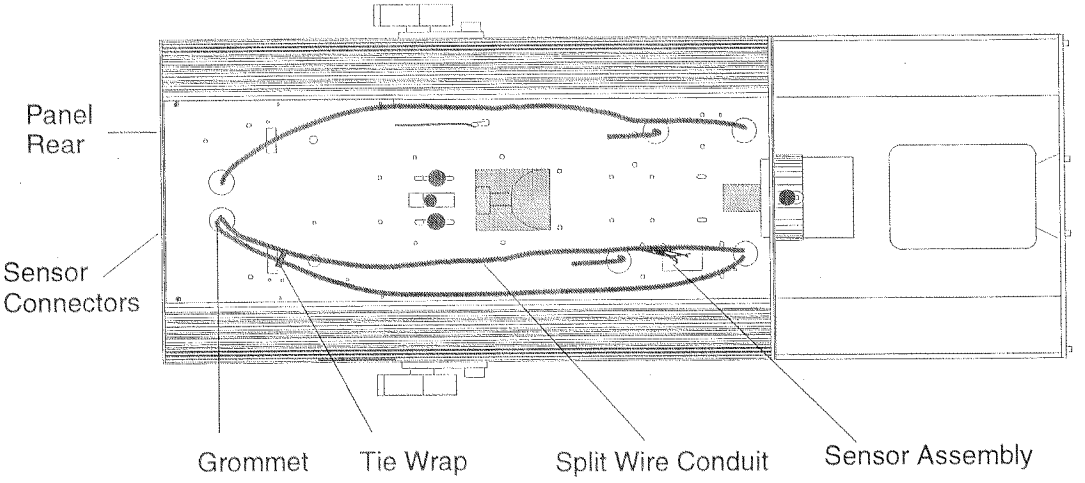


Figure 8.9. Removing Sensor Wiring from Split Wire Conduit

Then, pull the Sensor wiring harness out of the split wire conduit. If the sensor is still under factory warranty return it to the factory.

9. Install the new Sensor wiring harness in the reverse order. Ensure that you dress all the wires back into the split wire conduit. Also ensure Connector 3 is plugged into matting Connector 3 on the PCB and Connector 4 is plugged into mating Connector 4. Replace any wire conduit tie wraps that were cut during removal.

   Hint: Before you install the new sensor assembly, make a mark on the sensor plate next to sensor 3. This will make orientation easier after the wires are dressed back into the split wire conduit. To determine sensor 3 follow the wires back to sensor connector 3. Both connectors are labeled with a small band indicating connectors 3 and 4.

   Note: it is essential to position the sensors correctly when replacing them in the fixture or the Gobo and Color wheels will run continuously.

10. When you are satisfied that the Sensor assembly is properly installed, replace the rear panel and air inlet panel. Replace the bottom access door. Power up the system and test operation.

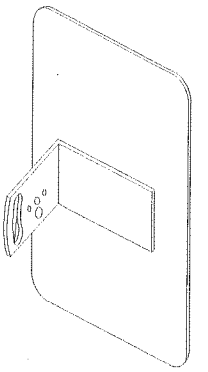
Replacing the Mirror Assembly

The mirror assembly is factory installed and under normal operation should never need replacing. However, if the mirror is inadvertently damaged, follow these steps to replace it.

Note: If the mirror is damaged from dropping the fixture there may be damage to other parts of the fixture requiring additional repair. Call HES Service before putting the fixture back in service.

To replace the mirror assembly:

1. Remove the two 6-32 by 6.35 mm (1/4 inch) long allen screws that attach the mirror assembly to the tilt motor. Refer to Figure 8.10.
2. Lift the mirror assembly from the stepper motor shaft and mirror stop pin.
3. Install the new mirror assembly in the reverse order.
4. Power fixture up and test. Return to service.



Mirror Assembly

1.
Remove Two Screws

2.
Lift Mirror Assembly From Stepper Motor Shaft

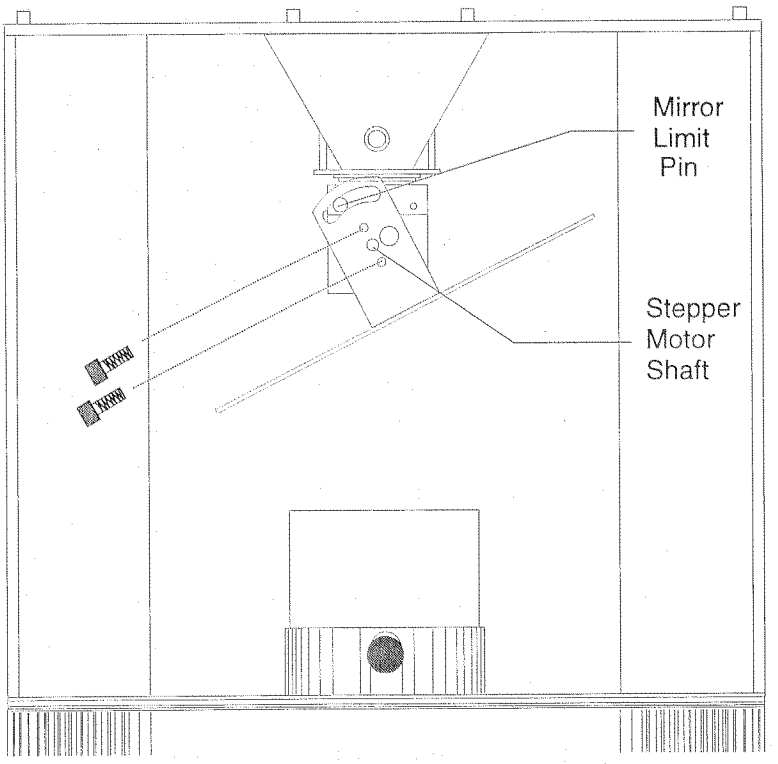


Figure 8.10. Replacing the Mirror Assembly

Troubleshooting and Repair

This troubleshooting section provides basic diagnosis of the *intellabeam* System. Use it as a guideline to point out simple solutions for common problems. If you encounter a problem that 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.

Some of the following information involves servicing that should only be undertaken by experienced technicians. Although, there are very simple ways to isolate the source of any problems that may arise. This section should help in pinpointing problems so that a quick solution may be found.

Warning: High voltage is present in the *intellabeam* Fixture during operation. This primarily comes from the lamp ignitor which has the potential to produce up to 5,000 volts while the lamp strikes. After the lamp strikes there is 230 volts ac present in the lamp circuit. The interlock switch under the top access door removes power to the fixture when you remove the door.

Diagnostic LED Indicators

The *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. Refer to Figure 8.13. Their purpose is to indicate the logic activity of their corresponding circuits which in turn provides essential clues to isolating problems. Before attempting any repairs, make sure to note the condition of these indicators.

Fan LED — Red

This LED glows steadily when: power to the fixture is "On", the data cable is plugged in, and the fan is functional. When you turn the fixture "Off" the fan continues to run for three minutes, then both the fan and the LED turn "Off". If this LED goes Off during operation, indicating that the fan is inoperative, then the fixture will quickly overheat. In this case a thermal shutdown will occur.

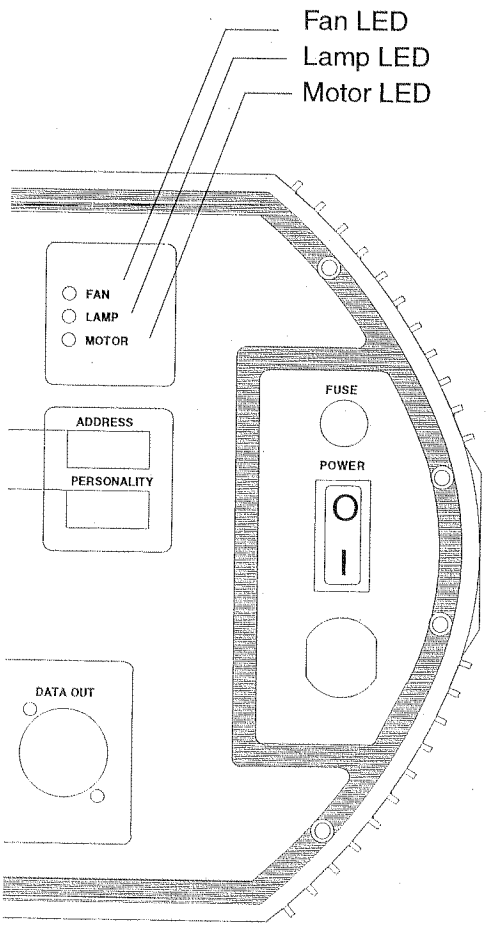


Figure 8.13. LED Indicators

Lamp LED — Yellow

This LED glow steadily while the MSR 700 lamp is operating. If the lamp extinguishes or fails to strike, then the indicator will flash at a rate of one flash per second. If the LED is constant "On" and the lamp is "Off" then the fixture is experiencing a thermal condition. When the fixture cools the lamp will start flashing. This LED is also programmed to display fixture resets. The number of flashes indicates the number of resets that have occurred. For example, three flashes indicate that three resets have occurred since the fixture was turned on. The fast flashing rate will occur regardless of the other lamp LED states. That is, if the fixture is displaying a slow flash and two resets have occurred, then the led will flash slowly several times, be interrupted by two fast flashes, then return to slow flashing, and continue to repeat the cycle. Power the fixture "Off" to clear the reset counter. This LED turns off fifteen seconds after the controller is turned off or the fixture is locked out.

