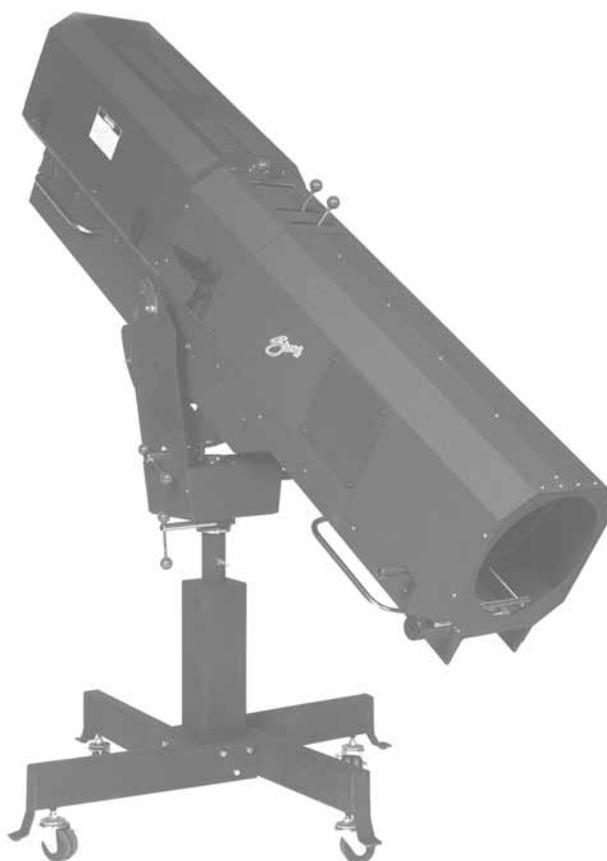


# FOLLOW SPOTLIGHT INSTRUCTION MANUAL

## XENON GLADIATOR IV

Equipment Type 47070-02 • Rev. January 2009



a division of Ballantyne of Omaha, Inc.

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<b>BULB WATTAGE</b>	<b>CURRENT RANGE (DC)</b>	<b>NOMINAL CURRENT</b>	<b>DO NOT EXCEED</b>
2000	50-90 A.	75 A.	90 A.
2500	70-100 A.	90 A.	100 A.
3000	60-110 A.	100 A.	110 A.
4000	80-150 A.	125 A.	150 A.



## PREFACE

STRONG INTERNATIONAL'S XENON GLADIATOR IV Model 47070 is a direct current follow spotlight system complete with a lamphouse, xenon power supply, optical system, color boomerang, and base stand assembly. The spotlight assembly consists of the arc lamp, variable focus lens system, color boomerang, and base. The separate xenon power supply completes the installation. Only these special power supplies furnished by Strong Entertainment Lighting can be used with the Gladiator IV. For installation and operation of the power supply, see the instruction manual furnished separately.

THE XENON LAMPHOUSE utilizes a xenon bulb designed for horizontal operation, and a deep ellipse metal reflector, as a light source. The reflector operates in a fixed position, and is dichroic ("cold") coated to reduce heat in the projected light. A lens blower and heat filter, mounted in the spotlight optical system, further reduce heat at the projection lens and color media.

ONLY XENON BULBS specifically designed for horizontal operation should be used in this follow spot. The Gladiator IV lamphouse is designed to use the LTIX-4500W-HS watt bulb, and replacement bulbs (4000-4500 watt, not exceeding 4500 watts) must be certified as 100% interchangeable with this bulb. Lower wattage (2000-3000 watt Type "HS") bulbs may be installed in the Gladiator IV using an optional anode support collet and cathode adapter kit supplied by Strong. All required bulb cabling and contact clamps are provided in the xenon lamphouse.

ADJUSTMENT CONTROL for the xenon bulb is located at the rear of the lamphouse behind the access cover. The adjustments control the horizontal, vertical and focal movement of the bulb.

INSTRUMENTATION of the lamphouse includes a DC ammeter and a running time meter. The ammeter continuously displays the operating current (amperage) applied to the bulb; pressing the VOLTS/AMPS switch below the ammeter momentarily indicates the DC voltage at the arc. The running time meter records the elapsed hours of the bulb. A second rocker switch controls lamp ON/OFF.

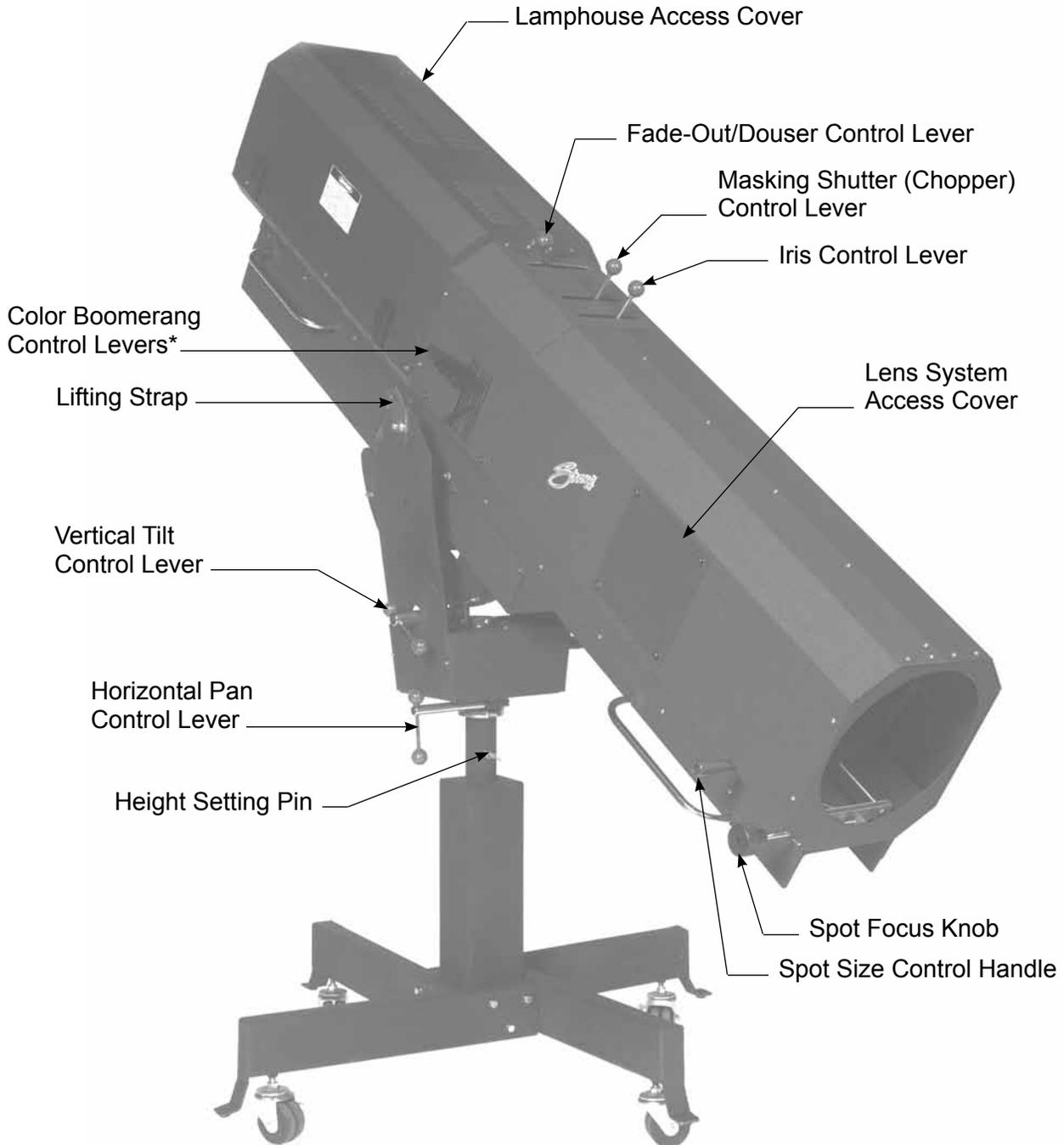
TWO LAMPHOUSE COOLING BLOWERS are internally wired and operate on AC voltage derived from the xenon power supply. These blowers are required to maintain a safe operating temperature at the bulb seals. A third blower cools the optical system and the center-mounted color boomerang. These blowers operate continuously until the xenon power supply is de-energized.

THE LAMPHOUSE is supplied with a 13 foot (4 meter) cable containing the DC leads, the AC control wires, and the ground wire. The cable terminates in a multiple-pin, quick-disconnect plug keyed to mate with the receptacle on the power supply cabinet.

WHEN TRANSPORTING THE SPOTLIGHT, it is necessary to remove the xenon bulb and place it in its original shipping container to prevent breakage. See the SAFETY PROCEDURES section following, and permit only trained and authorized personnel to handle the xenon bulb.

IF AT ANY TIME you have a suggestion, or desire aid in securing anticipated results, write directly to STRONG INTERNATIONAL, 4350 McKinley Street, Omaha, Nebraska 68112 USA, or online at [www.strong-lighting.com](http://www.strong-lighting.com).

# XENON GLADIATOR IV



\* Color Boomerang Type 7200264 shown;  
see Figure 6B for Type 7200709 (Front Mount)

Leveling Feet *not shown*;  
see Figure 8

## INSTALLATION AND SETTING UP SPOTLIGHT

THE XENON GLADIATOR IV is shipped in sections which must be assembled. Lifting straps on the yoke assembly permit completely assembling the spotlight on the floor and later hoisting it to an elevated position.

ASSEMBLE THE FOUR BASE LEGS to the lower square section of the base column, leg brackets downward, and align the holes. Secure using the (4) T-bolts. Insert a leveling foot with locknuts in each of the four leg brackets and level the base before continuing the installation.

WHEN INSTALLED in a permanent location, the casters and leveling feet must be removed, and the clearance holes in the base leg brackets used for hardware (user supplied) to bolt the base to the floor or platform. If it is desired to have the unit portable, when operating, the leveling feet *must* be adjusted down until the weight of the spotlight has been shifted from the casters to the leveling feet.

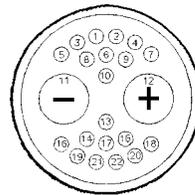
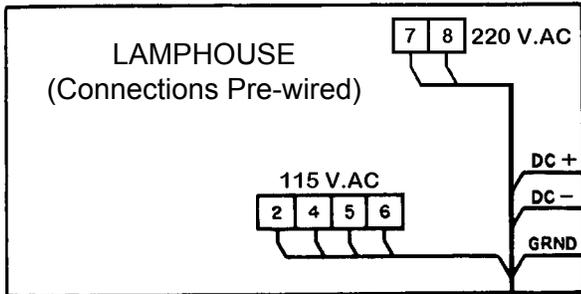
THE INNER TUBE of the support yoke has three holes to permit adjusting the height of the spotlight. The three holes are on four-inch centers and will allow an optical height of approximately 53 inches, 57 inches, and 61 inches above floor level to the optical center of the lamphouse and lens system. Insert the height location pin through the hole in the outer tube and one of the holes in the inner tube. The leveling feet may be adjusted through an additional two-inch range.

