User Manual

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x.Spot™ User Manual
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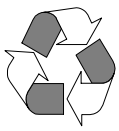
Printed in the USA

S.G.



Contacting High End Systems®

US and the Americas

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Declaration of Conformity according to ISO/IEC Guide 22 and EN45104

Manufacturer's name: High End Systems, Inc.

Distributor's name: High End Systems, Inc.
Distributor's address: 2217 West Braker Lane
Austin, Texas 78758 USA

Declares that the product

Product Name: x.Spot
Product Number: All
Product Options: All

conforms to the following EEC directives:
73/23/EEC, as amended by 93/68/EEC
89/336/EEC, as amended by 92/31/EEC and 93/68/EEC

Equipment referred to in this declaration of conformity was first manufactured in compliance with the following standards in 2001:

Safety:
EN 60598-1: 1997/A1:1998
EN 60598-2-17: 1989/A2:1991

EMC:
EN 55022+A1+A2: 1987 Class A
EN55024: 1998
EN61000-4-2: 1995 Level 3, Cls2
EN61000-4-3: 1995 Level 2
EN61000-4-4: 1995 Level 2
EN61000-4-5: 1995 Level 2
EN61000-4-6: 1996 Level 2
EN61000-4-11: 1994
EN61000-3-2: 1995 Class A

USA, Wednesday, October 03, 2001
Kenneth Stuart Hansen, Compliance Engineer

Product Modification Warning

High End Systems products are designed and manufactured to meet the requirements of United States and International safety regulations. Modifications to the product could affect safety and render the product non-compliant to relevant safety standards.

Mise En Garde Contre La Modification Du Produit
Les produits High End Systems sont conçus et fabriqués conformément aux exigences des règlements internationaux de sécurité. Toute modification du produit peut entraîner sa non conformité aux normes de sécurité en vigueur.

Produktmodifikationswarnung
Design und Herstellung von High End Systems entsprechen den Anforderungen der U.S. Amerikanischen und internationalen Sicherheitsvorschriften. Abänderungen dieses Produktes können dessen Sicherheit beeinträchtigen und unter Umständen gegen die diesbezüglichen Sicherheitsnormen verstoßen.

Avvertenza Sulla Modifica Del Prodotto
I prodotti di High End Systems sono stati progettati e fabbricati per soddisfare i requisiti delle normative di sicurezza statunitensi ed internazionali. Qualsiasi modifica al prodotto potrebbe pregiudicare la sicurezza e rendere il prodotto non conforme agli standard di sicurezza pertinenti.

Advertencia De Modificación Del Producto
Los productos de High End Systems están diseñados y fabricados para cumplir los requisitos de las reglamentaciones de seguridad de los Estados Unidos e internacionales. Las modificaciones al producto podrían afectar la seguridad y dejar al producto fuera de conformidad con las normas de seguridad relevantes.

FCC Information

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Important Safety Information

Instructions pertaining to continued protection against fire, electric shock, exposure to excessive ultraviolet (UV) radiation, and injury to persons are found in Appendix C. Please read all instructions prior to assembling, mounting, and operating this equipment.

Important: Informations De Sécurité

Les instructions se rapportant à la protection permanente contre les incendies, l'électrocution, l'exposition à un rayonnement ultraviolet (UV) excessif et aux blessures corporelles se trouvent dans l'Annexe C.
Veuillez lire toutes les instructions avant d'assembler, de monter ou d'utiliser cet équipement.

Wichtige Sicherheitshinweise

Sicherheitsanleitungen zum Schutz gegen Feuer, elektrischen Schlag, übermäßige UV-Strahlung und Verletzung von Personen finden Sie in Anhang C.
Vor der Montage, dem Zusammenbau und der Intbetriebnahme dieses Geräts alle Anleitungen sorgfältig durchlesen.

Informazioni Importanti Di Sicurezza

Le istruzioni sulla protezione da incendi, folgorazione, esposizione eccessiva a raggi ultravioletti (UV) e infortuni sono contenute nell'appendice C.
Si prega di leggere tutte le istruzioni prima di assemblare, montare e azionare l'apparecchiatura.

Informacion Importante De Seguridad

En el Apéndice C se encuentran instrucciones sobre protección continua contra incendios, descarga eléctrica, exposición excesiva a radiación ultravioleta (UV) y lesiones personales.
Lea, por favor, todas las instrucciones antes del ensamblaje, montaje y operación de este equipo.

Symbols

The following international caution and warning symbols appear in margins throughout this manual to highlight messages.

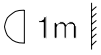
Caution: This symbol appears adjacent to Caution messages. Not heeding these messages could result in personal injury and/or damage to equipment.

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

This symbol indicates that a fire hazard is present. Not heeding these messages could result in serious personal injury.

This symbol indicates that eye protection is required.

This symbol indicates an explosion hazard.



This symbol indicates the minimum distance to a lighted object, which in this case, is 1 meter.

This symbol indicates a hot surface.

This symbol indicates that an object not be mounted on a flammable surface

Warranty Information

Limited Warranty

Unless otherwise stated, your *product* is covered by a two year parts and labor limited warranty. Dichroic filters are not guaranteed against breakage or scratches to coating. 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 Material Authorization (RMA) number 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.

Any Product unit or parts returned to High End Systems 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 an RMA number. Accompany all returned Product units or parts with a written explanation of the alleged problem or malfunction. Ship returned Product units or parts to: 2227 West Braker Lane, Austin, TX 78758 USA.

Note: Freight Damage Claims are invalid for fixtures shipped in non-factory boxes and packing materials.

Freight

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 WAS FORESEEN OR UNFORESEEN.

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

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Chapter 1:
Features and Specifications

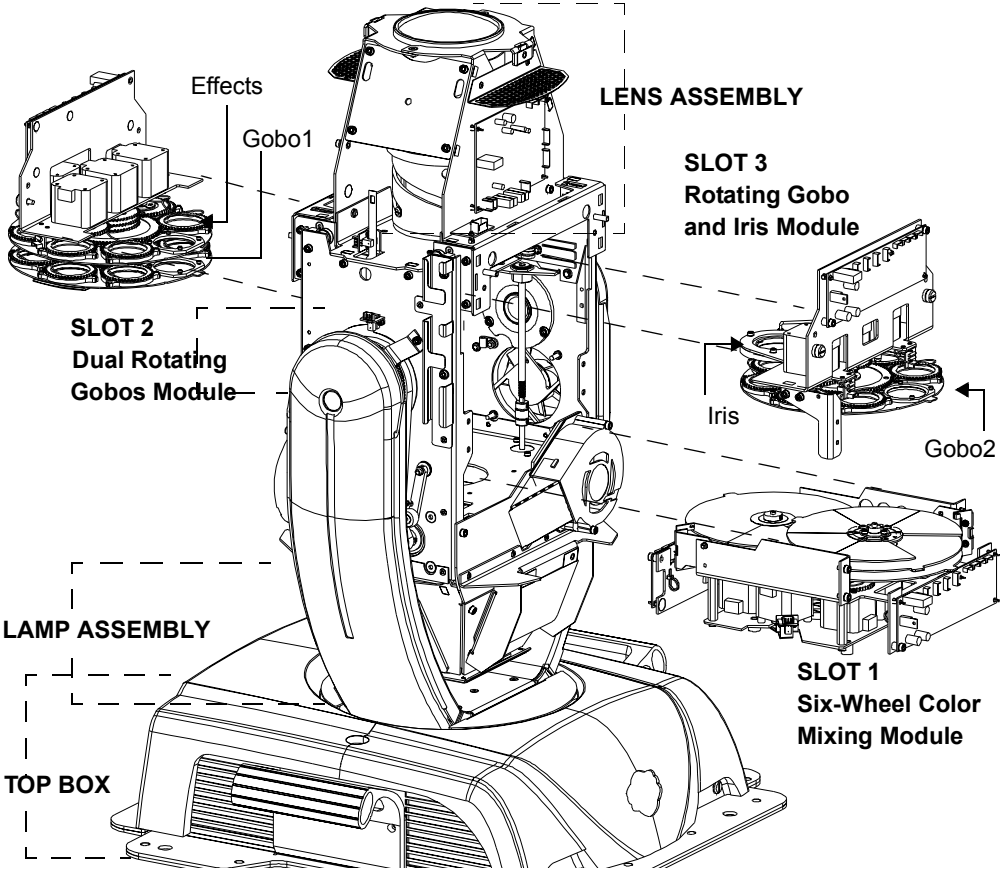
The x.Spot ™ luminaire integrates multiple advances in automated lighting technology to give the lighting designer the ultimate hard-edge fixture for professional applications. The modular design shown in Figure 1-1 includes three user-configurable slots to allow maximum customization and upgradability.

Standard Configuration

A standard configuration for x.Spot includes the following modules:

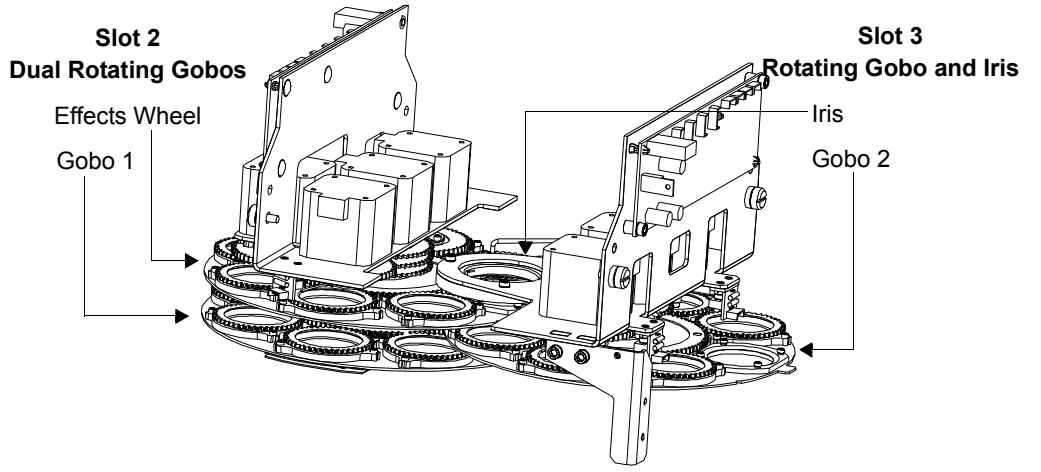
- Slot 1—Six-Wheel Color Mixing
- Slot 2—Dual Rotating Gobos
- Slot 3—Rotating Gobo and Iris

Figure 1-1 x.Spot Fixture Components



In the standard x.Spot configuration, the wheels of the modules in Slots 2 and 3 interleave to allow for the maximum range of effects.

Figure 1-2 Module Interleaving in Standard x.Spot™ fixture



x.Spot™ Features

Basic Fixture

- 4:1 f2.0 11-element zoom lens (11°–45°) with constant aperture and focus tracking while zooming
- 630° Pan and 240° Tilt
- Variable frost
- Mechanical and electronic strobe
- Smooth, linear dimming
- Remote focus
- Independent electronic homing for fixture function groups

Operation

- USITT DMX-512 1990 Compatible
- ACN-ready Ethernet connector
- High-resolution optical encoders to monitor position and correct on the fly
- Onboard programming and playback
- TalkBack protocol support for automating remote patching, status updates, etc.
- Large dot matrix display
  —allows for 2 lines of text
  —automatic inversion based on fixture orientation

Construction

- Flicker-free, electronic universal power supply (100–230V) (50-60Hz)
- Modular construction for easy upgrading and customizing
- Square base for universal truss mounting
- Easy head removal with clamshell bezels
- Ease of maintenance
  —modularity
  —interchangeable driver boards between modules
  —minimum metric standard tool set

Module Features

Six-Wheel Color Mixing Module

- Smooth CMY color mixing
- Six-position dichroic color wheel with five (5) replaceable color filters plus open
- Variable Color Temperature Correction (3000°K –7500°K) through the use of CTO and CTB filters
- Frost wedges on CTO and CTB filters to implement remote three-level beam flatness adjustment

Dual Rotating Gobo Module

- Two Gobo wheels:
  — Gobo wheel 1 has seven rotating, indexing Lithopatterns® glass gobos with stacking capability (plus open)
  — Effects Gobo wheel has rotating, indexing glass effects in seven apertures (plus open)
  — Moire and overlay effects capability on two positions of Gobo wheel 1

Rotating Gobo and Iris Module

- Gobo wheel 2 has seven rotating, indexing Lithopatterns® glass gobos with stacking capability (plus open)
- Variable Iris

Optional Accessories

The x.Spot optional accessories available from your High End Systems dealer/distributor are listed in the table below. For more information about optional accessories, contact either your High End Systems dealer/distributor, High End System Sales, or visit the High End Systems Web site at www.highend.com. For additional contact information, see “Contacting High End Systems®” on page ii.

Part Description	Part Number
Replacement MSR700-SA lamp	55030054
Color wheel dichroic filters	See Note
Lithopatterns	See Note
Effect Glass	See Note
HandShake Controller	10020001
Whole Hog II lighting console	25020001
Heavy duty 5-pin XLR cable (10’)	55050017
Heavy duty 5-pin XLR cable (25’)	55050018
Heavy duty 5-pin XLR cable (50’)	55050019
Heavy duty 5-pin XLR cable (100’)	55050020
Male 5-pin XLR terminator	90404039
Galvanized safety cable	12040001
Cheeseborough clamp	55040014
Lightwave Research Upload Dongle	26040002
Center-hole mounting brackets	80430080
Road case for x.Spot fixtures	46070001
Lithomotion module	46040001
Framing module	46040002

Note: Call High End Systems for information on standard or custom dichroic color filters, lithopatterns and effect glass.

Specifications

Physical Specifications

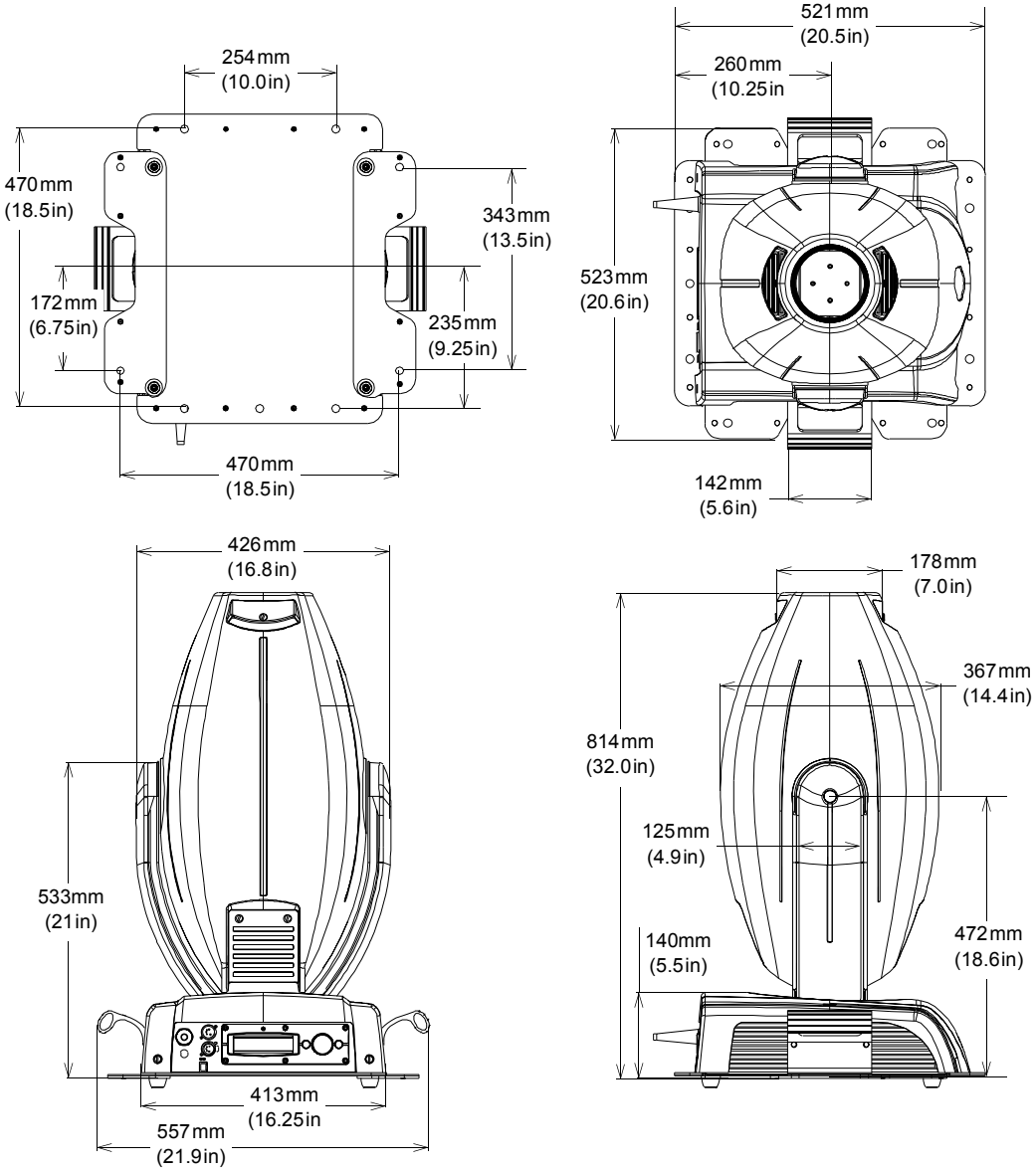
Height: 814.5mm (32.0 in)

Width: 521mm (20.6 in)

Depth: 520.8mm (20.5in)

Weight: 31.8kg (70lb)

Figure 1-3 x-Spot Dimensions



Electrical Specifications

Warning: Class 1 equipment - This equipment must be earthed.

Selectable voltages: Universal Input from 100–230 VAC, (50–60 Hz)

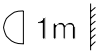
Rated power: 1200 W

Fuses: Motor power supply output: 2.5 A, 250 V slow blow only.
2- and 3-phase driver boards: 2.5A, 125 V, Slow Blow SMF
One external main fuse: 15 A, 250 V slow blow only

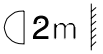
Environmental Specifications

Maximum ambient temperature, (T_a): 50° C (122°F)

Maximum exterior surface temperature: 130° C (266°F)



Minimum distance to flammable objects: 1 m (3.28 ft)



Minimum distance to lighted object: 2 m (6.56 ft)

Do not mount on a flammable surface.

Dichroic, Litho, and Effect Specifications

Dichroic Glass

- Thickness: 1.8 mm ± 0.25 mm (0.069 in ± 0.010 in)

LithoPatterns

- Diameter: 36.45 mm ± 0.13 mm (1.435 in ± .006)
- Image area: 31.75 mm ± 0.25 mm (1.250 in ± 0.010 in)
- Thickness (rotating litho): 1.78 mm ± 0.13 mm (.070 in ± .006)
- Thickness (static litho):1.78 mm ± 0.13 mm (.070 in ± .006)

Effect Glass

- Diameter: 36.45 mm ± 0.13 mm (1.435 in ± .006)
- Image area: 31.75 mm ± 0.25 mm (1.250 in ± .010)
- Maximum thickness: 3.81 mm (.150 in)

Lamp Specifications

- Lamp type: Philips MSR700SA 700W short arc
- Color temperature: 5600 K
- Life: 500 hours

Lens Specifications

- Zoom Ratio: 4:1
- Effective focal length: 41 mm–165 mm
- Full field of view range: 11.8°–45.2°

Cable and Connector Specifications

DMX data cables:

Belden® 9842 or equivalent (meets specifications for EIA RS-485 applications) with the following characteristics:

- Two twisted pairs (4-conductors) plus a shield
- Maximum capacitance between conductors: <15 pF/ft.
- Maximum capacitance between conductor and shield: 55 pF/ft.
- Maximum resistance: 20 Ω/1000 ft.
- Nominal impedance: 120 Ω

DMX data connectors:

- 5-pin male and female XLR connectors

DMX data terminators:

- 5-pin male XLR connector with 120 ohm termination resistor

Chapter 2:
Setup and Configuration

2

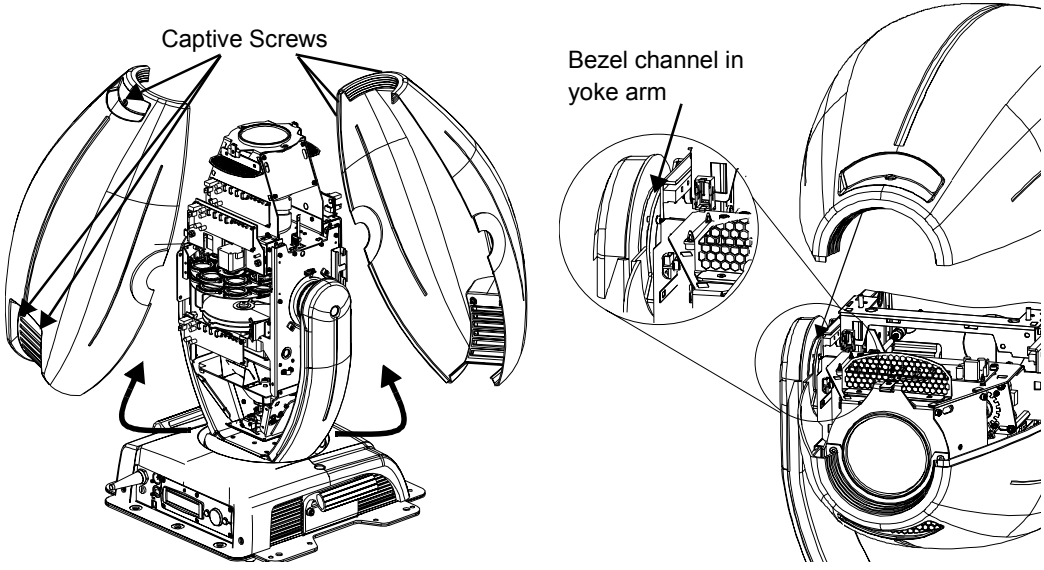
Unpacking the Fixture

Unpack the x.Spot fixture and verify that it is undamaged. Inspect both the outside of the fixture for physical damage and the optical assembly for damage to glass components. To access the optical assembly, loosen the three (3) captive screws on each side of the fixture head. Remove the bezel by lifting away from the base and toward the lens, see Figure 2-1.

If there is damage, notify both the shipping agent and the sales agent immediately.

When replacing the bezel, ensure that it is fitted securely in the yoke channel on both sides of the fixture as shown in Figure 2-1.

Figure 2-1 Removing and replacing the bezel



Save All Shipping Materials

Do not discard the shipping carton and packing materials. The carton and packing materials are specifically designed to protect the product during transport.

High End Systems® assumes no responsibility for products that are damaged during transport. Return a product for repair in its original shipping carton and packing materials.

Before sending anything to the factory, call your High End Systems dealer/distributor for a Return Material Authorization (RMA) number. The factory cannot accept any goods shipped without an RMA number.

Installing a Power Cord Cap

X.Spot fixtures are shipped without an attached power cord cap. Different locations (even within the same country) may require a different power cord cap to connect the fixture to a power outlet.

Because of the variety of power cord caps used worldwide, High End Systems, Inc. cannot make specific recommendations for the power cord cap.

Contact a local authority for the type of power cord cap needed. When installing the power cord cap, note that the cores in the mains lead are colored in accordance with the following code:

- green and yellow = earth
- blue = neutral
- brown = live

Warning: Class 1 equipment - This equipment must be earthed.

Installing a Line Cord Cap - U.K. Only

In the United Kingdom, the colours of the cores in the mains lead of this equipment may not correspond with the colored markings identifying the terminals in the fixture's plug. Therefore, install a line cord cap in accordance with the following code:

- The core which is coloured green and yellow must be connected to the plug terminal which is marked with the letter "E," or by the earth symbol ⏚, or coloured green, or green and yellow.
- The core which is coloured blue must be connected to the terminal which is marked with the letter "N" or coloured black.
- The core which is coloured brown must be connected to the terminal which is marked with the letter "L" or coloured red.

Warning: Class 1 equipment - This equipment must be earthed.

Vatic Fitter Heads Information - Danmark

Advarsel: Beskyttelse mod elektrisk chock.

Vigtigt!

Lederne med gul/groen isolation maa kun tilsluttes en klemme maerket

 eller 

Mounting the Fixture

Mount x.Spot fixture either upright (on the fixture's base), in any orientation suspended from a support system (such as a truss) or permanently to a wall or ceiling.

Warnings: Equipment suitable for dry locations only. Do not expose this equipment to rain or moisture.

Maintain a minimum distance of 1 m (3.28 ft.) from combustible materials.

Maintain a minimum distance of 2 m (6.56 ft.) from illuminated object.

Do not mount on a flammable surface.

Use a secondary safety cable when mounting this fixture.

Mounting the Fixture Upright

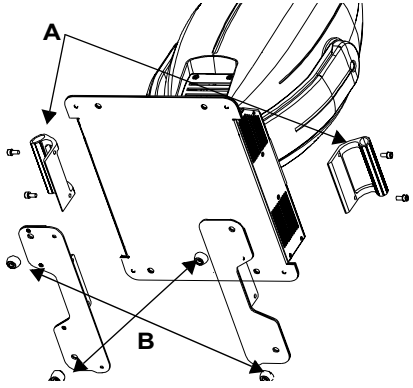
Caution: Do not mount the fixture upright without the four rubber feet.

To mount the fixture upright, make sure that all four rubber feet are installed on the fixture's base and place the fixture on a sturdy, stable surface that will support more than the 32kg (70lbs) weight of the x.Spot fixture. If the surface is above floor height, use safety cables to secure the fixture to the surface .

Truss Mounting

When mounting the fixture on a truss or another type of support, verify the truss or support will handle the combined weight of *all* the devices on the truss.

Figure 2-2 Removing handles and side wings



To remove side wings:

Remove 2 screws from each handle (A) and detach

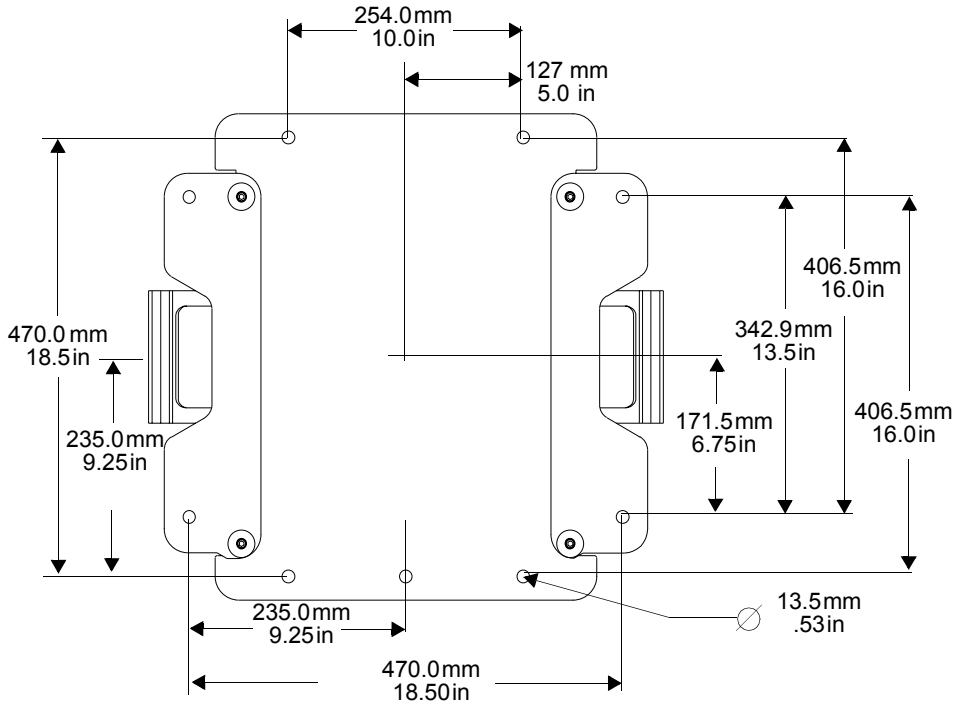
Remove screw from the bottom of each rubber foot (B)

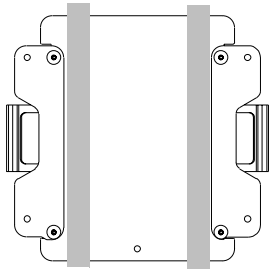
The x.Spot fixture has two available mounting brackets. The standard mounting bracket maximizes handle comfort while allowing diagonal single-pole truss mounting. Optional Center-hole mounting brackets allow for traditional single pole mounting, see "Optional Accessories" on page 1-4.

Both mounting bracket styles install on the fixture in the same way. Handles and mounting brackets can also be removed entirely to accommodate unique installations, see Figure 2-2.

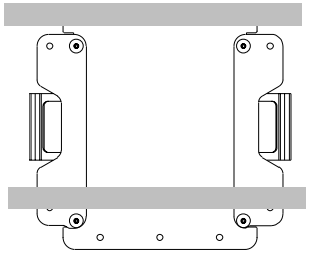
X.Spot fixtures are designed for 3- or 4-point installation on standard 12, 16 or 18 1/2 in. truss and are easily adapted for intelligent (retractable) truss mounting. Figure 2-3 shows some basic mounting options.

Figure 2-3 Baseplate configuration for standard truss sizes

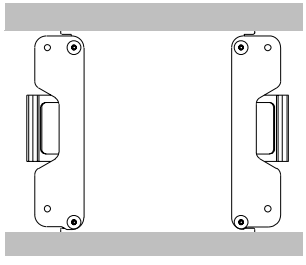




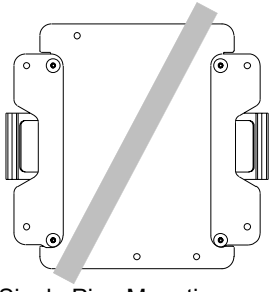
12in x 12in Light Duty



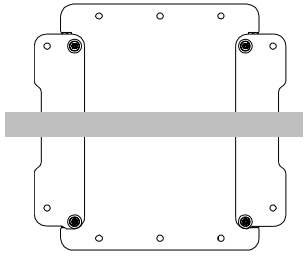
12in x 18in Light Duty



20.5in x 20.5in Medium Duty



Single Pipe Mounting



Single Pipe Mounting with optional brackets

Safety Cable

High End Systems strongly recommends using safety cables when mounting any fixture. Verify the cable used is capable of supporting the weight of the fixture. Galvanized safety cables can be ordered from your High End Systems dealer/distributor (see “Optional Accessories” on page 1-4).

Fixture Clamps

Verify that fixture clamps used are capable of supporting the weight of the fixture. Deluxe C-clamps for a two-inch truss are available from your High End Systems dealer/distributor (see “Optional Accessories” on page 1-4).

Suggested Truss Mounting Procedure

Note: Due to the wide variety of possible lighting designs, High End Systems cannot make specific mounting recommendations. Consider the following procedure as a suggested guideline only.

You will need:

- safety cables (2)
- clamps (3 or 4)
- locking washers (3 or 4)

1. Disconnect power to the fixture. If it has been operating, allow the fixture to cool for five minutes before handling.
2. At least 2 people are required to mount the x.Spot fixture with one person on each side supporting and attaching that side of the fixture. Once the clamps are attached, one person can support the fixture while the other attaches safety cables.

   Always stand on a firm, stable surface when mounting a fixture to its support. The fixture should be at a comfortable working height, and should either be resting on a stable surface, or held in a stable manner. *Do not allow one person to both support and mount the fixture*.
3. Attach suitable clamps through the holes on the base of the fixture. *Use locking washers when attaching the clamps to the fixture’s base.*
4. Tighten the clamps firmly to the fixture’s base and to the support.
5. Loop one or more suitable safety cables around the support, around the fixture’s base, and through the fixture’s handles.

Linking the Fixtures

X.Spot fixtures can be linked to other fixtures on a standard DMX 512 link and then be controlled by the first fixture on the link or a DMX controller.

The number of fixtures on a link will be determined by the combined number of channels required by all the fixtures. The standard configuration for an x.Spot fixture requires 38 channels on a DMX 512 link.

When connecting more than 32 fixtures to a link, use a DMX splitter. The 32 device limit complies with the EIA-485 standard. Connecting more than 32 devices per link without a DMX splitter will eventually deteriorate the digital signal.

Controllers, serial data distributors, data line optoisolators, and any fixtures using the RS-422 DMX standard of serial communications (including Dataflash® AF1000 xenon strobes, and Intellabeam® fixtures) block software uploads, crossloads, or TalkBack™ protocol on a link. Therefore, make sure to either put all of these devices after the x.Spot™ fixture on the link, or bypass these devices when performing software uploads or crossloads.

Data Cabling and Connectors

To link one or more fixtures to a controller and/or to each other, obtain data cabling. Cabling can be purchased from High End Systems (see “Optional Accessories” on page 1-4) or constructed.

High End Systems recommends data-grade cable. Data-grade cable is designed to carry a high-quality signal with less susceptibility to electromagnetic interference.