Motor LED — Green

This LED indicates that the 24 volt dc motor supply is operating within specifications. It glows when there is power to the fixture, regardless of the status of the controller. If this LED goes "Off" during operation it indicates a loss of 24

volts dc. Its likely the 24 volt fuse (F2 – 5 amp fuse on the power supply board) experienced and over current condition on the power supply board. Try replacing the fuse. The *Changing the Voltage Selection* Jumpers section in Chapter 2 explains how to access the power supply board and identify F2.

Common Fixture Problems

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

Lamp does not strike

Before you change what appears to be a premature lamp failure, observe the three rear panel LED indicators to ensure that the failure is not a symptom of another problem. For example, if the cooling fan fails, the rising fixture temperature is sensed, and the fixture turns off the lamp. Refer to the *Diagnostic LED Indicators* section for LED analysis.

If a lamp fails to strike on initial power up and the yellow LED on the rear panel of the fixture is flashing once per second, then the lamp may be bad, or it may be too hot to strike, wait five minutes and home the fixture. If the lamp does strike initially, but then extinguishes by itself, or if power is interrupted to the unit, then you must wait 10 to 15 minutes before you can restrike the lamp.

Lamp does not strike, and LED indicators do not come on

If all three of the rear panel LED indicators are off, then it is likely that the fixture has lost power. Check the main fuse on the rear panel of the fixture. Check the power input to the fixture with a VOM meter. If there is voltage, then test the line fuse on the rear panel. Refer to Figure 8.11 for fuse location. Also refer to the *Changing the intellabeam Fuse* section in Chapter 2. A power interruption to one fixture will not affect others in the system unless they originate from the same power source.

Gobo or Color wheel cannot find home position

If the unit is continuously homing itself it will emit an audible tone from the constant rotation of the stepper motor; the optical sensors may need to be cleaned. To clean the optical sensors, follow the optical sensor cleaning procedures described earlier in this chapter.

Fixture does not respond to the controller

If the fixture fails to respond to the controller observe the red Fan LED and the yellow Lamp LED. If both indicators are off, 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.

Other Fixture Problems

If a problem cannot be diagnosed and corrected using one of the previous recommendation, then call HES Service for assistance. If the fixture is under warranty, contact HES Service or your dealer for service.

If you are technically inclined, the modular fixture design allows you to perform some internal repairs, such as, replacing the logic PCB or the power supply PCB. However, it is recommended that you contact HES Service to confirm your suspicions. This will save time and ensure that you obtain the correct part.

Located on the rear panel of the fixture are: the input and output data jacks, the Address and Personality DIP switches, the power switch, and the fuse holder. The logic board is mounted to the inside of this panel. Figure 8.8 shows a transparent view of the rear panel and logic board. The power supply board is mounted to the fixture body just inside the rear panel opening. The *Changing the Voltage Selection Jumpers* section in Chapter 2 show how to access the power supply board. These two boards 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.

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 you return any equipment to the manufacturer for service, you must obtain a return authorization (r.a.) number from a Lightwave Research dealer. Ship all equipment in original packaging, or suitable container.

Chapter 9
Warranty Information

Limited Warranty

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 an Item Under Warranty for Repair

It is necessary to obtain a Return Authorization number (RA#) from your dealer or point of purchase **BEFORE** any units are returned for repair. The manufacturer will make the final determination as to whether or not the unit is covered by warranty. Lamps are covered by the lamp manufacturer's warranty.

Please Note: Freight Damage Claims are invalid for fixtures shipped in non-factory boxes and packing materials.

Any Product unit or parts returned to High End must be packaged in a suitable manner to ensure the protection of such Product unit or parts, and such package shall be clearly and prominently marked to indicate that the package contains returned Product units or parts and with a Returned Authorization (RA#) number. Accompany all returned Product units or parts with a written explanation of the alleged problem or malfunction.

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. HIGH END SYSTEMS, INC. MAKES NO WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO ANY PRODUCT, AND HIGH END SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HIGH END SHALL NOT BE LIABLE FOR ANY INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGE, INCLUDING LOST PROFITS, SUSTAINED OR INCURRED IN CONNECTION WITH ANY PRODUCT OR CAUSED BY PRODUCT DEFECTS OR THE PARTIAL OR TOTAL FAILURE OF ANY PRODUCT REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT,

TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR OTHERWISE, AND WHETHER OR NOT SUCH DAMAGE WERE FORESEEN OF UNFORSEEN.

Warranty is void if the product is 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.

Appendix A
intellabeam Fixture Specifications

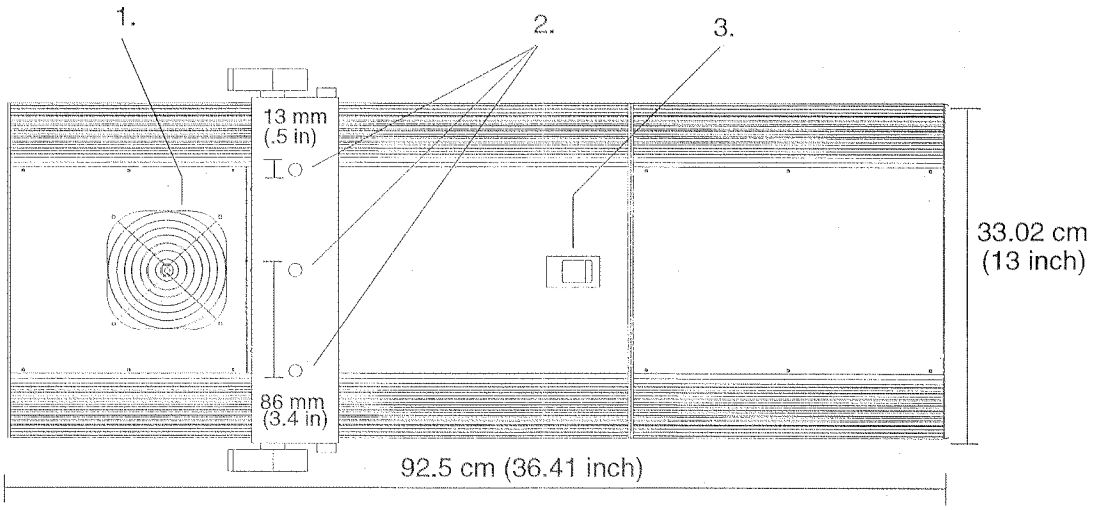
- ❑ Computer optimized reflector and lens assembly for maximum output
- ❑ 11 dichroic colors plus white on bidirectional wheel
- ❑ 12 dual colors
- ❑ 12 Gobos on bidirectional wheel
- ❑ Multi colored special effects patterns
- ❑ Astigmatism corrected lenses: 10, 12.5 and 17 degrees
- ❑ Full range dimming, fade to black, and cross-fades between fixtures
- ❑ Smooth, precise microstepped beam positioning
- ❑ Variable speed iris for beam sizing
- ❑ Variable speed of mirror scan, gobo, and color changes
- ❑ High resolution stepper motors
- ❑ Dark shutter (gate)
- ❑ Self-test diagnostic start-up routine
- ❑ Front surface break resistant mirror
- ❑ Pan mirror movement 170 degrees
- ❑ Tilt effective mirror movement 110 degrees
- ❑ DMX 512 (and extended) compatible
- ❑ XLR connectors
- ❑ 700 watt metal discharge lamp
- ❑ 1000 hour rated lamp life
- ❑ High color temperature lamp: 5600K
- ❑ Maximum color change rate: 250 milliseconds
- ❑ Remote lamp turn-on
- ❑ High efficiency power supply
- ❑ LED indicators provide fixture status
- ❑ Auto remote cooling system shutdown
- ❑ Durable powder coat finish
- ❑ Voltage selectable:
  - 100 volts @ 50/60 Hertz
  - 120 volts @ 50/60 Hertz
  - 240 volts @ 50/60 Hertz
- ❑ Power consumption
  - 8.5 amps @ 120volts/60 Hertz
  - 5 amps @ 240 volts/60 Hertz
- ❑ 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
- ❑ Weight: 25.9 kg (62 lb), boxed for shipping 32 kg (77 lb)