THE HORIZONTAL SWING and vertical tilt locking knobs are on the right hand (operating) side of the yoke assembly. Level the yoke and tighten both of these locking devices securely before attempting to place the lamphouse and lens system on the support yoke.

PLACE THE LAMPHOUSE and lens system on the yoke assembly, with the spot size control handle to the right hand (operating) side, the same as the locking controls on the yoke. Line up four tapped (5/16-18) mounting holes in the bottom of the base rail mounting bracket with mating holes in the yoke saddle and secure using the four 5/16-18 wing screws, lockwashers and flatwashers. Two sets of holes allow setting correct balance for units with or without the front-mounted boomerang; the mounting holes are also slotted to allow fine adjustment for precisely balancing the spotlight. Loosen the tilt lock and test the spotlight balance before permanently tightening the wing screws.

ATTACH THE LAMPHOUSE CABLE CONNECTOR to the mating receptacle on the power supply. The lamphouse and power supply connectors are keyed for correct pin alignment; make certain pins are seated before tightening the locking ring. DO NOT energize the xenon power supply before the xenon bulb is correctly installed into the lamphouse.

## LAMPHOUSE - POWER SUPPLY Interconnection Diagram

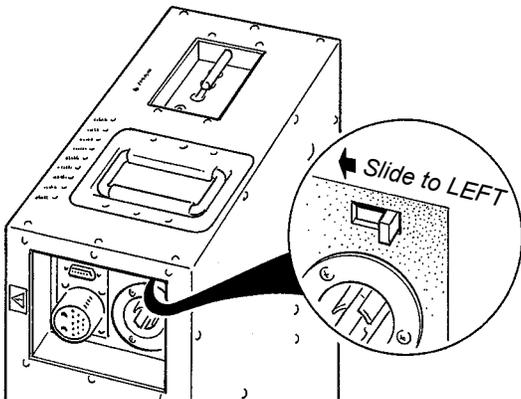
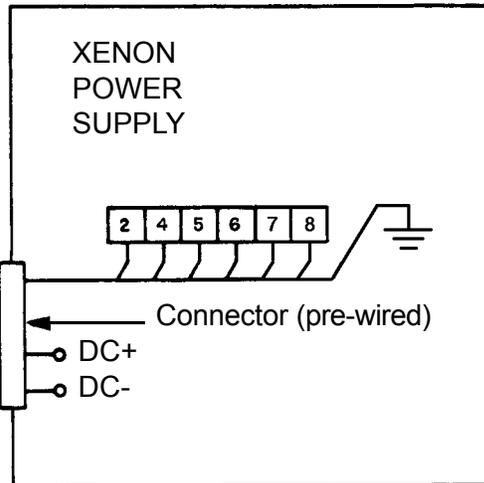


CONNECTOR	
Pin	Wire No.
11	DC-
12	DC+
2	2
4	4
5	5
6	6
9	7
10	8
14	Grnd

Lamphouse  
Cable Assembly

**SYSTEM MUST BE GROUNDED**  
All wiring must conform to local codes;  
shield lamphouse cable in conduit  
if required.

Check Slide Switch (below) on Power  
Supply for correct "SPOT" position.



## SAFETY PROCEDURES



### READ CAREFULLY BEFORE INSTALLING XENON BULB



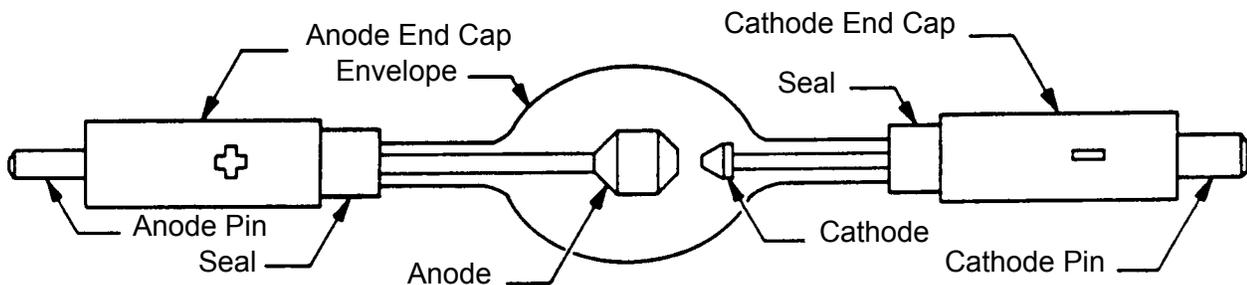
THE XENON BULB is highly pressurized. When ignited, the normal operating temperature of the bulb increases the pressure to a level at which the bulb may explode if not handled in strict accordance to the manufacturer's operating instructions.

THE BULB is stable at room temperature, but may still explode if dropped or otherwise mishandled. Breakage resulting from transport and handling is *not* covered by the bulb manufacturer's warranty, and it is strongly recommended to dismount the xenon bulb when transporting the spotlight.

REFER bulb replacement and service to QUALIFIED PERSONNEL with adequate protective clothing (face shield, clean cotton gloves, welder's jacket). For routine lamphouse service, observe the following rules:

1. Allow the bulb to cool to room temperature before opening the lamphouse. Put on protective clothing described above.
2. De-energize the xenon power supply at the AC source before opening the lamphouse compartment.
3. When possible, encase the bulb in its protective cover when cleaning or servicing the lamphouse interior. The bulb, when outside the lamphouse, must be encased in the cover.
4. Clean the bulb after it has cooled to room temperature. Do not touch the quartz envelope of the bulb; fingerprints will burn in and create hot spots which may shorten bulb life. If fingermarks are made, they should be carefully removed with methyl alcohol and cotton prior to bulb operation.
5. Never view an ignited bulb directly. **BLINDNESS OR PERMANENT EYE DAMAGE MAY BE INCURRED.**
6. Use only xenon bulbs designated as OZONE FREE. When possible, vent the lamphouse exhaust to outside atmosphere.
7. Maintain the lamphouse blowers in good operating condition. Keep the blower inlets and grilles clean for unrestricted air flow.
8. To insure maximum bulb life, operate the lamphouse blowers for **at least** ten minutes after extinguishing the bulb.
9. If returning a bulb for warranty adjustment, pack it in its original shipping container. Complete and return all required warranty information.

10. Dispose of expired bulbs that are beyond warranty in the following manner: Wrap the bulb tightly in several layers of canvas or heavy cloth. Place it on a hard surface and shatter the envelope with a sharp hammer blow. DO NOT place an unshattered bulb in an ordinary refuse container.
11. DO NOT PERMIT UNAUTHORIZED PERSONNEL TO PERFORM OR ATTEMPT ANY PHASE OF XENON BULB HANDLING OR SERVICE.



#### **PRIOR TO INSTALLING BULB, PLEASE NOTE:**

For use in a Gladiator IV lamphouse, it is necessary to remove the anode lead (if attached) from the anode end cap of the xenon bulb. Observe all bulb safety procedures and leave the bulb in its protective cover. Grasp the bulb by the anode (+) end cap. Use small channel locks or slip-joint pliers and grip the bulb lead fitting at the crimp joint nearest the end cap, and unscrew the lead. If the bulb manufacturer uses a brazed rather than threaded connection, cut the lead from the end cap, cutting as close as possible to the end cap.

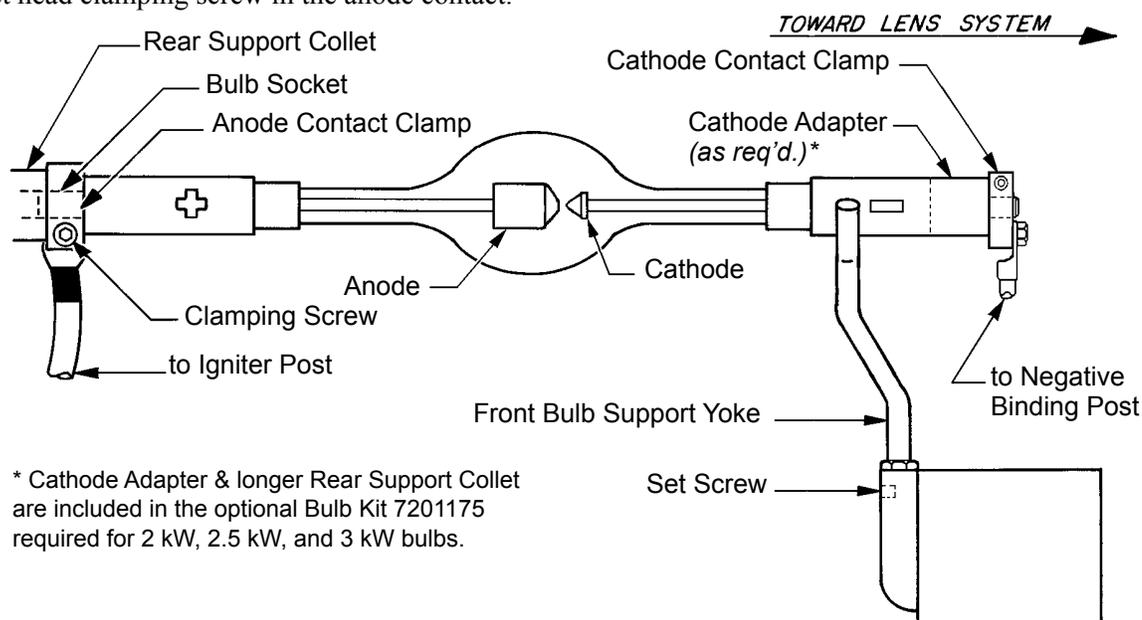
The standard bulb support collet (7200285) measures 4-11/16 inches (120mm) overall and is designed for a 4000 watt "HS" xenon theater bulb. When using a smaller, lower wattage bulb, a longer support collet (7200638) measuring 6-7/16 inches (164mm) must be installed in place of the standard collet, and a chromed cathode adapter (7201174) must be mounted to the bulb's cathode pin. These components are included in the optional Bulb Kit 7201175, and both the collet and the bulb adapter should be mounted prior to installing the bulb.

## BULB INSTALLATION

OBSERVE ALL SAFETY PROCEDURES when working around the xenon bulb. Open the lamphouse access cover by releasing the clasps and swinging the cover up to its stop. Loosen the (5) captive fasteners and remove the two bulb compartment side covers. Verify that the lamphouse is fitted with the correct support collet appropriate to the desired bulb wattage. The bulb leads and contact clamps are tied down for shipping. Free the clamps and slide the anode clamp over the brass socket of the rear support collet.

REMOVE THE PLASTIC PROTECTIVE COVER from the xenon bulb only if necessary. Handle the bulb by the metal end caps *only*. Dismount the anode lead from the (+) end cap of the bulb if attached. Grasp the bulb by the metal anode (+) end cap *only* when unscrewing the lead from the bulb; DO NOT hold the bulb at the cathode (-) end cap when removing the anode lead.