DMX Data Cables

Use Belden® 9842 or equivalent (meets specifications for EIA RS-485 applications) data cables with the following characteristics:

- Two twisted pairs (4-conductors) plus a shield
- Maximum capacitance between conductors: <15 pF/ft.
- Maximum capacitance between conductor and shield: 55 pF/ft.
- Maximum resistance: 20 Ω/1000 ft.
- Nominal impedance: 120 Ω

Cable Connectors

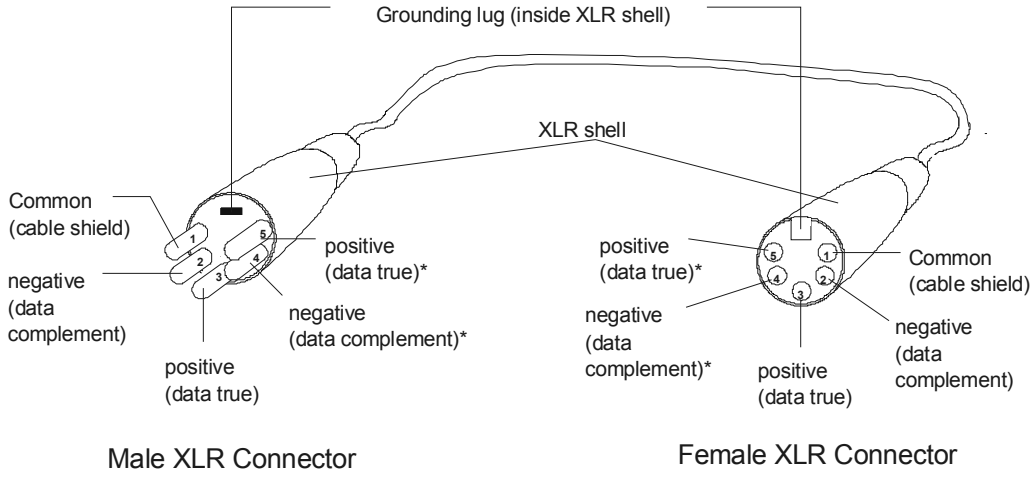
The x.Spot fixture accepts 5-pin XLR cable connectors. Cabling must have a male XLR connector on one end of the cable and a female XLR connector on the other end.

Pin one is the common (cable shield), pin two is the data complement (negative), pin three is the data true (positive). Pins four and five are not used, but they allow a secondary data link to pass through the fixture, (see Figure 2-4).

Test each cable with a voltage/ohm meter (VOM) to verify correct polarity and to make sure that the negative and positive pins are not grounded or shorted to the shield or to each other.

Caution: Do not connect anything to the ground lug on the XLR connectors. Do not connect or allow contact between the common (cable shield) and the fixture's chassis ground. Grounding the common could cause a ground loop and/or erratic behavior.

Figure 2-4 XLR 5-pin connector



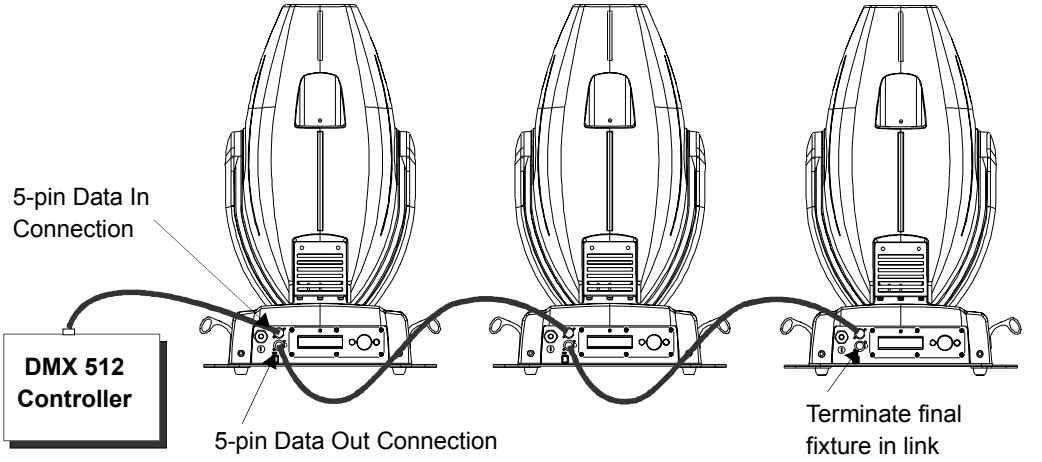
**This data line is not used by the fixture, but allows data to pass through the fixture.*

Setting up the Link

To link one or more fixtures to a DMX controller as shown in Figure 2-5:

1. Connect the male XLR connector of a DMX Data cable to the controller's DMX Data Out connector.
2. Connect the Data cable's female XLR connector to the Data In connector of the first (or next) fixture on the DMX link.
3. Continue linking the remaining fixtures connecting a cable from the Data Out connector of each fixture to the Data In connector of the next fixture on the link.
4. Connect a male terminator to the Data Out connector of the last fixture in the link (see "Constructing a Terminator" on page 2-8). For information on obtaining a terminator, see "Optional Accessories" on page 1-4.

Figure 2-5 Linking x.Spot fixtures



To control fixtures in stand-alone mode (without a controller):

1. Connect the male XLR connector of a DMX Data cable to the Data Out connector on the fixture addressed at DMX Start channel 1.
2. Connect the cable's female XLR connector to the Data In connector of the next fixture on the DMX link.
3. Continue linking the remaining fixtures connecting a cable from the Data Out connector of each fixture to the Data In connector of the next fixture on the link.
4. Connect a male terminator to the Data Out connector of the last fixture in the link (see "Constructing a Terminator"). For information on obtaining a terminator, see the following section.

Constructing a Terminator

Install a 120 ohm, 1/4 watt (minimum) terminator in the fixture's Data Out (female) cable connector in the *last* fixture on each DMX link. A terminator on the last fixture of the link prevents data reflection, which can corrupt the data communication on the link.

Purchase a terminator from a High End Systems dealer/distributor (see "Optional Accessories" on page 1-4), or follow the instructions below to construct a terminator.

To construct a terminator:

1. Disassemble a male 5-pin XLR connector.
2. Solder a 120 ohm resistor, minimum of 1/4 watt, between pins two and three (see Figure 2-6)
3. Reassemble the XLR connector

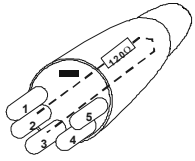


Figure 2-6 Data cable terminator

Powering On the Fixture

Caution: Do not power on the fixture until verifying that the line cord cap is suitable for the power source in your location.

Warning: This equipment for connection to a branch circuit having a maximum overload protection of 20 A.

The x.Spot fixture does not have a power switch. To power on the fixture, simply connect it to an appropriately-rated power source. Once connected, controller commands can remotely power up or shutdown the fixture (see Appendix A for DMX Tables). However, it is very important to disconnect power to the fixture before performing certain procedures shown in this manual.

Homing the Fixture

When the x.Spot fixture is connected to an appropriately-rated power source, it automatically begins a homing procedure to verify that the major functions of the fixture (color wheels, iris, and shutter) are oriented properly. For information on remotely homing the fixture via a DMX controller, (see Appendix A for DMX Tables). The initial homing ends with the display in the Menu Locked mode.

Viewing the Display Panel

The x.Spot display panel gives access to the fixture's onboard Menu System. When the Menu System is in locked mode, the panel displays in large 8-character words designed to be viewed from a distance. Under normal circumstances, when the display is locked, it cycles between displaying the fixture's software version [V##.##], the High End Systems logo, the x.Spot logo, the fixture's configuration type [STANDARD] and the fixture's DMX start channel [DMX_C###]. Any errors present are also displayed in an 8-character error description. Chapter 3 describes the menu system in detail.

Fixture Software Version

The software version loaded on the fixture can vary even between units purchased at the same time. "Verifying and Uploading Fixture Software" on page 2-10 describes the procedures to ensure that all x.Spot fixtures on the link are running the latest software.

Fixture Configuration Type

The configuration type indicates the fixture's modular setup. The Standard configuration shown in the example above contains Six-Wheel Color Mixing in Slot 1, Dual Rotating Gobos in Slot 2 and Rotating Gobo and Iris in Slot 3. See Table 3-2 on page 3-20 for alternate 8-character configuration type descriptions.

DMX Start Channel

The DMX Start Channel is the first channel currently assigned to that fixture in its range of channels on a DMX link. To reset the DMX start channel, see “To Set the Start Channel on an x.Spot Fixture:” on page 2-11.

Error Message Display

Errors are displayed in short 8-character form when the menu system is locked. Unlocked, in the two-line format, more detailed descriptions are available. See an explanation of navigating to the Display Errors option on page 2-10. For more information on error messages, see “Error Message Troubleshooting” on page 6-2.

Verifying and Uploading Fixture Software

Check the display in the Menu Locked mode to identify the Software version loaded on that fixture. Verify that the version displayed by the fixture is the latest available. The latest software for Studio Beam fixtures is available in the support section of the High End Systems® web site (www.highend.com). If a software upgrade is required, there are three ways to upload new software to x.Spot fixtures:

1. Attach a High End Systems Upload Dongle to the computer and upload the software to the x.Spot fixture.

   A High End Systems Upload Dongle requires a 386-based (or faster) computer, MS DOS® version 3.3 (or later) or Windows 95/98/ME, and one MB of free disk space. To obtain an Upload Dongle (with installation and operation instructions), contact your High End Systems dealer/distributor (see “Contacting High End Systems®” on page -ii).

2. Crossload software from one fixture that contains the new software to all other x.Spot fixtures on the link. See “Crossloading Fixture Software” on page 3-21.
3. Upload the new software to all x.Spot fixtures on the link using a HandShake™ handheld controller from High End Systems.

Note: Before uploading new software, disconnect any controllers, bypass any serial data distributors and/or data line optoisolators, and bypass or make sure that any fixtures using RS-422 communications (such as Dataflash® AF1000 xenon strobes, and Intellabeam® fixtures) are located after all the x.Spot fixtures on the link. These devices will block communication with any other x.Spot fixtures on the link

Setting the DMX Start Channel

Each standard configuration x.Spot fixture requires a block of 38 consecutive channels on a 512-Channel DMX link.

Customized x.Spot fixtures may have modules with a different number of channels required. Use that range in calculating the Start channels on the link for those fixtures.

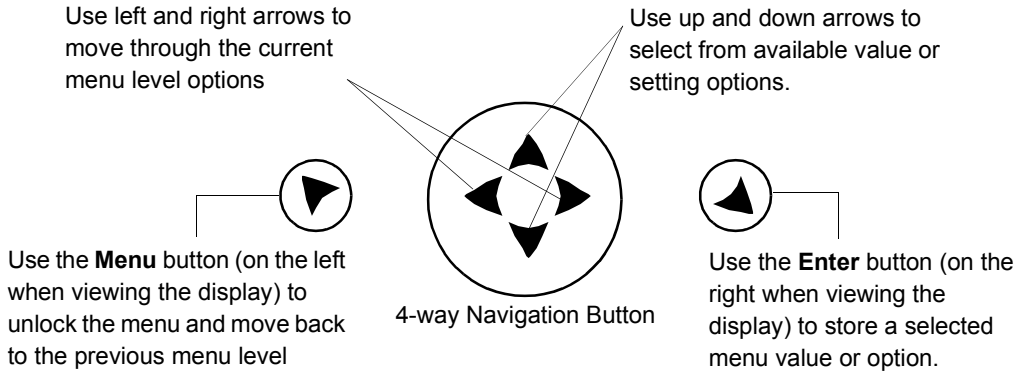
Up to thirteen 38-channel standard x.Spot fixtures can be assigned to a single 512-Channel DMX link.

For more information on Start Channels, see "Determining DMX Start Channel Assignment" on page 3-6.

To Set the Start Channel on an x.Spot Fixture:

1. Access the fixture's menu system via the dot matrix display on the fixture's front panel. For a detailed description of the menu system, see Chapter 3.

Figure 2-7 The x.Spot menu system navigation buttons



Note: Navigation system buttons' functions invert automatically when the fixture is turned upside down.

2. Unlock the menu system by pressing and holding down the Menu button until the extended 2-line display appears. `DMX ADDRESS MENU` is the first option at the top menu level.
3. Press the Enter button to select. The display will show `SET DMX START CHANNEL:###.` The display will show the start channel currently assigned to the fixture.
4. Use the up and down arrow buttons on the Navigation button to select a new DMX start channel. The display will flash a new option ready for selection.

Note: The last valid Start channel for an x.Spot fixture is based on the channel range required by fixture's module configuration. The last valid start channel for a standard configuration x.Spot fixture is 475 (512–38+1).

5. Press the Enter button to accept the new DMX Start channel. The display will stop flashing when a new option is entered. The new option will not be stored until the Enter button is pressed.

Shutting Down the Fixture

The x.Spot fixture automatically shuts down in the event of DMX data loss. A DMX controller can shut down the fixture remotely with the Shutdown option in the Control Channel, see "Appendix A: x.Spot™ DMX Protocol" for DMX tables.

Note: Before shutting down the fixture, set the Focus parameter to 65%. This balances the head on shutdown for easier handling and transporting.

Chapter 3: Fixture Operation

The Onboard Menu System controls all fixture operation. This chapter discusses Accessing the Menu System, navigation, the options available at each Menu level, and includes examples.

DMX programming, used to control one or more fixtures on a link for show creation, can be executed through the Onboard Presets Menu or a DMX Controller. For more information regarding DMX programming options and parameters, see “Chapter 4: DMX Programming” .

Direct x.Spot Menu System Access

The display panel allows direct access to the fixtures menu system for feature control.

Major operational features for x.Spot™ fixtures include:

- Assigning a DMX start channel
- Accessing and setting fixture options
- Viewing fixture status
- Crossloading software
- Performing self tests
- DMX programming, storing, and playing scenes

TalkBack™ Support for Remote Access

All x.Spot fixtures support TalkBack” technology. TalkBack™ technology is a new feature that allows remote access to the menu system built into High End Systems fixtures. A DMX controller supporting TalkBack protocol like the HandShake™ handheld controllers from High End Systems, can remotely access any option in the x.Spot onboard menu system.

TalkBack protocol uses the normal DMX-512 connection for bi-directional communication with the fixture so physical access to the fixture is no longer required to perform operations like changing a DMX address or configuring preset programs. TalkBack protocol utilizes the primary DMX link (pins 2-3) in a half-duplex communication mode. This means that it does not require pins 4-5 to be connected or used to receive TalkBack messages coming from the fixture.

TalkBack protocol uses a discovery process to find the unique number that is embedded inside each fixture, similar to a serial number. Once the fixtures have all been identified, the current fixture parameter settings and information can be accessed. Fixture access can happen at anytime, but the Talkback messages are only valid after the fixture starts homing.

Navigating the Menu System

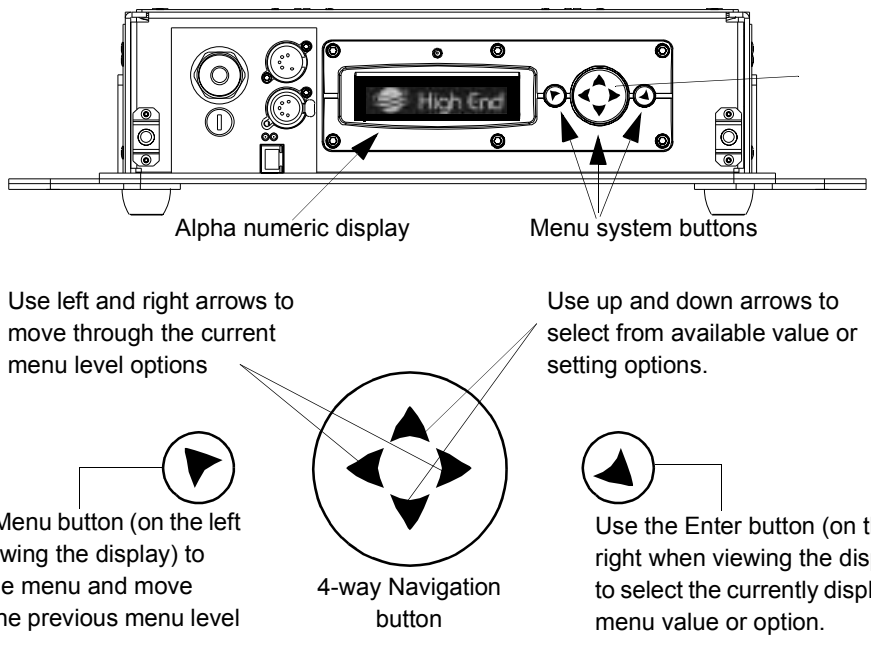
The x.Spot Display

Figure 3-1 shows the elements of the x.Spot display panel. The Menu system buttons on the x.Spot display panel control navigation. The Menu button is on the left. The Enter button is on the right. The center button navigates through the current menu level options [Left and Right] and values available for the current option [Up and Down].

The front panel on x.Spot fixtures has a dot matrix display and six arrows on navigation buttons. The unique x.Spot display reduces the menu levels required and dramatically increases usability with the capability of displaying up to two 16-character lines of text.

The x.Spot fixture can sense orientation and will automatically invert the display and the navigation buttons' functions when the fixture is mounted upside down. For unique orientations, the automatic invert feature can be overridden, and the fixture set manually. See "Display Invert" on page 3-18.

Figure 3-1 Front panel display



Navigational Basics

1. Unlock the Menu system by pressing the Menu ▶ button for a few seconds until the display goes to the 2-line format.
2. Use the left and right arrows ◀▶ on the 4-way Navigation button to scroll through Menu options at the current level.
3. Stop at the desired menu and press the Enter ◀ button to select.

   Note:The new option will not be stored unless the Enter button is pressed.
4. If there is another level of menu choices repeat Steps 2 and 3.
5. At the option or setting level of the menu, use the up and down arrows on the Navigation button ▲▼ to scroll to the desired option or setting. The option flashes until the Enter button is pressed. Pressing the Enter button stores the new value for that option. Pressing the Menu button returns to the previous menu level *without changing* the value of an option.
6. Continue pressing the Menu button to move back up levels until exiting the menu system.

Display in Menu Locked Mode

The x.Spot display panel gives access to the fixture's onboard Menu System. When the Menu System is in locked mode, the panel displays in large 8-character words designed to be viewed from a distance. Under normal circumstances, when the display is locked, it cycles between displaying the fixture's software version [V##.##], the High End Systems logo, the x.Spot logo, the fixture's configuration type [STANDARD] and the fixture's DMX start channel [DMX_C###]. Any errors present are also displayed in an 8-character error description. Chapter 3 describes the menu system in detail.

Fixture Software Version

The software version loaded on the fixture can vary even between units purchased at the same time. "Verifying and Uploading Fixture Software" on page 2-10 describes the procedures to ensure that all x.Spot fixtures on the link are running the latest software.

Fixture Configuration Type

The configuration type indicates the fixture's modular setup. The STANDARD configuration shown in the example above contains Six-Wheel Color Mixing in Slot 1, Dual Rotating Gobos in Slot 2 and Rotating Gobo and Iris in Slot 3. See Table 3-2 on page 3-20 for alternate 8-character configuration type descriptions.

DMX Start Channel

The DMX Start Channel is the first channel currently assigned to that fixture in its range of channels on a DMX link. To reset the DMX start channel, see "Setting DMX

Start Channel" on page 3-6. For more information on DMX Start channels, see "Setting the DMX Start Channel" on page 2-11.

Error Message Display

Errors are displayed in short 8-character form when the menu system is locked. Unlocked, menu system's 2-line format displays more detailed information. For information on accessing the detailed error message, see "Display Errors" on page 3-28. For information on interpreting error messages, see "Error Message Troubleshooting" on page 6-2.

Unlocking the Menu System

To unlock the menu system, press and hold the Menu button until the display changes to the 2-line format. The menu system is protected against inadvertent menu changes by requiring the Menu button to be held for a few seconds before allowing entry to the menus. DMX Address Menu is the first option on the top menu level.

Exiting the Menu System

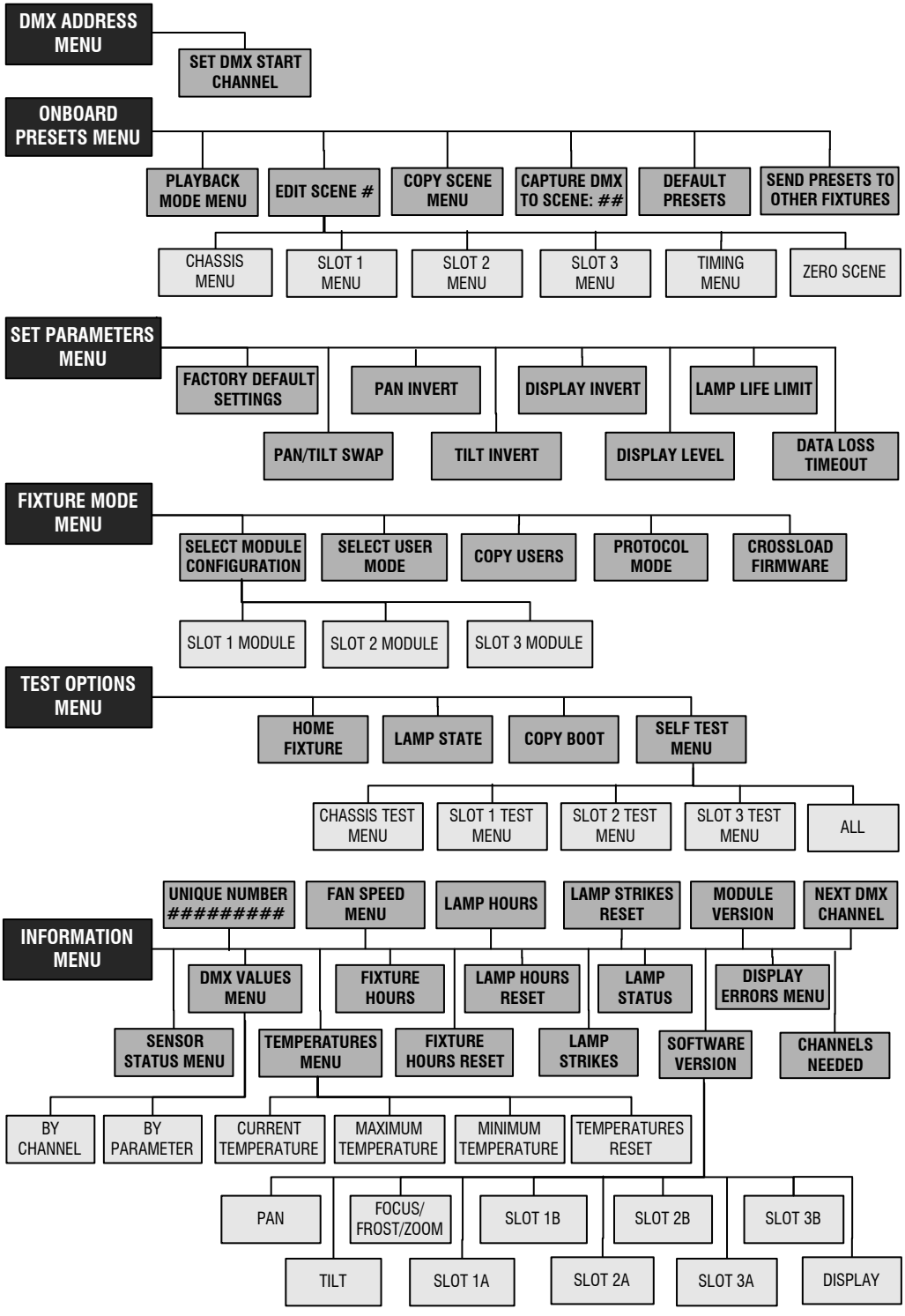
To exit the menu system, keep pressing the Menu button to back out of each menu level until the High End Systems logo appears. The word AUTOLOCK will appear briefly on the display to indicate the fixture's software is "locking" the display. The display switches back to the large 8-character format and, after a few seconds, begins the standard display for the locked mode as described above.

The Menu System Structure

Figure 3-1 illustrates the Menu System's top three levels. The following sections in Chapter 3 describe options available in each of the top level menus and show examples of specific options located in that menu.

Appendix D contains a complete Menu map of all the options and settings available in the x.Spot Menu System.

Figure 3-2 x.Spot Menu System Overview



DMX Address Menu

DMX Address is the top level menu selection used to set the fixture's DMX start channel. Use this menu option, to change the *existing* DMX start channel to another DMX start channel.

Setting DMX Start Channel

To set the DMX start channel:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus. `DMX ADDRESS MENU` is the first menu item at the top level.
1. Press the Enter button to select. The display will show `SET DMX START CHANNEL:###.` The display will show the start channel currently assigned to the fixture.
2. Use the up and down arrows on the Navigation button to select a new DMX start channel from 001– 498. The display will flash a new option ready for selection.

   Note: The last valid Start channel for an x.Spot fixture is based on the channel range required by fixture's module configuration. The last valid start channel for a standard configuration x.Spot fixture is 475 (512–38+1).

3. Press the Enter button to accept the new DMX Start channel.

   Note: If the Enter button is not pressed, the old value will remain selected after exiting the menu.

Determining DMX Start Channel Assignment

There are 512 available channels on each DMX link divided among *all* the devices in a particular link. A fixture must have a *unique* Start channel number in order to respond *independently* to controller commands.

To determine each fixture's DMX start channel in a link, identify the channel range of every fixture on the link. Channel range is the number of consecutive channels a fixture requires. Each standard configuration x.Spot fixture requires a block of 38 consecutive channels on a 512-Channel DMX link. The Start channel is the first number a fixture's channel range.

Customized x.Spot fixtures may have may require a different number of channels. Use that range in calculating the Start channels on the link for those fixtures. The following options in the Menu system assist in determining the configuration, number of channels and the next available start channel on the DMX link for a specific fixture.

- "Module Configuration Menu" on page 3-20
- "Channels Needed" on page 3-28
- "Next DMX Channel" on page 3-28

The notes in Table 3-1 show the various considerations in determining valid Start Channels for fixtures on a 512 DMX link. A single 512-Channel DMX link can accommodate up to thirteen 38-channel standard x.Spot fixtures.

Table 3-1 Example: Determining DMX Start Channels on a Link

Fixture location on the link	Fixture type	DMX channels used per fixture	DMX Start channel	Channel range used	Notes
First	x.Spot	38 channels	C001	1-38	The Start channel indicates a block of channels assigned to a fixture with the first number in that channel range.
Third	x.Spot	38 channels	C039	39-76	Fixture can be assigned the second block of DMX channels without physically being the second fixture on the link.
Second	x.Spot	38 channels	C078	77-114	To avoid overlapping channels, place the start channel at the beginning of a range of available channels large enough to accommodate that fixture type
Fourth	Studio Spot	18 channels	C121	121-138	Every channel in the link does not need to be assigned.
Fifth	Custom x.Spot (Color Mix only)	22 channels	C140	139-160	The channel range required for a fixture type can change with custom fixtures
•	•	•	•	•	•
•	•	•	•	•	•
•	•	•	•	•	•

When setting the Start channel on a fixture, remember:

- A fixture's physical location on the link does not have to coincide with the order of channel range assignments in the link. See Row 2 in Table 3-1.
- The fixture's channel range must not overlap any other device's channel range on the link. When two devices on the same DMX link have overlapping channel ranges, one or both devices will be disabled or behave erratically. The single exception would be if two or more fixtures need to respond to controller commands in exactly the same way. In that case, those fixtures must be the same type (for example two x.Spot fixtures) and must share the *entire* channel range.

Onboard Presets Menu

The Presets menu provides many of the features of a DMX controller onboard the fixture. Presets give the user the capability of programming fixtures for stand-alone operation by creating, storing, sequencing, synchronizing and playing back scenes. Onboard Presets also allows to viewing, programming and copying parameters between scenes on a single fixture or sending them to other fixtures.

For more information on DMX programming at the fixture level including looping scenes and synchronizing playback, see “Show Creation with Onboard Preset Menu” on page 4-2.

Playback Mode Menu

This level 2 menu option turns preset playback off or on and displays the currently programmed sequence of scenes. Set the user mode to A or B through the FIXTURE MODE MENU, to access this menu option for that user mode. For more information, see “Select User Mode” on page 3-20.

When PLAYBACK MODE is ON, the fixture plays the currently programmed sequence up to 16 scenes in length (the maximum for each user mode) or until it reaches a *zeroed* scene which indicates the end of a sequence.

The fixture ships with a factory programmed preset sequence that is the initial sequence for the PLAYBACK MODE. As scene values are edited, the default sequence is revised to include the new values for that scene.

To Playback a scene:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll through the top level to ONBOARD PRESETS MENU and press the Enter button to select.
3. Using the left and right arrows on the Navigation button, scroll to PLAYBACK MODE MENU. The current state (ON or OFF) will be displayed.
4. If OFF is displayed, use the up and down arrows on the Navigation button to scroll to ON. The fixture will begin playing the currently programmed sequence and press the Enter button to select.

Edit Scene ## Menu

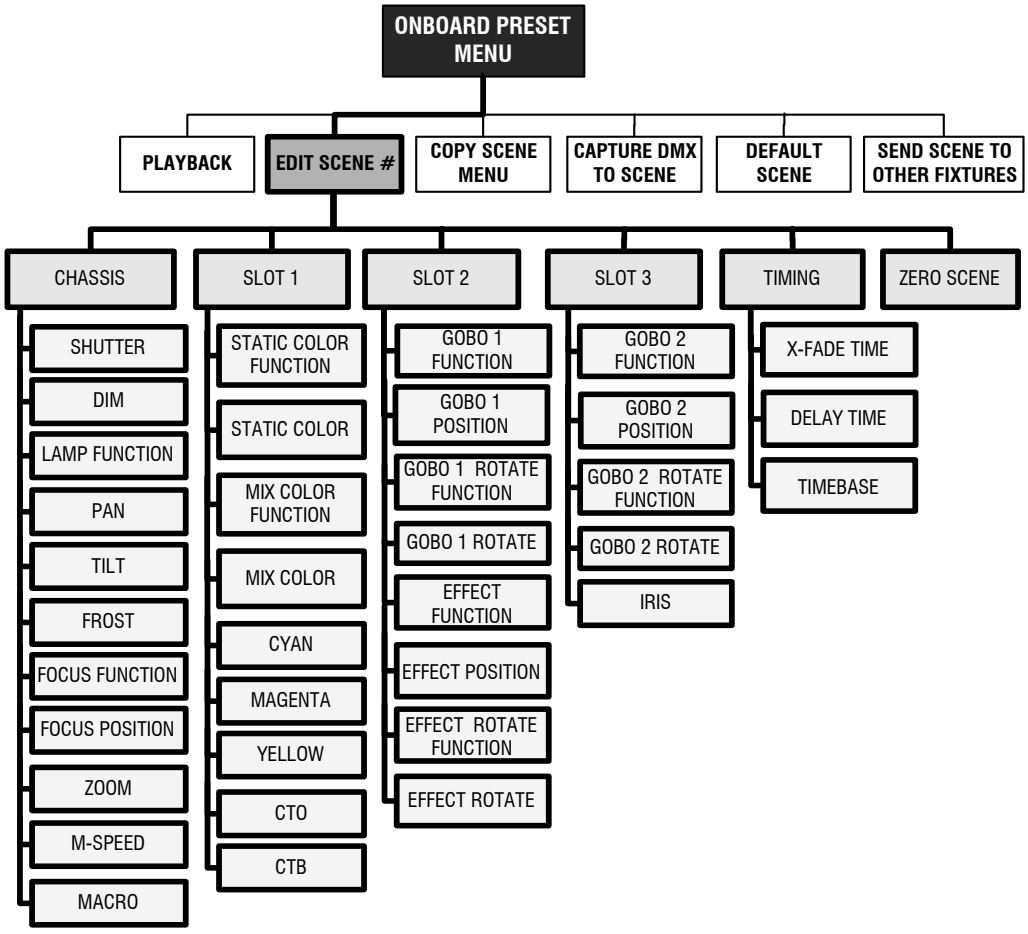
The EDIT SCENE ## menu gives direct control at the fixture level over the same parameters as a DMX controller. Edit parameter DMX values of factory preset scenes to create new scenes, add timing to scenes, zero (erase) the programming for a scene or end a loop in this menu. After setting the user mode to A or B through the FIXTURE

MODE MENU, the operator can access the 16 scenes for that user mode. For more information, see “Select User Mode” on page 3-20.

Editing Scene Parameters by Slot

The x.Spot fixture parameters are associated with the chassis or the module they control, and appear as level 3 menu items in the Onboard Preset Menu. Figure 3-3 shows the functions controlled in the Edit Scene menu.

Figure 3-3 Edit Scene Menu Options in Standard x.Spot



When a scene is edited, the new values become part of the currently programmed sequence. Exit the ONBOARD PRESETS MENU with Playback ON, to view the programmed sequence with the modified scene values.

The following SCENE EDIT example describes steps to create a tricolor rotating tunnel with a ramping size change. All module parameters and values are for a Standard Configuration x.Spot fixture, see “Standard Configuration” on page 1-1.

To access a Scene for editing:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll through the top level to `ONBOARD PRESETS MENU` and press the Enter button to select
3. Using the left and right arrows on the Navigation button, scroll to `EDIT SCENE##`.
4. Use the up and down arrows on the Navigation button to scroll to the number of the scene for editing (in this example, `SCENE 1`) and press the Enter button to select.