Specification subject to change without prior notice

A

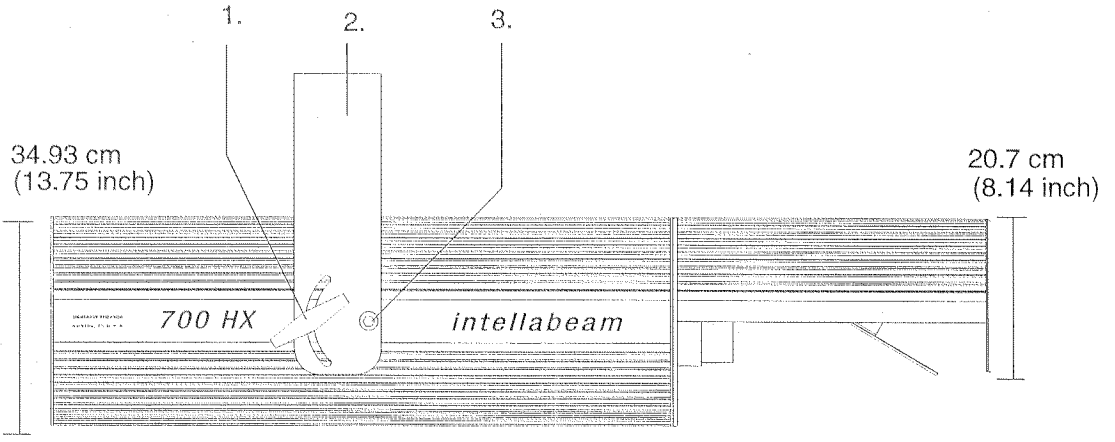
Appendix B
intellabeam Fixture Illustrations

intellabeam Fixture Top View



1. Cooling Fan 2. Yoke Mounting Holes 3. Top Access Door Latch

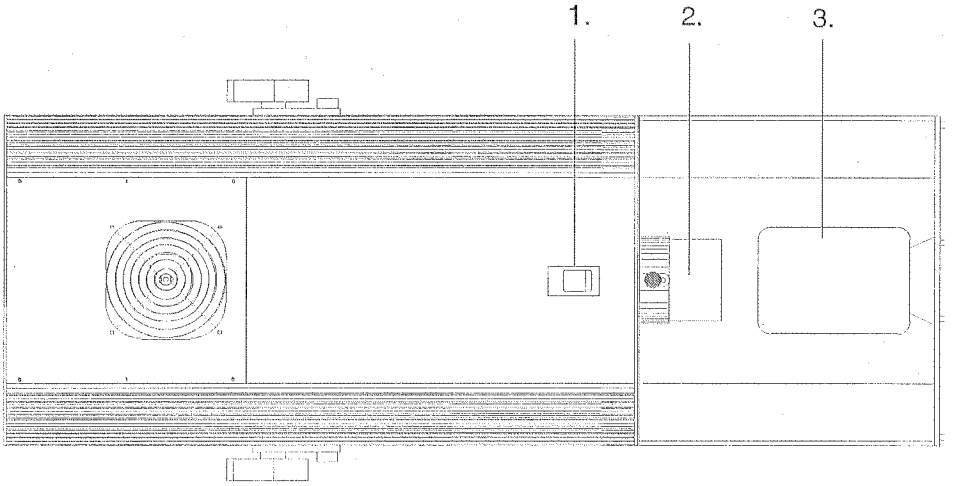
intellabeam Fixture Side View



1. Clamping T-Handle 2. Yoke 3. Allen Cap Screw

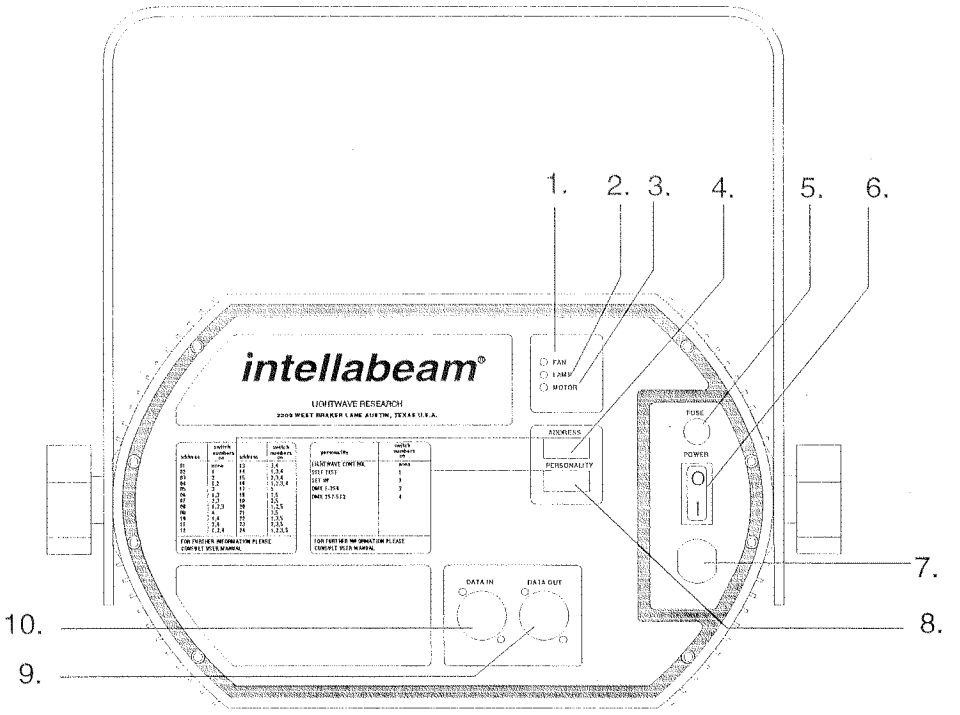
B

intellabeam Fixture Bottom View



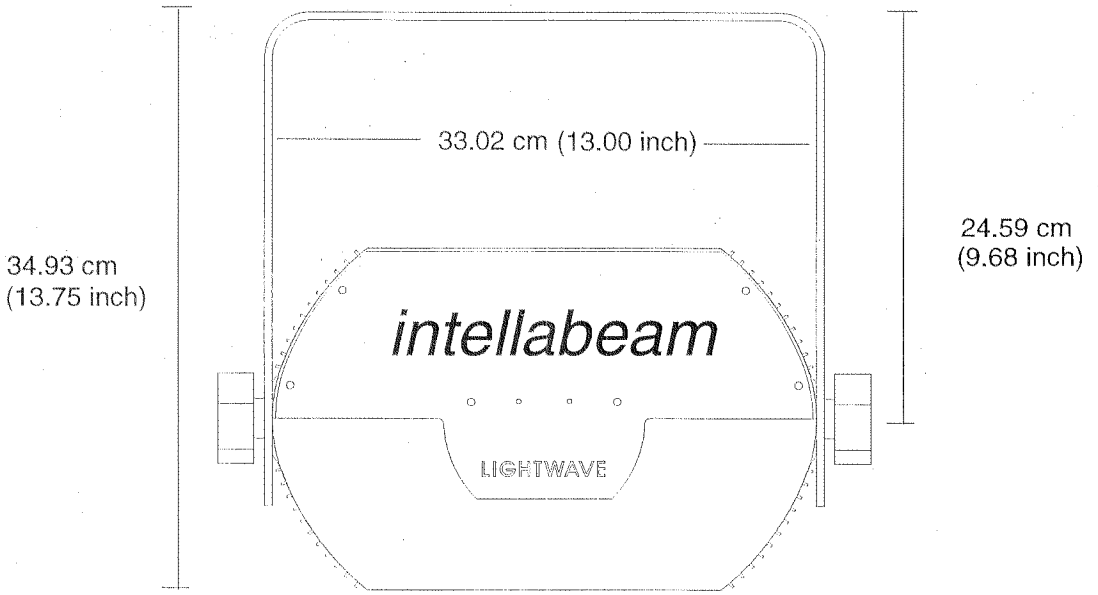
1. Bottom Access Door Latch
2. Lens Tube
3. Mirror