INSERT THE BULB into the lamphouse, passing the anode (+) end cap through the center hole of the reflector. Take care not to bump or scratch the surface of the reflector. Insert the anode (+) pin into the rear support collet and contact clamp. Rest the cathode (-) end cap in the front bulb support yoke. Seat the anode (+) pin into the rear support collet as far as possible for correct focus travel. Securely tighten the socket head clamping screw in the anode contact.



REST THE CATHODE END CAP in the "V" of the bulb yoke. Dress the bulb lead directly in front of the bulb support yoke to minimize the projected shadow, but do not allow it to touch grounded metal lamphouse components; the bulb yoke and the support casting are insulated from ground. Slide the cathode contact clamp over the cathode (-) pin and securely tighten the clamping screw.

REMOVE THE PLASTIC COVER from the bulb. Record the bulb serial number, date, and lamphouse hours on the Xenon Bulb Record on the inside back cover of this manual. Replace the bulb enclosure covers and secure the captive fasteners. Use of these covers maximizes bulb cooling for long life.

ESTABLISH A ROUTINE of periodically checking all electrical connections for tightness. Loose contacts, particularly in the DC circuit, will cause overheating and damage the xenon bulb and other components. Normal xenon bulb warranties allow **no credit** for bulb damage caused by overheating.

REFER TO THE BULB MANUFACTURER'S INSTRUCTIONS regarding bulb rotation. Most bulb manufacturers recommend rotating the bulb 180° at 50% of warranty hours. After rotating the bulb, operate at maximum allowable current for several hours, and then return to the nominal operating current.

IN THE EVENT of a bulb warranty claim, the bulb must be packaged in its original shipping container, and returned with all required warranty forms completed. Contact the dealer through whom the bulb was originally purchased for correct procedures and Return Authorizations.

IT IS A COMMON PRACTICE to replace the bulb at the expiration of its warranty period. If a xenon bulb explodes in operation, the reflector and other lamphouse components are frequently damaged. The xenon bulb manufacturer will extend *no credit* for a replacement reflector if the defective bulb is beyond warranty. Explosion-damaged reflectors are to be returned to the **bulb supplier**, NOT Strong Entertainment Lighting, unless the bulb was supplied by Strong.

### ARC STABILIZATION MAGNET

THE XENON BULB used in the Gladiator IV lamphouse requires use of an arc stabilization magnet. This magnet is located below and behind the reflector. The magnet is preset at the factory and should not require adjustment. Should it become necessary to adjust the magnet, the following procedure must be followed. Observe all bulb safety procedures when working in the lamphouse compartment.

A NORMAL ARC should appear as shown in Figure "A," and represents the correct magnet position. Figure "B" shows the position of the arc when the magnet is too low; Figure "C" shows the position of the arc when the magnet is too high. Condition "B" or "C" will cause arc flicker. If flicker is apparent in the projected spot, raise or lower the magnet on its slots as required to position the arc as illustrated in Figure "A."

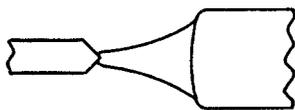


FIGURE A

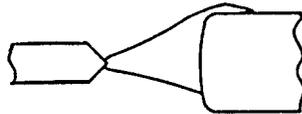


FIGURE B

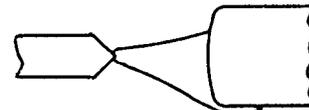


FIGURE C

THE MAGNET must always be installed with the longest portion of the magnet uppermost (nearest the bulb), and with the NORTH (N) pole pointing toward the operator side access door. Reversing the magnet will cause bulb flicker, and may inhibit bulb ignition. In new equipment, the magnet is normally in the center of the adjustment range. Changes in the magnet position are required *only* to correct an improperly burning arc (Figure "B" or "C").

ANY REPLACEMENT MAGNET should first be installed in the center position of the adjustment range. Raise or lower the magnet as required to center the arc as illustrated in Figure "A."

## OPERATION

OPEN THE BOOMERANG ACCESS COVER and verify that the round glass heat filter and ring assembly (Figure 5, Item 17) is installed into the bracket mounted to the fadeout and douser support housing. NOTE: The followspot should *never* be operated with this heat filter removed.

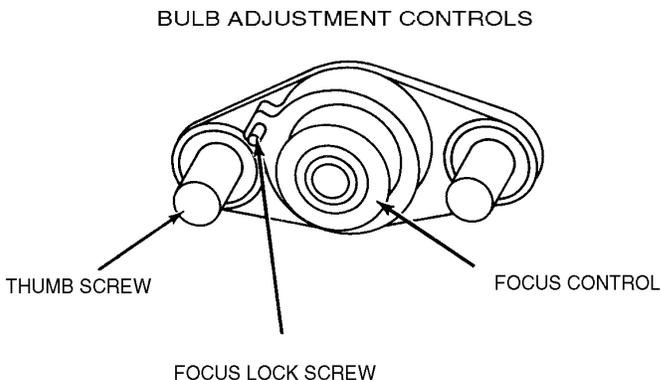
REMOVE THE PLASTIC COVER from the xenon bulb. DO NOT ignite the lamp with the cover on the bulb. Store the cover for future re-use. Replace and secure the inner bulb enclosure covers.

CLOSE THE LAMPHOUSE COVER and secure using both latches. Turn on the main line switch and/or circuit breaker to energize the xenon power supply. The spotlight blowers will start and operate continuously until the xenon power supply is de-energized.

PLACE THE **LAMP SWITCH** in the “ON” position and the lamp will ignite. Check the reading on the lamphouse ammeter. Nominal current for the 4000/4500 watt xenon bulb is 135 amperes. If using a lower wattage bulb, check the documentation packaged with the bulb for its current ratings. DO NOT, AT ANY TIME, exceed maximum rated amperage. Output current is adjusted at the xenon power supply; see power supply manual for instructions. Operation of a new bulb is normally started at the lower end of its range, and current is gradually increased as the bulb ages to maintain light output. During the ignition cycle, pressing the VOLTS/AMPS switch will briefly indicate the high “no load” (open circuit) DC voltage applied to the xenon bulb for ignition.

OPEN THE REAR COVER above the instrument panel by loosening the (2) thumbscrews. This exposes the bulb positioning controls in the lamphouse back casting. To focus the xenon bulb and obtain the best light on the stage, the two methods outlined below are the most suitable.

MOVE THE SPOT SIZE CONTROL HANDLE (trombone) on the large lens carriage all the way forward to project the smallest spot possible; place the iris, masking shutters (choppers) and the fadeout douser blades in their full open positions. Project a spot to a wall or similar flat perpendicular surface opposite the spotlight position.



THE CENTER SECTION of the bulb positioning controls is a threaded member that focuses the bulb in relation to the reflector. Turning this adjustment moves the bulb in only one plane, into or away from the reflector. Turning this section clockwise moves the arc away from the reflector. The small knurled screw to the left of this section can be tightened to lock the focusing mechanism after the following procedures have been completed.

THE LARGE THUMB SCREWS, on either side of the focusing control, lock the horizontal and vertical adjustment mechanism in position.

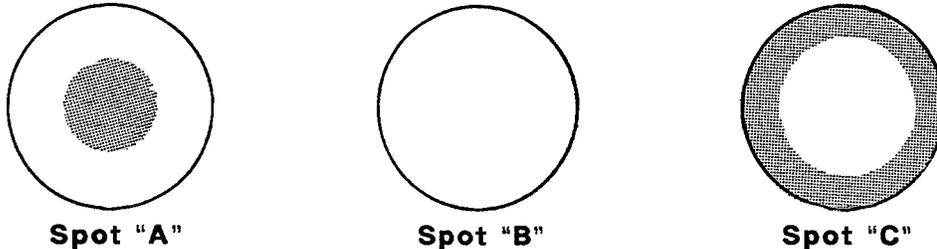
TURN THE CENTER FOCUSING SECTION of the bulb positioning control counterclockwise until a small black spot is projected onto the wall. It may be best to run this adjustment both directions to permit positive identification of the spot.

LOOSEN THE TWO THUMB SCREWS, one on either side of the center focusing section, just enough to permit manual movement of the complete assembly. The bulb positioning control will now move around these two thumb screws, and as this control is shifted, the smooth shadow of the bulb electrode can be seen extending beyond the projected center hole in the reflector. The shadow of the electrode (black spot) must be centered in the projected hole of the reflector (shaded, less dense dark area).

MOVE THE CONTROL SECTION around the two screws until the black spot is as round as possible to project. It may be necessary to again turn the focus control to project a sharply defined black spot.

AFTER THE BLACK SPOT is as even around the outside as possible to project, and appears centered in the shaded reflector center hole (Spot "A"), tighten the two large thumb screws to lock the position of the mechanism. Turn the center focus control to obtain the brightest light with the best light distribution (Spot "B") and continue to the defocused position (Spot "C") to verify that the bulb is centered in the reflector.

IF THE CENTER BRIGHT SPOT tracks off to the left, right, top, or bottom, it may be necessary to reposition the front bulb support yoke to compensate. Loosen the set screw in the support casting and reset the yoke as required. The hex nut may be used to lock the height of the yoke. Secure the yoke with the set screw after the bulb tracks on a straight axis. Return the focus control to the desired Spot "B," and rotate the spot focus control knob, located at the extreme front of the lens mechanism, to obtain the sharpest edge possible on the projected spot.



THE SECOND METHOD of focusing the xenon bulb is to project the spot to the stage, and working with the above lamphouse controls, adjust these controls to obtain a "hot spot" on the projected spot. Center this "hot spot" on the projected light by moving the entire control section around the two thumb screws. Once this "hot spot" is centered in the projected light, lock the control in position with the two thumb screws and turn the center section to obtain a spot with an even distribution of light. Rotate the lens spot focus control knob to obtain a sharp edge on the projected spot.

THESE ADJUSTMENTS should not be disturbed until after replacing or rotating the xenon bulb. At that time, the procedure on obtaining a smooth, round black spot, or "hot spot," may have to be repeated. Replace the cover plate over the bulb positioning controls and tighten the (2) thumbscrews.

BECAUSE OF NORMAL BULB AGING, and manufacturing tolerances between individual xenon bulbs, it may be necessary to operate different lamps at slightly higher or lower current settings to achieve balanced, uniform light output when two or more spotlights are used in one installation. This entails a slight current output adjustment at the xenon power supplies. See the power supply manual.

TO EXTINGUISH the arc, place the LAMP switch on the instrument panel to "OFF." The lamphouse blowers will continue to operate until the xenon power supply is de-energized. Allow the blowers to operate for ten minutes before turning off the power supply; a forced-air bulb cooling cycle at shutdown is *required* by all bulb manufacturers to comply with their warranty terms.