   Entering a scene number causes the fixture to begin play the current settings for that scene. Scrolling to a new option or setting causes the fixture to *play* the effect, but not to store it into memory until the Enter button is pressed.

   Note: To edit one of the other User mode's 16 scenes, see "Select User Mode" on page 3-20.

To edit the Chassis parameters:

5. `CHASSIS` is the first option in the Level 3 Menus. Press the Enter button to select.
6. Using the left and right arrows on the Navigation button, scroll to `SHUTTER.`
7. Use the up and down arrows to scroll to `SNAP/RAMP 26` to open the shutter at full speed, then ramp shut, and press the enter button to select.
8. Using the left and right arrows on the Navigation button, scroll to `FOCUS`.
9. Use the up and down arrows to scroll to set the `FOCUS` value to `20%*`, and press the enter button to select.
10. Using the left and right arrows on the Navigation button, scroll to `ZOOM`.
11. Use the up and down arrows to scroll to set the `ZOOM` value to `10%*`, and press the enter button to select.

    * *Adjust these values as needed for the distance between the fixture and the lighted surface.*

To edit the Slot 1 parameters:

12. Press the Menu button to return to Level 3 Menus. Use the left and right arrows on the Navigation button, to scroll to `SLOT 1` and press the Enter button to select.
13. Use the left and right arrows on the Navigation button to scroll to `STATIC COLR FUNC.`
14. Use the up and down arrows to scroll to `BLINK`, and press the enter button to select. `BLINK` closes, then reopens the shutter between indexed color changes.
15. Use the left and right arrows on the Navigation button to scroll to `STATIC COLOR.`

16. Use the up and down arrows to set STATIC COLOR value to BLINK COLOR 2/3, and press the enter button to select. This center's the beam halfway between Static Color Position 2 (Red) and Position 3 (Yellow).

To edit Slot 2 parameters:

17. Press the Menu button to return to Level 3 Menus. Use the left and right arrows on the Navigation button, to scroll to SLOT 2 and press the Enter button to select.
18. Use the left and right arrows on the Navigation button to scroll to EFFECT POSITION.
19. Use the up and down arrows to scroll to set the EFFECT POSITION value to POSITION 8, and press the enter button to select the psycho tunnel effect.
20. Use the left and right arrows on the Navigation button to scroll to EFFECT ROT FUNC.
21. Use the up and down arrows to scroll to set EFFECT ROT FUNC to FWD SPIN, and press the enter button to rotate the tunnel aperture.
22. Use the left and right arrows on the Navigation button to scroll to EFFECT ROTATE and press the enter button to select.
23. Use the left and right arrows to scroll to FORWARD ###
24. Use the up and down arrows to set the aperture's forward rotation speed to 100% of maximum and press the Enter button to select.

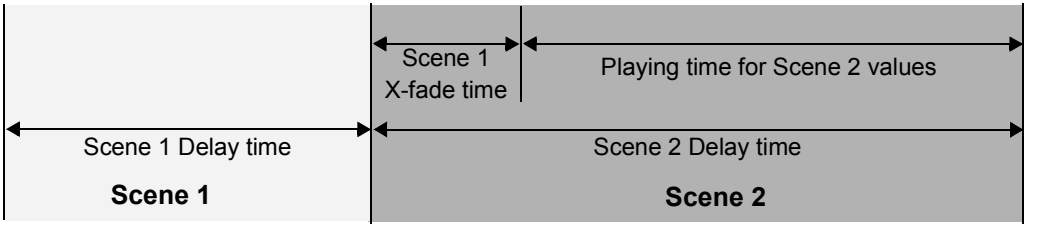
To edit Slot 3 parameters:

25. Press the Menu button to return to Level 3 Menus. Use the left and right arrows on the Navigation button to scroll to SLOT 3 and press the Enter button to select.
26. Use the left and right arrows to scroll to IRIS and press the Enter button to select.
27. Use the left and right arrows to scroll to RAMP/RAMP, then use the up and down arrows to scroll to a value of 5 and press the Enter button to select. This causes the iris to open and close at the same speed.

Adding Timing to a Scene

The EDIT SCENE menu's TIMING option sets crossfade and delay times for a scene and specifies the timebase for selected timing. X-FADE TIME is the time a fixture takes to transition (crossfade) from the DMX parameter values of one scene to the next. DELAY is the total time the fixture plays a scene before moving to the next scene and includes any X-FADE TIME at the beginning of the scene. TIMEBASE sets the units for timing in seconds, minutes or hours. Figure 3-4 describes the timing between 2 scenes.

Figure 3-4 Assigning timing to a scene



Note: If the X-FADETIME *is longer than the* DELAY *time for a scene, the fixture will not reach that scene's values before it begins to play the next scene.*

To set TIMING for a scene:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll through the top level to ONBOARD PRESETS MENU and press the Enter button to select.
3. Using the left and right arrows on the Navigation button, scroll to EDIT SCENE## and press the Enter button to select.
4. Using the left and right arrows on the Navigation button, scroll to TIMING and press the Enter button to select.
5. Using the left and right arrows on the Navigation button, scroll to TIMEBASE, and press the Enter button to select.
6. Use the up and down arrows to scroll to HOURS, MINUTES, or SECONDS, and press the Enter button to select the unit of measure desired.
7. Press the Menu button to move back to TIMING and press the Enter button to select.
8. Using the left and right arrows on the Navigation button, scroll to X-FADE TIME.
9. Use the up and down arrows to scroll to a setting from Ø.1 to 165 and press the Enter button to select the X-FADE TIME.
10. Press the Menu button to move back to TIMING and press the Enter button to select.
11. Using the left and right arrows on the Navigation button, scroll to DELAY TIME.
12. Use the up and down arrows to scroll to a setting from Ø.1 to 165 and press the Enter button to select the DELAY TIME.

Zero Scene

Zeroing a scene erases all its values and indicates the end of a Sequence when the fixture is in Playback Mode.

To ZERO SCENE:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll through the top level to ONBOARD PRESETS MENU and press the Enter button to select
3. Using the left and right arrows on the Navigation button, scroll to EDIT SCENE## and press enter to select.
4. Using the left and right arrows on the Navigation button, scroll to ZERO SCENE.
5. Use the up and down arrows to scroll to YES to erase the scene, and press the enter button to select.

Copy Scene Menu

Use the COPY SCENE MENU option to copy the settings for a source scene to a destination scene location. This menu option will copy between any of the 32 scene locations available.

To COPY SCENE:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll through the top level to ONBOARD PRESETS MENU and press the Enter button to select
3. Using the left and right arrows on the Navigation button, scroll to COPY SCENE. The display will return FROM SCENE X## with the current user mode and scene number.
4. Use the up and down arrows on the Navigation button to scroll to the scene to copy values from and press the Enter button to select. The fixture copies the DMX values assigned to the selected scene into memory and returns STORING, then displays TO SCENE ## when the action is complete.
5. Use the up and down arrows on the Navigation button to scroll to the destination scene for the values and press the Enter button to select. The fixture displays STORING as it replaces the DMX values in the destination scenes with the copied values and displays DONE when the action is complete.

Capture DMX to Scene

The CAPTURE DMX TO SCENE option works in conjunction with a DMX controller to automate the creation of scenes on multiple x-Spot fixtures connected to a DMX 512 link. Use the DMX controller to create a scene, then save (capture) the DMX values for that scene into a fixture's presets.

Transferring the DMX values to the fixture's onboard menu will allow playback without the controller or transfer to other x-Spot fixtures on the same DMX link, see "Send Presets to Other Fixtures" on page 3-15.

When capturing a scene into a fixture's presets, all parameter values must be constant (i.e., there cannot be any pan/tilt movement or scene-to-scene sequencing).

**Note: The fixture's on-board scene memory must be used to manually select values for the Crossfade and Delay parameters, since a DMX controller will not transmit those parameter values.*

This menu option can be accessed for either User A or User B. To change User mode, see "Select User Mode" on page 3-20.

To CAPTURE DMX TO SCENE:

1. If the menu system is locked, press and hold down the Menu button until the extended 2-line display appears indicating the top menu level.
2. Using the left and right arrows on the Navigation button, scroll through the top level to ONBOARD PRESETS MENU and press the Enter button to select.
3. Using the left and right arrows on the Navigation button, scroll to CAPTURE DMX TO SCENE. The display will show the current scene number.
4. Use the up and down arrows on the Navigation button to scroll to the scene number to take values from the controller and press the Enter button to select. The fixture takes a snapshot of the DMX values coming from the controller and assigns them to the selected scene. The display will return DONE when the action is complete.

Default Presets

The DEFAULT PRESETS option resets the fixture to the factory-program preset sequence. Enabling this menu erases any pre-programmed scenes or parameter values in the fixture's onboard memory for all scenes in that User Mode.

This menu option can be accessed for either User A or User B. To change User Mode, see "Select User Mode" on page 3-20.

To restore DEFAULT PRESETS:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.

2. Using the left and right arrows on the Navigation button, scroll through the top level to ONBOARD PRESETS MENU and press the Enter button to select.
3. Using the left and right arrows on the Navigation button, scroll to DEFAULT PRESETS.
4. Use the up and down arrows on the Navigation button to scroll to YES to reset the default presets or NO to leave current programming. Press the Enter button to select.

Send Presets to Other Fixtures

This menu options sends the values programmed for all 16 scenes of a User Mode on one x.Spot fixture to all other x.Spot fixtures on a DMX link. This menu option can be accessed for either User A or User B. To change User Mode, see "Select User Mode" on page 3-20.

To send a scene's parameter setting to other fixtures:

1. Disconnect or bypass any controllers, serial data distributors, data line optoisolators, and any fixtures using RS-422 communications (such as Dataflash® AF1000 xenon strobes, and Intellabeam® fixtures). These devices will block communication between x.Spot fixtures on the link.
2. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
3. Using the left and right arrows on the Navigation button, scroll through the top level to ONBOARD PRESETS MENU and press the Enter button to select
4. Using the left and right arrows on the Navigation button, scroll to SEND PRESETS TO FIXTURES?XXX.
5. Use the up and down arrows on the Navigation button to scroll to YES to SEND PRESETS and press the Enter button to select. The fixture sends presets for that scene to all x.Spots on the link and returns DONE when action is complete.

Set Parameters Menu

The Set Parameters menu sets all factory options to their default settings or changes the factory options individually. These factory options are set for the User A or User B bank of settings individually. To change User Mode, see “Select User Mode” on page 3-20.

Factory Default Settings

A standard configuration x.Spot fixture ships with the following factory default settings:

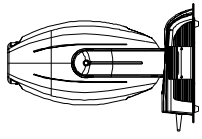
Preset Playback=OFF	Tilt Invert=DISABLED	Lamp Life Limit=DISABLED
Pan Tilt Swap=DISABLED	Display Invert=AUTO	Data Loss Timeout=SHORT
Pan Invert=DISABLED	Display Level=ON	Protocol=STANDARD

If any of the default settings are changed, this menu reverts to the OFF option. The ON option restores all factory defaults.

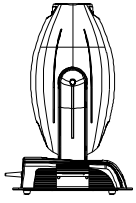
To check and reset factory defaults:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll through the top level to SET PARAMETERS MENU and press the Enter button to select.
3. Using the left and right arrows on the Navigation button, scroll to FACTORY DEFAULT SETTINGS. The current state (ON or OFF) will be displayed.
4. To reinstate the factory defaults if OFF is displayed, use the up and down arrows on the Navigation button to scroll to ON and press the Enter button to select.

Pan/Tilt Swap



This option swaps the pan motor and tilt motor operation to coordinate movements between fixtures on a link mounted perpendicular to each other.



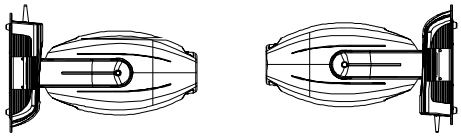
To swap Pan and Tilt:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll through the top level to SET PARAMETERS MENU and press the Enter button to select.
3. Using the left and right arrows on the Navigation button, scroll to PAN/TILT SWAP. The current state (ENABLED or DISABLED) will be displayed.

4. Use the up and down arrows on the Navigation button to scroll to ENABLED to swap pan and tilt or DISABLED to revert fixture to default setting and press the Enter button to select.

Pan Invert

This menu option inverts the direction of the pan motor to coordinate movements between fixtures facing each other horizontally.

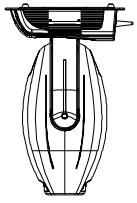


To invert the fixture's Pan motion:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll through the top level to SET PARAMETERS MENU and press the Enter button to select.
3. Using the left and right arrows on the Navigation button, scroll to PAN INVERT. The current state (ENABLED or DISABLED) will be displayed.
4. Use the up and down arrows on the Navigation button to scroll to ENABLED to invert Pan movement or DISABLED to revert fixture to default setting and press the Enter button to select.

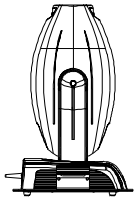
Tilt Invert

This menu option inverts the direction of the tilt motor to coordinate movements between fixtures on a link facing each other vertically.



To invert the fixture's Tilt motion:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll through the top level to SET PARAMETERS MENU and press the Enter button to select.

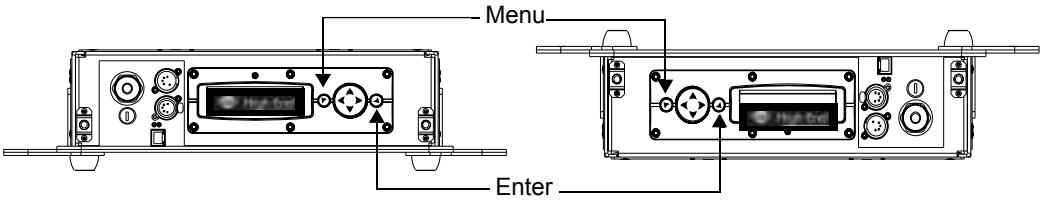


3. Using the left and right arrows on the Navigation button, scroll to TILT INVERT. The current state (ENABLED or DISABLED) will be displayed.
4. Use the up and down arrows on the Navigation button to scroll to ENABLED to invert Tilt movement or DISABLED to revert fixture to default setting and press the Enter button to select.

Display Invert

This menu item selects automatic or manual control of the display invert feature. The x.Spot fixture is set to automatically invert the orientation of the display's alphanumeric characters and navigation control functions when the fixture rotated more than 45% off of the horizontal axis, see Figure 3-5.

Figure 3-5 Automatic Display Invert feature.



To control the DISPLAY INVERT feature:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll through the top level to SET PARAMETERS MENU and press the Enter button to select.
3. Using the left and right arrows on the Navigation button, scroll to the DISPLAY INVERT MENU.
4. Using the up and down arrows on the Navigation button, choose ENABLE to invert the fixture's alphanumeric characters, DISABLE option to prevent inverting or AUTO to return the fixture's alphanumeric characters to normal orientation. Press the Enter button to accept the desired option.

Display Level

Use this menu option to turn the display on or off.

To change display level:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll through the top level to SET PARAMETERS MENU and press the Enter button to select.
3. Using the left and right arrows on the Navigation button, scroll to the DISPLAY LEVEL.
4. Using the up and down arrows on the Navigation button, choose ON to turn the display on or OFF to dim the display and press the Enter button to store the option.

Lamp Life Limit

Use this menu option to display the warning message Lamp Life Error when the current lamp hours reach the rated lamp life. When the LAMP LIFE LIMIT parameter is enabled, the fixture tracks the number of hours the lamp is on. At 650 hours, it displays an error message. At 710 hrs., the lamp shuts off, and the fixture will not strike until the lamp is replaced and the lamp hours are reset to 0. See “Replacing the Lamp” on page 5-4 and “Lamp HR/Strike Reset” on page 3-27.

To enable the LAMP LIFE LIMIT parameter:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll through the top level to SET PARAMETERS MENU and press the Enter button to select.
3. Using the left and right arrows on the Navigation button, scroll to LAMP LIFE LIMIT.
4. Using the up and down arrows on the Navigation button, choose the ENABLE option and press Enter to select.

Data Loss Timeout

Use this menu option to determine how the fixture will react in the event of DMX data loss. Set the shutter to stay open until shutdown or to close one second after data loss.

To set the DATA LOSS TIMEOUT:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll through the top level to SET PARAMETERS MENU and press the Enter button to select.
3. Using the left and right arrows on the Navigation button, scroll to DATA LOSS TIMEOUT.
4. Using the up and down arrows on the Navigation button, choose LONG to keep the shutter open until shutdown, or SHORT to close the shutter 1 second after data loss and press the Enter button to select.

Fixture Mode Menu

The Mode menu sets the module and protocol configuration, chooses User A or User B settings, copies settings to User A or User B, and crossloads software from one fixture to other x.Spot fixtures on the link.

Module Configuration Menu

Use this menu to view the module configuration for each slot of the fixture. An 8-character configuration type name is diplayed when the menu is in locked mode. The Module Configuration menu displays the contents of the slots for the fixture's configuration. Table 3-2 lists the module in each slot for x.Spot configuration types.

Table 3-2 Module Identification

Configuration Type	Slot 1	Slot 2	Slot 3
STANDARD	Six-Wheel Color Mix	Dual Rotating Gobos	Rotating Gobo and Iris
L-MOTION	Six-Wheel Color Mix	Dual Rotating Gobos	Lithomotion and Iris
FRAMING	Six-Wheel Color Mix	Single Rotating Gobo	Framing and Iris
CUSTOM	TBD	TBD	TBD

To view the MODULE CONFIG MENU:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll to the FIXTURE MODE MENU and press the Enter button to select.
3. Use the left and right arrows on the Navigation button to scroll to MODULE CONFIGURATION menu and press the Enter button to select.
4. Use the up and down arrows on the Navigation button to view the module description for each slot of the configuration.

Select User Mode

Use this menu item to switch the fixture's user type between User A and User B. Each user type includes 16 different presets (scenes) and needs to specified before defining settings in the SET PARAMETERS MENU or the PRESET MENU Level 2 options.

To SELECT USER MODE:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll to the FIXTURE MODE MENU and press the Enter button to select.

3. Use the left and right arrows on the Navigation button to scroll to SELECT USER MODE and press the Enter button to select.
4. Use the up and down arrows on the Navigation button to the A or B User Mode and press the Enter button to store.

Protocol Mode

This option sets the Protocol to be followed in assigning Start Channels and programming parameters. STANDARD protocol is the default on x.Spot fixtures. As other protocols are implemented for x.Spot fixtures, they will be available in this menu.

Copy Users

Use this menu to copy the parameter defaults, preset values or both from one User mode to the other.

To COPY USERS:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Using the left and right arrows on the Navigation button, scroll to the FIXTURE MODE MENU and press the Enter button to select.
3. Use the left and right arrows on the Navigation button to scroll to COPY USERS and press the Enter button to select.
4. Using the left and right arrows on the Navigation button scroll to COPY PRESET to copy only the preset settings, COPY PARAMETERS to copy the parameter defaults or COPY ALL and press the Enter button to store.
5. Use the up and down arrows on the Navigation button to select A→B or A←B and press the Enter button to store.

Crossloading Fixture Software

A fixture running a newer software version can load the new software to all other x.Spot fixtures on the link using the CROSSLOAD FIRMWARE menu option.

To CROSSLOAD FIRMWARE from one fixture to all x.Spot fixtures on the link:

1. Disconnect or bypass any controllers, serial data distributors, data line optoisolators, and any fixtures using RS-422 communications (such as Dataflash® AF1000 xenon strobes, and Intellabeam® fixtures). These devices will block communication between the crossloading fixture and any other x.Spot fixtures on the link.

2. On the crossloading fixture *only*, unlock the menu system by pressing and holding down the Menu button until the extended 2-line display appears indicating the top menu level.
3. Using the left and right arrows on the Navigation button, scroll to the `FIXTURE MODE MENU` and press the Enter button to select.
4. Use the left and right arrows on the Navigation button to scroll to `CROSSLOAD FIRMWARE`.
5. Use the up and down arrows on the Navigation button to scroll to the `YES` option and press the Enter button to store. The fixture will upload its software to all other x.Spot fixtures on the link.

When the crossload has finished successfully, `CROSSLOADING COMPLETE` will appear briefly in the display of the crossloading fixture, and all other fixtures will automatically home.

Note: If a new boot code was included with the latest software, the fixture displays a `BOOTDIFF` *error when it returns to the locked mode of the menu system. To correct the boot code, copy the new boot code to each fixture (see "Copying the Boot Code" on page 4-23).*

Test Options Menu

The TEST OPTIONS MENU manually homes the fixture, turns the lamp on or off, performs fixture self tests, and stores new boot code information. Performing fixture self tests may help identify mechanical problems in the fixture.

Note: To see the effects of the self tests, the lamp must be on. If the lamp is off when a self test runs, the display shows STRIKE LAMP *to indicate that the lamp is not struck, and the fixture will attempt to strike the lamp automatically.*

Homing the Fixture

The x.Spot fixture automatically homes all its functions whenever it is turned on. This menu option manually homes the entire fixture or any of the following functional groups individually:

COLOR GOBO BEAM PAN/TILT DIMMING ALL

To remotely home the fixture using a DMX controller, see “Control” on page 3-9 and the Channel 14 section of the DMX Table on page A-4.

To manually home the fixture:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Use the left and right arrows on the Navigation button to scroll to the TEST OPTIONS MENU and press the Enter button to select.
3. Use the left and right arrows on the Navigation button to scroll to HOME FIXTURE.
4. Use the up and down arrows on the Navigation button to scroll through the homing options available from all to selected function homing options. Press the Enter button to select.

Lamp State

The LAMP STATE option in the TEST OPTIONS menu turns the lamp ON or OFF.

Copying the Boot Code

When new software is uploaded to x.Spot fixtures, it may contain a new boot code which must be copied to each fixture. This is apparent if the fixture displays a BOOTDIFF error.

Caution: Do not remove power from the fixture while performing a boot copy.

To accept and store the new boot code:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.

2. Using the left and right arrows on the Navigation button, scroll to the TEST OPTIONS MENU and press the Enter button to select.
3. Using the left and right arrows on the Navigation button, scroll to the COPY BOOT option and press the Enter button to select.
4. Use the up and down arrows on the Navigation button to scroll to the YES option and then press the Enter button to store the command. The fixture will store the new boot code, then automatically home.

Self Test Menu

This option displays the steps and DMX values generated as the fixture tests the motor operation of various functions and wheels. Self test can be run and viewed on all the fixture parameters sequentially, or individual parameters. Table 3-3 shows the available self tests on each slot of a standard configuration x.Spot fixture.

Table 3-3 Self Test by Slot

Chassis	Slot 1	Slot 2	Slot 3
Pan	Static Color	Gobo 1	Gobo 2
Tilt	Cyan	Gobo 1 Rotate	Gobo 2 Rotate
Dim	Magenta	Effect	Iris
Frost	Yellow	Effect Rotate	
Focus	CTO		
Zoom	CTB		

To access the SELF TEST MENU:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Use the left and right arrows on the Navigation button to scroll to the TEST OPTIONS MENU and press the Enter button to select.
3. Use the left and right arrows on the Navigation button to scroll to ALL or an individual parameter's Slot location and press the Enter button to select.
4. If ALL is selected, the fixture begins running the self tests sequentially.
5. If a Slot is selected, use the up and down arrows on the Navigation button to scroll to a specific parameter and press the Enter button to view that parameter's self test.

Information Menu

The Information menu displays current fixture information such as internal temperature, lamp hours, total fixture hours, lamp strikes, hardware and software versions, DMX errors, and view DMX data for any device on the link. Lamp and Fixture hours resets are also executed in the Information Menu.

Sensor Status Menu

The Sensor Status displays the current numeric position of the fixture's encoders.

To view encoder values:

To access the DMX VALUES MENU:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Use the left and right arrows on the Navigation button to scroll to the INFORMATION MENU and press the Enter button to select.
3. Use the left and right arrows on the Navigation button to scroll to the SENSOR MENU and press the Enter button to select.
4. Use the left and right arrows on the Navigation button to scroll to view PAN ENCODER or TILT ENCODER value.

Unique Number

Each x.Spot fixture has a unique number similar to a serial number. TalkBack™ protocol uses this number to identify a fixture for remote communication over a DMX link. Use this option to view the fixture's unique number.

DMX Values Menu

Use this menu option to view current DMX value settings by channel or by parameters for each slot in the fixture. A standard configuration x.Spot fixture utilizes 38 channels on a DMX 512 link. Each DMX value is from 0-255.

When viewing DMX value settings by Channel, the x.Spot fixture displays current values for Channels 001– 512 in two lines of three DMX values each per screen. The number at the beginning of each line indicates the first channel with a value displayed on that line.

When viewing current DMX value settings by the Parameters for each Slot, the menu displays one parameter with the DMX value below it per screen. Parameters will change for different module configurations. For a listing of the Parameters available on a standard configuration x.Spot, see Table 4-1 on page 4-1.

To access the DMX VALUES MENU:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Use the left and right arrows on the Navigation button to scroll to the INFORMATION MENU and press the Enter button to select.
3. Use the left and right arrows on the Navigation button to scroll to the DMX VALUES MENU and press the Enter button to select.
4. Use the left and right arrows on the Navigation button to scroll to BY CHANNEL to view the current value assigned to each DMX channel, or BY PARAMETER to view a specific Parameter value and press the Enter button to select.
5. If BY CHANNEL is selected, use the up and down arrows scroll through the channel range. The display shows 6 DMX values per screen in two lines of 3 values each. The number at the beginning of the line indicates the channel number corresponding to the first value in that line.
6. If BY PARAMETER is selected, use the left and right arrows to scroll Slot options and press the Enter button to select the Slot containing the desired parameter. Use the left and right arrows to scroll through the parameters for that slot to view the current DMX value.

Temperatures Menu

The x.Spot fixture contains temperature sensors that track current, maximum and minimum temperatures produced in the unit. Sensors monitor the air temperature of the topbox and the lamp cooling fans in the fixture's head.

Initial setting for current, maximum and minimum temperatures are equal. As the sensor detects temperature changes, the fixture adjusts the minimum and maximum settings. Temperatures can be reset using TEMPERATURES RESET in the same menu level.

To view current, maximum, and minimum temperatures:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Use the left and right arrows on the Navigation button to scroll to the INFORMATION MENU and press the Enter button to select.
3. Use the left and right arrows on the Navigation button to scroll to the TEMPERATURES MENU and press the Enter button to select.
4. Use the left and right arrows on the Navigation button to scroll between CURRENT TEMPERATURE, MAXIMUM TEMPERATURE, MINIMUM TEMPERATURE and TEMPERATURE RESET. Press the Enter button to select.

5. If CURRENT TEMPERATURE, MAXIMUM TEMPERATURE, or MINIMUM TEMPERATURE is selected, use the up and down arrows on the Navigation button to view the temperature on the Topbox and Head sensors.
6. When TEMPERATURE RESET is selected, NO is displayed as a safe setting. Use the up and down arrows on the Navigation button to scroll to YES. Press the Enter button and hold for 5 seconds to reset all sensors to the CURRENT TEMPERATURE value.

Fixture Hours

Use this option to view the fixture operation time in hours and minutes.

Fixture Hours Reset

Use this option to reset the fixture operation time to Zero.

To access the FIXTURE HOURS RESET option:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Use the left and right arrows on the Navigation button to scroll to the INFORMATION MENU and press the Enter button to select.
3. Use the left and right arrows on the Navigation button to scroll to the FIXTURE HOURS RESET option and press the Enter button to select.
4. Use the up and down arrows on the Navigation button to scroll to YES. Press and hold the Enter button down for 5 seconds to select.

Lamp Hours

Use this option to view the lamp operation time in hours and minutes.

Lamp Strikes

Use this option to view the total number of lamp strikes.

Lamp HR/Strike Reset

After installing a new lamp the Lamp hours and Lamp strike sensors must be reset to 0 before the Lamp will strike.

To access the LAMP HR/STRIKE RESET option:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Use the left and right arrows on the Navigation button to scroll to the INFORMATION MENU and press the Enter button to select.

3. Use the left and right arrows on the Navigation button to scroll to the LAMP HR/STRIKE RESET option and press the Enter button to select.
4. Use the up and down arrows on the Navigation button to scroll to YES. Press and hold the Enter button down for 5 seconds to select.

Lamp Status

This option displays the current Lamp Status as LAMP OFF, LAMP ON, LAMP STRIKING, or LAMP ERROR.

Software Version

This option display's the fixture's CPU board Software version. The version number is composed of: V(Major).(Minor).(Build)

Display Errors

This menu option displays current errors in a descriptive 32-character text field.

To DISPLAY ERRORS:

1. Press the Menu button to unlock the menu system or to move back up the system to the top level menus.
2. Use the left and right arrows on the Navigation button to scroll to the INFORMATION MENU and press the Enter button to select.
3. Use the left and right arrows on the Navigation button to scroll to the DISPLAY ERRORS menu option and press the Enter button to select.
4. Use the up and down arrows on the Navigation button to view the list of current errors.

Channels Needed

The x.Spot modular design allows for multiple configurations, each requiring a different channel range based on the parameters for the particular modules loaded on the fixture, see "Determining DMX Start Channel Assignment" on page 3-6. Use this option to view the number of channels required (channel range) for the fixture's specific configuration. The standard configuration x.Spot fixture has a 38-channel range.

Next DMX Channel

Use this option to view the next available DMX Start channel on the link following this fixture and is based on the fixture's specific configuration. The value displayed uses the formula (current Start channel + channels needed for this fixture +1).

Chapter 4: DMX Programming

A Parameter (construct) is a fixture attribute that can be controlled to modify the light beam in terms of color, beam quality and pattern, intensity, or focus (position). To program fixtures, DMX values are assigned to each of the fixture's parameters according to that fixtures DMX protocol. A scene (sometimes referred to as a *cue* or *look* depending on the controller used) is one set of attribute options. Combining scenes into sequences, assigning times and synchronizing fixtures on a link are the basics of show creation.

This chapter discusses the DMX programming options and describes the parameters in the x.Spot DMX protocol. For a complete table of DMX values for the x.Spot fixture running standard protocol, see "Appendix A: x.Spot™ DMX Protocol" .

x.Spot DMX Protocol

The design of the x.Spot fixture allows for multiple configurations. Channels 1–14 control the general fixture operation and are basic to all configurations. In a standard configuration, Slot 1 holds a Six-Wheel Color Mix Module, Slot 2 has a Dual Rotating Gobos Module and a Rotating Gobo and Iris module is in Slot 3, see Table 4-1.

Table 4-1 Parameters for a Standard Configuration x.Spot Fixture

Module	Chan. #	Function
Basic Fixture Function	1	Pan Coarse
	2	Pan Fine
	3	Tilt Coarse
	4	Tilt Fine
	5	Lamp Control
	6	Shutter
	7	Dim
	8	Frost
	9	Focus Control
	10	Focus
	11	Zoom
	12	Mspeed
	13	Macro
	14	Control
Slot 1 Six-Wheel Color Mix	15	Static Color Function
	16	Static Color Position
	17	Mix Color Function
	18	Cyan
	19	Magenta
	20	Yellow
	21	CTO
	22	CTB

Module	Chan. #	Function
Slot 2 Dual Rotating Gobos	23	Gobo 1 Function
	24	Gobo 1 Position
	25	Gobo 1 Rotate Function
	26	Gobo 1 Rotate Coarse
	27	Gobo 1 Rotate Fine
	28	Effects Function
	29	Effects Position
	30	Effects Rotate Function
	31	Effects Rotate Coarse
	32	Effects Rotate Fine
Slot 3 Rotating Gobo and Iris	33	Gobo 2 Function
	34	Gobo 2 Position
	35	Gobo 2 Rotate Function
	36	Gobo 2 Rotate Coarse
	37	Gobo 2 Rotate Fine
	38	Iris

DMX Programming Options

X.Spot™ fixtures can be programmed to create and play back scenes with either a DMX-compatible controller or, at the fixture level, with the Onboard Menu System's Preset menu, see "Onboard Presets Menu" on page 3-8. However, a DMX compatible controller and the fixture's on-board menu system cannot be used at the same time. In other words, a scene cannot be created using the on-board memory and played back using a controller. Also, a controller cannot be used at the same time on-board scenes are playing.

Note: Because controllers cannot transmit crossfade or delay construct values, use preset programming in the onboard menu system to manually set those construct values at the fixture.

Show Creation with a DMX Controller

Using a DMX controller, an operator can program an unlimited number of sequences (combinations of scenes) and retain direct control over the x.Spot fixture at all times. The technique of programming a fixtures using a controller and then capturing the scene(s) to the on-board memory of multiple x.Spot fixtures can save time. For more information, see "Capture DMX to Scene" on page 3-14.

The Whole Hog II® Lighting Console, and the HandShake™ handheld controller are the DMX controllers available from High End Systems to control x.Spot fixtures (see "Optional Accessories" on page 1-4). For more information on whether a DMX controller supports x.Spot fixtures, contact the controller's vendor. For more information on operating the fixture with a controller (or control device such as DMX control software), consult the documentation provided with the controller.