intellabeam Fixture Rear View

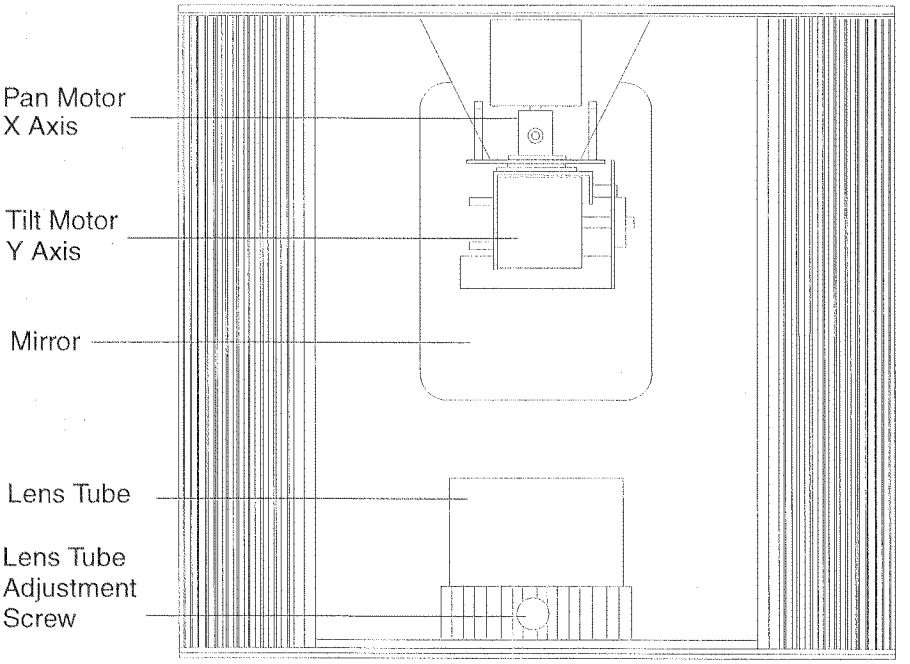


1. Red Fan LED Indicator
2. Yellow Lamp LED Indicator
3. Green Motor LED Indicator
4. Address DIP Switch
5. Main AC Input Fuse
6. Power Switch
7. AC Line Cord
8. Personality DIP Switch
9. "Data Out" Connector
10. "Data In" Connector

intellabeam Fixture Front View

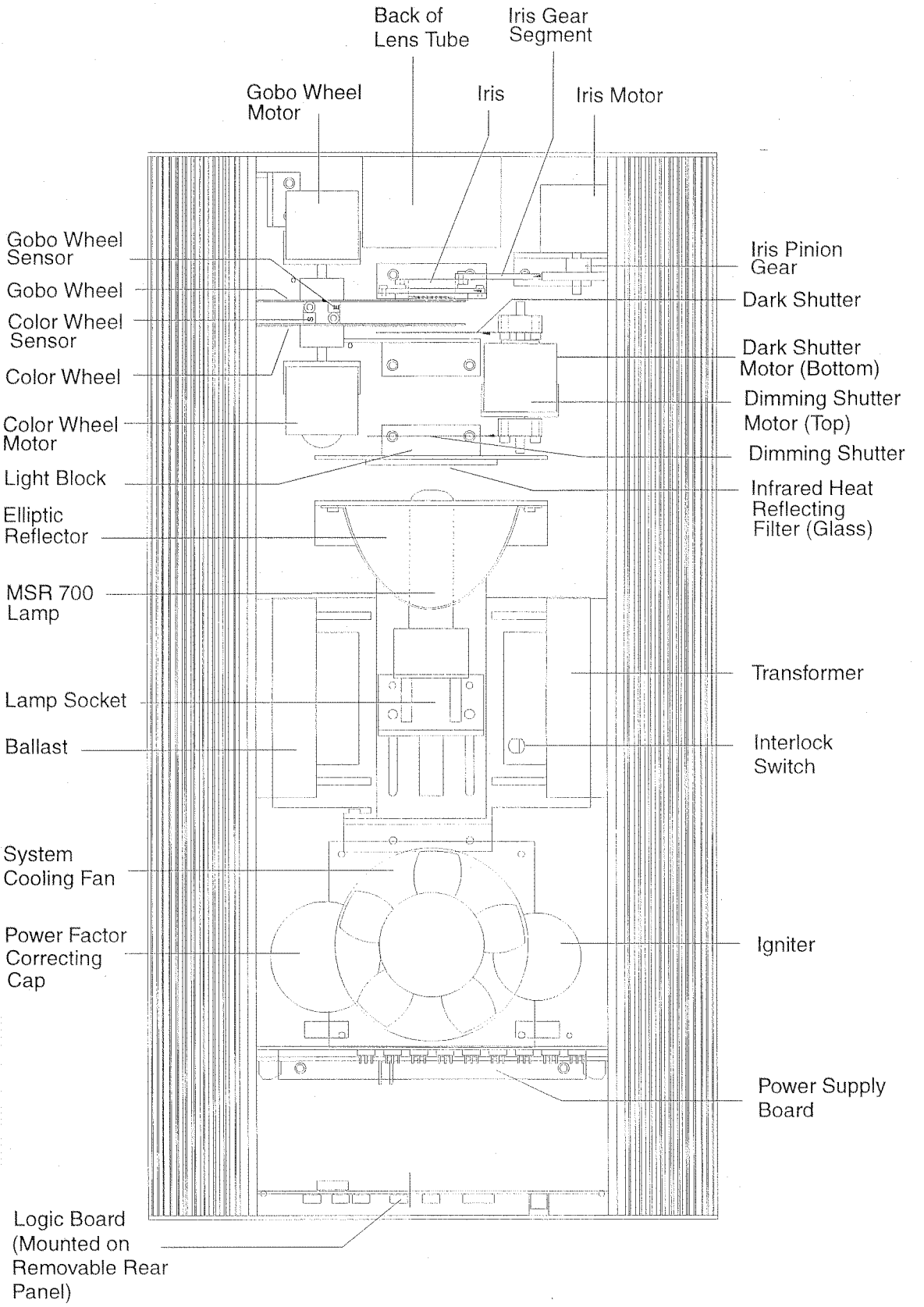


intellabeam Fixture Mirror Head Assembly



B

intellabeam Fixture Interior View



Appendix C
intellabeam Controller Specifications

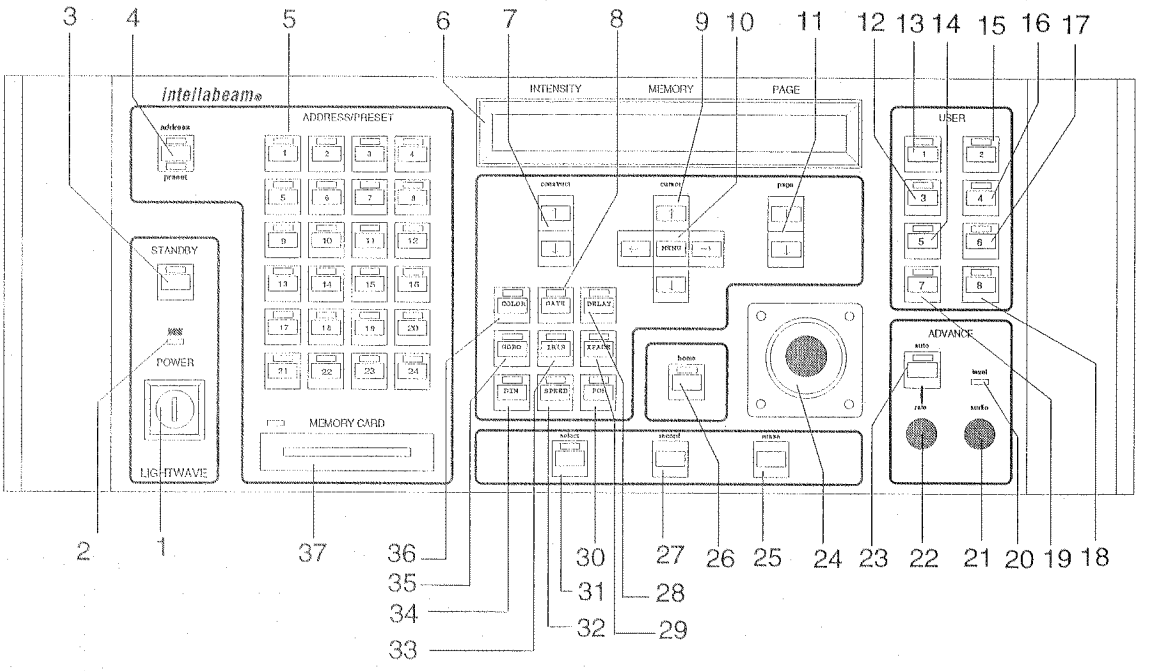
- ❑ Liquid Crystal Display (LCD)
- ❑ Simple menu operation with programming assistance prompts
- ❑ 9 Memories
- ❑ 891 programmable scenes
- ❑ 1024 programmable Presets—chase or fade loops
- ❑ 24 individual Addresses control 24 fixtures—Master/Slave capabilities
- ❑ Edit and page copy functions
- ❑ Memory lock
- ❑ Memory Card slot to:
  - Backup and transfer programs
  - Operating system upgrades
- ❑ Remote analog page access (scenes)
- ❑ Assignable special effects region
- ❑ "On-the-fly" color gobo intensity control
- ❑ Fixture parameter viewing
- ❑ Preset labeling
- ❑ Fixture exclusion
- ❑ Built-in 0 to 10 volts analog interface
- ❑ Inductive joystick
- ❑ Cross-fade functions
- ❑ Color modulate
- ❑ Gobo modulate
- ❑ Intensity modulate
- ❑ Eight user definable functions (macros)
- ❑ Two audio advance modes
- ❑ Stereo audio inputs
- ❑ Time delay factoring
- ❑ Individual fixture homing
- ❑ Remote enable
- ❑ Self-test diagnostics
- ❑ Positive feel switches
- ❑ RS-232 serial and MIDI port for external communications and control
- ❑ Locking key switch
- ❑ Voltage selectable:
  - 120 volts @ 50/60 Hertz (setting covers 95 to 135 volt range)
  - 230 volts @ 50/60 Hertz (setting covers 180 to 270 volt range)
- ❑ Frequency selectable:
  - 50 or 60 Hertz