BEFORE OPENING the lamphouse enclosure for servicing, allow the blowers to operate for twenty minutes, or until the bulb has cooled to room temperature.

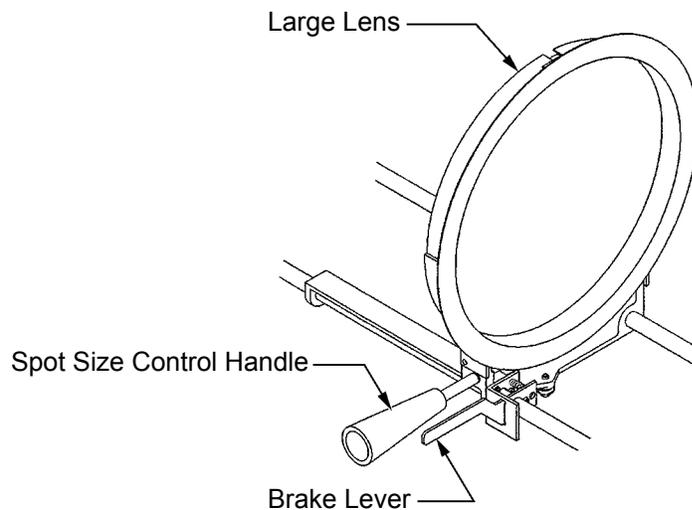
## HANDLING THE SPOTLIGHT

GENERALLY THE BEST POSITION for the operator to stand is near the center of the spotlight on the right side. The angle of tilt, the size of the porthole, and the layout of the spotlight position may dictate another location.

EACH OPERATOR will, after a few minutes of operation, generally develop his own system and position for most convenient operation.

THE HORIZONTAL SWING and vertical tilt are individually adjustable to give the desired degree of friction to suit the operator. The locking clamps are located on the right side of the yoke assembly.

AN EXPERIENCED OPERATOR will usually keep one hand on the spot size control handle. This allows both directing the spot and changing spot sizes immediately upon cue. Compressing the brake lever permits free movement of the large lens forward and back, and releasing the lever locks the spot size at the desired point of travel.



## OPERATION OF OPTICAL SYSTEM

THE IRIS CONTROL is the front lever that projects through the top of the optical system housing. When this lever is to the left (as viewed from the rear of the unit), the largest aperture is provided. Smaller apertures are obtained as the lever is moved to the left.

THE MAXIMUM FLOOD SPOT is obtained with the iris control lever to the right (near the operating side) for the largest aperture and with the spot size control handle moved as far to the rear as possible.

SMALLER SIZED SPOTS are projected as the spot size control handle is moved forward. Most of the spot sizes needed will be produced with the iris in its maximum open position.

FOR A "HEAD SPOT," or any spot smaller than can be obtained with the spot size control handle in its extreme forward position, shift the iris control lever to the left (away from operating side) for a smaller aperture. The iris control lever should always be returned to its extreme right position before the spot size control handle is again moved to obtain larger spots.

THE MASKING SHUTTER (chopper) lever is the middle lever projecting through the top of the optical system housing. The masking shutter blades are operated by this lever to shape the projected spot to a rectangle, strip spot, or dousing.

THE DISENGAGED POSITION of the masking shutter lever is to the extreme right (toward operating side) and varying degrees of masking to complete cutoff are obtained by moving the lever to the left (away from operating side). If dousing the spot for a prolonged period with the bulb operating, it is highly recommended to use the *Fadeout* doublers (below) to prevent heat damage to the masking shutter blades.

THE ANGLE of the masking shutter blades can be adjusted to compensate for the horizontal projection angle. Remove the color arm cover plate and dismount the boomerang. Loosen the (4) screws holding each of the masking shutter blades enough to allow adjustments. Ignite the bulb and adjust the angle of the *bottom* blade by tapping with a screwdriver so its projected edge lies parallel to the footlights. Tighten the screw. Operate the masking shutter lever to close the blades. Adjust the upper blade to close in line with the bottom blade and tighten the screw.

THE FADEOUT MECHANISM AND DOUSER CONTROL is the rear lever projecting through the top of the optical system cover. This lever controls the intensity of light from complete fadeout when the lever is to the left, to full intensity when the lever is to the right.

THE SPOT SIZE CONTROL HANDLE is located on the right hand side of the optical system just above the base rail. A variation of spot sizes from full flood to small spot can be obtained by moving the spot size control handle from one extreme to the other. Beam intensity is increased by this optical system when reducing from flood to spot, and maximum intensity is reached when the spot size control handle is in the extreme forward position. Compressing the brake lever forward of the handle permits free movement.

THE SPOT FOCUSING CONTROL KNOB is located on the operating side of the optical system at the forward end above the base channel. This control is used to adjust the optical system for the length of throw. When making an adjustment, rotate the spot focusing control knob until the sharpest edge is obtained on the projected spot.

## OPERATION OF COLOR BOOMERANG

THE COLOR BOOMERANG supplied with the Gladiator IV is selected when first ordering the spotlight from the factory. The Type 7200264 boomerang is mounted within the optical system and uses (6) 50mm dichroic discs as the color media. Type 7200709 mounts to the front of the lens barrel and uses conventional high-temperature color gels (i.e. Roscolux®) as color media.

EACH BOOMERANG is equipped with six color arms. A “starter” set of six 50mm dichroic color discs is included with the 7200264 unit. Additional colors, including color temperature reduction filters, are available from most theatrical supply dealers.

COLOR FILTERS are controlled by the six color levers of the boomerang. To engage an individual color filter, lower the desired filter selector lever. A rocker catch located in the color disc housing holds the filter in the light beam. To release a color, lower the filter release lever or engage another color, thus releasing the previous color automatically.

TO REPLACE A COLOR FILTER in the 7200264 boomerang (see Parts List, Figure 6A), it is recommended to dismount the entire assembly from the optical system and place it on a convenient working surface. Loosen the (2) quarter-turn fasteners and remove the side cover plate. The entire boomerang assembly can then be easily removed by loosening the single captive screw securing the boomerang bracket to the base rail, and lifting the bracket off the (2) locating pins. When re-installing the boomerang, align the holes in the boomerang base plate onto these pins before again securing the captive screw.

TO ATTACH A COLOR GEL to the color frame of the front-mounted 7200709 boomerang (see Parts List, Figure 6B), detach the color frame from the selector arm by loosening the set screw on the slide channel and lifting the frame off the arm. Spray the flat surface of the ring (without the channel clip) with an aerosol adhesive. Center the ring over a precut 13½ by 13½ inch (34 x 34cm) gel, and press the adhesive-coated side onto the gel. Allow a few minutes for the adhesive to dry and trim the excess gel material. Install the ring onto the boomerang color arm and tighten the set screw. Old gels can be removed from the color frame by scraping the gel and dried adhesive from the frame using a single-edge razor blade.

**NOTE:** WHEN INSTALLING COLOR FILTERS in either boomerang, the *less* dense colors (pink, amber) should be placed in the holders toward the **rear** of the boomerang (close to the arc), and those of *greater* density (red, green) should be placed in the holders toward the **front** of the boomerang (away from the arc). This measure will prolong the useful life of the filters.

## MAINTENANCE



CAUTION: DISCONNECT AC POWER BEFORE SERVICING



THE XENON GLADIATOR IV SPOTLIGHT requires very little maintenance to keep it in good working order.

THE REFLECTOR should be cleaned periodically with a soft, clean, lint-free cloth to remove dust from the reflecting surface. If excessively soiled, the reflector may be cleaned with Windex® or an equivalent glass cleaner. DO NOT use abrasive cleaners of any kind. Remove the heat filter ring and clean both surfaces of the filter glass with a lens cleaning solution formulated for coated lenses.

CHECK ALL ELECTRICAL CONNECTIONS for tightness on a regular basis. Loose connections, particularly in the DC circuit, may overheat and cause premature bulb failure and/or damage other lamphouse components.

LUBRICATE the (3) squirrelcage blower motors with two or three drops of non-detergent oil once every six months. The oil holes are located on the tops of the motors and are accessed by removing the motor covers from the off-operator side. An injection oiler is required to reach the inner oil holes.

THE XENON BULB should be checked occasionally for the presence of dust or foreign materials on the quartz envelope. If necessary, clean the envelope with alcohol, and wipe dry with a clean, lint-free cloth. Observe all safety procedures when working with the exposed bulb.

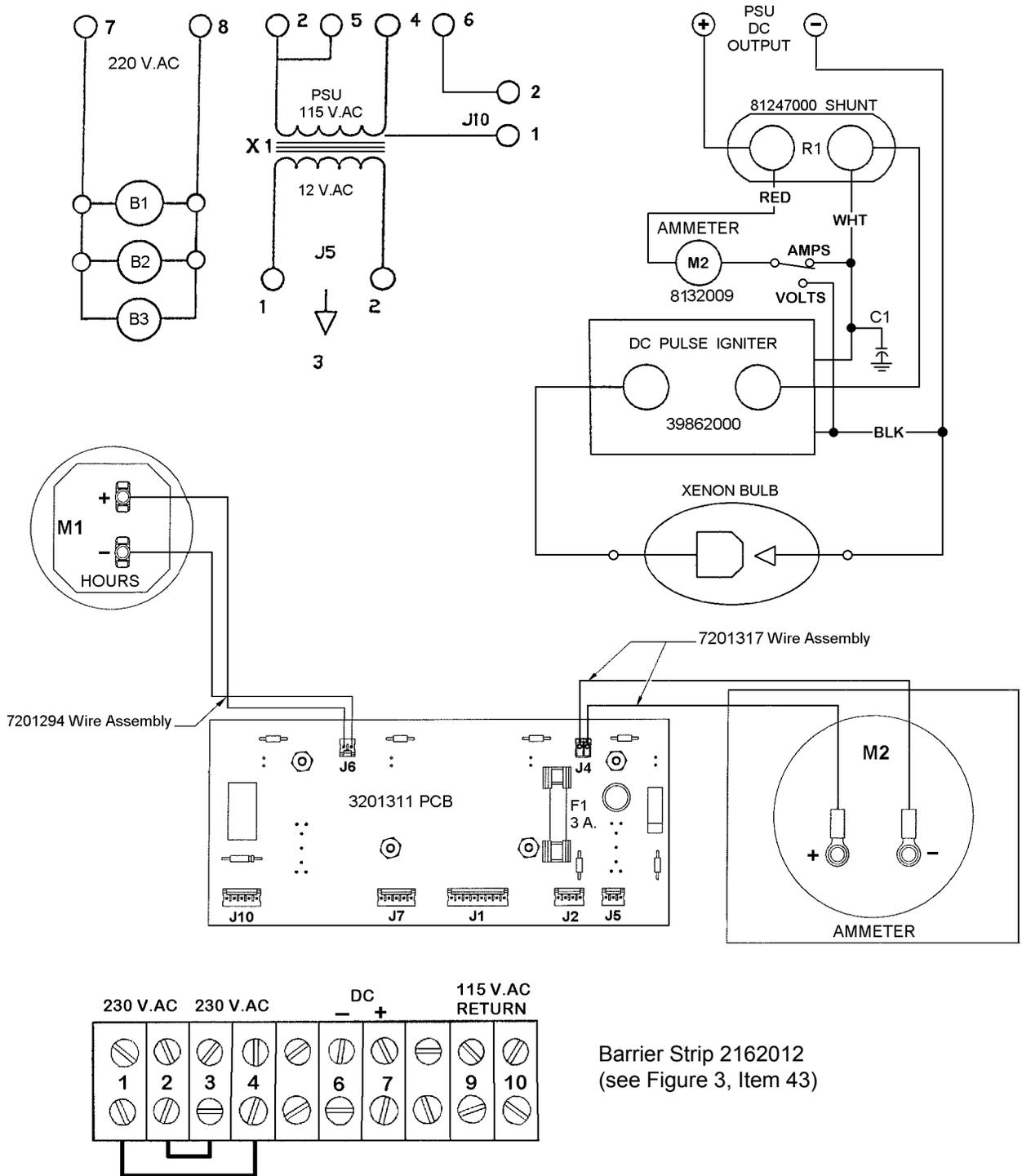
THE INSIDE OF THE LAMPHOUSE and the blower squirrelcages should be cleaned periodically, depending on the dust conditions at each installation. Keep the blower inlet and outlet grilles clean to permit free air flow.