Show Creation with Onboard Preset Menu

Fixture level DMX programming is executed in the Preset portion of fixture's Onboard Menu system. To create scenes, modify the default scenes in the fixture memory, see "Edit Scene ## Menu" on page 3-8. Add timing to scenes, see page 3-11. Then combine the scenes into loops.

Creating a Loop

A loop is a series of programmed scenes that continuously plays in sequential order. To create a loop, first create two or more contiguous scenes (see "Edit Scene ## Menu" on page 3-8). After creating scenes, go to the *next available* scene and choose the `ZERO SCENE` menu option to erase any programmed parameter values and mark the end of the loop, see "Zero Scene" on page 3-13.

Note: If all 16 available on-board scenes in a User Mode are included in a loop, the end of the loop does not need to be marked. When preset playback is set on,

the fixture will automatically loop after playing back all programmed scenes.

Playing Back a Loop

To play back a loop, set preset playback `ON` for each fixture, see "Playback Mode Menu" on page 3-8. When preset playback is on, the fixture automatically begins playing back the first scene and continues through the loop.

Note: Program Scene 1 to enable preset playback.

If power is removed during playback, when power is reapplied, the fixture will home and begin playback at the first scene. To stop playback, manually set playback mode to `OFF`, see "Playback Mode Menu" on page 3-8.

Synchronizing Preset Playback

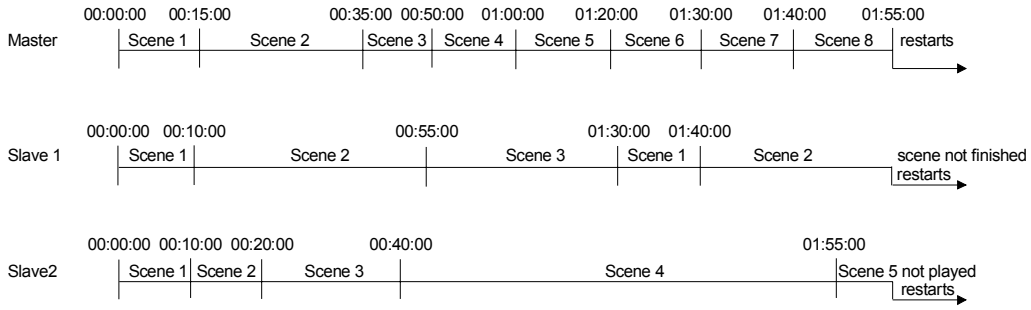
After creating one or more scenes for fixtures on a link, preset playback for all x.Spot™, Studio Beam™, Studio Spot™ 250, Studio Color® 250, Studio Color® 575, Studio Spot™ 575, EC-1™, ES-1™, Technobeam®, Technopro™, Technoray™, and Color Pro® HX, HXi, or FX fixtures in the link can be synchronized.

Note: Synchronizing preset playback is applicable for fixtures operating in stand-alone mode only. Do not include a DMX controller in the link while synchronizing preset scene playback.

The fixture assigned DMX Start Channel 1 becomes the master fixture. Synchronizing playback sets all applicable fixtures to a "master clock" so that all fixtures have a definite, synchronized starting point when playing back their sequences (or loops). The master fixture determines the sequence length for *all* the other fixtures in the link (slave fixtures), regardless of the number of programmed scenes or the sequence length of the individual slave fixtures.

When the master fixture reaches the end of its last scene, *all* fixtures will restart at scene 1 (regardless of whether the slave fixtures have finished playing their scenes) and *all* the "clocks" will be reset to zero. For example, if a slave fixture has a shorter sequence length, it continuously repeats its sequence until the master fixture resets all the clocks (see Figure 4-1). If a slave fixture has a longer sequence length, it restarts at scene 1 before completing its entire sequence.

Figure 4-1 Synchronized Playback Example



To enable synchronized playback:

1. Link the fixtures for synchronization (see “Linking the Fixtures” on page 2-6).
1. Terminate *both* the first and the last fixtures in the link and remove all DMX controllers from the link.
2. Make one fixture the master fixture by assigning it DMX Start Channel 1 or Fixture Number 1 (see “Setting DMX Start Channel” on page 3-6). Make sure *no other fixture* on the link is assigned DMX start channel 1 or Fixture Number 1.
3. Set preset playback `ON` for all fixtures on the link, see “Playback Mode Menu” on page 3-8.

DMX Parameter Descriptions

The following sections describe the Parameters for the modules in a standard configuration x.Spot fixture. All DMX values indicated in the detailed parameter descriptions are in decimal units.

Basic Fixture Parameters

Pan and Tilt

Channels 1–4 control the Pan and Tilt parameters. The x.Spot fixture has a 630° pan range and a 240° tilt range. DMX channels 1 and 3 allow coarse adjustment within 1–2 degrees of the desired pan and tilt position. DMX channels 2 and 4 allow fine adjustment to a fraction of a degree of the desired pan and tilt position.

MSpeed values control the pan and tilt motion for x.Spot fixtures by default, see “MSpeed (Motor Speed)” on page 4-8. To control the Pan and Tilt parameters with DMX controller crossfading, set Pan/Tilt MSpeed off in the Control parameter (see Table 4-4, “Control Setting Descriptions,” on page 4-9 and “Appendix A: x.Spot™ DMX Protocol”).

Note: Optical encoders for pan and tilt instantly correct the fixture’s position if the fixture is jarred from its programmed position. If a physical obstruction prevents the fixture from correcting its position, the fixture “times out” to prevent wear on the motors. If the fixture has timed out, remove the obstruction and home the fixture to return it to normal operation.

Lamp Function

The Lamp Function parameter (Channel 5) modifies the Shutter (Channel 6) and Dim (Channel 6) functions to enhance and expand the range of effects available on the x.Spot fixture including Light Burst™ effects, lightning strikes and Electronic Dimming™ effects.

The Light Burst™ effect boosts the Lamp above the 700 Watt level for the specified period of time. Boosting to white ends with the shutter open; boosting to black closes

the shutter. Boosting is also used to created Lightning effects with the Dim channel scaling the overall brightness. Table 4-2 describes the interaction between the Lamp Control and Shutter Parameters.

The x.Spot fixture supports Electronic Dimming™ effects as well as mechanical dimming and a combination of both. Electronic Dimming™ effect works by lowering the lamp power. Electronic Dimming alone will not go to black.

Shutter

The Shutter Parameter channel 6 determines the way the shutter is opened and closed. In addition to the normal functions, Lamp Control channel 5 modifies the Shutter parameter to create Lamp Burst, Lightning, and Electronic Dimming effects.

Table 4-2 Lamp Control and Shutter Parameter Settings

Lamp Function Setting	Shutter Setting	Description
Values 0-31 Normal Shutter Functions	Close	Closes shutter
	Periodic Strobe	Strobes beam at specified intervals
	Random/Random Strobe	Strobes beam randomly
	Random/Synchronous Strobe	Synchronizes random strobing of all x.Spot fixtures using the same controller
	Ramp Open/Snap Shut	Opens shutter at variable speeds, then snaps shut at full speed
	Snap Open/Ramp Shut	Opens shutter at full speed, then ramps shut
	Ramp Open/Ramp Shut	Opens shutter at variable speeds, then ramps shut
	Random Ramp/Snap	Opens shutter at random variable speeds, then snaps shut at full speed
	Snap/Random Ramp	Opens shutter at full speed, then ramps shut at random variable speeds
	Open	Opens shutter
Values 32-63 Lamp Assisted Strobes	Close	Closes shutter
	Periodic Strobe	Periodic and random strobe functions are lamp assisted.
	Random/Random Strobe	
	Random/Synchronous Strobe	
	Ramp Open/Snap Shut	Ramping functions are not lamp assisted.
	Snap Open/Ramp Shut	
	Ramp Open/Ramp Shut	
	Random Ramp/Snap	
	Random Snap/Ramp	
	Open	Opens shutter

Table 4-2 Lamp Control and Shutter Parameter Settings

Lamp Function Setting	Shutter Setting	Description
Values 64-95 Lamp Effects	Close	Closes shutter
	Periodic strobes	Strobes are mechanical and will go to black.
	Random/random strobes	
	Synchronous/random strobes	
	Boost lamp*, black. *Six time ranges from 1–.25 second*	Boosts the lamp for a specified time then closes the shutter.
	Boost lamp*, white. *Six time ranges from 1–.25 second*	Boosts the lamp for a specified time, then leaves the shutter open with the lamp dimmed.
	Lightning strike* *Six available for x.Spot fixtures*	Dim channel scales the overall brightness of the lightning effect.
	Open	Opens shutter
Values 96-127 Dual Dimming	Closed	The lamp electronically dims with the output ranging from a minimum–700W. as the mechanical dimming goes from 0%–100%.
	Open	
Values 128-159 Electronic Dimming™	Close	The shutter functions are the same as the normal shutter function range. Strobing and Dimming is accomplished electronically by adjusting the lamp power. Dimming will not go to black.
	Periodic Strobe	
	Random/Random Strobe	
	Random/Synchronous Strobe	
	Ramp Open/Snap Shut	
	Snap Open/Ramp Shut	
	Ramp Open/Ramp Shut	
	Random Ramp/Snap	
	Random Snap/Ramp	
	Open	

* *Before another Boost or Lightning effect can occur, the Shutter channel must be moved to either closed or open, or the Lamp Function channel must be moved outside the Lamp Effects range.*

Dim

The Dim parameter is controlled with DMX Channel 7. The Dim parameter provides full mechanical dimming capability without changing the color temperature or the beam shape. The dim values range from closed (DMX value of 0) to fully open (DMX value of 255). The Lamp Function channel, (see page 4-4), can be set to control whether the Dimming is accomplished by lower lamp power (electronic), closing the shutter (mechanical) or both (dual dimming). Table 4-2 describes the interaction between the Lamp Function, Shutter and Dim Channels.

Frost

The Frost parameter settings add a haze or fog effect in increasing/decreasing densities to the projected pattern. The Frost effect is achieved with two frost flags that mechanically open and close in the optical path. DMX Channel 8 controls the Frost parameter with the settings shown in Table 4-3.

Table 4-3 Frost Setting Descriptions

Frost Setting	Description
Open (No Frost)	Removes the frost flags from the optical path
Variable Frost	Allows variable diffusion from full open to closed
Full Frost	Frost flags fully closed in optical path
Periodic Frost Strobe	Allows variable strobing of the frost flags from slow to fast
Random Frost Strobe	Randomly strobes the frost flags from slow to fast
Ramp Open/Snap Shut	Ramps the frost flags open at variable speeds and snaps them shut at full speed
Snap Open/Ramp Shut	Opens the frost flags at full speed and then ramps them shut at variable speeds
Ramp Open/Ramp Shut	Ramps the frost flags open and then shut at variable speeds
Random Ramp/Snap	Ramps the frost flags open at random speeds and then snaps them shut at full speed
Random Snap/Ramp	Opens the frost flags at full speed and then ramps them shut at random speeds

Focus Control and Focus

Focus Control (Channel 9) sets the Focus to manual focus or the ZoomTrack™ lens system. With the ZoomTrack lens system on, the image automatically maintains focus as the zoom changes. Varying the Focus parameter while ZoomTrack lens system is activated will establish a new focus set point.

The variable Focus parameter (Channel 10) moves elements inside the fixture to focus on a close image (DMX value of 0) or on an image farther away (DMX value of 255).

Note: Adjusting the focus on x.Spot fixtures to focus on the iris, a gobo wheel or the effects wheel creates different patterns and/or effects.

Zoom

Channel 11 controls the Zoom parameter. The Zoom values range from 11° at a DMX value of 0 to 45° at a DMX value of 255.

MSpeed (Motor Speed)

The MSpeed parameter is controlled with DMX Channel 12. MSpeed is the time required for a motor to complete movement when changing from one position to another. MSpeed provides a means for all motors to reach their target position at the same time, even though each motor may have different distances to travel. MSpeed movement is extremely smooth because the fixture controls movements independent of DMX refresh rates.

MSpeed times vary from 0.15 seconds to 252.7 seconds. However, when MSpeed is applied to a parameter, the delay value (length of time allowed for the entire scene) needs to be longer than the MSpeed value to allow the motors to complete their movement before the end of the scene. An MSpeed value that is longer than the delay value could produce an undesirable result; for example, no light output during the scene. For a listing of exact MSpeed times, see “Appendix B: MSpeed Conversion Table” .

By default, MSpeed is applied to Pan and Tilt positioning. Disable MSpeed for pan and tilt with the Control parameter , see Table 4-4 on page 4-9 and “Appendix A: x.Spot™ DMX Protocol” . MSpeed times can also be applied to the following parameters:

- Color Function
- Gobo 2 Function
- Gobo 1 Function
- Effects Function

Macro

Channel 13 controls the Macro parameter. Internal Effects™ macros are factory-programmed sequences which allow complicated looks in one scene. Each Internal Effects™ macro modifies a specific set of parameters, while allowing user control of all other parameters in the scene. The four Internal Effects macros available on a standard configuration x.Spot fixture are Pan Sweep, Tilt Sweep, Clockwise Circle and Counterclockwise Circle.

The value set in the macro channel determines the size of each of the movements. The MSpeed channel determines the speed. With the MSpeed set between DMX 5-255 all internal effects complete movement at the selected MSpeed time (up to 25 seconds). An MSpeed DMX value less than 4 uses the default time of 2.5 seconds to provide a pleasing look when the additional variation given by using the MSpeed channel is not required.

Control

The Control parameter is controlled with DMX Channel 14.

To access all control settings (except for Pan & Tilt MSpeed Off), first select a control channel value, then set the Shutter channel to "0."

In the x.Spot fixture, the Control parameter functions have been expanded to allow remote homing of individual functions as well as the entire fixture with a DMX controller.

Table 4-4 Control Setting Descriptions

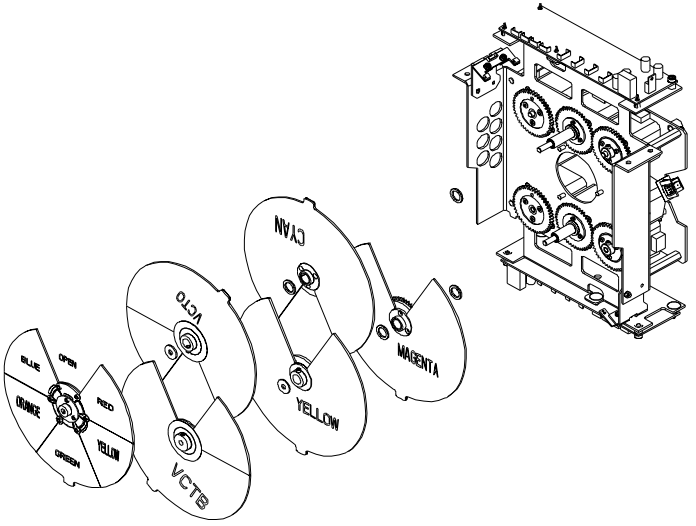
Control Setting	Description
Safe	Disables all Control settings for normal operation.
Pan & Tilt MSpeed Off	Sets Pan & Tilt MSpeed off.
Display Off	Sets display to off.
Display Dim	Dims display characters.
Display Bright	Brightens the display characters.
Home All	Remotely homes the fixture.
Lamp On	Remotely restrikes the fixture's lamp.
Lamp Off	Remotely extinguishes the fixture's lamp.
Shutdown	Remotely shuts down the fixture. When a fixture is shut down, the lamp is extinguished, power to the motors is disabled, and the display reads **[**SHUTDOWN**]**. If a fixture is in shutdown mode, the fixture must be homed to bring it back into operation.
Home Pan/Tilt	Remotely homes individual function groups without homing all the fixture's features.
Home Color System	
Home Gobo System	
Home Strobe/Dim	
Home Focus/Zoom/Frost	
Home Iris	

Six-Wheel Color Mixing Module Parameters

This module is the standard option for Slot 1 in x.Spot fixtures. It combines a static color wheel with three color mixing wheels and two color correction wheels as shown in Figure 4-3.

- The static color wheel contains 5 dichroic filter “wedges” plus open (white).
- The cyan, magenta, and yellow color mixing wheels have graduated color from open (white) to full saturation.
- Color Temperature Orange (CTO) and Color Temperature Blue (CTB) wheels provide variable color temperature correction and beam flatness control.

Figure 4-3 x.Spot color wheel assembly



Static Color Function

The Static Color function is controlled with DMX Channel 15. This parameter determines how the fixed color wheel moves. The Static Color Function parameter can be enabled in either full speed (controller crossfading the wheel positions), or MSpeed (MSpeed control of the wheel motor). For more information on MSpeed, see “MSpeed (Motor Speed)” on page 4-8. Table 4-5 describes the Static Color Functions available on the x.Spot fixture.

Table 4-5 Static Color Function Descriptions

Color Function	Description
Indexed	Allows the color wheel to take the quickest path and snap to the chosen whole or half color.
Forward Spin	Allows a forward color wheel spin at variable speeds.
Reverse Spin	Allows a reverse color wheel spin at variable speeds.
Continuous	Allows positioning at any point on the color wheel (allows for a smaller “step” between color wheel positions for color crossfades).

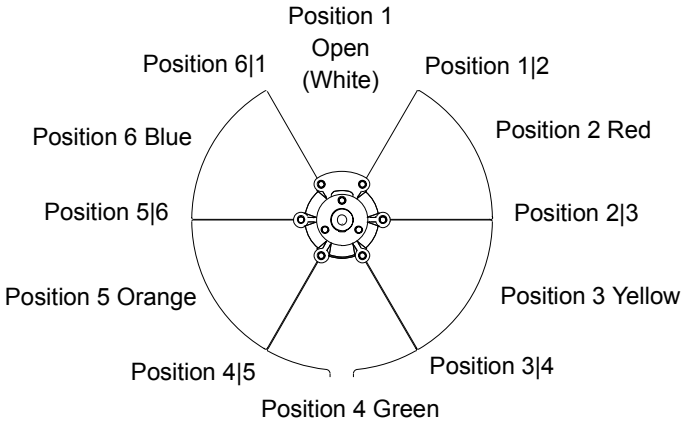
Table 4-5 Static Color Function Descriptions

Color Function	Description
Slow Scan	Slowly oscillates the wheel at a factory-determined range and speed
Fast Scan	Rapidly oscillates the wheel at a factory-determined range and speed
Random	Selects random whole color positions at variable speeds.
Blink-indexed	Closes then reopens the shutter between indexed color changes.

Static Color Position

DMX Channel 16 controls Static Color wheel position. Use this parameter to position the beam at the center of a color wedge or halfway between two adjacent colors. Figure 4-4 shows the available positions.

Figure 4-4 Static Color Wheel positions



Color Mix Function

This parameter determines how the cyan, magenta, and yellow color wheels move. The Color Function values can be enabled in either full speed (controller crossfading the wheel positions), or MSpeed (MSpeed control of the wheel motor). For more information on MSpeed, see “MSpeed (Motor Speed)” on page 4-8.

Table 4-6 describes the Color Mix Function settings.

Table 4-6 Color Mix Function Descriptions

Color Function	Description
Pure Mix	Allows color wheel movement from open (white) to saturated color (permits a smaller “step” between color wheel positions for color crossfades).
Continuous	Allows complete 360 degree color wheel movement.
Spin	Puts all three (cyan, magenta, and yellow) color wheels in spin mode. Wheel Spin speed, direction, or fixed position can be set individually on CMY channels.
Cycle	Uses only the color-mixing portion of the cyan, magenta, and yellow color wheels to cycle colors from red to green to blue at variable speeds (rate set by cyan DMX channel).
Random	Performs a pseudo-random color chase of 12 factory-selected colors using the cyan, magenta, and yellow color wheels at variable speeds (rate set by cyan DMX channel).
Blink	Defined using Continuous wheel operation. Shutter snaps closed during any color move, then re-opens.

Cyan, Magenta, and Yellow

These parameters determine how the individual color mixing wheels move. Channel 18 controls Cyan, Channel 19 controls Magenta and Channel 20 controls Yellow. The Color Function value choosen determines the available color wheel settings, (see Table 4-7).

Table 4-7 Cyan, Magenta, and Yellow Setting Descriptions

Color Function Setting Available	Description
Pure Mix Mode	Allows exact positioning of the color wheel from full color to white.
Continuous Mode	Allows exact positioning of the color wheel from white to full color to white over the full revolution of the wheel.
Spin Mode	Determines the color wheel spin speed, direction, or fixed position.
Cycle & Random Mode	Determines the speed at which all three (cyan, magenta, and yellow) color wheels move to the next cycle color or random color. *The Cyan color wheel sets the rate for all the wheels.*

CTO and CTB

Color Temperature Orange (CTO) and Color Temperature Blue (CTB) wheels allow a full range of color temperature adjustment in x.Spot fixtures. Channel 21 and 22 control the CTO and the CTB wheels respectively. Each wheel can be set from Full filtering to Open (no filtering). Full CTO adjusts temperature to a low value of 3,000K. Full CTB brings the color temperature to a high of 7,500K.

Both CTO and CTB contain a diffusion filter wedge used to adjust beam flatness. Beam flattening equalizes the intensity across the beam to minimize “hotspots”.

CTO and CTB are not affected by Color Mix function settings.

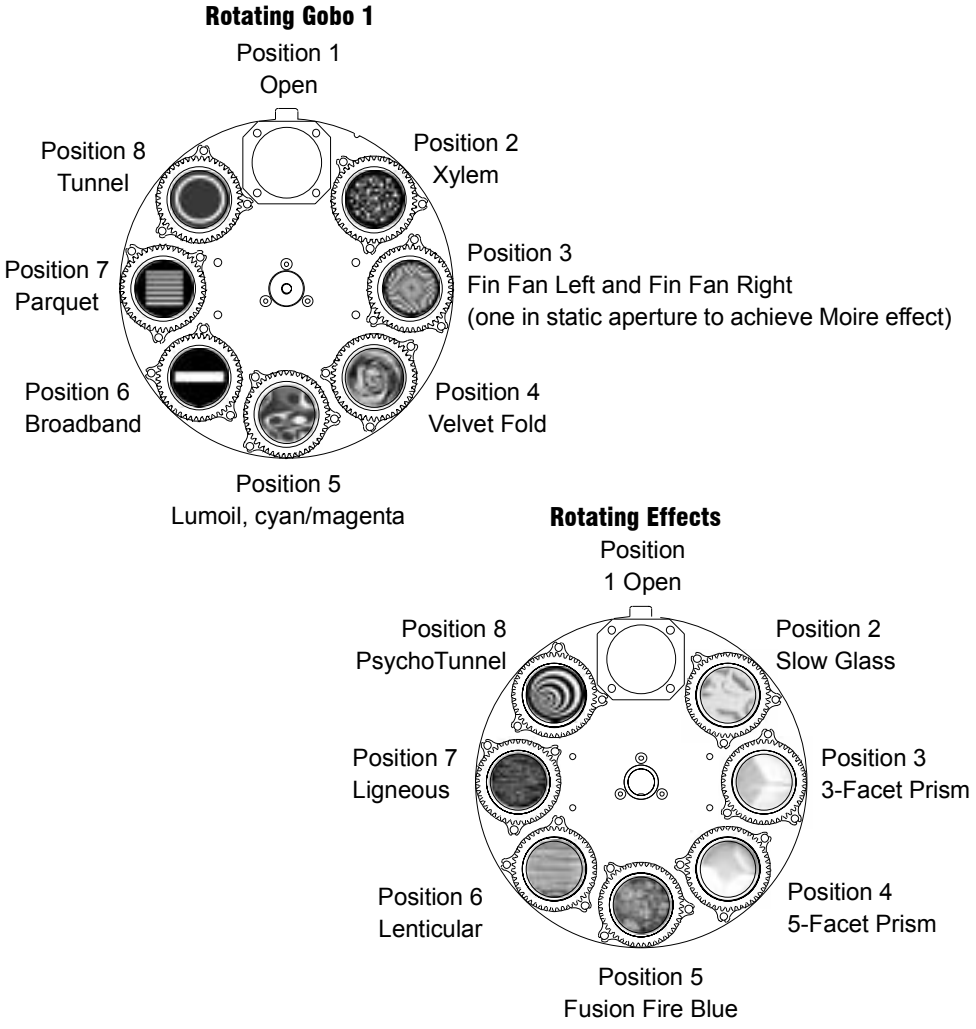
Dual Rotating Gobos Module Parameters

The Dual Rotating Gobos module shown in Figure 4-5 is the standard x.Spot module for Slot 2. Gobo 1 is an 8-position wheel containing seven standard lithopatterns plus open. An additional bracket behind positions 3 and 7 of Gobo 1 holds static lithos for creating various Moire and overlay effects at those positions.

The second wheel in this module is an 8-position Effects wheel containing seven effects and open.

This module uses the same size lithos as High End Systems Studio Spot 575 fixture and can be easily customized. See “Replacing x.Spot Lithopatterns® and Effects Glass” on page 5-12.

Figure 4-5 Wheels in the Dual Rotating Gobos module



In the following parameter descriptions, the term *Spin* indicates motion of the large wheel and *Rotate* refers to motion of the smaller aperture wheels holding individual lithopatterns or effects glass.

Gobo Function

The Gobo Function parameter is controlled with DMX Channel 23 for Gobo 1 and DMX Channel 28 for the Effects wheel and determines how the gobo wheel moves. The Gobo Function parameter can be enabled in either full speed (controller crossfading the wheel positions), or MSpeed (MSpeed control of the wheel motor) For more information about MSpeed, see “MSpeed (Motor Speed)” on page 4-8.

Table 4-8 Gobo Function Descriptions

Gobo Function	Description
Indexed	Allows the gobo wheel to take the quickest path and snap to the chosen aperture.
Forward Spin	Allows a forward gobo wheel spin at variable speeds.
Reverse Spin	Allows a reverse gobo wheel spin at variable speeds.
Scan	Oscillates the gobo wheel at a factory-determined range and speed.
Random	Selects random aperture positions at variable speeds.
Blink	Closes and opens the shutter on wheel position changes.
Continuous	Sets a crossfade as the wheel moves between chosen aperture positions.

Gobo Position

The Gobo Position parameter is controlled with DMX Channel 24 for Gobo 1 and DMX Channel 29 for the Effects wheel. A position can be set at the center of any aperture on the gobo to perform the function selected in the Gobo Function channel.

Gobo Rotate Function

The Gobo Rotate Function parameter is controlled with DMX Channel 25 for Gobo 1 and Channel 30 for the Effects wheel. Gobo Rotate refers to the motion of the individual aperture wheels. The Gobo Rotate Function parameter setting determines which rotate options are available (see Table 4-9)

Gobo Rotate Coarse/Fine

DMX Channels 26 and 31 control the Rotate Coarse parameter on Gobo 1 and the Effects wheel respectively. Rotate Coarse determines the coarse adjustment in 8-bit increments of the effect apertures’ rotation position in the Indexed, Scan and Blink modes. In Forward and Reverse modes, DMX values of 0-3 set the rotation to stop and set speed from slow (4) to fast (255).

Gobo Rotate Fine parameter allows for fine adjustment (16-bit increments) of the aperture rotation position in the Indexed, Scan and Blink modes. Gobo Rotate Fine is controlled with Channel 27 for Gobo 1 and Channel 32 for the Effects wheel.

Table 4-9 Gobo Rotate Functions and Rotate Options

Gobo Rotate Function	Gobo Rotate Option	Description
Indexed	Position stop on selected aperture at 0° to 360° of rotation	Rotates the specified indexed aperture to any position
Scan		Oscillates the selected aperture wheel at a factory-determined range and speed.
Blink		Closes and opens the shutter on rotate position changes
Forward Rotate	Forward Rotate	Forward aperture rotation from slowest to fastest
Reverse Rotate	Reverse Rotate	Reverse aperture rotation from slowest to fastest

Rotating Gobo and Iris Module Parameters

Rotating Gobo and Iris is the standard Slot 3 Module for the x.Spot fixture. It contains one 8-position Gobo wheel with seven rotating lithopatterns (plus open) and a variable iris, (see Figure 4-6).

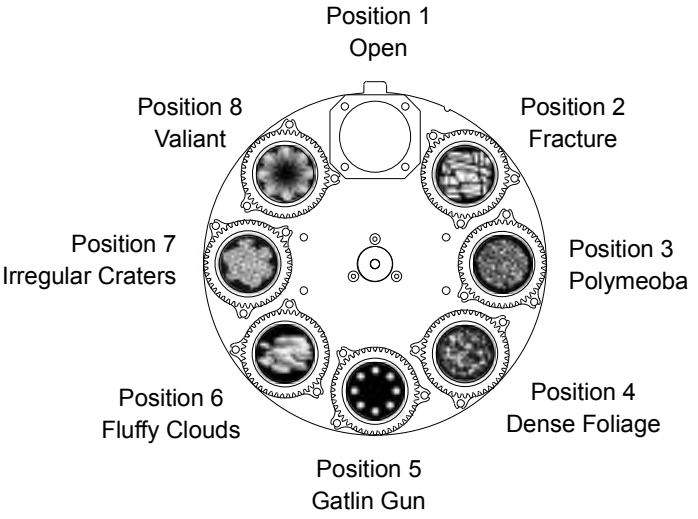


Figure 4-6 Rotating Gobo 2 Lithopatterns

In the following parameter descriptions, the term *Spin* indicates motion of the large wheel and *Rotate* refers to motion of the smaller aperture wheels holding individual lithopatterns.

Gobo 2 Function

The Gobo 2 Function parameter is controlled with DMX Channel 33. This parameter determines how the Gobo wheel moves. Table 4-10 describes the Gobo 2 Function parameter. It can be enabled in either full speed (controller crossfading the wheel positions), or MSpeed (MSpeed control of the wheel motor). For more information, see “MSpeed (Motor Speed)” on page 4-8.

Table 4-10 Gobo 2 Function Descriptions

Gobo 2 Function	Description
Indexed	Allows the gobo wheel to take the quickest path and snap to the chosen effect.
Forward Wheel Spin	Allows a forward gobo wheel spin at variable speeds.
Reverse Wheel Spin	Allows a reverse gobo wheel spin at variable speeds.
Scan	Oscillates the gobo wheel at a factory-determined range and speed.
Random	Selects random effect positions at variable speeds.
Blink Wheel	Closes and opens the shutter on wheel position changes.
Continuous	Sets a crossfade as the wheel moves between chosen aperture positions.

Gobo 2 Position

The Gobo 2 Position parameter is controlled with DMX Channel 34. A position can be set at the center of any of the eight apertures on the gobo.

Gobo 2 Rotate Function

The Gobo 2 Rotate Function parameter is controlled with DMX Channel 35. Gobo 2 Rotate refers to the motion of the individual apertures. The Gobo 2 Function parameter setting determines which rotate options are available. Table 4-11 lists the Gobo 2 Rotate setting.

Table 4-11 Gobo2 Rotate Functions and Available Options

Gobo Rotate Function	Gobo Rotate option	Description
Indexed	Position stop on selected aperture at 0° to 360° of rotation	Rotates the specified indexed aperture to any position
Scan		Oscillates the selected aperture wheel at a factory-determined range and speed.
Blink		Closes and opens the shutter on rotate position changes
Forward Rotate	Forward Rotate	Forward aperture rotation from slowest to fastest
Reverse Rotate	Reverse Rotate	Reverse aperture rotation from slowest to fastest

Gobo 2 Rotate Coarse/Fine

DMX Channel 36 controls the Rotate Coarse parameter on the Gobo 2 wheel. Rotate Coarse determines the coarse adjustment in 8-bit increments of the effect apertures' rotation position in the Indexed, Scan and Blink modes. In Forward and Reverse modes, DMX values of 0-3 set the rotation to stop and set speed from slow (DMX value = 4) to fast (DMX value = 255).

The Gobo Rotate Fine parameter allows for fine adjustment (16-bit increments) of the aperture rotation position in the Indexed, Scan and Blink modes. Gobo 2 Rotate Fine is controlled with Channel 37.

Iris

Iris is a continuous parameter controlled by DMX Channel 38. The iris is a device with a variable circular opening that controls the beam diameter projected from the selected fixture in a similar fashion that a camera's iris controls the amount of light entering the camera. Table 4-12 describes the Iris settings.

Table 4-12 Iris Setting Descriptions

Iris Setting	Description
Close	Closes the iris.
Variable Iris	Determines the diameter of the beam.
Open	Fully opens the iris.
Periodic Strobe (Variable)	Strobes the beam diameter at specified intervals.
Random Strobe (Variable)	Strobes the beam diameter at random intervals.
Ramp Open/Snap Shut (Variable)	Fully opens the iris at variable speeds, then snaps shut at full speed.
Snap Open/Ramp Shut (Variable)	Fully opens the iris at full speed, then ramps shut at variable speeds.
Ramp Open/Ramp Shut (Variable)	Fully opens the iris at variable speeds, then shuts at the same speed.
Random Ramp/Snap (Variable)	Fully opens the iris at variable, random speeds, then snaps shut at full speed.
Random Snap/Ramp (Variable)	Fully opens the iris at full speed, then ramps shut at variable, random speeds.
Open	Fully opens the iris.