- ❑ 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
- ❑ Weight: 6.4 kg (14 lb)

Specifications subject to change without prior notice

Appendix D
intellabeam Controller Illustrations

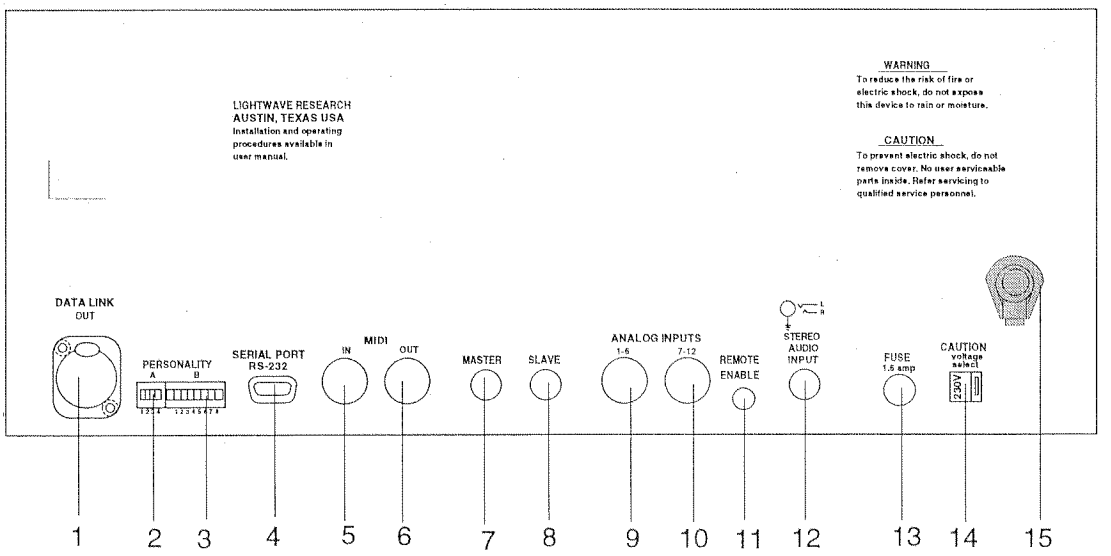
intellabeam Controller Front View



1. Power keyswitch
2. Slave mode indicator LED
3. Standby Key
4. Address/Preset select key
5. 24 Address/Preset keys
6. Liquid Crystal Display (LCD)
7. Construct Up/Down arror keys
8. Gate Construct key
9. Cursor arrow keys
10. Menu key
11. Page select keys
12. User Key 3 – Audio 1
13. User Key 1 – Random Advance
14. User Key 5 – Audio 2
15. User Key 2 – Effect 1 key
16. User Key 4 – Effect 2 key
17. User Key 6 – Effect 3 key
18. User Key 8
19. User Key 7
20. Audio Level Indicator
21. Audio Knob
22. Rate Knob
23. Audio Advance Key
24. Joystick
25. Erase Key
26. Home Key
27. Record Key
28. Delay Construct Key
29. Xfade Construct Key
30. POS Construct key
31. Select key
32. Speed Construct key
33. Iris Construct key
34. Dim Construct key
35. Gobo Construct key
36. Color Construct key
37. Memory Card slot

D

intellabeam Controller Rear View



1. Data Link Out connector
2. Personality DIP Switch A
3. Personality DIP Switch B
4. RS-232 Serial Port
5. MIDI In Port
6. MIDI Out Port
7. Master Out connector
8. Slave In connector
9. Analog Inputs connector (Channels 1-6)
10. Analog Inputs connector (Channels 7-12))
11. Remote Standby/Enable jack
12. Stereo Audio Input jack
13. Fuse (1.6 amp)
14. Voltage select switch
15. AC line cord

Appendix E
Binary Access Table

Use the Binary Access Table table to convert Preset numbers to Analog Input Channel 10 bit binary codes and vice versa. These codes equate to the first 10 channels of Analog Input Channels 1 to 12. The least significant binary bit is Channel 1.

To convert any decimal Preset number (1 to 1023) to its Analog Input channels, locate the number in the Preset Number (left most) column of the table. Then, read across to the Analog Input Channel column. Each channel that is marked with a "1" is active or "On" and each channel marked with a "0" is inactive or "Off". To select a Preset number enable the equivalent channels. For example, to select Preset 54, enable Channels 2, 3, 5, and 6. If you add up the binary weights for these bits, they would be equal to 54.

Note: The Binary Access Table is provided as a convenience so you do not have to convert the decimal number to binary and vice versa. However, if you want to translate your own numbers the binary weights are assigned as follows:

Analog Input Channel	Binary Weight
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128
9	256
10	512

For example, if you select Analog Input Channels 3, 6, and 8 you would add the binary weights associated to these numbers. Thus, add numbers 4, 32, and 128 to find the decimal equivalent. Thus, 4+32+128=Preset Number 164.

The Preset Key column lists the Preset Keys in repeated groups of 24. The Preset Level column provides a sequential list of Preset levels from 1 to 43. Use this column to coordinate Preset levels to Preset numbers. For example, the 24 Presets associated to Preset level 5 are 97 through 120.