THE LENS SYSTEM should be kept clean to prevent any light reduction in the projected spot. Tighten the horizontal swing and vertical tilt locking clamps. The front surface of the large lens is accessible through the front opening of the optical system housing. Remove the operator-side optical system access panel to clean the back surface of the large lens and access the small projection lens which is held in place with a large spring-type retainer ring at the front of its lens barrel.

CLEAN THE PROJECTION LENS and large lens with with any cleaner approved for use on coated projection lenses. Replace the projection lens tube with the arrows engraved in the barrel pointing toward the iris. Secure with the retainer ring.

BEFORE TRANSPORTING the spotlight, remove the xenon bulb from the lamphouse. Place the bulb in its plastic cover and original shipping container.

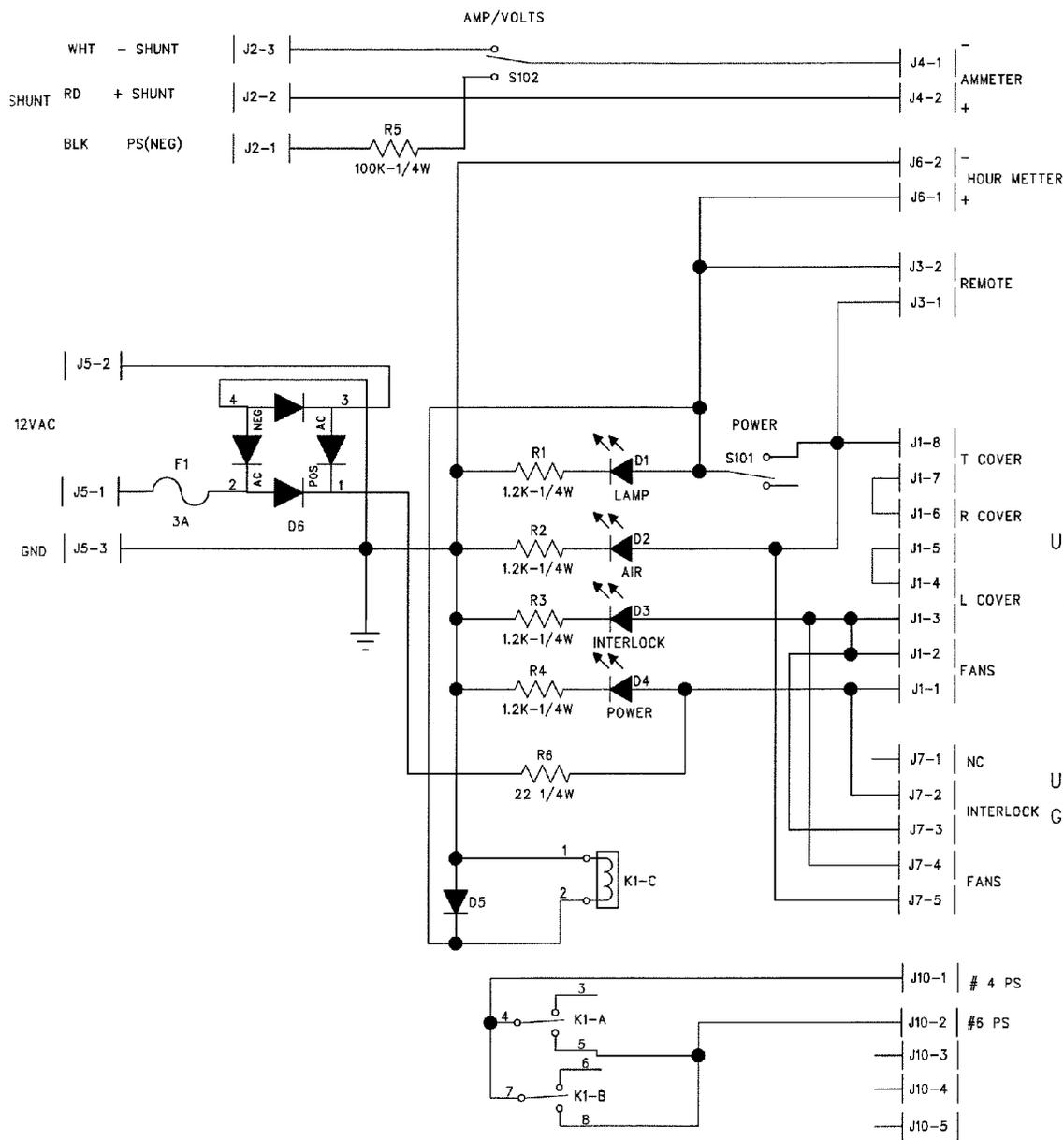
# LAMPHOUSE WIRING DIAGRAM



## WIRING DIAGRAM PARTS LIST

<u>Part No.</u>	<u>Description</u>
7200280	Blower (B1,B2,B3), 230 V.AC, 50/60 Hz.
3113289	Molex Plug, (3) Pin
7200255	Capacitor (C1), RF Suppression
81247000	Shunt (R1), 200 A. 50 mV.
7201313	Cable Assembly, Shunt to Control Panel J2
3201311	Printed Circuit Board Assembly, Analog Control Panel
2121017	Fuse, 3 A. Std. (F1 on 3201311)
24086000	Rocker Switch, VOLTS/AMPS (S102 on 3201311)
8161028	Rocker Switch, LAMP (S101 on 3201311)
8132009	Ammeter (M2), 0-200 A. 50 mV.
7201317	Cable Assembly, Ammeter to Control Panel J4
7132005	Hour Meter (M1), 10-80 V.DC
7201294	Cable Assembly, Hour Meter to Control Panel J6
7200253	Stepdown Transformer (X1)
7200252	Terminal Board & Molex Connector, Wired Assembly
2162012	Barrier Strip, (10) Terminal
2140014	Molex Receptacle, (12) Pin
39862000	Igniter Assembly
25476000	Igniter Printed Circuit Board Assembly
39875000	Igniter Case & Coil, Potted Assembly
3130231	Xenon Bulb, LTIX-4500W-HS
3130223	Xenon Bulb, LTIX-3000W-HS*
3130219	Xenon Bulb, LTIX-2500W-HS*
3130213	Xenon Bulb, LTIX-2000W-HS*
7200251	Interconnect Cable Assembly, Lamphouse/Power Supply (see Figure 9)

\* Requires *optional* 7201175 Bulb Mounting Kit



WIRING DIAGRAM, 3201311 PRINTED CIRCUIT BOARD

## TROUBLE CHART

### NORMAL OPERATION

WHEN THE SWITCH in the main AC supply line to the xenon power supply is in the ON position, and the 30 A. circuit breaker on the switching power supply is ON, the VIN light on the xenon power supply, and the lamphouse instrument panel POWER and AIR lights will glow. The cooling blowers in the lamphouse and in the power supply will operate. When all lamphouse covers are secured, the magnetic interlock switches will close and the PANELS light on the control panel will glow.

WHEN THE CONTROL PANEL LAMP SWITCH is placed in the ON position, the AC control circuit in the lamphouse will energize the xenon power supply circuitry providing DC current to the igniter and bulb. The green "GO" light on the xenon power supply and the LAMP light on the lamphouse control panel indicate a completed circuit.

THERE WILL BE a distinctly audible high voltage arc ping at the igniter arc gap and across the bulb electrodes. The bulb should ignite immediately after one or two of these high voltage pulses, and the lamp current will adjust to the output setting of the xenon power supply. Multiple ignition pulses prior to bulb ignition normally indicate a low DC output setting. Increase output to the bulb's initial ("nominal") current setting; see xenon power supply manual. A "warm" or aged xenon bulb might also require multiple strikes.

### TROUBLE SHOOTING

IF THE XENON BULB does not ignite, observe the following operational sequences for assistance in locating and isolating the trouble area.

WHEN THE FANS and the VIN indicator light on the power supply are on, the circuit in the power supply is trouble-free up to the terminal block in the power supply. At this time, the spotlight blowers should operate. If this does not occur, the trouble is in one of the blower motors, a loose connection, or a broken #7 or #8 lead (220 V.AC). Check at this time for 220 V.AC blower voltage at wires 7 & 8, and 220 V.AC at the lamphouse quick-disconnect pins I & J. CAUTION: exercise extreme caution when taking voltage measurements in a power "on" condition.

IF THE HIGH VOLTAGE PING or the ignition flash is not apparent, check voltages on the terminal board adjacent to the shunt. A reading of 120-170 V.DC "no load" should be measured between wires 6 and 7, and 115 V.AC between wires 9 and 10. If these voltages are not indicated, the problem is in the leads between the lamphouse and power supply, or in the power supply boost circuit. See the trouble shooting section of the power supply manual for additional instructions.

THE SWITCHING-TYPE XENON POWER SUPPLY furnished with the spotlight system includes thermal overload switches and protection circuits to prevent damage resulting from high or low input voltage. Loss of DC open circuit voltage, or an interruption of DC sustaining current, may be traced to these circuits. See the power supply manual.

IF THE HIGH VOLTAGE ARC is audible at the lamphouse and the bulb does *not* flash, check for a lamphouse DC lead arcing to ground. If no ground fault is detected, replace the bulb and attempt ignition with the new bulb.

IF THE HIGH VOLTAGE ARC is audible at the lamphouse, the flash of the bulb is apparent, but ignition of the bulb is not sustained, the problem area is in the power supply. See the trouble shooting section of the power supply manual for additional instructions.

IF THE HIGH VOLTAGE ARC is *not* audible or the flash of the bulb visible, the problem is in the igniter assembly.