Chapter 5: General Maintenance

The x.Spot fixture is designed for simple maintenance. Modules are easily removed for repair or custom configurations. The module driver boards are identical using orientation to differentiate their function for a specific module.

The following toolset is sufficient for the maintenance procedures in this chapter:

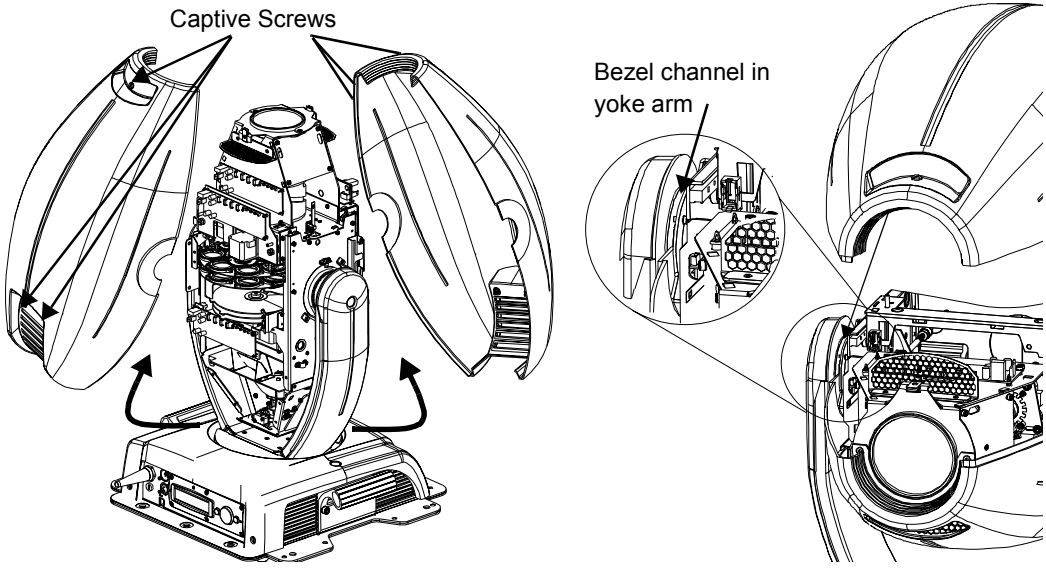
- 2.0, 2.5, and 3 mm allen wrench
- Flathead screwdriver
- Gloves
- Protective eyewear

This chapter includes information on replacing parts, and cleaning the fixture. Please note the warnings under each heading before servicing the fixture.

Warning: This fixture must be serviced by qualified personnel. The information listed in this chapter is intended to assist qualified personnel *only***.**

Several of the maintenance operations described in this chapter require bezel removal. To remove the bezel, loosen the three (3) captive screws on each side of the fixture head with a flathead screwdriver. Lift the bezel sides away from the base and toward the lens, see Figure 5-1.When replacing the bezel, ensure that it is fitted securely in the yoke channel on both side of the fixture as shown in Figure 5-1.

Figure 5-1 Removing and replacing the bezel



Replacing Parts

Warnings: Disconnect power before servicing.

Replace fuses with the specified type and rating only.

Equipment surfaces may reach temperatures up to 130° C (266° F). Allow the fixture to cool before handling.

Replacing Fuses

To replace a fuse:

1. Disconnect power to the fixture. If the fixture has been operating, allow the fixture to cool before handling.
2. Use Figure 5-2 with Table 5-1 to determine which fuse to replace and its location

Figure 5-2 Locate and access fuses.

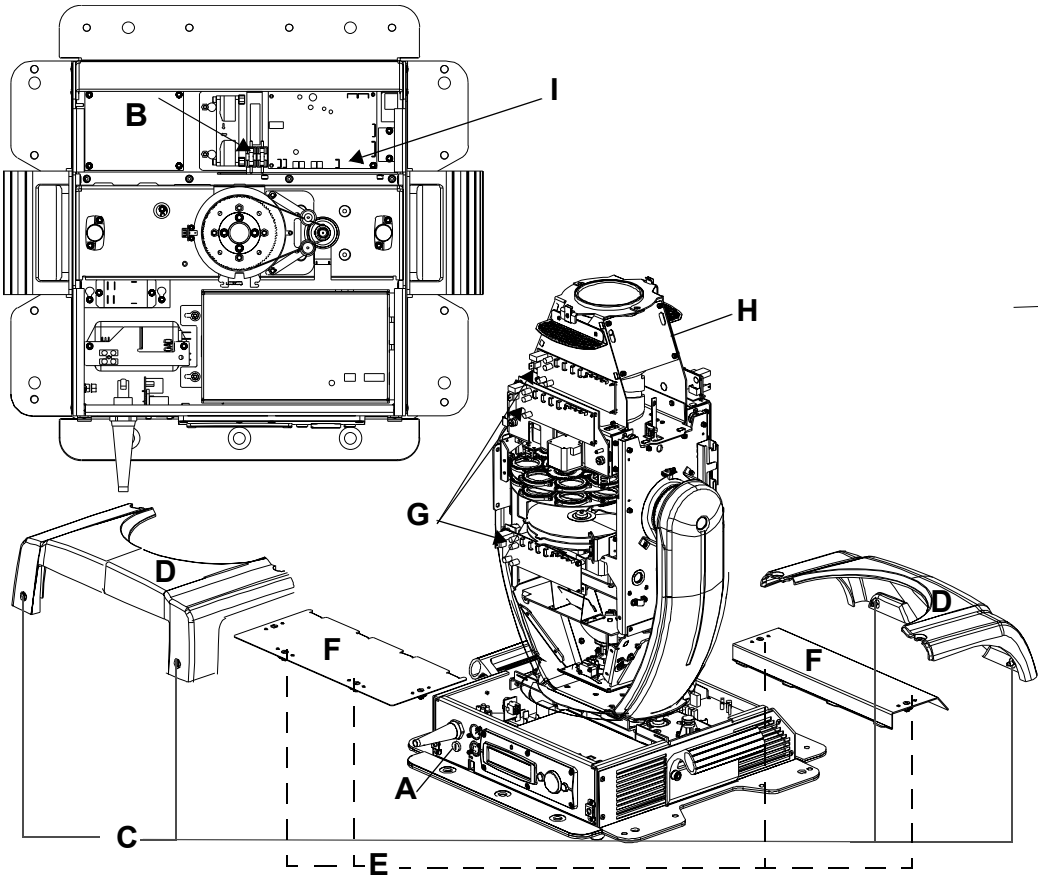


Table 5-1 Identifying blown fuses

Fuse	Fuse Location and Access (see Figure 5-2)	Symptom of Failure
Main fixture	One fuse on outside of fixture under power cap **(A)**.	Fixture shuts down and will not receive power.
Motor supply	Two output fuses inside the topbox next to pan board **(B)**. To access: 1. Use a wide-tip, flat head screwdriver to loosen the two captive screws **(C)** *on each side of the fixture* and remove the fixture's two panel covers **(D)**. 2. Rotate screw latches **(E)** on board cover plates **(F)** 180 degrees to unlock. Lift off board cover plates.	Fixture shuts down and will not receive power.
2-phase driver boards	Two fuses on the board controlling Focus/Frost/Zoom. Two fuses on each module driver board **(G)** below the connector. The Color mix module in Slot 1 has two driver boards. To access any of the 2-phase boards: • Remove the bezel as shown in Figure 5-1 on page 5-1. • Rotate fixture to the location of the	Module motors will be off. Each fuse protects two of the 4 motors associated with each board. LEDs will remain on.
3-phase Pan and Tilt boards	One fuse on the Tilt board **(H)** near the fixture lens. To access: • Remove the bezel as shown in Figure 5-1 on page 5-1	Pan or Tilt board-related motors and fans will be off.
	One fuse on the Pan board **(I)** in the topbox. To access: 1. Use a wide-tip, flat head screwdriver to loosen the two captive screws **(C)** *on each side of the fixture* and remove the fixture's two panel covers **(D)**. 2. Rotate screw latches **(E)** on board cover plates **(F)** 180 degrees to unlock. Lift off board cover plates.	

3. Replace the appropriate fuse(s) with a fuse of the same type and rating as shown in Table 5-2.

Table 5-2 Fuse replacement

Fuse	Fuse Type and Rating	Manufacturer	High End Systems p/n
Main fixture	15A, 250V, Slow Blow	Littelfuse 326 015 or Bussmann MDA-15	90403024
Motor supply	2.5A, 250V, Slow Blow	Littelfuse 215 02.5	90403027
2-phase driver boards	2.5A, 125V, Slow Blow SMF	Littelfuse R454 02.5	90402024
3-phase Pan and Tilt board			

Replacing the Lamp

Warnings: Disconnect power before re-lamping or servicing.

An operating, unshielded MSR lamp emits ultraviolet and visible (UV-vis) radiation which could damage eyes and skin. Whenever working on or near an exposed lamp, wear protective eye gear. Never look directly at the lamp while the lamp is on.

Hot lamp may be an explosion hazard. Do not open for five minutes after switching off. Wear eye and hand protection when re-lamping.

Equipment surfaces may reach temperatures up to 130° C (266° F). Allow the fixture to cool before handling.

Caution: This equipment is designed for use with a Philips® MSR 700SA 700Watt, metal halide lamp only. Use of any other type lamp may be hazardous and may void the warranty.

To install/replace the lamp:

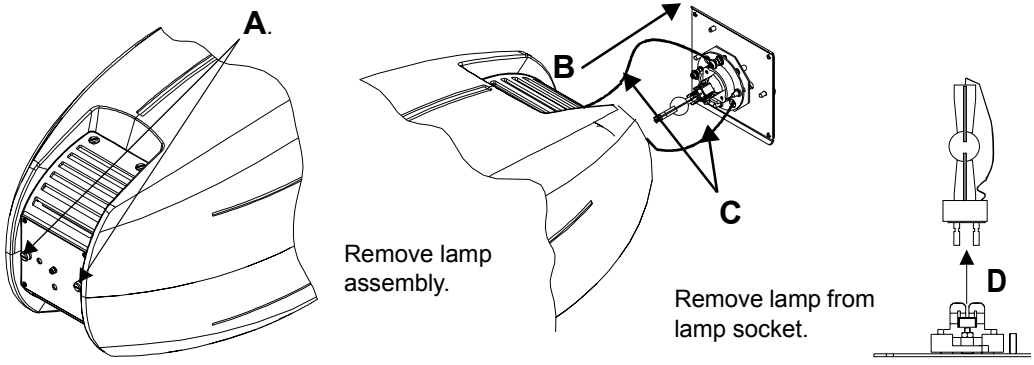
1. Disconnect power to the fixture. If the fixture has been operating, wait for the lamp to cool before handling.
2. Put on protective eyewear and gloves.

Refer to Figure 5-3 for Steps 3–8.

3. Using a wide tip, flat head screwdriver, loosen (*but do not remove*) the two lamp assembly screws **(A)**.
4. Pull the lamp assembly straight out of the fixture **(B)**.

   The lamp assembly is connected to the fixture by lamp socket wires **(C)**. Support the lamp assembly while replacing the lamp. *Do not allow the lamp socket wires to support the weight of the lamp assembly.*
5. Holding the existing lamp by its ceramic base, carefully pull the lamp straight out of the lamp socket **(D)**.

Figure 5-3 Replacing the lamp



Caution: Do not squeeze the lamp glass while removing the existing lamp from the socket. Lamp glass may shatter.

6. Remove all packaging materials from the new lamp. Holding the new lamp by its ceramic base, gently press the two base pins into the lamp socket until the lamp is firmly seated.

Caution: When handling the new lamp, avoid contact with the lamp glass. If the lamp glass is soiled by oil or dirt from skin, gloves, etc., clean the cold lamp glass with an alcohol wipe. A soiled lamp could overheat and burst, causing damage to the fixture.

7. Reinsert the lamp assembly straight into the fixture.

Caution: Make sure the lamp socket wires are not wrapped around the lamp or crimped while reinserting the lamp assembly.

8. Tighten the lamp assembly screws **(A)**.
9. Reset the lamp hours to zero to track the lamp life, (see “Lamp HR/Strike Reset” on page 3-27).
10. Optimize the new lamp.

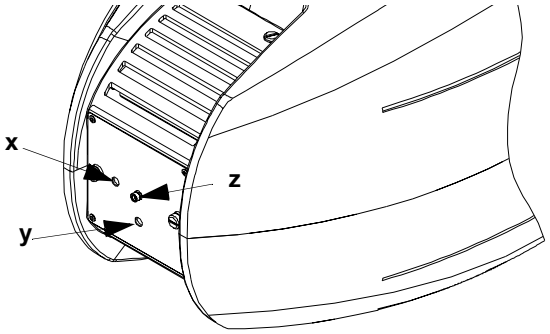
Optimizing the Lamp

Optimize the lamp after replacement, or if there is a “hot spot” of brightness anywhere other than the center of the light beam.

To complete the optimization procedure below, use either the fixture’s on-board menu system (see “Chapter 3: Fixture Operation” and “Appendix D: Menu Map”) or a DMX controller (see “Chapter 4: DMX Programming” and “Appendix A: x.Spot™ DMX Protocol”).

1. Orient the fixture so that the beam will project onto a flat, white surface at least 10 feet (3 m) away.
2. Turn the lamp on. Ensure the light beam is round and not oval. If necessary, adjust the pan and tilt construct values until the beam is round.
3. For x.Spot fixtures, adjust the focus until the edge of the light beam is sharp.
4. Set the DIM (intensity) channel at full (DMX value of 255).
5. Set diffusion filters. DMX channel 21 (CTB) = 43. DMX channel 22 (CTO) = 0.
6. Locate the three lamp optimization screws (x, y, and z) shown in Figure 5-4.
7. Look at the wall where the beam is projected and use the optimization screws to adjust the lamp’s position within the fixture until the “hotspot” of brightness is at the center of the beam and diffused. The *x* and *y* screws move the hotspot. The center *z* screw adjusts beam flatness.

Figure 5-4 Lamp optimization screws



Replacing a Driver Board

Warnings: Disconnect power before servicing.

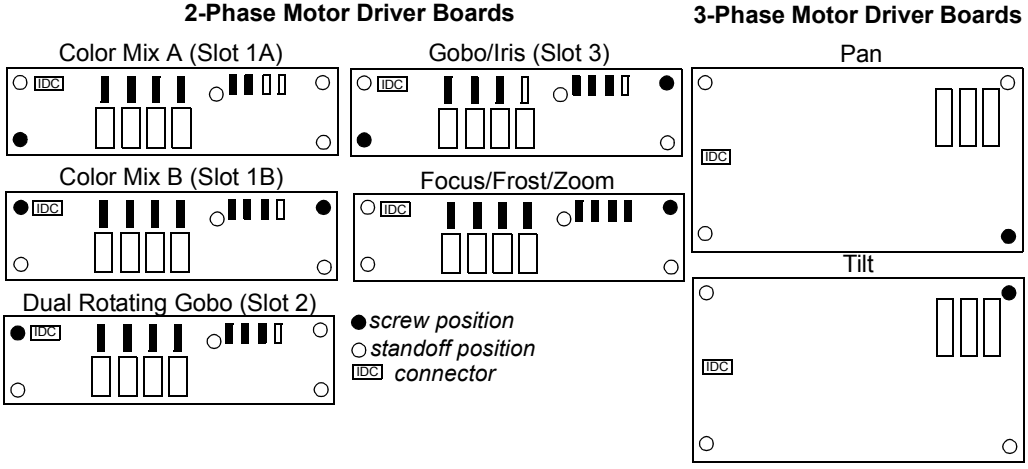
Equipment surfaces may reach temperatures up to 130° C (266° F). Allow the fixture to cool before handling.

The standard x.Spot fixture is designed with two basic types of motor driver boards:

1. Interchangeable 2-phase boards drive the motors for each of the user-configured modules, and the Focus/Frost/Zoom functions.
2. Interchangeable 3-phase pan and tilt driver boards.

Functional identification is accomplished with configuration of standoffs and contact screws that allow for position- specific board addressing, see Figure 5-5

Figure 5-5 Driver board configurations.



Caution: The fixture will not function correctly if contact screws are missing from driver boards.

When changing a board, align the screw holes and standoffs to ensure correct orientation in the fixture.

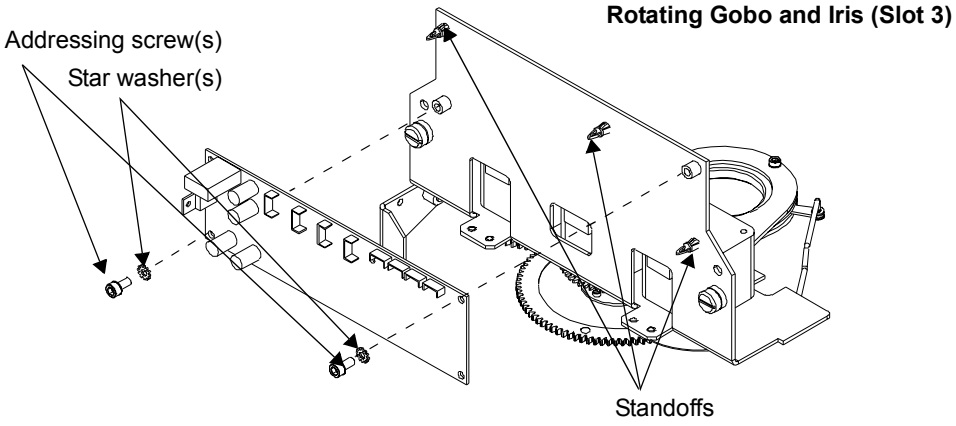
To replace a 2-phase driver board:

1. Remove the bezel as show in Figure 5-1 on page 5-1.
2. Use a 3 mm allen wrench to remove the addressing screws and star washers.
3. Position new board against module aligning the center top standoff. Place contact screw(s) in the appropriate position. Figure 5-6 shows the example for the Rotation Gobo and Iris Module.

   Note: When installing a replacement driver board on a module, always place a star washer between an address screw and the pad on the logic board to ensure good electrical contact.

4. Reattach the bezel, guiding it into the bezel channel on each yoke arm and retighten captive bezel screws (see Figure 5-1 on page 5-1)

Figure 5-6 Replacing a 2-phase driver board.



Replacing Modules

This section describes the steps for installing/replacing the modules available for a Standard configuration x.Spot fixture.

Before Beginning

Please note the following warnings and cautions before performing the procedure outlined in this Installation Instruction.

Warnings: Disconnect power before servicing.

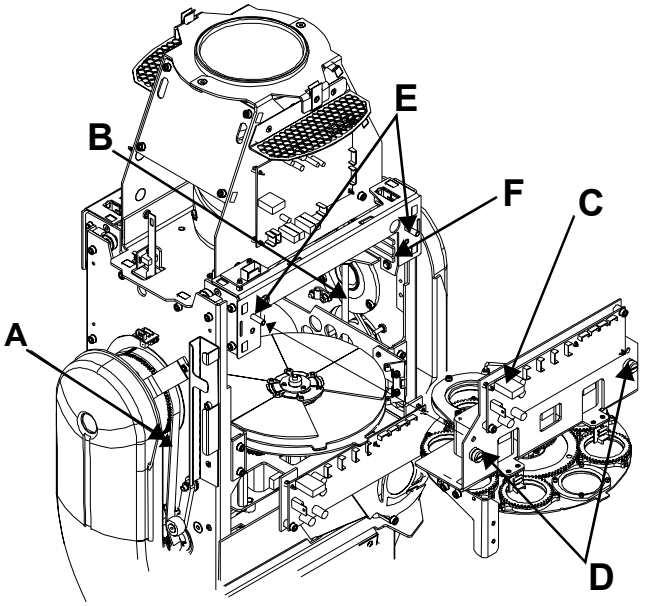
Equipment surfaces may reach temperatures up to 130° C (266° F). Allow the fixture to cool before handling.

Replacing a Rotating Gobo and Iris Module in Slot 3

Refer to Figure 5-7 for Steps 1–4 in this section.

1. Remove the bezel as shown in Figure 5-1 on page 5-1, and, with the lens pointed up, rotate the fixture so the tilt belt **(A)** is on your left. Locate the Rotating Gobo and Iris Module in Slot 3 (closest to the lens) and gently push the module toward the lens until the linear slide **(B)** reaches its limit.
2. Detach the IDC connector **(C)** from the driver board.
3. Loosen the two captive screws **(D)** on the module and pull it straight out of the unit.
4. Slide the new module into the unit, positioning the Gobo wheel between the Dual Gobos in Slot 2 on the opposite side of the fixture. Use the aligning pins **(E)** and bottom (toward lamp) channel guides **(F)** to orient it properly

Figure 5-7 Installing/Replacing Slot 3 Module.



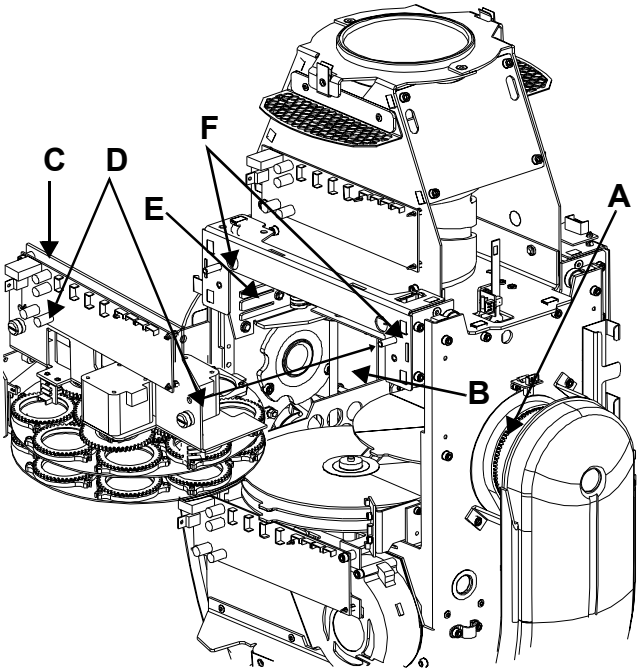
5. Tighten the captive screws and reattach the IDC connector.
6. Reattach the bezel guiding it into the bezel channel on each yoke arm and retighten captive bezel screws as shown in Figure 5-1 on page 5-1.
7. Place the old module in the new unit's anti-static bag for return. Include the Return Material Authorization number (RMA#) obtained from your dealer or point of purchase along with a written explanation of the problem or malfunction.

Replacing a Dual Rotating Gobo Module in Slot 2

Refer to Figure 5-8 for Steps 1–4 in this section.

1. Remove the bezel as shown in Figure 5-1 on page 5-1, and, with the lens pointed up, rotate the fixture so the tilt belt **(A)** is on your right. Locate the Dual Rotating Gobo Module in Slot 2 (nearest the lens) and gently push the module toward the lens until the linear slide **(B)** reaches its limit.
2. Detach the IDC connector **(C)** from the driver board.
3. Loosen the two captive screws on the module **(D)** and pull it straight out of the unit.
4. Slide the new module into the unit positioning the Gobo wheels on either side of the Gobo wheel in Slot 3 on the opposite side of the fixture. Use the top (toward the lens) channel guides **(E)** and the aligning pins **(F)** and to orient it properly

Figure 5-8 Installing/Removing Slot 2 Module.



5. Tighten the captive screws and reattach the IDC connector.
6. Reattach the bezel guiding it into the bezel channel on each yoke arm and retighten captive bezel screws as shown in Figure 5-1 on page 5-1.
7. Place the old module in the new unit's anti-static bag for return. Include the Return Material Authorization number (RMA#) obtained from your dealer or point of purchase along with a written explanation of the problem or malfunction.

Replacing a Six-Wheel Color Mix Module for Slot 1

To replace a Six-Wheel Color Mix Module:

1. Remove the bezel as shown in Figure 5-1 on page 5-1.
2. Remove the modules in Slots 3 and 2 (see “Replacing a Rotating Gobo and Iris Module in Slot 3” on page 5-8 and “Replacing a Dual Rotating Gobo Module in Slot 2” on page 5-9)

Refer to Figure 5-9 for Steps 3–7 in this section.

Locate the Six-Wheel Color Mix Module that extends through the fixture in Slot 1(at the base of the unit) and detach the IDC connector **(A)** from the driver board on **each side** of the Color Mix module.

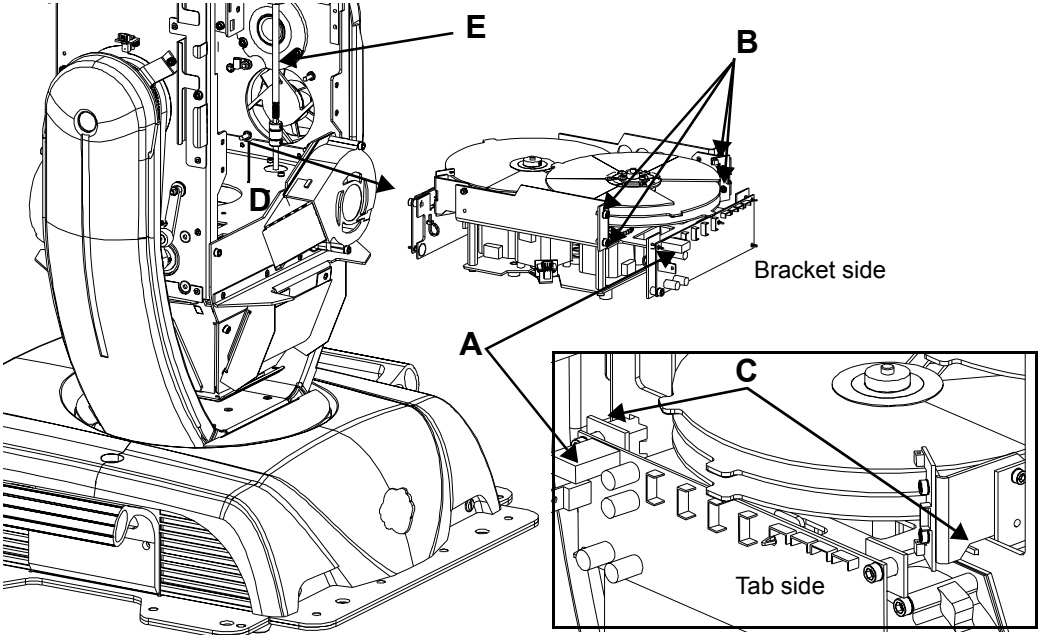
Position the fixture to the side with a bracket holding the module to the fixture frame. Use a 3 mm hex wrench to remove the 4 bracket screws **(B)** and their star washers.

On the opposite side of the fixture from the module bracket, locate the 2 tabs that hold the module in slots on the fixture frame **(C)**. Carefully move the module towards the bracket side just enough to release the tabs from the slots.

Grasping the module from each side, lift it up and slide it toward the bracket and out of the fixture **(D)**.

Slide the new Color Mix Module into the frame guiding it between the linear slides **(E)** and securing the two tabs in their slots.

Figure 5-9 Removing/Installing Slot 3 module



3. Replace the star washers and 3mm hex screws and reattach both IDC connectors to the driver boards.
4. Reattach the bezel guiding it into the bezel channel on each yoke arm and retighten captive bezel screws as shown in Figure 5-1 on page 5-1.
5. **Place the old module in the new unit's anti-static bag for return.** Include the Return Material Authorization number (RMA#) obtained from your dealer or point of purchase along with a written explanation of the problem or malfunction.

Replacing Static Color Wheel Dichroic Wedges

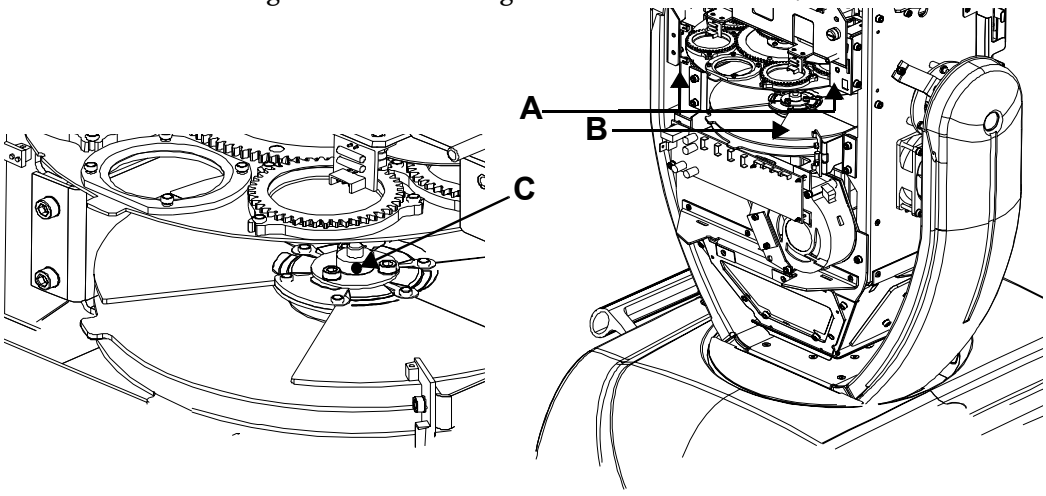
This section describes replacing the Static Color Wheel dichroic wedges in the x.Spot Six-Wheel Color Mix module.

Replace color wedges if they are damaged or broken, to change their order in the wheel, or to install a new or custom color. (See "Optional Accessories" on page 1-4 for ordering information.)

To replace a color wedge:

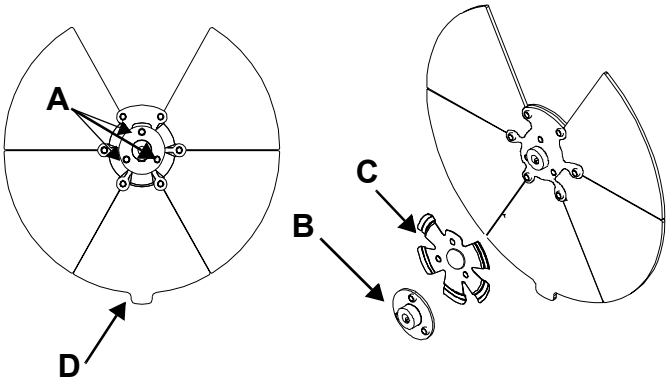
1. Remove both sides of the bezel as shown in Figure 5-1 on page 5-1.
2. Referring to Figure 5-11, grasp the upper module frame **(A)** and gently push it toward the lens as far as it will go. The static color wheel **(B)** is the top wheel on the Six-Wheel Color Mix module in Slot 1 at the base of the unit.
3. Use a 2 mm allen wrench to loosen the side set screw **(C)** on the hub of the static color wheel.
4. Grasping the hub, lift the wheel up and out of the fixture and place on a clean, flat surface.

Figure 5-10 Removing the Static Color Wheel.



5. Referring to Figure 5-12, use a 2.5mm allen wrench to remove the 3 socket cap screws **(A)** holding the hub **(B)** and the spring retaining clip **(C)** to the wheel.

Figure 5-12 Accessing Dichroic wedges in Static Color Wheel.



6. Lift the retaining clip to access all the color wedges. Lift out and replace selected wedges.

   Note: The tabbed wedge **(D)** *must always remain in the position directly opposite the open position. When ordering color wedges be sure to specify whether it should be a tabbed or a standard shaped wedge.*

7. Align the retaining ring over the wedges. Replace socket cap screws. Tighten after all three screws are in place.
8. Replace the wheel in the fixture and tighten the set screw to secure it to the hub.
9. Reattach the bezel guiding it into the bezel channel on each yoke and retighten captive bezel screws, (see Figure 5-1).

Replacing x.Spot Lithopatterns® and Effects Glass

This section explains how to remove and replace individual components in the rotating gobo wheels for x.Spot fixtures. These directions apply to any gobo, lithopattern, or effect glass in x.Spot fixtures that adheres to the specifications listed in the section titled “Dichroic, Litho, and Effect Specifications” on page 1-6.

Replace lithopatterns or effects if they are damaged or broken, to change their order in the wheel, to clean them, or to install a new or custom lithopattern or effect. (See “Optional Accessories” on page 1-4 for ordering information.)

If applicable, remove all pieces of broken glass in the fixture before beginning.

Warnings: Disconnect power before servicing.

Equipment surfaces may reach temperatures up to 130° C (266° F). Allow the fixture to cool before handling.

To replace a lithopattern or effects glass in a rotating effects or gobo wheel:

1. Remove the fixture's bezel cover as shown in Figure 5-1 on page 5-1. Manually rotate the gobo wheel until the selected lithopattern or effect is easy to access).
2. Locate the spring securing the litho or effect to the wheel (see Figure 5-13). Pull the spring tip towards the center of the aperture. The spring will release from its groove inside the aperture.
3. Remove the spring and lithopattern or effect as shown in Figure 5-13.
4. Place the new lithopattern or effect into the aperture.