Preset Number	Preset Key	Preset Level	Analog Input Channel 1	2	3	4	5	6	7	8	9	10
1	1	1	1	0	0	0	0	0	0	0	0	0
2	2	1	0	1	0	0	0	0	0	0	0	0
3	3	1	1	1	0	0	0	0	0	0	0	0
4	4	1	0	0	1	0	0	0	0	0	0	0
5	5	1	1	0	1	0	0	0	0	0	0	0
6	6	1	0	1	1	0	0	0	0	0	0	0
7	7	1	1	1	1	0	0	0	0	0	0	0
8	8	1	0	0	0	1	0	0	0	0	0	0
9	9	1	1	0	0	1	0	0	0	0	0	0
10	10	1	0	1	0	1	0	0	0	0	0	0
11	11	1	1	1	0	1	0	0	0	0	0	0
12	12	1	0	0	1	1	0	0	0	0	0	0
13	13	1	1	0	1	1	0	0	0	0	0	0
14	14	1	0	1	1	1	0	0	0	0	0	0
15	15	1	1	1	1	1	0	0	0	0	0	0
16	16	1	0	0	0	0	1	0	0	0	0	0
17	17	1	1	0	0	0	1	0	0	0	0	0
18	18	1	0	1	0	0	1	0	0	0	0	0
19	19	1	1	1	0	0	1	0	0	0	0	0
20	20	1	0	0	1	0	1	0	0	0	0	0
21	21	1	1	0	1	0	1	0	0	0	0	0
22	22	1	0	1	1	0	1	0	0	0	0	0
23	23	1	1	1	1	0	1	0	0	0	0	0
24	24	1	0	0	0	1	1	0	0	0	0	0
25	1	2	1	0	0	1	1	0	0	0	0	0
26	2	2	0	1	0	1	1	0	0	0	0	0
27	3	2	1	1	0	1	1	0	0	0	0	0
28	4	2	0	0	1	1	1	0	0	0	0	0
29	5	2	1	0	1	1	1	0	0	0	0	0
30	6	2	0	1	1	1	1	0	0	0	0	0
31	7	2	1	1	1	1	1	0	0	0	0	0
32	8	2	0	0	0	0	0	1	0	0	0	0
33	9	2	1	0	0	0	0	1	0	0	0	0
34	10	2	0	1	0	0	0	1	0	0	0	0
35	11	2	1	1	0	0	0	1	0	0	0	0
36	12	2	0	0	1	0	0	1	0	0	0	0
37	13	2	1	0	1	0	0	1	0	0	0	0
38	14	2	0	1	1	0	0	1	0	0	0	0
39	15	2	1	1	1	0	0	1	0	0	0	0
40	16	2	0	0	0	1	0	1	0	0	0	0
41	17	2	1	0	0	1	0	1	0	0	0	0
42	18	2	0	1	0	1	0	1	0	0	0	0
43	19	2	1	1	0	1	0	1	0	0	0	0
44	20	2	0	0	1	1	0	1	0	0	0	0
45	21	2	1	0	1	1	0	1	0	0	0	0
46	22	2	0	1	1	1	0	1	0	0	0	0
47	23	2	1	1	1	1	0	1	0	0	0	0
48	24	2	0	0	0	0	1	1	0	0	0	0
49	1	3	1	0	0	0	1	1	0	0	0	0
50	2	3	0	1	0	0	1	1	0	0	0	0
51	3	3	1	1	0	0	1	1	0	0	0	0
52	4	3	0	0	1	0	1	1	0	0	0	0
53	5	3	1	0	1	0	1	1	0	0	0	0
54	6	3	0	1	1	0	1	1	0	0	0	0
55	7	3	1	1	1	0	1	1	0	0	0	0
56	8	3	0	0	0	1	1	1	0	0	0	0
57	9	3	1	0	0	1	1	1	0	0	0	0
58	10	3	0	1	0	1	1	1	0	0	0	0
59	11	3	1	1	0	1	1	1	0	0	0	0
60	12	3	0	0	1	1	1	1	0	0	0	0
61	13	3	1	0	1	1	1	1	0	0	0	0
62	14	3	0	1	1	1	1	1	0	0	0	0
63	15	3	1	1	1	1	1	1	0	0	0	0
64	16	3	0	0	0	0	0	0	1	0	0	0
65	17	3	1	0	0	0	0	0	1	0	0	0
66	18	3	0	1	0	0	0	0	1	0	0	0
67	19	3	1	1	0	0	0	0	1	0	0	0
68	20	3	0	0	1	0	0	0	1	0	0	0
69	21	3	1	0	1	0	0	0	1	0	0	0
70	22	3	0	1	1	0	0	0	1	0	0	0
71	23	3	1	1	1	0	0	0	1	0	0	0
72	24	3	0	0	0	1	0	0	1	0	0	0
73	1	4	1	0	0	1	0	0	1	0	0	0
74	2	4	0	1	0	1	0	0	1	0	0	0
75	3	4	1	1	0	1	0	0	1	0	0	0
76	4	4	0	0	1	1	0	0	1	0	0	0
77	5	4	1	0	1	1	0	0	1	0	0	0
78	6	4	0	1	1	1	0	0	1	0	0	0
79	7	4	1	1	1	1	0	0	1	0	0	0
80	8	4	0	0	0	0	1	0	1	0	0	0
81	9	4	1	0	0	0	1	0	1	0	0	0
82	10	4	0	1	0	0	1	0	1	0	0	0
83	11	4	1	1	0	0	1	0	1	0	0	0
84	12	4	0	0	1	0	1	0	1	0	0	0
85	13	4	1	0	1	0	1	0	1	0	0	0
86	14	4	0	1	1	0	1	0	1	0	0	0
87	15	4	1	1	1	0	1	0	1	0	0	0
88	16	4	0	0	0	1	1	0	1	0	0	0
89	17	4	1	0	0	1	1	0	1	0	0	0
90	18	4	0	1	0	1	1	0	1	0	0	0
91	19	4	1	1	0	1	1	0	1	0	0	0
92	20	4	0	0	1	1	1	0	1	0	0	0
93	21	4	1	0	1	1	1	0	1	0	0	0
94	22	4	0	1	1	1	1	0	1	0	0	0
95	23	4	1	1	1	1	1	0	1	0	0	0
96	24	4	0	0	0	0	0	1	1	0	0	0
97	1	5	1	0	0	0	0	1	1	0	0	0
98	2	5	0	1	0	0	0	1	1	0	0	0
99	3	5	1	1	0	0	0	1	1	0	0	0
100	4	5	0	0	1	0	0	1	1	0	0	0
101	5	5	1	0	1	0	0	1	1	0	0	0
102	6	5	0	1	1	0	0	1	1	0	0	0
103	7	5	1	1	1	0	0	1	1	0	0	0
104	8	5	0	0	0	1	0	1	1	0	0	0
105	9	5	1	0	0	1	0	1	1	0	0	0
106	10	5	0	1	0	1	0	1	1	0	0	0
107	11	5	1	1	0	1	0	1	1	0	0	0
108	12	5	0	0	1	1	0	1	1	0	0	0
109	13	5	1	0	1	1	0	1	1	0	0	0
110	14	5	0	1	1	1	0	1	1	0	0	0
111	15	5	1	1	1	1	0	1	1	0	0	0
112	16	5	0	0	0	0	1	1	1	0	0	0
113	17	5	1	0	0	0	1	1	1	0	0	0
114	18	5	0	1	0	0	1	1	1	0	0	0
115	19	5	1	1	0	0	1	1	1	0	0	0
116	20	5	0	0	1	0	1	1	1	0	0	0
117	21	5	1	0	1	0	1	1	1	0	0	0
118	22	5	0	1	1	0	1	1	1	0	0	0
119	23	5	1	1	1	0	1	1	1	0	0	0
120	24	5	0	0	0	1	1	1	1	0	0	0
121	1	6	1	0	0	1	1	1	1	0	0	0
122	2	6	0	1	0	1	1	1	1	0	0	0
123	3	6	1	1	0	1	1	1	1	0	0	0
124	4	6	0	0	1	1	1	1	1	0	0	0
125	5	6	1	0	1	1	1	1	1	0	0	0
126	6	6	0	1	1	1	1	1	1	0	0	0
127	7	6	1	1	1	1	1	1	1	0	0	0
128	8	6	0	0	0	0	0	0	0	1	0	0
129	9	6	1	0	0	0	0	0	0	1	0	0
130	10	6	0	1	0	0	0	0	0	1	0	0
131	11	6	1	1	0	0	0	0	0	1	0	0
132	12	6	0	0	1	0	0	0	0	1	0	0
133	13	6	1	0	1	0	0	0	0	1	0	0
134	14	6	0	1	1	0	0	0	0	1	0	0
135	15	6	1	1	1	0	0	0	0	1	0	0
136	16	6	0	0	0	1	0	0	0	1	0	0
137	17	6	1	0	0	1	0	0	0	1	0	0
138	18	6	0	1	0	1	0	0	0	1	0	0