EXCHANGE of components (i.e. known-good igniters, printed circuit boards) between similar Strong Gladiators IV units to aid in diagnosis of a problem is encouraged. This will not lead to equipment damage, and will not void equipment warranty.

## GLADIATOR IV TROUBLESHOOTING



EXERCISE ALL DUE CAUTION WHEN MEASURING  
VOLTAGES IN A "POWER ON" CONDITION



### **Bulb fails to ignite.**

1. AC power not on to lamphouse. Turn switching power supply 30 A. circuit breaker ON. If 230 V.AC not read at 1 & 2, or POWER indicator not glowing, see power supply manual.
2. Faulty "ON-OFF" switch. Check for voltage at terminal block positions 9 & 10; check for loose terminals or wiring. Replace if defective.
3. Low AC source voltage actuating "brownout" protection circuit in xenon power supply.

### **Bulb fails to ignite, power supply circuit breaker trips.**

1. Slide switch on power supply (near MS receptacle) in incorrect SPOT/CONS position. Place in SPOT (left) setting.

### **Bulb fails to ignite; ping audible, bulb flash visible.**

1. Inadequate DC output from xenon power supply. Set power supply output to correct range required for bulb wattage (120-150 A. for 4000 watt). Do not exceed 150 A.
2. If bulb flash is visible but faint, check for defective printed circuit board in igniter. Replace if defective.
3. Faulty or expired xenon bulb. Replace as required.

### **Bulb fails to ignite; ping audible, no bulb flash.**

1. Faulty xenon bulb. Check for cracked electrodes or darkened envelope. Replace if defective.
2. Ignition pulse shorting to ground. Inspect DC leads for burned insulation; dress leads away from grounded metal components.
3. Arc gap on igniter PC board too short. Discharge igniter capacitors by shorting across arc gap screws with insulated-handle screwdriver and widen the opening between the two screw tips.

### **No high voltage ping audible; LAMP switch in "ON."**

1. Loss of AC control voltage. Check xenon power supply for tripped circuit breaker or open thermal switch. See power supply manual.
2. Lamphouse top cover interlock switch open. Top cover must be closed and both latches secured.
3. Xenon power supply "GO" light not glowing. Check lamphouse covers; see power supply manual.
4. Little or no DC "No Load" voltage. Measure DC "No Load" voltage at 6 & 7. See power supply manual.
5. Open fuse F1 (15 A.) on switching power supply primary PC board. SEE POWER SUPPLY MANUAL. Allow (20) minutes for capacitor discharge before replacing.
6. Loose spark gap connections or terminals. Repair or replace igniter PC board as required.
7. Arc gap on igniter PC board too wide. Discharge capacitors; shorten gap between the two screws.

**Current display not operating.**

1. Check for loose connection on plug J4 on control panel PC board.
2. Defective M2 ammeter. Replace as required.

**Elapsed bulb hours not recording.**

1. Check for loose connection on plug J6 on control panel PC board.
2. Defective M1 hour meter. Replace as required.

**Bulb goes out during operation.**

1. Xenon power supply overheated; thermal switch open. Check power supply blower(s), air inlets and outlets unobstructed. See power supply manual.
2. Lamphouse cover loose or open. Close and secure.
3. Xenon bulb depressurizing. Check for envelope discoloration; replace if defective.
4. Fluctuating AC source voltage actuating brownout or surge protection circuits in xenon power supply. See power supply manual.

**Noise in theatre sound as bulb ignites.**

1. Faulty RF suppression capacitor(s). Remove and test C1. Replace if defective.
2. Lamphouse, power supply, or sound system not properly grounded. Connect to adequate earth ground.

**Excessive light flicker.**

1. Faulty or aged bulb. Check for cracked or sagging electrodes; replace if defective.
2. Excessive ripple in DC output. See power supply manual.
3. Arc stabilization magnet reversed. NORTH pole should point toward operator's side. Check with compass if required.

**Reduced light output.**

1. Normal bulb aging. Increase output current. DO NOT EXCEED MAXIMUM CURRENT LEVEL SPECIFIED BY BULB MANUFACTURER.
2. Soiled reflector. Clean using commercial glass cleaner; USE NO ABRASIVES.
3. Soiled heat filter, projection lens, or large lens. Clean as required.
4. Bulb or reflector position altered. Correct alignment; see preceding OPERATION section.

**Extremely long duration between ignition pulses.**

1. Low DC "no load" voltage from the xenon power supply. Check "no load" voltage; see power supply manual.
2. Faulty igniter printed circuit board assembly. A "Ping" sound is normal; excessive "Hissing" is abnormal. Replace if defective.

**Colors burning or fading prematurely.**

1. Bulb incorrectly focused to "hot spot." Refocus bulb to flat field with iris fully open and spot size control handle ("trombone") fully forward.
2. Heat filter glass missing. Do not operate without filter glass in place.
3. Reflector or heat filter coating peeled. Wipe coated surface with clean, dry cloth or paper towel; peeled coating appears as "glitter." Replace if defective.