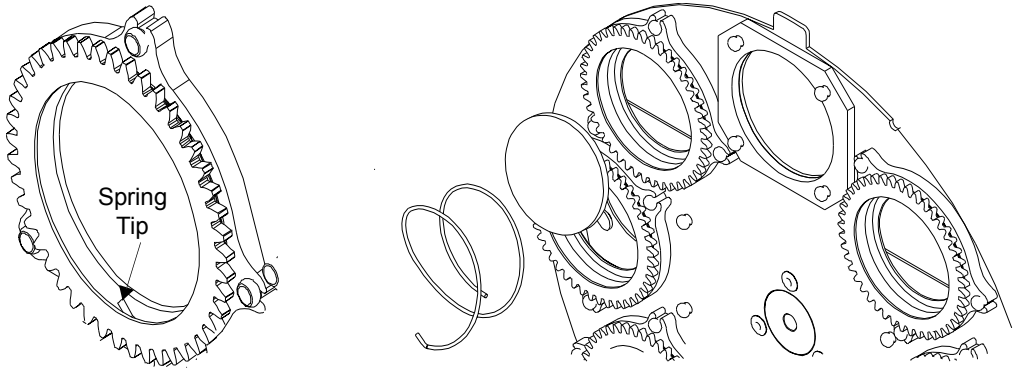
   Install lithopatterns with the coated side away from the lamp. Install effect glass with the smooth side toward the lamp.

   To determine which side of the litho is coated, place the tip of a pen against each side of the litho and view it from a slight angle. On the coated side, the tip of the pen appears to touch its reflection. On the uncoated side, there appears to be a gap between the pen and its reflection

   Note: To create a moire effect in position 3 or 7 of Gobo 1, install the rotating and static lithos with the coated sides together. In this case, the rotating lithopattern would be the opposite of the other lithos in the wheel.
5. Replace the spring.
6. After replacing the lithopattern or effects glass, clean it by using a soft, lint-free cotton cloth and a mild glass cleaning solution (*containing no ammonia*).

Replace the bezel (see Figure 5-1 on page 5-1).

Figure 5-13 Replacing a lithopattern or effects glass in a rotating gobo wheel.



7.

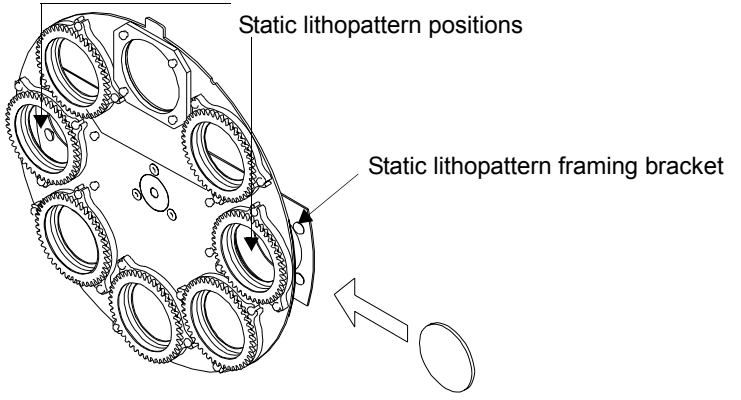
Replacing Static Lithopatterns®

Positions 3 and 7 on Gobo Wheel 1 in the Dual Rotating Gobo Module contain slots for the addition of static lithopatterns, (see Figure 5-14).

To replace a static litho:

1. Use the directions from the preceding section to remove the rotating litho in front of the static litho.
2. Gently spread the static litho framing bracket away from the wheel and slide the static lithopattern out of the frame (see Figure 5-14).
3. Choose the orientation of the selected lithopattern. To product a moiré effect place the coated side of the top litho facing toward the bottom litho. For morphing effects, place the coated side of the top litho facing away from the lamp.
4. Slide the new lithopattern into the frame. Make sure the static litho is seated.
5. After replacing the litho, clean it by using a soft, lint-free cotton cloth and a mild glass cleaning solution (*containing no ammonia*).
6. Replace the bezel, (see Figure 5-1 on page 5-1).

Figure 5-14 Replacing Static lithopatterns.



Cleaning the Glass Components

Warnings: Disconnect power before servicing.

Equipment surfaces may reach temperatures up to 130° C (266° F). Allow the fixture to cool before handling.

You will need:

- a soft, lint-free cotton cloth
- mild glass cleaning solution (containing no ammonia)

To clean the internal glass components:

1. Disconnect power to the fixture. If the fixture has been operating, allow the fixture to cool before handling.
2. Remove the bezel by loosening the 3 captive screws on each side.
3. Clean the dichroics, lithopattern and effects, color wheels, and lens using a mild glass cleaner (containing no ammonia) and a soft, lint-free cotton cloth.

Chapter 6: Troubleshooting

This chapter lists typical symptoms and solutions for problems you might experience when using x.Spot fixture. For additional help contact Customer Service for assistance, see “Contacting High End Systems®” on page ii.

Caution: This fixture must be serviced by qualified personnel. The information listed in this section is intended to assist qualified personnel only.

LED States

LEDs located throughout the x.Spot indicate how the unit is functioning. Table 6-1 lists LED States, and problems they may indicate.

Table 6-1 LED State

Location	LED #	State	Problem?	Description
2-phase board	LD1-LD4	Green	No	S1-S4 sensor open
		Yellow	No	S1-S4 sensor closed
		Flashing red	No	Board is initializing
		Infinitely flashing red	Yes	Board not receiving data
		Red	Yes	Board not receiving data
		Flashing red and green	Yes	Addressing screw(s) missing from board
		Sporadically flashing green & yellow	Yes	2 boards are addressed the same. (Corrected by adding addressing screw to appropriate location)
		OFF	Yes	Board not receiving power
	LD5	Green	No	Receiving proper voltage
		Dim green	Yes	Board not receiving data
		OFF	Yes	Board not receiving power

Table 6-1 LED State

Location	LED #	State	Problem?	Description
3-phase board	LD1	Green	No	Board receiving proper voltage
		Dim green	Yes	Board not receiving data
		OFF	Yes	Board not receiving power
	LD2	Red	No	HD6 sensor open
		Green	No	HD6 sensor closed
		Flashing red	Yes	Board not receiving data
		OFF	Yes	Board not receiving data or power
	LD3	Green	No	Board programmed properly
		Flashing red	Yes	Board not programmed
CPU board	LD1	Orange	No	Receiving information from 2 & 3 phase boards
	LD1	Dimly flickering	Yes	Not receiving information from 2 & 3 phase boards
	LD2	Green	No	Board receiving proper voltage
		OFF	Yes	Board not receiving power
	LD3	Red	No	Currently not used
	LD4	Green	No	Receiving data
		OFF	Yes, if data is applied	Not receiving data
Data Com board.	Receive	Green	No	Receiving data
		OFF	Yes, if data is applied	Not receiving data
	Transmit	Red	No	Transmitting data
		OFF	Yes, if data is applied	Not transmitting data

Error Message Troubleshooting

X.Spot fixtures display errors in 8-character form when the menu system is locked. Unlocked, you can find a more detailed description in the two-line format menu system. See an explanation of navigating to the Display Errors option on page 3-28. The following pages list some of the error messages available in x-Spot fixtures. For other error messages, contact customer service for assistance, see “Contacting High End Systems®” on page ii.

Always check wiring connections as the first step in identifying problems indicated by error messages, see “Wire Harness Connections” on page 6-9.

Since driver boards are interchangeable, functionality can be verified by replacing a board with another board of it’s type on the fixture, see “Replacing a Driver Board” on page 5-6.

Display Error Messages

8 Character Error Message	16 Character Error Message	Location	Problem/Procedure *For replacement parts, see "Contacting High End Systems®" on page ii*
LAMPFAN1	LAMP FAN 1 STOPPED	Lamp fan on side with tilt board. Connects to Tilt board HD9.	*Fan is not operating:* 1. Check wiring connections at fan and board. 2. Verify board operation by switching it with another 3-phase board from the fixture, see "Replacing a Driver Board" on page 5-6. 3. Check for wire harness damaged or dead fan motor
LAMPFAN2	LAMP FAN 2 STOPPED	Lamp fan on side opposite tilt board. Connects to Tilt board HD3.	
OPTCFAN	OPTICS FAN STOPPED	Optics fan. Connects to Tilt board HD4.	
TOPBFAN1	TOP BOX FAN 1 STOPPED	Motor power supply fan. Connects to Pan board HD4	
TOPBFAN2	TOP BOX FAN 2 STOPPED	Lamp power supply fan. Connects to Pan board HD3.	
LMP1TEMP	HEAD TEMP 1 MISSING	Temp sensor on tilt board side. Connects to Tilt board HD5.	*Temperature sensor is not operating:* 1. Check wiring connections at temp sensor and board . 2. Check for wire damage or dead fan.
LMP2TEMP	HEAD TEMP 2 MISSING	Temp sensor on side away from Tilt board. Connects to Tilt board HD10 .	
TOPTEMP	TOP BOX TEMP MISSING	Top box motor power supply fan. Connects to HD10 on Pan board.	

Display Error Messages

8 Character Error Message	16 Character Error Message	Location	Problem/Procedure *For replacement parts, see "Contacting High End Systems®" on page ii*
PANSLOT	PAN HOMING SLOT NOT FOUND	Top box 3-phase board	*Pan or Tilt is not homing correctly:* 1. Check that there are no obstructions keeping the unit from correcting position. 2. Check wiring connections. – Sensor wire at sensor and board HD6. – Motor wire at motor and board M1. – Encoder wire at encoder and board HD7. 3. Replace with another 3-phase board to check for board malfunction, see "Replacing a Driver Board" on page 5-6. 4. Check that the Sensor is installed and undamaged. 5. Check for sensor wire damage. 6. Check for a broken belt. 7. Check for wire harness or encoder damage. 8. Replace motor.
TILTENCD	TILT ENCODER TIMEOUT	Head 3-phase board	
EDGEDIM1	DIM 1 HOMING OPEN NOT FOUND	Upper dim flag on side opposite Tilt board.	*Dim flags are not homing correctly:* 1. Check for obstruction to dim flag movement. 2. Verify color mix board operation by switching with another 2-phase board from the fixture, see "Replacing a Driver Board" on page 5-6. 3. Check Dim flag motor wire connection at motor and M1 on Color Mix board. 4. Check Dim sensor S1 connection at sensor and board. 5. Check that Dim flag sensor is installed, undamaged and operating. 6. Check that Dim flag set screw is tight. 7. Check for wire harness damage.
OPENDIM1			
EDGEDIM2	DIM 2 HOMING OPEN NOT FOUND	Lower dim flag on side with Tilt board.	
OPENDIM2			

Display Error Messages

8 Character Error Message	16 Character Error Message	Location	Problem/Procedure *For replacement parts, see "Contacting High End Systems®" on page ii*
CTO TAB	CTO HOMING TAB NOT FOUND	Color mix module 2-phase board M2 on Tilt board side of fixture.	*Color mix wheel is not homing correctly:* 1. Check if broken Color mix wheel is or another obstruction is preventing tab from being found. 2. Check connection of Color mix sensor S2 at sensor and board. 3. Check Color mix wheel wire connections to motor and board. 4. Check for Color mix board malfunction by substituting another 2-phase boards from the fixture, see "Replacing a Driver Board" on page 5-6. 5. Check that Color mix wheel homing Wheel sensor is installed. 6. Check that Set screws on color mix wheel hub and color mix drive gear hub are tight. 7. Check that Drive gear is aligned with wheel gear. 8. Check for a missing thrust washer causing two wheels to move simultaneously. 9. Check for dead color mix sensor, color mix board, color mix motor. 10.Check for Color mix wire harness damage.
COLOR	COLOR 1 HOMING TAB NOT FOUND	Color mix module 2-phase board M3 on Tilt board side of fixture.	
CYAN	CYAN HOMING TAB NOT FOUND	Color mix module 2-phase board M4 on Tilt board side of fixture.	
MAGENTA	MAGENTA HOMING TAB NOT FOUND	Color mix module 2-phase board M2 on side opposite tilt board.	
CTB TAB	CTB HOMING TAB NOT FOUND	Color mix module 2-phase board M3 on side opposite tilt board.	
YELLOW	YELLOW HOMING TAB NOT FOUND	Color mix module 2-phase board M4 on side opposite tilt board.	

Display Error Messages

8 Character Error Message	16 Character Error Message	Location	Problem/Procedure *For replacement parts, see "Contacting High End Systems®" on page ii*
GOBO1TAB	GOBO 1 HOMING TAB NOT FOUND	Dual litho module M2	*Gobo wheel is not homing correctly:* 1. Check and clear any wheel obstructions. 2. Check wheel wire connection at motor and board. 3. Verify board functioning by substituting with another 2-phase board from the fixture, see "Replacing a Driver Board" on page 5-6. 4. Check that set screws on wheel hub and drive gear hub are tight. 5. Check that wheel sensor S1 is installed and connected at sensor and board and is operating. 6. Check for wheel wire harness damaged, see "Wire Harness Connections" on page 6-9. 7. Check that Drive gear is aligned with wheel gear. 8. Check if missing thrust washer is causing two wheels to move simultaneously. 9. Check for wheel damage 10.Replace wheel motor.
EFFECT	EFFECT HOMING TAB NOT FOUND	Dual litho module M3	
GOBO2TAB	GOBO 2 HOMING TAB NOT FOUND	Litho/Iris module M2	
GOBO1TAB	GOBO 1 ROTATE TAB NOT FOUND	Dual litho module M4	*Litho rotate not homing correctly:* 1. Check for rotate sensor tab obstructions. 2. Check rotate wire connection at motor and board. 3. Check rotate sensor connection at sensor and board. 4. Verify board functioning by substituting with another 2-phase board from the fixture, see "Replacing a Driver Board" on page 5-6. 5. Check that rotate sensor is installed and undamaged. 6. Check that set screws on drive gear hub and rotate gear hub are tight. 7. Check that drive gear is aligned with rotate gear. 8. Check for rotate or sensor wire damage. 9. Replace motor.
EFFECT	EFFECT ROTATE TAB NOT FOUND	Dual litho module M1	
GOBO2TAB	GOBO 2 ROTATE TAB NOT FOUND	Litho/Iris module M1	

Display Error Messages

8 Character Error Message	16 Character Error Message	Location	Problem/Procedure *For replacement parts, see "Contacting High End Systems®" on page ii*
EDGEFCS1	FOCUS 1 HOMING EDGE NOT FOUND	Focus/Frost/Zoom module 2 phase board, motor M3	*Focus not homing correctly:* 1. Focus homing tab not installed. 2. Check focus wire connection at motor and board. 3. Verify board functioning by substituting with another 2-phase board from the fixture, see "Replacing a Driver Board" on page 5-6. 4. Check that focus sensor is installed and functioning. 5. Check focus sensors S1 & S4 connection at sensor and board. 6. Check for focus wire harness damaged. 7. Replace motor.
EDGEFCS2	FOCUS 2 HOMING EDGE NOT FOUND	Focus/Frost/Zoom module 2 phase board, motor M4	
OPENZOOM	ZOOM HOMING OPEN NOT FOUND	Focus/Frost/Zoom module 2 phase board, sensor S2 and M2	*Zoom not homing correctly:* 1. Check Zoom sensor connections at sensor and board. 2. Check Zoom motor wire connections at motor and board. 3. Check for wire damage. 4. Verify board functioning by substituting with another 2-phase board from the fixture, see "Replacing a Driver Board" on page 5-6. 5. Check that Zoom sensor is installed and operating. 6. Check that sensor wheel is installed. 7. Check that pinion gear set screw is tight. 8. Check that Zoom belt is installed and undamaged. 9. Check for Zoom lens damage. 10.Replace motor.
CLOSZOOM	ZOOM HOMING CLOSING NOT FOUND	Focus/Frost/Zoom module 2 phase board, motor M2	

Display Error Messages

8 Character Error Message	16 Character Error Message	Location	Problem/Procedure *For replacement parts, see "Contacting High End Systems®" on page ii*
EDGEFRST	FROST HOMING EDGE NOT FOUND	Focus/Frost/Zoom module 2 phase board, motor M1, sensor S3	*Frost not homing correctly:* 1. Check Frost sensor connection at sensor and board. 2. Check Frost motor wire connection at motor and board. 3. Check for wire damage. 4. Verify board functioning by substituting with another 2-phase board from the fixture, see "Replacing a Driver Board" on page 5-6. 5. Check that Frost sensor tab is installed and operating. 6. Check that Frost gear set screw is tight. 7. Check that Frost gear is aligned with frost flag teeth. 8. Replace motor.
SLOT 1 ID	MODULE SLOT 1 CONFIG CHANGE	Module in Slot 1	*CPU did not find module:* 1. Check that module is assigned to slot ID, see "Module Configuration Menu" on page 3-20. 2. Check that module is plugged into head harness. 3. Check head harness, tilt harness, pan harness, top box harness for connection and damage, see "Wire Harness Connections" on page 6-9. 4. Check if motor power supply output fuse is blown, see "Replacing Fuses" on page 5-2.
SLOT 2 ID	MODULE SLOT 2 CONFIG CHANGE	Module in Slot 2	
SLOT 3 ID	MODULE SLOT 3 CONFIG CHANGE	Module in Slot 3	

Display Error Messages

8 Character Error Message	16 Character Error Message	Location	Problem/Procedure *For replacement parts, see "Contacting High End Systems®" on page ii*
LITETOUT	LAMP TOUT	Throughout fixture	*Lamp is off:* 1. Lamp may by too hot to strike. Wait several minutes for lamp to cool, try striking lamp, see"Lamp State" on page 3-23. 2. Verify Pan board with another 3-phase board from fixture, see"Replacing a Driver Board" on page 5-6. 3. Check that wire harness is connected and undamaged. 4. Check for damage to lamp or interlock switch. To replace lamp, see "Replacing the Lamp" on page 5-4. 5. Relay, Lamp power supply, or ignitor needs to be replaced.

Wire Harness Connections

lamp power supply	◄——►	pan board
lamp power supply	◄——►	ignitor
lamp power supply	◄——►	relay
ignitor harness	◄——►	ignitor board
ignitor board	◄——►	relay ignitor
harness	◄——►	lamp socket
top box harness	◄——►	relay
top box harness	◄——►	pan board
main head harness	◄——►	interlock switch
tilt harness	◄——►	pan harness
pan harness	◄——►	top box harness
tilt harness	◄——►	main head harness

Appendix A: x.Spot™ DMX Protocol

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
		BASIC FIXTURE FUNCTIONS			
1	**Pan Coarse**	Coarse-adjusts pan to approximately 2 degrees of desired position	0-255	0-100	00-FF
2	**Pan Fine**	Fine-adjusts pan position in increments less than 1 degree	0-255	0-100	00-FF
3	**Tilt Coarse**	Coarse-adjusts tilt to approximately 2 degrees of desired position	0-255	0-100	00-FF
4	**Tilt Fine**	Fine-adjusts tilt position in increments less than 1 degree	0-255	0-100	00-FF
5	**Lamp Function**	Normal Shutter Functions	0-31	0-12	00-1F
		Lamp Assisted Strobes *boosts the Lamp above 700 Watts for periodic and random strobes set in Shutter channel 6.*	32-63	13-25	20-3F
		Lamp Effects *boosts the lamp above 700 watts for Boost to White, Boost to Black, or Lightning effects set in Shutter channel 6.*	64-95	35-37	40-5F
		Dual Dimming *adds electronic dimming to the mechanical dimming set in the Dim channel 7. (0%–100%*)	96-127	38-50	60-7F
		Electronic Dimming Only *Lamp output varies from a minimum–700W; does not go to black*	128-159	50-62	80-9F
		Reserved	160-191	63-75	A0-BF
		Reserved	192-223	75-88	C0-DF
		Normal Shutter Functions	224-255	88-100	E0-FF
6	**Shutter, Normal Function** *Lamp Function channel set from 0-31*	Close	0-23	0-9	00-17
		Periodic Strobe (variable)	24-49	9-19	18-31
		Random/Random Strobe (variable)	50-75	20-29	32-4B
		Random/Synchronous Strobe (variable)	76-101	30-40	4C-65
		Ramp Open/Snap Shut (variable)	102-127	40-50	66-7F
		Snap Open/Ramp Shut (variable)	128-153	50-60	80-99
		Ramp Open/Ramp Shut (variable)	154-179	60-70	9A-B3
		Random Ramp/Snap (variable)	180-205	71-80	B4-CD
		Random Snap/Ramp (variable)	206-231	81-91	CE-E7
		Open	232-255	91-100	E8-FF

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
6	**Shutter, Lamp Assisted Strobes** *Lamp Function channel set from 32–63*	Close	0-23	0-9	00-17
		Periodic Strobe (variable, Lamp assisted)	24-49	9-19	18-31
		Random/Rand Strobe (variable, Lamp assisted)	50-75	20-29	32-4B
		Random/Sync (variable, Lamp assisted)	76-101	30-40	4C-65
		Ramp Open/Snap Shut (variable)	102-127	40-50	66-7F
		Snap Open/Ramp Shut (variable)	128-153	50-60	80-9A
		Ramp Open/Ramp Shut (variable)	154-179	60-70	9A-B3
		Random Ramp/Snap (variable)	180-205	71-80	B4-CD
		Random Snap/Ramp (variable)	206-231	81-91	CE-E7
		Open	232-255	91-100	E8-FF
	Shutter, Lamp Effect *Lamp Function channel set from 64–95*	Close	0-23	0-9	00-17
		Periodic lamp strobes	24-49	9-19	18-31
		Random random lamp strobes	50-75	20-29	32-4B
		Synchronous random lamp strobes	76-101	30-40	4C-65
		Boost lamp 1.0 second, black	102-105	40-41	66-69
		Boost lamp 0.75 second, black	106-109	42-43	6A-6D
		Boost lamp 0.66 second, black	110-113	43-44	6E-71
		Boost lamp 0.5 second, black	114-117	45-46	72-75
		Boost lamp 0.33 second, black	118-121	46-47	76-79
		Boost lamp 0.25 second, black	122-127	48-50	7A-7F
		Boost lamp 1.0 second, white	128-131	50-51	80-83
		Boost lamp 0.75 second, white	132-135	52-53	84-87
		Boost lamp 0.66 second, white	136-139	53-55	88-8B
		Boost lamp 0.50 second, white	140-143	55-56	8C-8F
		Boost lamp 0.33 second, white	144-147	56-58	90-93
		Boost lamp 0.25 second, white	148-153	58-60	94-99
		Lightning strike 1	154-157	60-62	9A-9D
		Lightning strike 2	158-161	62-63	9E-A1
		Lightning strike 3	162-165	64-65	A2-A5
		Lightning strike 4	166-169	65-66	A6-A9
		Lightning strike 5	170-173	67-68	AA-AD
		Lightning strike 6	174-179	68-70	AE-B3
		Reserved. Default Black.	180-231	71-91	B4-E7
		Open	232-255	91-100	E8-FF

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
6	**Shutter, Electronic Dimming:** *Lamp Function channel set from 128-159*	Close	0-23	0-9	00-17
		Periodic Strobe (variable)	24-49	9-19	18-31
		Random/Rand Strobe (variable)	50-75	20-29	32-4B
		Random/Sync (variable)	76-101	30-40	4C-65
		Ramp Open/Snap Shut (variable)	102-127	40-50	66-7F
		Snap Open/Ramp Shut (variable)	128-153	50-60	80-99
		Ramp Open/Ramp Shut (variable)	154-179	60-70	9A-B3
		Random Ramp/Snap (variable)	180-205	71-80	B4-CD
		Random Snap/Ramp (variable)	206-231	81-91	CE-E7
		Open	232-255	91-100	E8-FF
7	**Dim**	Mechanical dimming only, from closed–open	0-255	0-100	00-FF
		Mechanical + electronic dimming from closed–open *Lamp Control channel 5 set from 96–127*	0-255	0-100	00-FF
8	**Frost**	Open (No Frost)	0	0	00
		Variable Frost (open to closed)	1-127	1-49	01-7F
		Full Frost	128-135	50-53	80-87
		Periodic Frost Strobe (slow to fast)	136-151	53-59	88-97
		Random Frost Strobe (slow to fast)	152-167	60-66	98-A7
		Ramp Open/Snap Shut	168-183	66-72	A8-B7
		Snap Open/Ramp Shut	184-199	72-78	B8-C7
		Ramp Open/Ramp Shut	200-215	78-84	C8-D7
		Random Ramp/Snap	216-231	85-91	D8-E7
		Random Snap/Ramp	232-247	91-97	E8-F7
		Open (No Frost)	248-255	97-100	F8-FF
9	**Focus Function**	ZoomTrack	0-31	0-12	00-1F
		Manual Focus	32-63	13-24	20-3F
		Reserved	64-95	25-37	40-5F
		Reserved	96-127	38-49	60-7F
		Reserved	128-159	50-62	80-9F
		Reserved	160-191	63-74	A0-BF
		Reserved	192-223	75-87	C0-DF
		Reserved	224-255	88-100	E0-FF
10	**Focus**	Auto or Manual Focus In	0	0	00
		Auto or Manual Focus Out	255	100	FF
11	**Zoom**	Zoom in	0	0	00
		Zoom out	255	100	FF
12	**MSpeed**	(see “MSpeed Conversion Table in Appendix B)			

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
13	**Macro** *(MacroSpeed controlled via Mspeed)*	Macro Off	0-5	0-2	00-05
		Pan sweep from small to large angle	6-62	2-24	06-3E
		Macro Off	63-65	25-26	3F-41
		Tilt sweep from small to large angle	66-122	26-48	42-7A
		Macro Off	123-125	48-49	7B-7D
		Clockwise circle from small to large	126-160	49-63	7E-A0
		Macro Off	161-163	63-64	A1-A3
		Counterclockwise circle from small to large	164-198	64-78	A4-C6
		Reserved	199-255	78-100	C7-FF
14	**Control** *(Set Shutter Channel to "0" to access Control channel settings except for Pan/Tilt)*	Safe	0-9	0-4	00-09
		Pan and Tilt Mspeed Off	10-19	4-8	0A-13
		Display Off	20-28	8-11	14-1C
		Display Dim	30-38	12-15	1E-26
		Display Bright	40-48	16-19	28-30
		Home All	60-68	24-27	3C-44
		Lamp On	80-88	31-35	50-58
		Lamp Off	90-98	35-38	5A-62
		Shutdown	120-130	47-51	78-82
		Reserved	131-149	51-58	83-95
		Home Pan/Tilt	160-168	63-66	A0-A8
		Home Color System	170-178	67-70	AA-B2
		Home Gobo System	180-188	70-74	B4-BC
		Home Strobe/Dim	190-198	75-78	78-C6
		Home Focus/Zoom/Frost	200-208	78-82	C8-D0
		Home Iris	210-218	82-86	D2-DA

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
SLOT 1: SIX-WHEEL COLOR MIXING MODULE					
15	Static Color Function	***Full Speed Control***			
		Indexed	0 - 15	0-6	0-0F
		Forward Spin	16-31	6-12	10-1F
		Reverse Spin	32-47	13-18	20-2F
		Continuous	48-63	19-25	30-3F
		Slow Scan	64-79	25-31	40-4F
		Fast Scan	80-95	31-37	50-5F
		Random	96-111	38-44	60-6F
		Blink-Indexed	112-127	44-50	70-7F
		MSpeed Control			
		Indexed	128-143	50-56	80-8F
		Forward Spin	144-159	57-62	90-9F
		Reverse Spin	160-175	63-69	A0-AF
		Continuous	176-191	69-75	B0-BF
		Slow Scan	192-207	75-81	C0-CF
		Fast Scan	208-223	82-88	D0-DF
		Random	224-239	88-94	E0-EF
		Blink	240-255	94-100	F0-FF
16	Static Color Position	***Indexed, Scan, and Blink Modes***			
		Color Position 1 Open (White)	0-23	0-9	0-17
		Position 1|2	24-42	2-17	18-2A
		Position 2	43-61	17-24	2B-3D
		Position 2|3	62-80	24-31	3E-50
		Position 3	81-99	32-38	51-62
		Position 3|4	100-118	39-46	63-76
		Position 4	119-137	47-54	77-89
		Position 4|5	138-156	54-61	8A-9C
		Position 5	157-175	62-69	9D-AF
		Position 5|6	176-194	69-76	B0-C2
		Position 6	195-213	77-84	C3-D5
		Position 6|1	214-232	84-91	D6-E8
		Position 1 Open (White)	233-255	91-100	E9-FF
		Spin Mode			
		Spin Stop	0	0	0
		Forward Spin Slowest to Fastest	4-255	2-100	.04-FF
		Reverse Spin Slowest to Fastest	4-255	2-100	.04-FF
		Random Mode			
		Random Stop	0	2-100	.04-FF
		Random Slowest to Fastest	4-255	2-100	.04-FF
		Continuous Mode			
		Positioning from 0-360 degrees	0-255	0-100	0-FF

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
17	Mix Color Function	***Full Speed Control***			
		Pure Mix	0-15	0-6	0-0F
		Continuous	16-31	6-12	10-1F
		Reserved	32-47	13-18	20-2F
		Spin (Wheel Spin speed, direction, or fixed position set individually on CYM channels.)	48-63	19-25	30-3F
		Cycle (Rate set by Cyan channel)	64-79	25-31	40-4F
		Reserved	80-95	31-37	50-5F
		Random (Rate set by Cyan channel.)	96-111	38-44	60-6F
		Blink (Defined using Continuous wheel operation)	112-127	44-50	70-7F
		MSpeed Control			
		Pure Mix	128-143	50-56	80-8F
		Continuous	144-159	57-62	90-9F
		Reserved	160-175	63-69	A0-AF
		Spin (Wheel Spin speed, direction, or fixed position set individually on CYM channels.)	176-191	69-75	B0-BF
		Cycle (Rate set by Cyan channel)	192-207	75-81	C0-CF
		Reserved	208-223	82-88	D0-DF
		Random (Rate set by Cyan channel.)	224-239	88-94	E0-EF
		Blink	240-255	94-100	F0-FF
18	Cyan	***Pure Mix Mode***			
		Full Cyan	0	0	00
		Open	255	100	FF
		Continuous and Blink Modes			
		Full Cyan	0	0	0
		Open	127	50	7F
		Full Cyan	128	50	80
		Open	255	100	FF
		Spin Mode			
		Continuous Positioning	0-127	0-50	00-7F
		Reverse Spin fastest	128-157	50-62	80-9D
		Reverse Spin slowest	158-187	62-73	9E-BB
		Spin Stop	188-195	74-77	BC-C3
		Forward Spin slowest	196-225	77-88	C4-E1
		Forward Spin fastest	226-255	89-100	E2-FF
		Cycle and Random Modes			
		Slow Rate	0	0	00
		Fast Rate	255	100	FF

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
19	Magenta	***Pure Mix Mode***			
		Full Magenta	0	0	00
		Open	255	100	FF
		Continuous and Blink Modes			
		Full Magenta	0	0	0
		Open	127	50	7F
		Full Magenta	128	50	80
		Open	255	100	FF
		Spin Mode			
		Continuous Positioning	0-127	0-50	00-7F
		Reverse Spin fastest	128-157	50-62	80-9D
		Reverse Spin slowest	158-187	62-73	9E-BB
		Spin Stop	188-195	74-77	BC-C3
		Forward Spin slowest	196-225	77-88	C4-E1
		Forward Spin fastest	226-255	89-100	E2-FF
20	Yellow	***Pure Mix Mode***			
		Full Yellow	0	0	00
		Open	255	100	FF
		Continuous and Blink Modes			
		Full Yellow	0	0	0
		Open	127	50	7F
		Full Yellow	128	50	80
		Open	255	100	FF
		Spin Mode			
		Continuous Positioning	0-127	0-50	00-7F
		Reverse Spin fastest	128-157	50-62	80-9D
		Reverse Spin slowest	158-187	62-73	9E-BB
		Spin Stop	188-195	74-77	BC-C3
		Forward Spin slowest	196-225	77-88	C4-E1
		Forward Spin fastest	226-255	89-100	E2-FF
21	Color Temperature Orange	***Always in Continuous Mode***			
		Open	0	0	0
		Full CTO	170	67	AA
		Beam flatten	213	84	D5
		Open	255	100	FF
22	Color Temperature Blue	***Always in Continuous Mode***			
		Beam flatten	0	0	0
		Open	43	17	2B
		Full CTB	213	84	D5
		Beam flatten	255	100	FF

A

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
SLOT 2: DUAL ROTATING GOBOS MODULE					
23	Gobo1 Function	***Full Speed Control***			
		Indexed	0 - 15	0-6	0-0F
		Forward Wheel Spin	16-31	6-12	10-1F
		Reverse Wheel Spin	32-47	13-18	20-2F
		Scan	48-63	19-25	30-3F
		Random	64-79	25-31	40-4F
		Blink	80-95	31-37	50-5F
		TBC	96-111	38-44	60-6F
		Continuous	112-127	44-50	70-7F
		MSpeed Control			
		Indexed	128-143	50-56	80-8F
		Forward Wheel Spin	144-159	57-62	90-9F
		Reverse Wheel Spin	160-175	63-69	A0-AF
		Scan	176-191	69-75	B0-BF
		Random	192-207	75-81	C0-CF
		Blink	208-223	82-88	D0-DF
		TBC	224-239	88-94	E0-EF
		Continuous	240-255	94-100	F0-FF
24	Gobo 1 Position.	***Indexed /Blink/Scan Modes***			
		Position 1 (Open)	0-15	0-6	0-0F
		Position 2	16-47	6-18	10-2F
		Position 3	48-79	19-31	30-4F
		Position 4	80-111	31-44	50-6F
		Position 5	112-143	44-56	70-8F
		Position 6	144-175	57-69	90-AF
		Position 7	176-207	69-81	B0-CF
		Position 8	208-239	82-94	D0-EF
		Position 1 (Open)	240-255	94-100	F0-FF
		Spin Mode			
		Spin Stop	0-3	0-1	0-3
		Spin Forward Slowest to Fastest	4-255	2-100	4-FF
		Spin Reverse Slowest to Fastest	4-255	2-100	4-FF
		Random Mode			
		Random Stop	0-3	0-1	0-3
		Random Slowest to Fastest	4-255	2-100	4-FF
		Continuous Mode			
		Positioning from 1-360 degrees	0-255	100	FF