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

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

Preset Number	Preset Key	Preset Level	Analog Input Channel 1	2	3	4	5	6	7	8	9	10
415	7	18	1	1	1	1	1	0	0	1	1	0
416	8	18	0	0	0	0	0	1	0	1	1	0
417	9	18	1	0	0	0	0	1	0	1	1	0
418	10	18	0	1	0	0	0	1	0	1	1	0
419	11	18	1	1	0	0	0	1	0	1	1	0
420	12	18	0	0	1	0	0	1	0	1	1	0
421	13	18	1	0	1	0	0	1	0	1	1	0
422	14	18	0	1	1	0	0	1	0	1	1	0
423	15	18	1	1	1	0	0	1	0	1	1	0
424	16	18	0	0	0	1	0	1	0	1	1	0
425	17	18	1	0	0	1	0	1	0	1	1	0
426	18	18	0	1	0	1	0	1	0	1	1	0
427	19	18	1	1	0	1	0	1	0	1	1	0
428	20	18	0	0	1	1	0	1	0	1	1	0
429	21	18	1	0	1	1	0	1	0	1	1	0
430	22	18	0	1	1	1	0	1	0	1	1	0
431	23	18	1	1	1	1	0	1	0	1	1	0
432	24	18	0	0	0	0	1	1	0	1	1	0
433	1	19	1	0	0	0	1	1	0	1	1	0
434	2	19	0	1	0	0	1	1	0	1	1	0
435	3	19	1	1	0	0	1	1	0	1	1	0
436	4	19	0	0	1	0	1	1	0	1	1	0
437	5	19	1	0	1	0	1	1	0	1	1	0
438	6	19	0	1	1	0	1	1	0	1	1	0
439	7	19	1	1	1	0	1	1	0	1	1	0
440	8	19	0	0	0	1	1	1	0	1	1	0
441	9	19	1	0	0	1	1	1	0	1	1	0
442	10	19	0	1	0	1	1	1	0	1	1	0
443	11	19	1	1	0	1	1	1	0	1	1	0
444	12	19	0	0	1	1	1	1	0	1	1	0
445	13	19	1	0	1	1	1	1	0	1	1	0
446	14	19	0	1	1	1	1	1	0	1	1	0
447	15	19	1	1	1	1	1	1	0	1	1	0
448	16	19	0	0	0	0	0	0	1	1	1	0
449	17	19	1	0	0	0	0	0	1	1	1	0
450	18	19	0	1	0	0	0	0	1	1	1	0
451	19	19	1	1	0	0	0	0	1	1	1	0
452	20	19	0	0	1	0	0	0	1	1	1	0
453	21	19	1	0	1	0	0	0	1	1	1	0
454	22	19	0	1	1	0	0	0	1	1	1	0
455	23	19	1	1	1	0	0	0	1	1	1	0
456	24	19	0	0	0	1	0	0	1	1	1	0
457	1	20	1	0	0	1	0	0	1	1	1	0
458	2	20	0	1	0	1	0	0	1	1	1	0
459	3	20	1	1	0	1	0	0	1	1	1	0
460	4	20	0	0	1	1	0	0	1	1	1	0
461	5	20	1	0	1	1	0	0	1	1	1	0
462	6	20	0	1	1	1	0	0	1	1	1	0
463	7	20	1	1	1	1	0	0	1	1	1	0
464	8	20	0	0	0	0	1	0	1	1	1	0
465	9	20	1	0	0	0	1	0	1	1	1	0
466	10	20	0	1	0	0	1	0	1	1	1	0
467	11	20	1	1	0	0	1	0	1	1	1	0
468	12	20	0	0	1	0	1	0	1	1	1	0
469	13	20	1	0	1	0	1	0	1	1	1	0
470	14	20	0	1	1	0	1	0	1	1	1	0
471	15	20	1	1	1	0	1	0	1	1	1	0
472	16	20	0	0	0	1	1	0	1	1	1	0
473	17	20	1	0	0	1	1	0	1	1	1	0
474	18	20	0	1	0	1	1	0	1	1	1	0
475	19	20	1	1	0	1	1	0	1	1	1	0
476	20	20	0	0	1	1	1	0	1	1	1	0
477	21	20	1	0	1	1	1	0	1	1	1	0
478	22	20	0	1	1	1	1	0	1	1	1	0
479	23	20	1	1	1	1	1	0	1	1	1	0
480	24	20	0	0	0	0	0	1	1	1	1	0
481	1	21	1	0	0	0	0	1	1	1	1	0
482	2	21	0	1	0	0	0	1	1	1	1	0
483	3	21	1	1	0	0	0	1	1	1	1	0
484	4	21	0	0	1	0	0	1	1	1	1	0
485	5	21	1	0	1	0	0	1	1	1	1	0
486	6	21	0	1	1	0	0	1	1	1	1	0
487	7	21	1	1	1	0	0	1	1	1	1	0
488	8	21	0	0	0	1	0	1	1	1	1	0
489	9	21	1	0	0	1	0	1	1	1	1	0
490	10	21	0	1	0	1	0	1	1	1	1	0
491	11	21	1	1	0	1	0	1	1	1	1	0
492	12	21	0	0	1	1	0	1	1	1	1	0
493	13	21	1	0	1	1	0	1	1	1	1	0
494	14	21	0	1	1	1	0	1	1	1	1	0
495	15	21	1	1	1	1	0	1	1	1	1	0
496	16	21	0	0	0	0	1	1	1	1	1	0
497	17	21	1	0	0	0	1	1	1	1	1	0
498	18	21	0	1	0	0	1	1	1	1	1	0
499	19	21	1	1	0	0	1	1	1	1	1	0
500	20	21	0	0	1	0	1	1	1	1	1	0
501	21	21	1	0	1	0	1	1	1	1	1	0
502	22	21	0	1	1	0	1	1	1	1	1	0
503	23	21	1	1	1	0	1	1	1	1	1	0
504	24	21	0	0	0	1	1	1	1	1	1	0
505	1	22	1	0	0	1	1	1	1	1	1	0
506	2	22	0	1	0	1	1	1	1	1	1	0
507	3	22	1	1	0	1	1	1	1	1	1	0
508	4	22	0	0	1	1	1	1	1	1	1	0
509	5	22	1	0	1	1	1	1	1	1	1	0
510	6	22	0	1	1	1	1	1	1	1	1	0
511	7	22	1	1	1	1	1	1	1	1	1	0
512	8	22	0	0	0	0	0	0	0	0	0	1
513	9	22	1	0	0	0	0	0	0	0	0	1
514	10	22	0	1	0	0	0	0	0	0	0	1
515	11	22	1	1	0	0	0	0	0	0	0	1
516	12	22	0	0	1	0	0	0	0	0	0	1
517	13	22	1	0	1	0	0	0	0	0	0	1
518	14	22	0	1	1	0	0	0	0	0	0	1
519	15	22	1	1	1	0	0	0	0	0	0	1
520	16	22	0	0	0	1	0	0	0	0	0	1
521	17	22	1	0	0	1	0	0	0	0	0	1
522	18	22	0	1	0	1	0	0	0	0	0	1
523	19	22	1	1	0	1	0	0	0	0	0	1
524	20	22	0	0	1	1	0	0	0	0	0	1
525	21	22	1	0	1	1	0	0	0	0	0	1
526	22	22	0	1	1	1	0	0	0	0	0	1
527	23	22	1	1	1	1	0	0	0	0	0	1
528	24	22	0	0	0	0	1	0	0	0	0	1
529	1	23	1	0	0	0	1	0	0	0	0	1
530	2	23	0	1	0	0	1	0	0	0	0	1
531	3	23	1	1	0	0	1	0	0	0	0	1
532	4	23	0	0	1	0	1	0	0	0	0	1
533	5	23	1	0	1	0	1	0	0	0	0	1
534	6	23	0	1	1	0	1	0	0	0	0	1
535	7	23	1	1	1	0	1	0	0	0	0	1
536	8	23	0	0	0	1	1	0	0	0	0	1
537	9	23	1	0	0	1	1	0	0	0	0	1
538	10	23	0	1	0	1	1	0	0	0	0	1
539	11	23	1	1	0	1	1	0	0	0	0	1
540	12	23	0	0	1	1	1	0	0	0	0	1
541	13	23	1	0	1	1	1	0	0	0	0	1
542	14	23	0	1	1	1	1	0	0	0	0	1
543	15	23	1	1	1	1	1	0	0	0	0	1
544	16	23	0	0	0	0	0	1	0	0	0	1
545	17	23	1	0	0	0	0	1	0	0	0	1
546	18	23	0	1	0	0	0	1	0	0	0	1
547	19	23	1	1	0	0	0	1	0	0	0	1
548	20	23	0	0	1	0	0	1	0	0	0	1
549	21	23	1	0	1	0	0	1	0	0	0	1
550	22	23	0	1	1	0	0	1	0	0	0	1
551	23	23	1	1	1	0	0	1	0	0	0	1
552	24	23	0	0	0	1	0	1	0	0	0	1