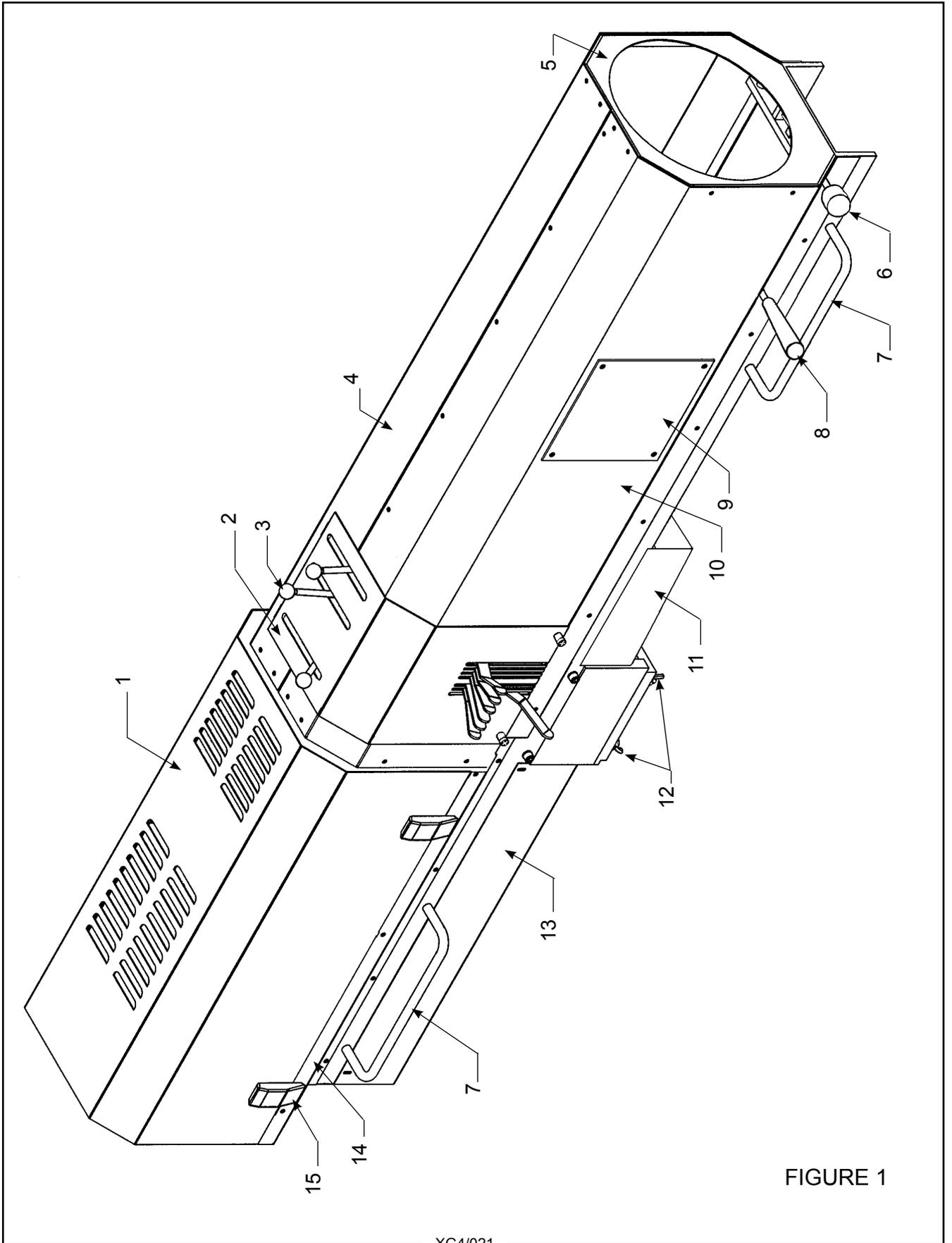


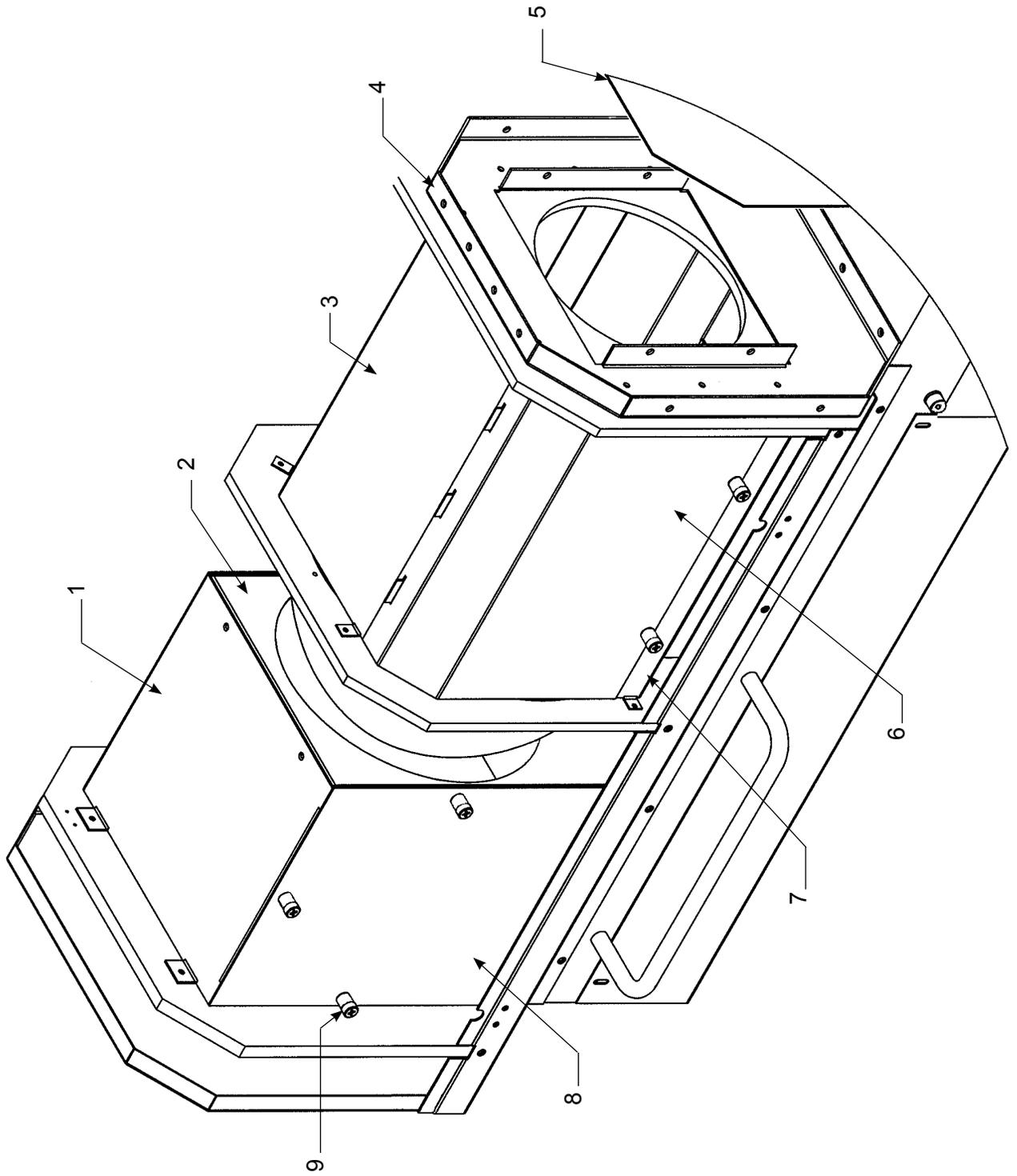
FIGURE 1

## PARTS LIST

Figure 1

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	7200164	Lamphouse Top Cover & Access Panel
-	7200163	Side Cover, Off-Operator Side (not shown)
2	7200247	Cover Plate, Optical System Controls (as shown)
2	7201000	Cover Plate, Optical System Controls (no color arm slots)
-	7151008	Captive Fastener (as req'd.)
3	10048A00	Knob
4	7200207	Lens System Cover, Off-Operator Side
5	7200175	Front Cover, Lens System
6	25064000	Lens Focus Knob
7	25221000	Hand Rail
-	4310751	Mounting Screw, 5/16-18 x 3/4"
-	4317000	Lockwasher, 5/16"
8	51509000	Handle, Spot Size Control
9	7200246	Access Panel
-	31875000	Thumbscrew, 10-32 (4 req'd.)
10	7200206	Lens System Cover, Operator Side
11	7200397	Bottom Cover, Front
12	4310753	Wing Screw, 5/16-18 (4 req'd.)
-	4317100	Washer, 5/16" (4 req'd.)
13	7200170	Bottom Cover, Rear
14	7200162	Lower Cover, Lamphouse Access
15	3118007	Clasp Latch (2 req'd.)

FIGURE 2

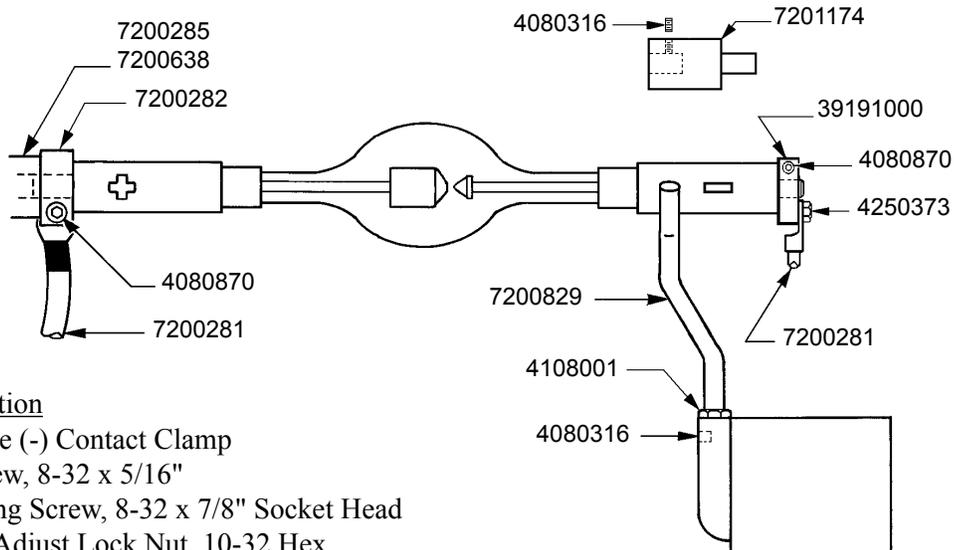


## PARTS LIST

Figure 2

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	7200160	Bulb Enclosure Top Cover, Rear
2	7200159	Bulb Enclosure Brace
-	00M15315	Arc Stabilization Magnet (not shown)
-	81137000	Magnet Clamp
-	4080259	Set Screw, 8-32 x 1/4"
3	7200166	Bulb Enclosure Top Cover, Front
4	7200173	Mounting Bracket, Fade Out Assembly
5	7200258	Light Shield (see Figure 3, Item 14)
6	7201328	Access Panel Assembly, Front
7	7200165	Bulb Enclosure Lower Cover, Left & Right (2 req'd.)
8	7201327	Access Panel Assembly, Rear
9	7151008	Captive Fastener (incl. with Items 6 & 8)

### BULB MOUNTING COMPONENTS



<u>Part No.</u>	<u>Description</u>
39191000	Negative (-) Contact Clamp
4080316	Set Screw, 8-32 x 5/16"
4080870	Clamping Screw, 8-32 x 7/8" Socket Head
4108001	Height Adjust Lock Nut, 10-32 Hex
4250373	Screw, 1/4-20 x 3/8" Hex Head
7200281	Bulb Lead Assembly (complete set)
7200282	Positive (+) Contact Clamp
7200285	Rear Bulb Support Collet, 4 kW (see Figure 3, Item 52)
7200638	Optional Rear Bulb Support Collet, 2-3 kW
7200829	Front Bulb Support Yoke (see Figure 3, Item 47)
7201174	Optional Cathode Adapter, 2-3 kW

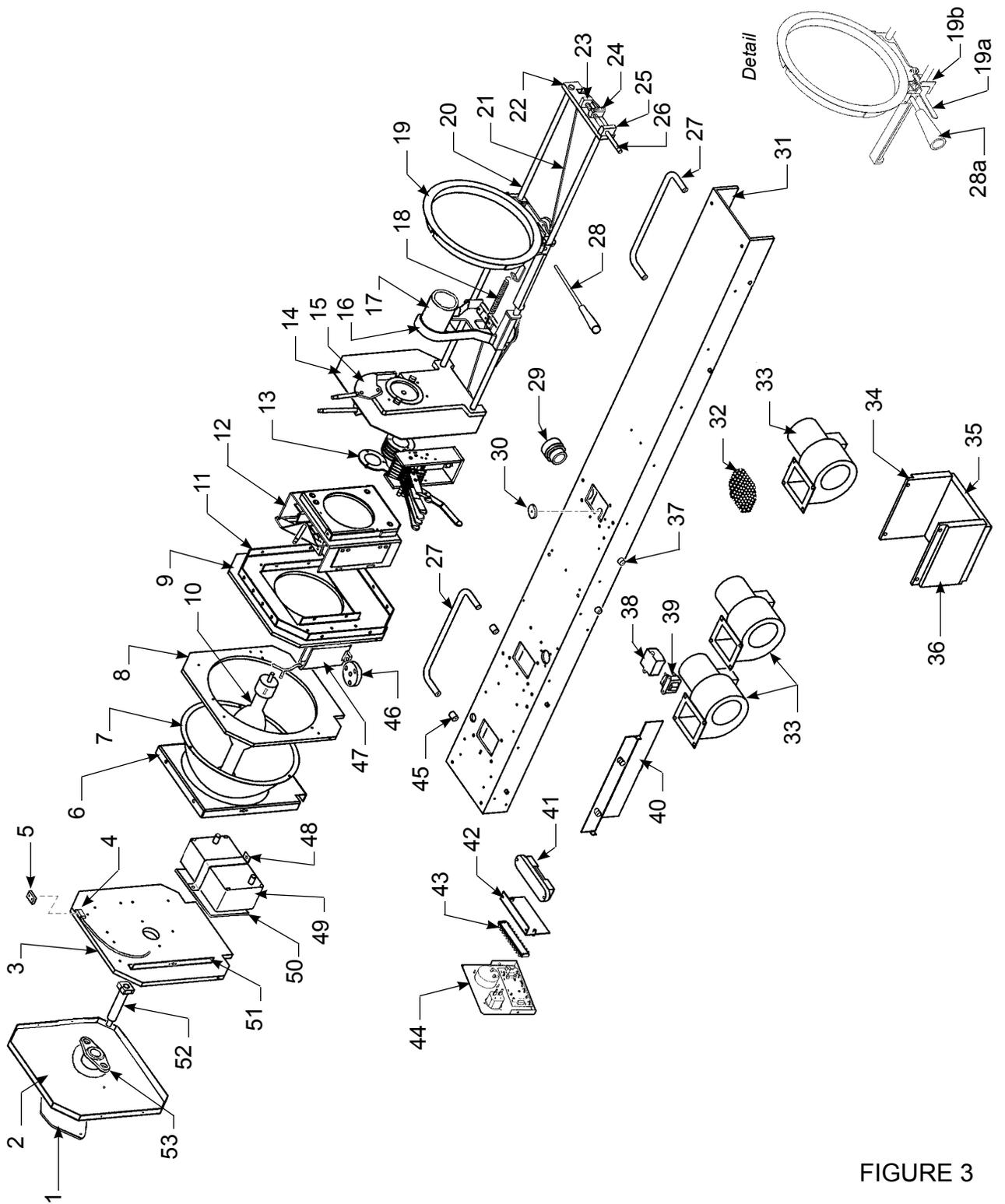


FIGURE 3

## PARTS LIST

Figure 3

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	7200658	Access Cover Plate
-	4100504	Mounting Screw, 10-32 x 1/2"
-	31875000	Thumbscrew, 10-32
2	7200158	Lamphouse Back Cover
3	7200155	Rear Lamphouse Bulkhead Plate
-	4250752	Mounting Screw, 1/4-20 x 3/4"
-	4257000	Lockwasher, 1/4"
4	2161006	Interlock Switch & Lead Assembly
-	4040500	Mounting Screw, 4-40 x 1/2"
5	2198544	Magnet, Switch Actuator (mounts to Figure 1, Item 1)
6	7200159	Bulb Enclosure Brace (see Figure 2, Item 2)
-	00M15315	Arc Stabilization Magnet (not shown)
-	81137000	Magnet Clamp
-	4080259	Set Screw, 8-32 x 1/4"
7	25361000	Flanged Reflector, 12.8" Diameter
-	4081504	Mounting Screw, 8-32 x 1-1/2" (3 req'd.)
-	2158040	Compression Spring (3 req'd.)
-	4088002	Cap Nut, 8-32 (3 req'd.)
8	7200156	Reflector Bulkhead Plate
-	4250752	Mounting Screw, 1/4-20 x 3/4"
-	4257000	Lockwasher, 1/4"
9	7200157	Front Lamphouse Bulkhead Plate
-	4250752	Mounting Screw, 1/4-20 x 1/2"
-	4257000	Lockwasher, 1/4"
10	3130231	Xenon Bulb, 4 kW Type "HS"
11	7200173	Support Bracket, Fade Out Assembly
-	4080375	Mounting Screw, 8-32 x 3/8" Pan Head
12	7200261	Fade Out & Heat Filter Assembly (see Figure 5)
-	4250752	Mounting Screw, 1/4-20 x 3/4"
-	4258007	Locking Hexnut, 1/4-20
-	4257102	Washer, 1/4"
13	7200264	Color Boomerang Assembly (see Figure 6A)
14	7200258	Light Shield
15	7200257	Iris & Chopper Assembly (see Figure 7)
-	4250752	Mounting Screw, 1/4-20 x 3/4"
-	4257000	Lockwasher, 1/4"
16	7200289	Small Lens Carriage
17	83144000	Lens Barrel
-	4080371	Mounting Screw, 8-32 x 3/8" Flat Head (3 req'd.)
-	44239C00	Projection Lens (ISCO)
-	83155000	Lens Retaining Clip (2 req'd.)
18	51162000	Expansion Spring
-	51120000	Spring Retaining Bracket