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
25	Gobo 1 Rotate Function	***Full Speed Control***			
		Indexed	0-15	0-6	0-0F
		Forward Rotate	16-31	6-12	10-1F
		Reverse Rotate	32-47	13-18	20-2F
		Scan	48-63	19-25	30-3F
		Blink	64-79	25-31	40-4F
		Reserved	80-95	31-37	50-5F
		Reserved	96-111	38-44	60-6F
		Reserved	112-127	44-50	70-7F
		MSpeed Control			
		Indexed	128-143	50-56	80-8F
		Forward Rotate	144-159	57-62	90-9F
		Reverse Rotate	160-175	63-69	A0-AF
		Scan	176-191	69-75	B0-BF
		Blink	192-207	75-81	C0-CF
		Reserved	208-223	82-88	D0-DF
		Reserved	224-239	88-94	E0-EF
		Reserved	240-255	94-100	F0-FF
26	Gobo 1 Rotate Coarse	***Indexed /Scan/Blink Modes***			
		Position 0-360 degrees	0-255	0-100	0-FF
		Rotate Mode			
		Rotate Stop	0-3	0-1	0-3
		Forward Rotate Slowest to Fastest	4-255	2-100	4-FF
		Reverse Rotate Slowest to Fastest	4-255	2-100	4-FF
		Scan Mode			
		Scan Slowest to Fastest	0-255	0-100	0-FF
27	Gobo 1 Rotate Fine	***Indexed Mode***			
		Low Order Byte 0-360 degrees	0-255	0-100	0-FF

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
28	Effects Function	***Full Speed Control***			
		Indexed	0 - 15	0-6	0-0F
		Forward Wheel Spin	16-31	6-12	10-1F
		Reverse Wheel Spin	32-47	13-18	20-2F
		Scan	48-63	19-25	30-3F
		Random	64-79	25-31	40-4F
		Blink	80-95	31-37	50-5F
		TBC	96-111	38-44	60-6F
		Continuous	112-127	44-50	70-7F
		MSpeed Control			
		Indexed	128-143	50-56	80-8F
		Forward Wheel Spin	144-159	57-62	90-9F
		Reverse Wheel Spin	160-175	63-69	A0-AF
		Scan	176-191	69-75	B0-BF
		Random	192-207	75-81	C0-CF
		Blink	208-223	82-88	D0-DF
		TBC	224-239	88-94	E0-EF
		Continuous	240-255	94-100	F0-FF
29	Effects Position	***Indexed/Blink/Scan Modes***			
		Position 1 (Open)	0-15	0-6	0-0F
		Position 2	16-47	6-18	10-2F
		Position 3	48-79	19-31	30-4F
		Position 4	80-111	31-44	50-6F
		Position 5	112-143	44-56	70-8F
		Position 6	144-175	57-69	90-AF
		Position 7	176-207	69-81	B0-CF
		Position 8	208-239	82-94	D0-EF
		Position 1 (Open)	240-255	94-100	F0-FF
		Spin Mode			
		Spin Stop	0-3	0-1	0-3
		Forward Spin Slowest to Fastest	4-255	2-100	4-FF
		Reverse Spin Slowest to Fastest	4-255	2-100	4-FF
		Random Mode			
		Random Stop	0-3	0-1	0-3
		Random Slowest to Fastest	4-255	2-100	4-FF
		Continuous Mode			
		Positioning from 1-360 degrees	0-255	100	FF

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
30	Effects Rotate Function	***Full Speed Control***			
		Indexed	0-15	0-6	0-0F
		Forward Rotate	16-31	6-12	10-1F
		Reverse Rotate	32-47	13-18	20-2F
		Scan	48-63	19-25	30-3F
		Blink	64-79	25-31	40-4F
		Reserved	80-95	31-37	50-5F
		Reserved	96-111	38-44	60-6F
		Reserved	112-127	44-50	70-7F
		MSpeed Control			
		Indexed	128-143	50-56	80-8F
		Forward Rotate	144-159	57-62	90-9F
		Reverse Rotate	160-175	63-69	A0-AF
		Scan	176-191	69-75	B0-BF
		Blink	192-207	75-81	C0-CF
		Reserved	208-223	82-88	D0-DF
		Reserved	224-239	88-94	E0-EF
		Reserved	240-255	94-100	F0-FF
31	Effects Rotate Coarse	***Indexed/Blink Modes***			
		Position from 0-360 degrees	0-255	0-100	0-FF
		Continuously Variable Forward Rotate Mode			
		Rotate Stop	0-3	0-1	0-3
		Forward Rotate Slowest to Fastest	4-255	2-100	4-FF
		Reverse Rotate Slowest to Fastest	4-255	2-100	4-FF
		Scan Mode			
		Scan Slowest to Fastest	0-255	0-100	0-FF
32	Effects Rotate Fine	***Indexed Mode***			
		Low Order Byte position from 0-360 degrees	0-255	0-100	0-FF

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
SLOT 3: ROTATING GOBO 2 AND IRIS MODULE					
33	Gobo 2 Function	***Full Speed Control***			
		Indexed	0 - 15	0-6	0-0F
		Forward Wheel Spin	16-31	6-12	10-1F
		Reverse Wheel Spin	32-47	13-18	20-2F
		Scan	48-63	19-25	30-3F
		Random	64-79	25-31	40-4F
		Blink	80-95	31-37	50-5F
		TBC	96-111	38-44	60-6F
		Continuous	112-127	44-50	70-7F
		MSpeed Control			
		Indexed	128-143	50-56	80-8F
		Forward Wheel Spin	144-159	57-62	90-9F
		Reverse Wheel Spin	160-175	63-69	A0-AF
		Scan	176-191	69-75	B0-BF
		Random	192-207	75-81	C0-CF
		Blink	208-223	82-88	D0-DF
		TBC	224-239	88-94	E0-EF
		Continuous	240-255	94-100	F0-FF
34	Gobo 2 Position	***Indexed/Scan/Blink Modes***			
		Position 1 (Open)	0-15	0-6	0-0F
		Position 2	16-47	6-18	10-2F
		Position 3	48-79	19-31	30-4F
		Position 4	80-111	31-44	50-6F
		Position 5	112-143	44-56	70-8F
		Position 6	144-175	57-69	90-AF
		Position 7	176-207	69-81	B0-CF
		Position 8	208-239	82-94	D0-EF
		Position 1 (Open)	240-255	94-100	F0-FF
		Spin Mode			
		Spin Stop	0-3	0-1	0-3
		Forward Spin Slowest to Fastest	4-255	2-100	4-FF
		Reverse Spin Slowest to Fastest	4-255	2-100	4-FF
		Random Mode			
		Random Stop	0-3	0-1	0-3
		Random Slowest to Fastest	4-255	2-100	4-FF
		Continuous Mode			
		Positioning from 1-360 degrees	0-255	100	FF

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
35	Gobo 2 Rotate Function	***Full Speed Control***			
		Indexed	0-15	0-6	0-0F
		Forward Rotate	16-31	6-12	10-1F
		Reverse Rotate	32-47	13-18	20-2F
		Scan	48-63	19-25	30-3F
		Blink	64-79	25-31	40-4F
		Reserved	80-95	31-37	50-5F
		Reserved	96-111	38-44	60-6F
		Reserved	112-127	44-50	70-7F
		MSpeed Control			
		Indexed	128-143	50-56	80-8F
		Forward Rotate	144-159	57-62	90-9F
		Reverse Rotate	160-175	63-69	A0-AF
		Scan	176-191	69-75	B0-BF
		Blink	192-207	75-81	C0-CF
		Reserved	208-223	82-88	D0-DF
		Reserved	224-239	88-94	E0-EF
		Reserved	240-255	94-100	F0-FF
36	Gobo 2 Rotate Coarse	***Indexed/Blink Modes***			
		Position from 0-360 degrees	0-255	0-100	0-FF
		Continuously Variable Forward Rotate Mode			
		Rotate Stop	0-3	0-1	0-3
		Forward Rotate Slowest to Fastest	4-255	2-100	4-FF
		Reverse Rotate Slowest to Fastest	4-255	2-100	4-FF
		Scan Mode			
		Scan Slowest to Fastest	0-255	0-100	0-FF
37	Gobo 2 Rotate Fine	***Indexed Mode***			
		Low Order Byte position from 0-360 degrees	0-255	0-100	0-FF
38	Iris	Closed	0	0	0
		Variable Iris	1-127	1-50	01-7F
		Open	128-135	50-53	80-87
		Periodic Strobe (Variable)	136-151	53-59	88-97
		Random Strobe (Variable)	152-167	60-66	98-A7
		Ramp Open/Snap Shut (Variable)	168-183	66-72	A8-B7
		Snap Open/Ramp Shut (Variable)	184-199	72-78	B8-C7
		Ramp Open/Ramp Shut (Variable)	200-215	78-84	C8-D7
		Random Ramp/Snap (Variable)	216-231	85-91	D8-E7
		Random Snap/Ramp (Variable)	232-247	91-97	E8-F7
		Open	248-255	97-100	F8-FF

Appendix B: MSpeed Conversion Table

The following table lists the MSpeed (motor) movement times and their corresponding DMX controller values. If you have a numeric-type controller, use the Value Decimal (dec.) column. If you have a fader-type controller, use the Value Percentage (%) column. If your controller allows you to program hex values, use the Value (hex) column.

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
0.15	255	100	FF
0.15	254	100	FE
0.17	253	99	FD
0.19	252	99	FC
0.21	251	98	FB
0.25	250	98	FA
0.29	249	98	F9
0.35	248	97	F8
0.41	247	97	F7
0.47	246	96	F6
0.55	245	96	F5
0.63	244	96	F4
0.73	243	95	F3
0.83	242	95	F2
0.94	241	95	F1
1.05	240	94	F0
1.18	239	94	EF
1.31	238	93	EE
1.45	237	93	ED
1.60	236	93	EC
1.75	235	92	EB
1.92	234	92	EA
2.09	233	91	E9
2.27	232	91	E8
2.46	231	91	E7
2.66	230	90	E6
2.86	229	90	E5
3.07	228	89	E4h
3.29	227	89	E3
3.52	226	89	E2
3.76	225	88	E1
4.00	224	88	E0
4.25	223	87	DF
4.52	222	87	DE
4.78	221	87	DD
5.06	220	86	DC
5.34	219	86	DB
5.64	218	85	DA
5.94	217	85	D9
6.25	216	85	D8
6.56	215	84	D7
6.89	214	84	D6
7.22	213	84	D5
7.56	212	83	D4
7.91	211	83	D3
8.27	210	82	D2
8.63	209	82	D1
9.00	208	82	D0
9.39	207	81	CF
9.77	206	81	CE
10.17	205	80	CD
10.58	204	80	CC
10.99	203	80	CB
11.41	202	79	CA
11.84	201	79	C9
12.28	200	78	C8
12.72	199	78	C7
13.17	198	78	C6
13.63	197	77	C5
14.10	196	77	C4
14.58	195	76	C3
15.07	194	76	C2
15.56	193	76	C1
16.06	192	75	C0
16.57	191	75	BF
17.09	190	75	BE
17.61	189	74	BD
18.14	188	74	BC
18.68	187	73	BB
19.23	186	73	BA
19.79	185	73	B9
20.36	184	72	B8
20.93	183	72	B7
21.51	182	71	B6
22.10	181	71	B5
22.70	180	71	B4
23.30	179	70	B3
23.92	178	70	B2
24.54	177	69	B1
25.17	176	69	B0
25.80	175	69	AF

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
26.45	174	68	AE
27.10	173	68	AD
27.76	172	67	AC
28.43	171	67	AB
29.11	170	67	AA
29.80	169	66	A9
30.49	168	66	A8
31.19	167	65	A7
31.90	166	65	A6
32.62	165	65	A5
33.34	164	64	A4
34.08	163	64	A3
34.82	162	64	A2
35.57	161	63	A1
36.33	160	63	A0
37.09	159	62	9F
37.87	158	62	9E
38.65	157	62	9D
39.44	156	61	9C
39.44v	156	61	9C
40.23	155	61	9B
41.04	154	60	9A
41.85	153	60	99
42.68	152	60	98
43.50	151	59	97
44.34	150	59	96
45.19	149	58	95
46.04	148	58	94
46.90	147	58	93
47.77	146	57	92
48.65	145	57	91
49.54	144	56	90
50.43	143	56	8F
51.33	142	56	8E
52.24	141	55	8D
53.16	140	55	8C
54.09	139	55	8h
55.02	138	54	8A

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
55.96v	137	54	89
56.91	136	53	88
57.87	135	53	87
58.84	134	53	86
59.81	133	52	85
60.79	132	52	84
61.78	131	51	83
62.78	130	51	82
63.79	129	51	81
64.80	128	50	80
65.82	127	50	7F
66.85	126	49	7E
67.89	125	49	7D
68.94	124	49	7C
69.99	123	48	7B
71.05	122	48	7A
72.13	121	47	79
73.20	120	47	78
74.29	119	47	77
75.38	118	46	76
76.49	117	46	75
77.60	116	45	74
78.71	115	45	73
79.84	114	45	72
80.98	113	44	71
82.12	112	44	70
83.27	111	44	6F
84.43	110	43	6E
85.59	109	43	6D
86.77	108	42	6C
87.95	107	42	6B
89.14	106	42	6A
90.34	105	41	69
91.55	104	41	68
92.76	103	40	67
93.98	102	40	66
95.21	101	40	65
96.45	100	39	64

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
97.70	99	39	63
98.95	98	38	62
100.22	97	38	61
101.49	96	38	60
102.77	95	37	5F
104.05	94	37	5E
105.35	93	36	5D
106.65	92	36	5C
107.96	91	36	5B
109.28	90	35	5A
110.61	89	35	59
111.94	88	35	58
113.28	87	34	57
114.63	86	34	56
115.99	85	33	55
117.36	84	33	54
118.73	83	33	53
120.12	82	32	52
121.5v	81	32	51
122.91	80	31	50
124.31	79	31	4F
125.73	78	31	4E
127.15	77	30	4D
128.58	76	30	4C
130.02	75	29	4B
134.39	72	28	48
135.86	71	28	47
137.34	70	27	46
138.82	69	27	45
140.32	68	27	44
141.82	67	26	43
143.33	66	26	42
144.85	65	25	41
146.38	64	25	40
147.92	63	25	3F
149.46	62	24	3E
151.01	61	24	3D
152.57	60	24	3C

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
154.14	59	23	3B
155.71	58	23	3A
157.30	57	22	39
158.89	56	22	38
160.49	55	22	37
162.09	54	21	36
163.71	53	21	35
165.33	52	20	34
166.96	51	20	33
168.60	50	20	32
170.25	49	19	31
171.91	48	19	30
173.57	47	18	2F
175.24	46	18	2E
176.92	45	18	2D
178.61	44	17	2C
180.30	43	17	2B
182.01	42	16	2A
183.72	41	16	29
185.44	40	16	28
187.17	39	15	27
188.90	38	15	26
190.65	37	15	25
192.40	36	14	24
194.16	35	14	23
195.92	34	13	22
197.70	33	13	21
199.48	32	13	20
201.28	31	12	1F
203.08	30	12	1E
204.88	29	11	1D
206.70	28	11	1C
208.52	27	11	1B
210.36	26	10	1A
212.19	25	10	19
214.04	24	9	18
215.90	23	9	17
217.76	22	9	16

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
219.63	21	8	15
221.51	20	8	14
223.40	19	7	13
225.30	18	7	12
227.20	17	7	11
229.11	16	6	10
231.03	15	6	0F
232.96	14	5	0E
234.90	13	5	0D
236.84	12	5	0C
238.79	11	4	0B
240.75	10	4	0A
242.72	9	4	09
244.70	8	3	08
246.68	7	3	07
248.68	6	2	06
250.68	5	2	05
246.68	7	3	07
248.68	6	2	06
250.68	5	2	05
252.68	4	2	04

Appendix C
Safety Information

Warning: For Continued Protection Against Fire

1. This equipment is designed for use with a Philips 700 Watt, GY 9.5 base, metal halide lamp only. Use of any other type lamp may be hazardous and may void the warranty.

2. Do not mount on a flammable surface.

3. Maintain minimum distance of 1.0 meter (3.28 feet) from combustible materials.
4. Replace fuses only with the specified type and rating.

5. Observe minimum distance to lighted objects of 2.0 meters (6.6 feet).
6. This equipment for connection to branch circuit having a maximum overload protection of 20 A.

Warning: For Continued Protection Against Electric Shock

1. If this equipment was received without a line cord plug, attach the appropriate line cord plug according to the following code:
   - brown–live
   - blue–neutral
   - green/yellow–earth
2. As the colours of the cores in the mains lead of this equipment may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
   - the core which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol ⏚, or coloured green or green and yellow.
   - the core which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
   - the core which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.
3. Class I equipment. This equipment must be earthed.
4. Equipment suitable for dry locations only. Do not expose this equipment to rain or moisture.
5. Disconnect power before re-lamping or servicing.
6. Refer servicing to qualified personnel; no user serviceable parts inside.

Warning: For Continued Protection Against Exposure To Excessive Ultraviolet (UV) Radiation

1. Do not operate this equipment without complete lamp enclosure in place or if shields, lenses, or ultraviolet screens are damaged.
2. Change shields, lenses, or ultraviolet screens if they have become visibly damaged to such an extent that their effectiveness is impaired, for example by cracks or deep scratches.
3. Never look directly at the lamp while lamp is on.

Warning: For Continued Protection Against Injury To Persons

1. Use secondary safety cable when mounting this fixture.
2. Caution: hot lamp may be an explosion hazard. Do not open for 5 minutes after switching off. Wear eye and hand protection when re-lamping.
3. Equipment surfaces may reach temperatures up to 100° C (212° F). Allow 5 minutes for cooling before handling.
4. Change the lamp if it becomes damaged or thermally deformed.

Appendice C
Importantes Informations Sur La Sécurité

Mise En Garde: Pour Une Protection Permanente Contre Les Incendies

1. Cet appareil est conçu uniquement pour une lampe métallique à halogène Philips, de 700 watts, à base GY 9.5. Son utilisation avec tout autre type de lampe peut être dangereuse et annuler la garantie.

2. Ne pas monter les lampes sur une surface inflammable.

3. Maintenir à une distance minimum de 1.0 mètre de matières inflammables.
4. Ne remplacer les fusibles qu'avec des modèles et valeurs assignées recommandés.

5. Respecter une distance minimum de 2.0 mètre par rapport aux objets éclairés.
6. Cet appareil de connection au circuit comporte une protection contre les surcharges de 20 A.

Mise En Garde: Pour Une Protection Permanente Contre Les Chocs Électriques

1. Si cet équipement est livré sans prise de cable, veuillez connecter la prise de cable correcte selon le code suivant:
   - marron - phase
   - bleu - neutre
   - vert/jaune - terre
2. Débrancher le courant avant de changer les lampes ou d'effectuer des réparations.
3. Cet équipement doit être uniquement utilisé dans des endroits secs. Ne pas l'exposer à la pluie ou l'humidité.
4. À l'intérieur de l'équipement il n'y a pas de pièces remplaçables par l' utilisateur. Confiez l'entretien à un personnel qualifié.
5. Equipement de Classe I. Cet équipement doit être mis à la terre.

Mise En Garde: Pour Une Protection Permanente Contre Des Expositions Excessives Aux Rayons Ultra Violets (UV)

1. Ne pas utiliser cet appareil si le boîtier de la lampe n'est pas complètement fixé ou si les blindages, lentilles, ou écrans ultraviolets sont endommagés.
2. Changer les blindages ou les écrans ultraviolets s'ils sont visiblement endommagés au point que leur efficacité aient été altérée, par exemple par des fissures ou de profondes égratignures.
3. Ne jamais regarder directement la lampe quand celle ci est allumée.

Mise En Garde: Pour Une Protection Permanente Contre Les Blessures Corporelles

1. Lors de l'assemblage, utiliser un câble de sécurité secondaire.
2. AVERTISSEMENT: les lampes chaudes comportent un risque d'explosion. Après l'avoir éteinte, attendre 5 minutes avant de la dégager. Lors du remplacement de la lampe, une protection des yeux et des mains est requise.
3. Les surfaces de l'appareil peuvent atteindre des températures de 100 C. Laisser refroidir pendant 5 minutes avant la manipulation.
4. Changer la lampe si elle est endommagée ou thermiquement déformée.

Anhang C
Wichtige Hinweise Für Ihre Sicherheit

Warnung: Zum Schutz Vor Brandgefahr

1. Dieses Gerät ist nur für den Gebrauch mit einer 700-Watt, Philips, Metall-Halogen-Lampe mit GY 9.5-Sockel konzipiert. Der Gebrauch irgend eines anderen Lampentyps könnte Sie gefährden und Ihre Garantie außer Kraft setzen.

2. Das Gerät nie auf einer feuergefährlichen Fläche montieren.

3. Stets einen Mindestabstand von 1 Meter zu brennbaren Materialien einhalten.
4. Zum Ersatz nur Sicherungen verwenden, die dem vorgeschriebenen Typ und Nennwert entsprechen.

5. Einen Mindestabstand von 2 Meter zu den angestrahlten Objekten einhalten.
6. Dieses Gerät darf nur an eine Zweigleitung mit einem Überlastungsschutz von höchstens 20 A angeschlossen werden.

Warnung: Zum Schutz Gegen Gefährliche Körperströme

1. Wenn dieses Gerät ohne einen Netzkabelstecker erhalten wurde, ist der entsprechende Netzkabelstecker entsprechend dem folgenden Code anzubringen:
   - Braun - Unter Spannung stehend
   - Blau - Neutral
   - Grün/Gelb - Erde
2. Vor dem Austauschen von Lampen oder vor Wartungsarbeiten stets den Netzstecker ziehen.
3. Diese Geräte sind nur zum Einbau in trockenen Lagen bestimmt und müssen vor Regen und Feuchtigkeit geschützt werden.
4. Servicearbeiten sollten nur von Fachpersonal ausgeführt werden. Das Gerät enthält keine wartungsbedürftigen Teile.
5. Dieses Gerät gehört zur Klasse I. Dieses Gerät muß geerdet werden.

Warnung: Zum Schutz Gegen Übermässige Ultraviolett (UV)-Bestrahlung

1. Benutzen Sie dieses Gerät nur, wenn das komplette Lampengehäuse fest eingebaut ist; ebenfalls dürfen keine der Schutzabdeckungen, Linsen oder der UV-Schutz Beschädigungen aufweisen.
2. Die Schutzabdeckungen, Linsen und der UV-Schutz müssen ausgewechselt werden, wenn sie sichtlich dermaßen beschädigt sind, daß sie ihre Wirksamkeit einbüßen, z.B. infolge von Rissen oder tiefen Kratzern.
3. Nie direkt in die eingeschaltete Lampe schauen.

Warnung: Zum Schutz Vor Verletzungen

1. Verwenden Sie bei der Installation des Beleuchtungskörpers ein zusätzliches Sicherheitskabel.
2. VORSICHT: Bei einer heiße Lampe besteht Explosionsgefahr. Nach dem Abschalten der Netzspannung sollten Sie etwa 5 Minuten warten, bevor Sie das Lampengehäuse öffnen. Schützen Sie beim Auswechseln der Lampen Ihre Hände und tragen Sie eine Schutzbrille.
3. Die Oberflächen des Gerätes können Temperaturen bis zu 100 C erreichen. Vor dem Anfassen stets 5 Minuten lang abkühlen lassen.
4. Falls die Lampe beschädigt oder durch Wärmeeinwirkung verformt ist, muß sie ausgewechselt werden.

Apéndice C
Información Importante De Seguridad

Advertencia: Para Protección Continua Contra Incendios

1. Este equipo está diseñado para utilizarse únicamente con la lámpara de haluro metálico Philips serie M, de 700 vatios y base GY 9.5. El uso de cualquier otro tipo de lámpara puedá resultar peligroso, y puedá anular la garantía.

2. No monte el equipo sobre una superficie inflamable.

3. Mantenga una distancia mínima de materiales combustibles de 1,0 metro.
4. Cambie los fusibles únicamente por otros que sean del tipo y la clasificación especificadas.

5. Guarda una distancia mínima a objetos iluminados de 2.0 metro.
6. Este equipo debe conectarse a un circuito que tenga una protección máxima contra las sobrecargas de 20 A.

Advertencia: Para La Protección Continua Contra Electrocuciones

1. Si se recibió este equipo sin el enchufe de alimentacion, monte usted el enchufe correcto según el clave siguente:
   - moreno - vivo
   - azul - neutral
   - verde/amarillo - tierra
2. Desconecte el suministro de energía antes de recambiar lámparas o prestar servicio de reparación.
3. Este equipo se adecua a lugares secos solamente. no lo exponga a la lluvia o humedad.
4. Derive el servicio de reparación de este equipo al personal calificado. El interior no contiene repuestos que puedan ser reparados por el usuario.
5. Equipo de Clase I. Este equipo debe conectarse a la tierra.

Advertencia: Para Protección Continua Contra La Exposición A Radiación Ultravioleta (UV) Excesiva

1. No opere este equipo sin tener colocada en su lugar la caja protectora completa de la lámpara o bien, si el blindaje, los lentes o las pantallas ultravioletas están dañadas.
2. Cambie el blindaje, los lentes o las pantallas ultravioleta si nota una avería visible, a tal grado que su eficacia se vea comprometida. Por ejemplo, en el caso de grietas o rayaduras profundas.
3. Jamás mire directamente a la lámpara en tanto ésta esté encendida.

Advertencia: Para Protección Continua Contra Lesiones Corporales

1. Use cable secundario de seguridad al montar este aparato.
2. Precaución: una lámpara caliente puede constituir un peligro de explosión. No la abra por 5 minutos luego de haberla apagado. Lleve puestos, un protector ocular, y guantes al recambiar lámparas.
3. Las superficies del equipo pueden alcanzar temperaturas máximas de 100 grados centígrados. Deje que se enfríen por 5 minutos antes de tocarlas.
4. Cambie la lámpara si ésta se avería o deforma por acción térmica.

Appendice C
Importanti Informazioni Di Sicurezza

Avvertenza: Per Prevenire Incendi

1. Questa apparecchiatura è stata progettata per l'uso esclusivo con lampada a sali metallici Philips da 700 watt, base GY 9.5. L'uso di qualsiasi altro tipo di lampada può essere pericoloso e può annullare la garanzia.

2. Da non montare sopra una superficie infiammabile.

3. Mantenere l' apparecchio a un minimo di 1.0 metri (3.28 piedi) di distanza dai materiali combustibili.
4. Rimpiazare i fusibili usando soltanto quelli del tipo e della taratura adatta.

5. Mantenere una distanza minima di 2.0 metri dagli oggetti accesi.
6. Questa apparecchiatura e' da collegarsi ad un circuito con una protezzione da sovraccarico massima di 20 amperes.

Avvertenza: Per Prevenire Le Scosse Elettriche

1. Se questa apparecchiatura è stata consegnata senza una spina del cavo di alimentazione, collegare la spina appropriata del cavo di alimentazione in base ai seguenti codici:
   - marrone - sotto tensione
   - blu - neutro
   - verde/giallo - terra
2. Disinnestare la corrente prima di cambiare la lampadina o prima di eseguire qualsiasi riparazione.
3. Questa apparecchiatura e' da usarsi in ambienti secchi. Non e' da essere esposta ne alla pioggia ne all' umidita'.
4. Per qualsiasi riparazione rivolgersi al personale specializzato. L' utente non deve riparare nessuna parte dentro l' unita'.
5. Aparecchio di Classe I. Questa apparecchiatura deve essere messa a terra.

Avvertenza: Per Proteggersi Contro Le Radiazioni Dei Raggi Ultravioletti

Non usare questa apparecchiatura se il sistema di chiusura della lampadina non e' completo o se gli scudetti, le lenti, o gli schermi ultravioletti si sono visibilmente danneggiati di maniera tale che la loro efficacia sia stata ridotta --- ad esempio, se vi sono visibili spaccature o graffi profondi. Mai guardare direttamente verso la lampadina quando sia accesa.

Avvertenza: Per Non Ferire Ad Altre Persone

1. Al montare questa apparechiatura, usare un secondo cavo di sicurezza.

2. Avvertenza: la lampadina calda potrebbe esplodere. Spegnerla per 5 minuti prima di aprirla. Usare protezzioni per le mani e per gli occhi prima di cambiare la lampadina.
3. Le superfici della apparecchiatura possono arrivare a temperature di 100 gradi centrigradi (212 gradi f). Aspettare 5 minuti prima di maneggiare.
4. Cambiare la lampadina se si danneggia o se si e' deformata dovuto alle alte temperature.

Vigtig Sikkerhedsinformation

Advarsel: Beskyttelse mod elektrisk chock.

VIGTIGT! LEDEREN MED GUL/GROEN ISOLATION MAA KUN TILSLUTTES KLEMME MAERKET ⏚ ELLER ⏚.

Appendix D: Menu Map

This Appendix contains the Menu Map for the standard x.Spot fixture configuration. Edit Scene parameters in the Preset Menu and some settings in other menus will vary in different module configurations.

Navigational Basics

1. Unlock the Menu system by pressing the Menu button for a few seconds until the display goes to the 2-line format. You are now at the top level menus.
2. Use the left and right arrows ◄► on the 4-way Navigation button to scroll through Menu options at the current level.
3. Stop at the option you want and press the Enter button to select

   Note: The menu system does not store an option until the Enter button is pressed.
4. If there is another level of menu choices repeat Steps 2 and 3.
5. When you reach the option or setting level of the menu, the display shows the option currently set for that menu item. Use the up and down ▲▼ arrows on the Navigation button to scroll to the desired option or setting. The option will blink until selected. Pressing the Enter button stores the setting. Pressing the Menu button returns you to the previous menu level *without changing* the value of an option.
6. Continue pressing the Menu button to move back up levels until exiting the menu system.

D

Level 1 Menus

The following tables describe the sub-levels and options for each of the top level menus. See Chapter 3 for a more detailed description of the menu system and examples of selected operations. The following comprise the top level of the x.Spot menu system:

DMX ADDRESS MENU	FIXTURE MODE MENU
ONBOARD PRESET MENU	TEST OPTIONS MENU
SET PARAMETERS	MENUINFORMATION MENU

DMX Address Menu

Level 2	Option/Setting	Description/Notes
▼ *enters and exits Menu System*	▲▼ *scrolls between values* ◀ *selects*	
SET DMX START CHANNEL: ###	1-498	Selected value becomes the first DMX value in the range for that fixture on a DMX 512 link.