Preset Number	Preset Key	Preset Level	Analog Input Channel 1	2	3	4	5	6	7	8	9	10
553	1	24	1	0	0	1	0	1	0	0	0	1
554	2	24	0	1	0	1	0	1	0	0	0	1
555	3	24	1	1	0	1	0	1	0	0	0	1
556	4	24	0	0	1	1	0	1	0	0	0	1
557	5	24	1	0	1	1	0	1	0	0	0	1
558	6	24	0	1	1	1	0	1	0	0	0	1
559	7	24	1	1	1	1	0	1	0	0	0	1
560	8	24	0	0	0	0	1	1	0	0	0	1
561	9	24	1	0	0	0	1	1	0	0	0	1
562	10	24	0	1	0	0	1	1	0	0	0	1
563	11	24	1	1	0	0	1	1	0	0	0	1
564	12	24	0	0	1	0	1	1	0	0	0	1
565	13	24	1	0	1	0	1	1	0	0	0	1
566	14	24	0	1	1	0	1	1	0	0	0	1
567	15	24	1	1	1	0	1	1	0	0	0	1
568	16	24	0	0	0	1	1	1	0	0	0	1
569	17	24	1	0	0	1	1	1	0	0	0	1
570	18	24	0	1	0	1	1	1	0	0	0	1
571	19	24	1	1	0	1	1	1	0	0	0	1
572	20	24	0	0	1	1	1	1	0	0	0	1
573	21	24	1	0	1	1	1	1	0	0	0	1
574	22	24	0	1	1	1	1	1	0	0	0	1
575	23	24	1	1	1	1	1	1	0	0	0	1
576	24	24	0	0	0	0	0	0	1	0	0	1
577	1	25	1	0	0	0	0	0	1	0	0	1
578	2	25	0	1	0	0	0	0	1	0	0	1
579	3	25	1	1	0	0	0	0	1	0	0	1
580	4	25	0	0	1	0	0	0	1	0	0	1
581	5	25	1	0	1	0	0	0	1	0	0	1
582	6	25	0	1	1	0	0	0	1	0	0	1
583	7	25	1	1	1	0	0	0	1	0	0	1
584	8	25	0	0	0	1	0	0	1	0	0	1
585	9	25	1	0	0	1	0	0	1	0	0	1
586	10	25	0	1	0	1	0	0	1	0	0	1
587	11	25	1	1	0	1	0	0	1	0	0	1
588	12	25	0	0	1	1	0	0	1	0	0	1
589	13	25	1	0	1	1	0	0	1	0	0	1
590	14	25	0	1	1	1	0	0	1	0	0	1
591	15	25	1	1	1	1	0	0	1	0	0	1
592	16	25	0	0	0	0	1	0	1	0	0	1
593	17	25	1	0	0	0	1	0	1	0	0	1
594	18	25	0	1	0	0	1	0	1	0	0	1
595	19	25	1	1	0	0	1	0	1	0	0	1
596	20	25	0	0	1	0	1	0	1	0	0	1
597	21	25	1	0	1	0	1	0	1	0	0	1
598	22	25	0	1	1	0	1	0	1	0	0	1
599	23	25	1	1	1	0	1	0	1	0	0	1
600	24	25	0	0	0	1	1	0	1	0	0	1
601	1	26	1	0	0	1	1	0	1	0	0	1
602	2	26	0	1	0	1	1	0	1	0	0	1
603	3	26	1	1	0	1	1	0	1	0	0	1
604	4	26	0	0	1	1	1	0	1	0	0	1
605	5	26	1	0	1	1	1	0	1	0	0	1
606	6	26	0	1	1	1	1	0	1	0	0	1
607	7	26	1	1	1	1	1	0	1	0	0	1
608	8	26	0	0	0	0	0	1	1	0	0	1
609	9	26	1	0	0	0	0	1	1	0	0	1
610	10	26	0	1	0	0	0	1	1	0	0	1
611	11	26	1	1	0	0	0	1	1	0	0	1
612	12	26	0	0	1	0	0	1	1	0	0	1
613	13	26	1	0	1	0	0	1	1	0	0	1
614	14	26	0	1	1	0	0	1	1	0	0	1
615	15	26	1	1	1	0	0	1	1	0	0	1
616	16	26	0	0	0	1	0	1	1	0	0	1
617	17	26	1	0	0	1	0	1	1	0	0	1
618	18	26	0	1	0	1	0	1	1	0	0	1
619	19	26	1	1	0	1	0	1	1	0	0	1
620	20	26	0	0	1	1	0	1	1	0	0	1
621	21	26	1	0	1	1	0	1	1	0	0	1
622	22	26	0	1	1	1	0	1	1	0	0	1
623	23	26	1	1	1	1	0	1	1	0	0	1
624	24	26	0	0	0	0	1	1	1	0	0	1
625	1	27	1	0	0	0	1	1	1	0	0	1
626	2	27	0	1	0	0	1	1	1	0	0	1
627	3	27	1	1	0	0	1	1	1	0	0	1
628	4	27	0	0	1	0	1	1	1	0	0	1
629	5	27	1	0	1	0	1	1	1	0	0	1
630	6	27	0	1	1	0	1	1	1	0	0	1
631	7	27	1	1	1	0	1	1	1	0	0	1
632	8	27	0	0	0	1	1	1	1	0	0	1
633	9	27	1	0	0	1	1	1	1	0	0	1
634	10	27	0	1	0	1	1	1	1	0	0	1
635	11	27	1	1	0	1	1	1	1	0	0	1
636	12	27	0	0	1	1	1	1	1	0	0	1
637	13	27	1	0	1	1	1	1	1	0	0	1
638	14	27	0	1	1	1	1	1	1	0	0	1
639	15	27	1	1	1	1	1	1	1	0	0	1
640	16	27	0	0	0	0	0	0	0	1	0	1
641	17	27	1	0	0	0	0	0	0	1	0	1
642	18	27	0	1	0	0	0	0	0	1	0	1
643	19	27	1	1	0	0	0	0	0	1	0	1
644	20	27	0	0	1	0	0	0	0	1	0	1
645	21	27	1	0	1	0	0	0	0	1	0	1
646	22	27	0	1	1	0	0	0	0	1	0	1
647	23	27	1	1	1	0	0	0	0	1	0	1
648	24	27	0	0	0	1	0	0	0	1	0	1
649	1	28	1	0	0	1	0	0	0	1	0	1
650	2	28	0	1	0	1	0	0	0	1	0	1
651	3	28	1	1	0	1	0	0	0	1	0	1
652	4	28	0	0	1	1	0	0	0	1	0	1
653	5	28	1	0	1	1	0	0	0	1	0	1
654	6	28	0	1	1	1	0	0	0	1	0	1
655	7	28	1	1	1	1	0	0	0	1	0	1
656	8	28	0	0	0	0	1	0	0	1	0	1
657	9	28	1	0	0	0	1	0	0	1	0	1
658	10	28	0	1	0	0	1	0	0	1	0	1
659	11	28	1	1	0	0	1	0	0	1	0	1
660	12	28	0	0	1	0	1	0	0	1	0	1
661	13	28	1	0	1	0	1	0	0	1	0	1
662	14	28	0	1	1	0	1	0	0	1	0	1
663	15	28	1	1	1	0	1	0	0	1	0	1
664	16	28	0	0	0	1	1	0	0	1	0	1
665	17	28	1	0	0	1	1	0	0	1	0	1
666	18	28	0	1	0	1	1	0	0	1	0	1
667	19	28	1	1	0	1	1	0	0	1	0	1
668	20	28	0	0	1	1	1	0	0	1	0	1
669	21	28	1	0	1	1	1	0	0	1	0	1
670	22	28	0	1	1	1	1	0	0	1	0	1
671	23	28	1	1	1	1	1	0	0	1	0	1
672	24	28	0	0	0	0	0	1	0	1	0	1
673	1	29	1	0	0	0	0	1	0	1	0	1
674	2	29	0	1	0	0	0	1	0	1	0	1
675	3	29	1	1	0	0	0	1	0	1	0	1
676	4	29	0	0	1	0	0	1	0	1	0	1
677	5	29	1	0	1	0	0	1	0	1	0	1
678	6	29	0	1	1	0	0	1	0	1	0	1
679	7	29	1	1	1	0	0	1	0	1	0	1
680	8	29	0	0	0	1	0	1	0	1	0	1
681	9	29	1	0	0	1	0	1	0	1	0	1
682	10	29	0	1	0	1	0	1	0	1	0	1
683	11	29	1	1	0	1	0	1	0	1	0	1
684	12	29	0	0	1	1	0	1	0	1	0	1
685	13	29	1	0	1	1	0	1	0	1	0	1
686	14	29	0	1	1	1	0	1	0	1	0	1
687	15	29	1	1	1	1	0	1	0	1	0	1
688	16	29	0	0	0	0	1	1	0	1	0	1
689	17	29	1	0	0	0	1	1	0	1	0	1
690	18	29	0	1	0	0	1	1	0	1	0	1

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

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