Onboard Presets Menu

Level 2	Level 3	Level 4	Option/Setting	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◀▶ *moves between items on the same level.* ◀ *selects*			▲▼ *scrolls between values* ◀ *selects*	
PLAYBACK MODE MENU	PLAYBACK MODE		ON	Plays the currently programmed sequence of scenes up to 16 scenes or until it reaches a *zeroed* scene
			OFF	Turns Playback off
	SCENE PLAYING:			Displays the scene # currently playing when PLAYBACK MODE is ON
EDIT SCENE##			1-16	Selects scene 1-16 in the current User Mode to edit
	CHASSIS MENU	SHUTTER (Options with all LAMP FUNCTION settings)	OPEN 255	Opens shutter and displays DMX value of 232 or 255
			CLOSE 0	Closes shutter and displays related DMX value of 0
			PERIODIC ## ###	Sets Periodic beam strobing rates from 1–26 with DMX value
			RANDOM ## ###	Sets Random beam strobing rates from 1–26 with DMX value
			RAND/SYNC ## ###	Sets Synchronized random strobing of all x.Spot fixtures using the same controller at strobe rates from 1–26 with DMX value
		SHUTTER (Options only with LAMP FUNCTION setting at NORMAL or LAMP STROBE)	RAMP/SNAP ## ###	Set strobe rate from 1–26 with DMX value to open shutter at variable speeds, then snap shut at full speed
			SNAP/RAMP ## ###	Set strobe rate from 1–26 with DMX value to open shutter at full speed, then ramp shut
			RAMP/RAMP ## ###	Set strobe rate from 1–26 with DMX value to open shutter at variable speeds, then ramp shut
			RNDRMPSNP ## ###	Set strobe rate from 1–26 with DMX value to open shutter at random variable speeds, then snaps shut at full speed
			RNDSNPRMP ## ###	Set strobe rate from 1–26 with DMX value to open shutter at full speed, then ramp shut at random variable speeds

Onboard Presets Menu

Level 2	Level 3	Level 4	Option/Setting		Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ◄ *selects*			▲▼ *scrolls between values* ◄ *selects*		
EDIT SCENE##	CHASSIS MENU	SHUTTER (Options only with LAMP FUNCTION setting at LAMP EFFECT)	BOOST##BLK	###	Set time in sec of 1.0, .75,.66,.50,.33,.25 with DMX value to boost the lamp then closes the shutter
			BOOST##WHT	###	Select time in sec of 1.0, .75,.66,.50,.33,.25 with DMX value to boost the lamp then leave the shutter open with lamp dimmed
			LIGHTNING #	###	Select from factory programmed lightning effects 1–6 with DMX value. *Dim channel scales brightness of the lightning effects.*
		DIM	###%	###	DIM from 0-100% with DMX value. See LAMP FUNCTION
		LAMP FUNCTION	NORMAL	###	No modification to Shutter or Dim functions
			LAMP STROBE	###	Adds Lamp boosting to strobing in the Shutter options
			LAMP EFFECT	###	Adds Boost effects and lightning effects to Shutter options
			DUAL DIM	###	Adds electronic dimming to mechanical dimming for Dim settings.
			LAMP DIM	###	Sets Dim for electronic dimming only.
		PAN	DEG###	#####	Displays Degrees from 0–620 with 16-bit DMX value
		TILT	DEG###	#####	Displays Degrees from 0–240 with 16-bit DMX value
		FROST	OPEN	###	Opens the frost flags and displays DMX values 1 and 255
			VARIABLE ###%	###	Set variable diffusion from full (100%) with frost flags closed to (0%)
			CLOSED	135	DMX value for fully closed frost flags
			PERIODIC ##	###	Set Periodic strobe rates from 1–16 with DMX value
			RANDOM ##	###	Set Random strobe rates from 1–16 with DMX value
			RAMP/SNAP ##	###	Set strobe rates from 1–16 with DMX value to ramp frost flags open, then snap shut at full speed
			SNAP/RAMP ##	###	Set strobe rates from 1–16 with DMX value to snap frost flags open at full speed, then ramp shut at variable speeds
			RAMP/RAMP ##	###	Set strobe rates from 1–16 with DMX value to ramp frost flags open then ramp shut at variable speeds
			RNDRMPSNP ##	###	Set strobe rates from 1–16 with DMX value to randomly ramp frost flags open then snap shut at full speed
			RNDSNPRMP ##	###	Set strobe rates from 1–16 with DMX value to randomly snap frost flags open at full speed, then ramp shut

D

Onboard Presets Menu

Level 2	Level 3	Level 4	Option/Setting		Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ▲ *selects*			▲▼ *scrolls between values* ▲ *selects*		
EDIT SCENE ##	CHASSIS MENU	FOCUS FUNCTION	MANUAL	63	Sets Focus parameter to operate manually
			ZOOMTRACK	0	Sets Focus parameter to automatically track Zooming
			TBD	64	Reserved for future use
		FOCUS POSITION	###%	###	0-100% of travel with the corresponding DMX value. 0%=focus in, 100%=focus out
		ZOOM POSITION	###%	###	0-100% of internal lens movement range with the DMX value. 0%=zoom in, 100%=zoom out.
		M-SPEED	###.##SEC	###	Seconds from.15–252.7 with the corresponding DMX value
		MACRO	MACROOFF	0	Displays DMX value for Macro off
			PAN1###	###	Steps of pan sweep motion from 1–58 with DMX value
			MACROOFF	63	Displays DMX value for Macro off
			TILT1###	###	Steps of tilt sweep motion from 1–58 with DMX value
			MACROOFF	123	Displays DMX value for Macro off
			CIRCLE1 ##	###	Clockwise circle angle steps from 1–36 with DMX value
			MACROOFF	161	Displays DMX value for Macro off
			CIRCLE2 ##	###	Counterclockwise circle angle steps from 1–36 with DMX value
			TBD	###	Reserved for future use

Onboard Presets Menu

Level 2	Level 3	Level 4	Option/Setting		Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ◄ *selects*			▲▼ *scrolls between values* ◄ *selects*		
EDIT SCENE ##	SLOT 1 MENU	STATIC COLOR FUNCTION	INDEXED	###	Takes quickest path and snaps to the chosen whole or half color
			FWD SPIN	###	Forward color wheel spin at variable speeds
			REV SPIN	###	Reverse color wheel spin at variable speeds
			CONTIN	###	Positioning at any point on the color wheel
			SLOW SCN	###	Oscillates the wheel at a slow range and speed
			FAST SCN	###	Oscillates the wheel at a fast range and speed
			RANDOM	###	Random whole color positions at variable speeds
			BLINK	###	Closes then reopens the shutter between indexed color changes
			MS-INDEXED	###	These Static Color Functions operate the same as full speed functions, but at the motor speed time assigned in the MSPEED Menu . For more information, see“MSpeed (Motor Speed)” on page 4-8
			MS-FWD SPIN	###	
			MS-REV SPIN	###	
			MS-CONTIN	###	
			MS-SLOW SCN	###	
			MS-FAST SCN	###	
			MS-RANDOM	###	
			MS-BLINK	###	
		STATIC COLOR	OPEN	###	When STATIC COLOR FUNCTION = INDEXED or MS-INDEXED, the display indicates options for centering the beam at a full color position or between two color positions on the wheel and the associated DMX value. When STATIC COLOR FUNCTION is set at SLOW SCN, FAST SCN, BLINK, MS-SLOW SCN, MS-FAST SCN, or MS-BLINK, that word replaces COLOR in the display and fixture performs that function at the selected position.
			COLOR 1/2	###	
			COLOR 2	###	
			COLOR 2/3	###	
			COLOR 3	###	
			COLOR 3/4	###	
			COLOR 4	###	
			COLOR 4/5	###	
			COLOR 6	###	
			COLOR 6/1	###	
			FWD SPIN###%	###	Options when STATIC COLOR FUNCTION = FWD SPIN OR MS-FWD SPIN. Set speed from slow(0%) to fast (100%) to STOP
			SPIN STOP	###	
			REV SPIN###%	###	Options when STATIC COLOR FUNCTION = REV SPIN or MS-REV SPIN. Set speed from slow (0%) to fast spin (100%) to STOP
			SPIN STOP	###	
			DEG###	###	STATIC COLOR FUNCTION is = CONTIN, Set from 1-360 degrees.
			RANDOM###%	###	Options when STATIC COLOR FUNCTION = RANDOM, Set speed from slow (0%) to fast random color (100%) to STOP
			RANDOM STOP	###	

Onboard Presets Menu

Level 2	Level 3	Level 4	Option/Setting		Description/Notes
▼ *enters and exits Menu System and moves up levels* ◀▶ *moves between items on the same level.* ◀ *selects*			▲▼ *scrolls between values* ◀ *selects*		
EDIT SCENE ##	SLOT 1 MENU	MIX COLOR FUNC	PURE MIX	###	Allows color wheel movement from open (white) to saturated color (permits a smaller "step" between color wheel positions for crossfades).
			CONTINUOUS	###	Allows complete 360 degree color wheel movement.
			TBD	###	Reserved, uses pure Mix as default.
			SPIN	###	Puts all three (cyan, magenta, and yellow) color wheels in spin mode. Wheel Spin speed, direction, or fixed position can be set individually on CMY channels.
			CYCLE	###	Cycle colors from red to green to blue at variable speeds (rate set by cyan DMX channel).
			TBD	###	Reserved; uses pure Mix as default.
			RANDOM	###	Performs a pseudo-random color chase of 12 factory-selected colors using the cyan, magenta, and yellow color wheels at variable speeds (rate set by cyan DMX channel).
			BLINK	###	Defined using Continuous wheel operation. Shutter snaps closed during any color move, then re-opens.
			MS-PURE MIX	###	These Mix Color Functions operate the same, but at the motor speed time assigned in the MSPEED Menu instead of full speed. For more information, see"MSpeed (Motor Speed)" on page 4-8
			MS-CONTINUOUS	###	
			MS-TBD	###	
			MS-SPIN	###	
			MS-CYCLE	###	
			MS-TBD	###	
			MS-RANDOM	###	
			MS-BLINK	###	
		CYAN	PURE MIX###%	###	MIX COLOR FUNC=PURE MIX, set from 0–100% Cyan
			CONTIN ###%	###	MIX COLOR FUNC=CONTIN, Open to 100% Cyan
			FWD SPIN ##	###	When MIX COLOR FUNC=SPIN, Set forward spin speed rate from 0–60 or reverse spin speed rate from 60-0. Set Position on wheel from 1-360 degrees.
			POSITION ###	###	
			REV SPIN ##	###	
			SPIN STOP	###	
			CYCRATE ###%	###	MIX COLOR FUNC=CYCLE: Cycle rate as 0–100% of maximum
			RDMRATE ###%	###	MIX COLOR FUNC=RANDOM: Random rate as 0–100% of maximum
			BLINK ###%	###	MIX COLOR FUNC=BLINK: Blink rate as 0–100% of maximum

Onboard Presets Menu

Level 2	Level 3	Level 4	Option/Setting	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ◄ *selects*			▲▼ *scrolls between values* ◄ *selects*	
EDIT SCENE ##	SLOT 1 MENU	MAGENTA	PURE MIX ###% ###	MIX COLOR FUNC=PURE MIX: 0pen–100% Magenta
			CONTIN ###% ###	MIX COLOR FUNC=CONTIN: 0pen–100% Magenta
			FWD SPIN ### ###	When MIX COLOR FUNC=SPIN, Set forward spin speed rate from 0–60 or reverse spin speed rate from 60-0. Set Position on wheel from 1-360 degrees.
			POSITION ### ###	
			REV SPIN ### ###	
			SPIN STOP ###	
			MAGENTA NOT USED	MIX COLOR FUNC=CYCLE or RANDOM
			BLINK ###% ###	MIX COLOR FUNC=BLINK
		YELLOW	PURE MIX ###% ###	MIX COLOR FUNC=PURE MIX.0pen–100% Yellow
			CONTIN ###% ###	MIX COLOR FUNC=CONTIN.0pen–100% Yellow
			FWD SPIN ## ###	When MIX COLOR FUNC=SPIN, Set forward spin speed rate from 0–60 or reverse spin speed rate from 60-0. Set Position on wheel from 1-360 degrees.
			POSITION ### ###	
			REV SPIN ## ###	
			SPIN STOP ###	
			YELLOW NOT USED	MIX COLOR FUNC=CYCLE or RANDOM
			BLINK ###% ###	MIX COLOR FUNC=BLINK
		CTO	CONTIN ### ###	Always in CONTIN mode. Select 1-360 degrees
		CTB	CONTIN ### ###	Always in CONTIN mode. Select 1-360 degrees

Onboard Presets Menu

Level 2	Level 3	Level 4	Option/Setting	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ◄ *selects*			▲▼ *scrolls between values* ◄ *selects*	
EDIT SCENE ##	SLOT 2 MENU	GOBO 1 FUNCTION	INDEXED ###	Quickest path and snap to the chosen position.
			FWD SPIN ###	Forward wheel spin at variable speeds.
			REV SPIN ###	Reverse wheel spin at variable speeds.
			SCAN ###	Oscillates the wheel at a factory-determined range and speed
			RANDOM ###	Selects random positions at variable speeds.
			BLINK ###	Closes then reopens the shutter between indexed position changes.
			TBD ###	Reserved
			CONTIN ###	Sets positioning at any point on the wheel
			MS-INDEXED ###	These GOBO 1 FUNCTIONs operate the same, but at the motor speed time assigned in the MSPEED Menu instead of full speed. For more information on Motor Speed, see“MSpeed (Motor Speed)” on page 4-8
			MS-FWD SPIN ###	
			MS-REV SPIN ###	
			SCAN ###	
			MS-RANDOM ###	
			MS-BLINK ###	
			MS-TBD ###	
			MS-CONTIN ###	
		GOBO 1 POSITION	OPEN ###	Sets wheel to open position + DMX value of 0 or 255
			POSITION 2 ###	When GOBO 1 FUNCTION = INDEXED or MS-INDEXED, the display indicates options for centering the beam at any litho position on the wheel. When GOBO 1 FUNCTION = RANDOM, SCAN, or BLINK, MS-RANDOM, MS-SCAN, OR MS-BLINK, that word replaces Position in the display.
			POSITION 3 ###	
			POSITION 4 ###	
			POSITION 5 ###	
			POSITION 6 ###	
			POSITION 7 ###	
			POSITION 8 ###	
			CONTIN ### ###	GOBO 1 FUNCTION = CONTIN. Set from 0-360 degrees .

Onboard Presets Menu

Level 2	Level 3	Level 4	Option/Setting	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ◄ *selects*			▲▼ *scrolls between values* ◄ *selects*	
EDIT SCENE ##	SLOT 2 MENU	GOBO 1 ROT FUNC	INDEXED ###	Gobo wheel takes the quickest path and snaps to chosen aperture.
			FWD ROT ###	Forward aperture wheel rotation at variable speeds.
			REV ROT ###	Reverse aperture wheel rotation at variable speeds.
			TBD ###	Reserved
			BLINK ###	Closes and opens the shutter on aperture position changes.
			TBD ###	Reserved
			MS-INDEXED ###	These Gobo 1 Rotate Functions operate the same, but at the motor speed time assigned in the MSPEED Menu instead of full speed. For more information, see"MSpeed (Motor Speed)" on page 4-8
			MS-FWD ROT ###	
			MS-REV ROT ###	
			MS-TBD ###	
			MS-BLINK ###	
			MS-TBD ###	
		GOBO 1 ROT	DEG ### #####	GOBO 1 ROT FUNC = INDEXED, TBD, MS-INDEXED. Sets aperture rotation from 0–360 degrees (16-bit DMX value)
			FORWARD###% #####	GOBO 1 ROT FUNC = FWD SPIN, MS-FWD SPIN. Sets aperture forward rotate speed from 0–100% of maximum speed to STOP (16-bit DMX value)
			STOP #####	
			REVERSE###% #####	GOBO 1 ROT FUNC = REV SPIN, MS-FWD SPIN. Sets aperture reverse rotate speed from 0–100% of maximum speed to STOP (16-bit DMX value)
			STOP #####	
			TBD #####	Reserved
			BLINK### #####	GOBO 1 ROT FUNC = BLINK, MS-BLINK.Sets aperture rotation from 0–360 degrees (16-bit DMX value)

Onboard Presets Menu

Level 2	Level 3	Level 4	Option/Setting	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ◄ *selects*			▲▼ *scrolls between values* ◄ *selects*	
EDIT SCENE ##	SLOT 2 MENU	EFFECT FUNCTION	INDEXED ###	Takes the quickest path and snaps to the chosen position.
			FWD SPIN ###	Allows a forward wheel spin at variable speeds.
			REV SPIN ###	Allows a reverse wheel spin at variable speeds.
			SCAN ###	Oscillates the wheel at a factory-determined range and speed
			RANDOM ###	Selects random whole positions at variable speeds.
			BLINK ###	Closes then reopens the shutter between indexed position changes.
			TBD ###	Reserved.
			CONTIN ###	Positioning at any point on the wheel.
			MS-INDEXED ###	These EFFECT FUNCTIONs operate the same, but at the motor speed time assigned in the MSPEED Menu instead of full speed. For more information, see“MSpeed (Motor Speed)” on page 4-8
			MS-FWD SPIN ###	
			MS-REV SPIN ###	
			SCAN ###	
			MS-RANDOM ###	
			MS-BLINK ###	
			MS-TBD ###	
			MS-CONTIN ###	
		EFFECT POSITION	OPEN ###	Sets wheel to open position + DMX value of 0 or 255
			POSITION 2 ###	When EFFECT FUNCTION = INDEXED or MS-INDEXED, the display indicates options for centering the beam at any litho position on the wheel and the associated DMX value. When EFFECT FUNCTION = RANDOM, SCAN, or BLINK, MS-RANDOM, MS-SCAN, OR MS-BLINK, that word replaces Position in the display.
			POSITION 3 ###	
			POSITION 4 ###	
			POSITION 5 ###	
			POSITION 6 ###	
			POSITION 7 ###	
			POSITION 8 ###	
			CONTIN ### ###	When EFFECT FUNCTION = CONTIN. Select from 0-360 degrees + the DMX value.

Onboard Presets Menu

Level 2	Level 3	Level 4	Option/Setting	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ◄ *selects*			▲▼ *scrolls between values* ◄ *selects*	
EDIT SCENE ##	SLOT 2 MENU	EFFECT ROT FUNC	INDEXED ###	Takes the quickest path and snaps to chosen aperture.
			FWD ROT ###	Allows a forward aperture wheel rotation at variable speeds.
			REV ROT ###	Allows a reverse aperture wheel rotation at variable speeds.
			TBD ###	Reserved
			BLINK ###	Closes and opens the shutter on aperture position changes.
			TBD ###	Reserved
			MS-INDEXED ###	These EFFECT ROTATE FUNCTIONs operate the same, but at the motor speed time assigned in the MSPEED Menu instead of full speed. For more information, see"MSpeed (Motor Speed)" on page 4-8
			MS-FWD ROT ###	
			MS-REV ROT ###	
			MS-TBD ###	
			MS-BLINK ###	
			MS-TBD ###	
		EFFECT ROTATE	DEG ### #####	EFFECT ROT FUNC = INDEXED, TBD, MS-INDEXED Sets aperture rotation from 0–360 degrees (16-bit DMX value)
			FORWARD###% #####	EFFECT ROT FUNC = FWD SPIN, MS-FWD SPIN Sets aperture forward rotate speed from 0–100% to STOP (16-bit DMX value)
			STOP #####	
			REVERSE###% #####	EFFECT ROT FUNC = REV SPIN, MS-FWD SPIN Sets aperture reverse rotate speed from 0–100% to STOP (16-bit DMX value)
			STOP #####	
			TBD #####	Reserved (16-bit DMX value)
			BLINK### #####	EFFECT ROT FUNC = BLINK, MS-BLINK. Sets aperture rotation from 0–360 degrees (16-bit DMX value)

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Onboard Presets Menu

Level 2	Level 3	Level 4	Option/Setting		Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ◄ *selects*			▲▼ *scrolls between values* ◄ *selects*		
EDIT SCENE ##	SLOT 3 MENU	GOBO 2 FUNCTION	INDEXED	###	Takes the quickest path and snaps to the chosen position.
			FWD SPIN	###	Allows a forward wheel spin at variable speeds.
			REV SPIN	###	Allows a reverse wheel spin at variable speeds.
			SCAN	###	Oscillates the wheel at a factory-determined range and speed
			RANDOM	###	Selects random positions at variable speeds.
			BLINK	###	Closes then reopens the shutter between indexed position changes.
			TBD	###	Reserved
			CONTIN	###	Allows positioning at any point on the wheel (allows for a smaller “step” between wheel positions for crossfades).
			MS-INDEXED	###	These GOBO 2 FUNCTIONs operate the same, but at the motor speed time assigned in the MSPEED Menu instead of full speed. For more information, see“MSpeed (Motor Speed)” on page 4-8
			MS-FWD SPIN	###	
			MS-REV SPIN	###	
			SCAN	###	
			MS-RANDOM	###	
			MS-BLINK	###	
			MS-TBD	###	
			MS-CONTIN	###	
		GOBO 2 POSITION	OPEN	###	Sets wheel to open position with DMX value of 0 or 255
			POSITION 2	###	When GOBO 2 FUNCTION = INDEXED or MS-INDEXED, the display indicates options for centering the beam at any litho position on the wheel and the associated DMX value. When GOBO 2 FUNCTION = RANDOM, SCAN, or BLINK, MS-RANDOM, MS-SCAN, OR MS-BLINK, that word replaces Position in the display.
			POSITION 3	###	
			POSITION 4	###	
			POSITION 5	###	
			POSITION 6	###	
			POSITION 7	###	
			POSITION 8	###	
			CONTIN ###	###	GOBO 2 FUNCTION=CONTIN. Select from 0-360 degrees with DMX value.

Onboard Presets Menu

Level 2	Level 3	Level 4	Option/Setting	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ◄ *selects*			▲▼ *scrolls between values* ◄ *selects*	
EDIT SCENE ##	SLOT 3 MENU	GOBO 2 ROT FUNC	INDEXED ###	Gobo wheel takes the quickest path and snap to chosen aperture.
			FWD SPIN ###	Forward aperture wheel rotation at variable speeds.
			REV SPIN ###	Reverse aperture wheel rotation at variable speeds.
			TBD ###	Reserved
			BLINK ###	Closes and opens the shutter on aperture position changes.
			TBD ###	Reserved
			MS-INDEXED ###	These Gobo 2 Rotate Functions operate the same, but at the motor speed time assigned in the MSPEED Menu instead of full speed. For more information, see"MSpeed (Motor Speed)" on page 4-8
			MS-FWD SPIN ###	
			MS-REV SPIN ###	
			MS-TBD ###	
			MS-BLINK ###	
			MS-TBD ###	
		GOBO 2 ROTATE	DEG ### #####	GOBO 2 ROT FUNC = INDEXED, TBD, MS-INDEXED Sets aperture rotation from 0–360 degrees (16-bit DMX value)
			FORWARD###% #####	GOBO 2 ROT FUNC = FWD SPIN, MS-FWD SPIN Sets aperture forward rotate speed from 0–100% to STOP (16-bit DMX value)
			STOP #####	
			REVERSE###% #####	GOBO 2 ROT FUNC = REV SPIN, MS-FWD SPIN Sets aperture reverse rotate speed from 0–100% to STOP (16-bit DMX value)
			STOP #####	
			TBD #####	Reserved (16-bit DMX value)
			BLINK### #####	GOBO 2 ROT FUNC = BLINK, MS-BLINK. Sets aperture rotation from 0–360 degrees (16-bit DMX value)

Onboard Presets Menu

Level 2	Level 3	Level 4	Option/Setting	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ◄ *selects*			▲▼ *scrolls between values* ◄ *selects*	
EDIT SCENE ##	SLOT 3 MENU	IRIS	CLOSE 0	Closes iris.
			VARIABLE ###% ###	Determines diameter of the beam.
			OPEN 128	Opens iris.
			PERIODIC ## ###	Strobes beam diameter at specified intervals.
			RANDOM ## ###	Strobes beam diameter at random intervals.
			RAMP SNAP ## ###	Opens iris at variable speeds, then snaps shut at full speed.
			SNAP RAMP ## ###	Opens iris at full speed, then ramps shut at variable speeds.
			RAMP RAMP ## ###	Opens iris at variable speeds, then shuts at same speed.
			RNDRMPSNP ## ###	Opens iris at variable, random speeds, then snaps shut at full speed
			RNDSNPRMP ## ###	Opens iris at full speed, then ramps shut at variable, random speeds
			OPEN 248	Opens iris
	TIMING MENU		X-FADETIME### ###	Sets time in steps from 0.1–165. Units determined by TIMEBASE
			DELAY TIME ### ###	Sets time in steps from 0.1–165. Units determined by TIMEBASE
			TIMEBASE XXXXXXX	Select Seconds, Minutes or Hours as the unit of time
	ZERO SCENE		YES	Erases the current scene. Returns DONE when action is complete
			NO	Does not erase current scene.
COPY SCENE MENU			FROM SCENE X ##	Scrolls from A1-16 through B1-16. After selection is entered the display returns STORING, then advances to TO SCENE X ##
			TO SCENE X ##	Scrolls from A1-16 through B1-16. After selection is entered the display returns STORING, then DONE when action is completed
CAPTURE DMX TO SCENE:##			1-16	Select scene in the current user mode and captures controllers DMX value
DEFAULT PRESETS			YES	Select to return to default presets. If selected, returns STORING, then DONE when complete
			NO	Leaves current programming
SEND PRESETS TO FIXTURES? XXX			YES	Sends presets to all x.spots on the link. Returns DONE when complete
			NO	Does not send presets.

Set Parameters Menu

Level 2	Options/Settings	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ◄ *selects*	▲▼ *scrolls between values* ◄ *selects*	
FACTORY DEFAULT SETTINGS: ##	ON	Reverts fixture to default setting
	OFF	Indicates a factory default has changed
PAN/TILT SWAP:	ENABLED	Swaps the Pan and Tilt Motion
	DISABLED	Restores default Pan and Tilt Motion
PAN INVERT:	ENABLED	Inverts Pan motor direction
	DISABLED	Restores default Pan motor direction
TILT INVERT:	ENABLED	Inverts Tilt motor direction
	DISABLED	Restores default Tilt motor direction
DISPLAY INVERT:	ENABLED	Inverts display functions
	DISABLED	Prevents display inversion
	AUTO	Returns display to normal orientation
DISPLAY LEVEL:	ON	Turns display on
	OFF	Display fully dimmed when menu is locked
LAMP LIFE LIMIT:	ENABLED	Tracks the time the lamp is on and sends a warning at 500 hrs.
	DISABLED	Disables lamp life tracking
DATA LOSS TIMEOUT:	LONG	Shutter closes when fixture shuts down
	SHORT	Shutter closes 1 second after data loss

Fixture Mode Menu

Level 2	Level 3	Option/Setting	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ▲ *selects*		▲▼ *scrolls between values* ▲ *selects*	
MODULE CONFIG MENU		SLOT 1 MODULE: XXXXXXXXXXXXXXX	Displays the contents of each slot. For a listing of modules in common configuration types, see“Module Configuration Menu” on page 3-20
		SLOT 2 MODULE: XXXXXXXXXXXXXXX	
		SLOT 3 MODULE: XXXXXXXXXXXXXXX	
SELECT USER MODE:		A	Selects User A
		B	Selects User B
COPY USERS	COPY PRESETS	A→B	Copies only the preset settings from the User A to User B
		A←B	Copies only the preset settings from the User B to User A
	COPY PARAMETERS	A→B	Copies the parameter defaults from User A to User B
		A←B	Copies the parameter defaults from User B to User A
	COPY ALL	A→B	Copies preset settings and parameter defaults from User A to User B
		A←B	Copies preset settings and parameter defaults from User B to User A
PROTOCOL MODE:		STANDARD	Factory default setting
		REDUCED	Optional protocol (under development)
		FLAT	Optional protocol (under development)
CROSSLOAD FIRMWARE:		NO	Safe setting
		YES	Uploads fixture software to all other x.Spot fixtures on the link

Test Options Menu

Level 2	Level 3	Level 4	Option/Setting	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ▲ *selects*			▲▼ *scrolls between values* ▲ *selects*	
HOME FIXTURE:			ALL	Homes all fixture functions
			COLOR	Homes an individual fixture function
			GOBO	
			BEAM	
			PAN/TILT	
			DIMMING	
LAMP STATE:			ON	Indicates or turns lamp on
			OFF	Indicates or turns lamp off
COPY BOOT:			NO	Does nothing when selected
			YES	Copies boot code to fixture
SELF TEST MENU	CHASSIS TEST MENU	PAN		Displays the steps and DMX values as a self test for the selected function runs in the format: STEP ## DMX:###
		TILT		
		DIM		
		FROST		
		FOCUS		
		ZOOM		
	SLOT 1 TEST MENU	STATIC COLOR		
		CYAN		
		MAGENTA		
		YELLOW		
		CTO		
		CTB		
	SLOT 2 TEST MENU	GOBO 1		
		GOBO 1 ROTATE		
		EFFECTS		
		EFFECTS ROTATE		
	SLOT 3 TEST MENU	GOBO 2		
		GOBO 2 ROTATE		
		IRIS		
	ALL			Performs and displays all self test functions sequentially

Information Menu

Level 2	Level 3	Level 4	Level 5	Option/Setting	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◀▶ *moves between items on the same level.* ◢ *selects*				▲▼ *scrolls between values* ◢ *selects*	
SENSOR STATUS MENU	PAN ENCODER ###				Displays absolute position of Pan
	TILT ENCODER #####				Displays absolute position of Tilt
UNIQUE NUMBER ########					Displays fixture's unique 10-character number
DMX VALUES MENU	BY CHANNEL			1:### ### ### 4:### ### ###	Displays current values for Channels 001– 512 and 6 DMX values/screen. The number at the beginning of each line indicates the first channel with a value displayed on that line.
				7 ### ### ### 10:### ### ###	
				###:### ## ### ###:### ## ###	
	BY PARAMETER	CHASSIS PARAMETERS MENU	DMX BREAKS ####		Displays one parameter per screen with current DMX value below it.
			DMX FRAMING ERR ###		
			DMX OVERRUN ERR ###		
			DMS START CHANNEL ###		
			PAN COURSE ###		
			PAN FINE ###		
			TILT COARSE ###		
			TILT FINE ##		
			LAMP CONTROL ###		
			SHUTTER ###		
			DIM ###		
			FROST ###		
			FOCUS CONTROL ###		

Information Menu

Level 2	Level 3	Level 4	Level 5	Option/Setting	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ◄ *selects*				▲▼ *scrolls between values* ◄ *selects*	
DMX VALUES MENU	BY PARAMETER	SLOT1 PARAMETERS	STATIC COLOR FUNCTION ###		Displays one parameter per screen with current DMX value below it.
			STATIC COLOR POSITION ###		
			MIX COLOR FUNCTION ###		
			MIX COLOR POSITION ###		
			CYAN ###		
			MAGENTA ###		
			YELLOW ###		
			CTO ###		
			CTB ###		
		SLOT 2 PARAMETERS	GOBO 1 FUNCTION ###		Displays one parameter per screen with current DMX value below it.
			GOBO 1 POSITION ###		
			GOBO 1 ROTATE FUNCTION ###		
			GOBO 1 ROTATE COARSE ###		
			GOBO 1 ROTATE FINE ###		
			EFFECTS FUNCTION ###		
			EFFECTS POSITION ###		
			EFFECTS ROTATE FUNCTION ###		
			EFFECTS ROTATE COARSE ###		
			EFFECTS ROTATE FINE ###		

Information Menu

Level 2	Level 3	Level 4	Level 5	Option/Setting	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ◄ *selects*				▲▼ *scrolls between values* ◄ *selects*	
DMX VALUES MENU	BY PARAMETER	SLOT3 PARAMETERS	GOBO 2 FUNCTION ###		Displays one parameter per screen with current DMX value below it.
			GOBO 2 POSITION ###		
			GOBO 2 ROTATE FUNCTION ###		
			GOBO 2 ROTATE COARSE ###		
			GOBO 2 ROTATE FINE ###		
			IRIS		
TEMPERATURES MENU	CURRENT TEMPERATURE			TOPBOX: ###C	Displays current temperature of selected sensor in centigrade
				HEAD 1: ###C HEAD 2: ###C	
	MAXIMUM TEMPERATURE			TOPBOX: ###C	
				HEAD 1: ###C HEAD 2: ###C	
	MINIMUM TEMPERATURE			TOPBOX: ###C	
				HEAD 1: ###C HEAD 2: ###C	
	TEMPERATURES RESET			NO	Default “safe” setting
				YES	Press Enter for 5 seconds to reset all four sensors to current temperature
FAN SPEED MENU				TOPBOX 1: ###RPS TOPBOX 2: ###RPS	Indicates the speed of selected fan in revolutions per second
				HEAD 1: ###RPS HEAD 2: ###RPS	
				OPTICS: ###RPS	
FIXTURE HOURS:	###:##				Displays fixture operation time in hours:minutes
FIXTURE HOURS RESET:				NO	Default “safe” setting
				YES	Press Enter for 5 seconds to reset fixture hours to 0
LAMP HOURS:	###:##				Displays lamp operation time in hours:minutes
LAMP STRIKES:	####				Displays current number of lamp strikes

Information Menu

Level 2	Level 3	Level 4	Level 5	Option/Setting	Description/Notes
▼ *enters and exits Menu System and moves up levels* ◄► *moves between items on the same level.* ▲ *selects*				▲▼ *scrolls between values* ▲ *selects*	
LAMP HR/STRIKE RESET: ###				NO	Default “safe” setting
				YES	Press Enter for 5 seconds to reset fixture hours to 0
LAMP STATUS:	LAMP OFF				Displays current lamp status
	LAMP ON				
	LAMP STRIKING				
	LAMP ERROR				
SOFTWARE VERSION:	V ##.##.###				Major.Minor.Build
MODULE VERSION MENU	PAN HW:# SW:#				Displays the Hardware and Software versions for each logic board in the fixture. Displays NOT AVAILABLE if a board does not exist in that position.
	TILT HW:# SW:#				
	FOCUS/FROST/ZOOM HW:# SW:#				
	SLOT 1A HW:# SW:#				
	SLOT 1B HW:# SW:#				
	SLOT 2A HW:# SW:#				
	SLOT 2B HW:# SW:#				
	SLOT 3A HW:# SW:#				
	SLOT 3B HW:# SW:#				
DISPLAY ERRORS MENU	XXXXXXXXXXXXXXX XXXXXXXXXXXXXXX				Scrolls through errors displayed in 2-line, 16-character format
CHANNELS NEEDED:	##				Displays channel range for current configuration (38 for standard x.Spot)
NEXT DMX CHANNEL:	##				(Current start channel + channels needed+1)

Symbols

A

B

C

D

E

M

N

O

P

R

S

T

U

W

X

Y