**PARTS LIST, Figure 3 (continued)**

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
19	51914000	Large Lens Ring
-	4110371	Mounting Screw, 10-24 x 3/8" Fillister Head (6 req'd.)
-	51408000	Large Lens 19a 7200649 Brake Lever
-	51417000	Lens Retainer - 7158005 Expansion Spring
-	51350000	Large Lens Carriage 19b 7200648 Lever Bracket
-	7200641	Large Pulley - 4040500 Screw, 4-40 x 1/2"
-	51160000	Pulley Axle, Shoulder Bolt
20	7200202	Slide Rod (2 req'd.)
-	51114000	Stop Collar
-	51479000	Collar Bushing, Rubber
21	2171187	Cable, Lens Focus (Order 4.5 feet)
22	7200203	End Bracket, Slide Rods
23	7200205	Inner Bearing Block
24	7200321	Lens Focus Block
-	25069000	Cable Clamping Plate
-	4080502	Mounting Screw, 8-32 x 1/2" Socket Head
25	7200204	Outer Bearing Block
26	7200214	Lens Focus Shaft
27	25221000	Hand Rail
-	4310751	Mounting Screw, 5/16-18 x 3/4"
-	4311750	Mounting Screw, 5/16-18 x 1-3/4" (with Item 45)
-	4317000	Lockwasher, 5/16"
28	7200647	Shaft, Spot Size Handle
-	2148011	Retaining Ring, 3/8" External
28a	51509000	Handle
29	81143000	Bushing, Xenon Power Supply Cable
-	7200251	Interconnect Cable Assembly, Lamphouse/Power Supply (Figure 9)
30	25089000	Small Pulley (2 req'd.)
-	51160000	Shoulder Bolt, Pulley Axle
31	7200168	Base Channel
32	7200286	Grille, Blower Outlet (3 req'd.)
33	7200280	Blower, 230 V.AC, 50/60 Hz. (B1, B2, B3)
-	4250373	Mounting Screw, 1/4-20 x 3/8" Hex Head
-	4257000	Lockwasher, 1/4"
-	7200208	Blower Motor Cover (not shown; 3 req'd.)
34	7200278	Base Adapter, Side
35	25223000	Base Adapter, Center
36	7200278	Base Adapter, Side
-	4311000	Assembly Screw, 5/16-18 x 1" Socket Head
37	4370754	Adapter Mounting Screw, 3/8-16 x 3/4" Socket Head (4 req'd.)
38	7200255	Filter Capacitor & Leads Assembly (C1)
-	4080250	Mounting Screw, 8-32 x 1/4" Pan Head
39	7200253	Transformer & Leads Assembly (X1)
-	4080250	Mounting Screw, 8-32 x 1/4" Pan Head

**PARTS LIST, Figure 3 (continued)**

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
40	7200165	Bulb Enclosure Panel, Lower (2 req'd.)
41	81247000	Shunt (R1), 200 A. 50 mV.
-	4080754	Mounting Screw, 8-32 x 3/4" Pan Head
-	7201313	Cable Assembly, Shunt to Control Panel
42	7200209	Mounting Bracket, Terminal Board
-	4080250	Mounting Screw, 8-32 x 1/4" Pan Head
43	7200252	Terminal Board & Molex, Wired Assembly
-	2162012	Barrier Strip, (10) Terminal (incl. with 7200252)
-	4080506	Mounting Screw, 8-32 x 1/2" Pan Head
44	7201315	Control Panel Assembly (see Figure 4)
45	7200213	Spacer, Hand Rail (2 req'd.)
-	4311750	Mounting Screw, 5/16-18 x 1-3/4"
46	81301000	Insulator, Negative Binding Post
-	4080506	Mounting Screw, 8-32 x 1/2" Pan Head
-	81300000	Binding Post, 3/8-16 Brass (soldered to 7200251 Wire Assembly)
-	4378003	Hexnut, 3/8-16 Brass
-	4377000	Lockwasher, 3/8"
47	40107000	Air Duct Casting
-	4250507	Duct Mounting Screw, 1/4-20 x 1/2" Hex Head Nylon
-	7200287	Insulator Spacer Plate
-	4310750	Insulator Mounting Screw, 5-16-18 x 3/4" Hex Head Nylon
-	7200829	Bulb Yoke
-	4080316	Yoke Set Screw, 8-32 x 5/16"
48	7200169	Retaining Strap, Igniter
-	4080375	Mounting Screw, 8-32 x 3/8" Pan Head
49	39862000	DC Pulse Igniter Assembly
50	7200395	Insulator Plate
51	7200174	Mounting Bracket, Bulb Enclosure (2 req'd.)
-	4080375	Mounting Screw, 8-32 x 3/8" Pan Head
52	7200285	Rear Bulb Support Collet, 4 kW
-	7200638	Optional Bulb Support Collet, 2-3 kW
-	7200282	Positive Contact Clamp (incl. with 7200285, 7200638)
53	65827000	Bulb Adjustment Assembly

<b>65827000</b>	<b>Bulb Adjustment Assembly</b>
2148027	Snap Ring, Collet Retaining
37985000	Thumb Screw (2 req'd.)
15010000	Compression Spring (2 req'd.)
65116000	Casting, Adjustment Mechanism
65150000	Fender Washer (2 req'd.)
65153000	Focus Lockscrew
65154000	Nylon Locking Ball
65959000	Focus Screw & Bearing Assembly

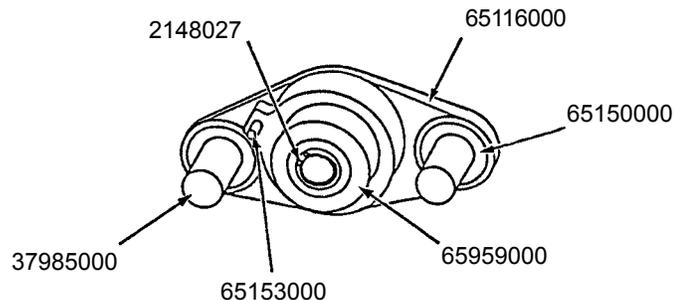
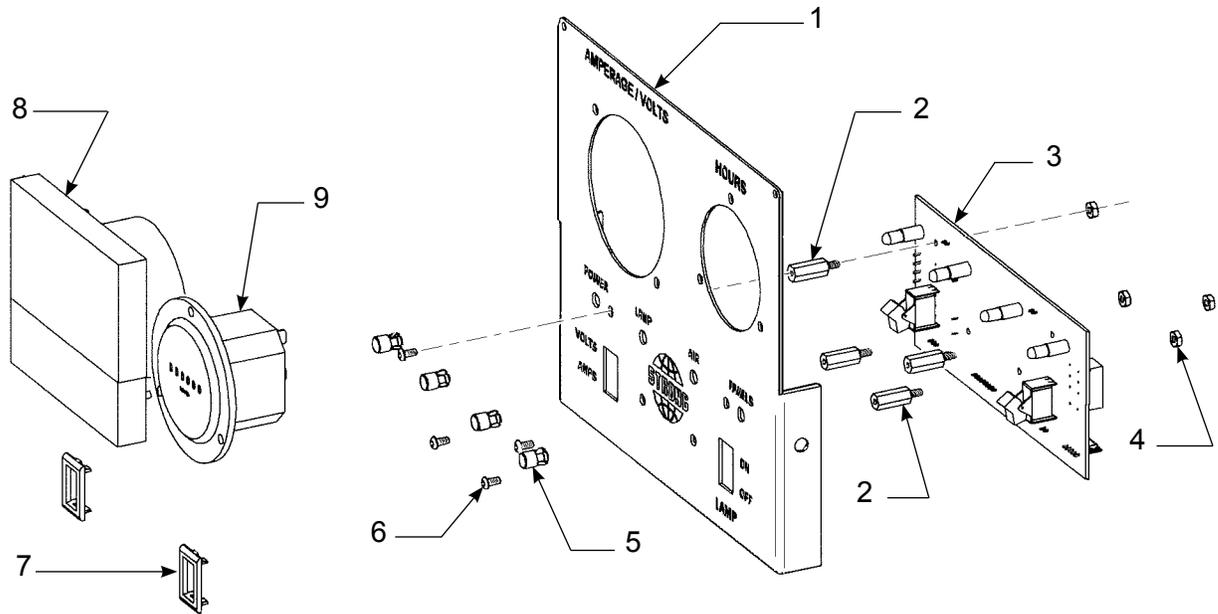


FIGURE 4



7201315 Control Panel Assembly

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	7201282	Panel, less Components
-	4100501	Mounting Screw, 10-32 x 1/2"
2	7198017	Standoff, 4-40 x 5/8" (4 req'd.)
3	3201311	Printed Circuit Board Assembly
4	4048005	Hexnut, 4-40 Nylon (4 req'd.)
5	8130030	Lens, Green Plastic (4 req'd.)
6	4040251	Screw, 4-40 x 1/4" Button Head (4 req'd.)
7	5161015	Switch Bezel (2 req'd.)
8	8132009	Ammeter (M2), 0-200 A. 50 mV.
-	7201317	Plug & Wire Assembly, Ammeter
9	7132005	Hour Meter (M1), 10-80 V.DC
-	7201294	Plug & Wire Assembly, Hour Meter
-	7201308	Spacer Ring (not shown; 2 req'd.)

Fade Out & Heat Filter Assembly

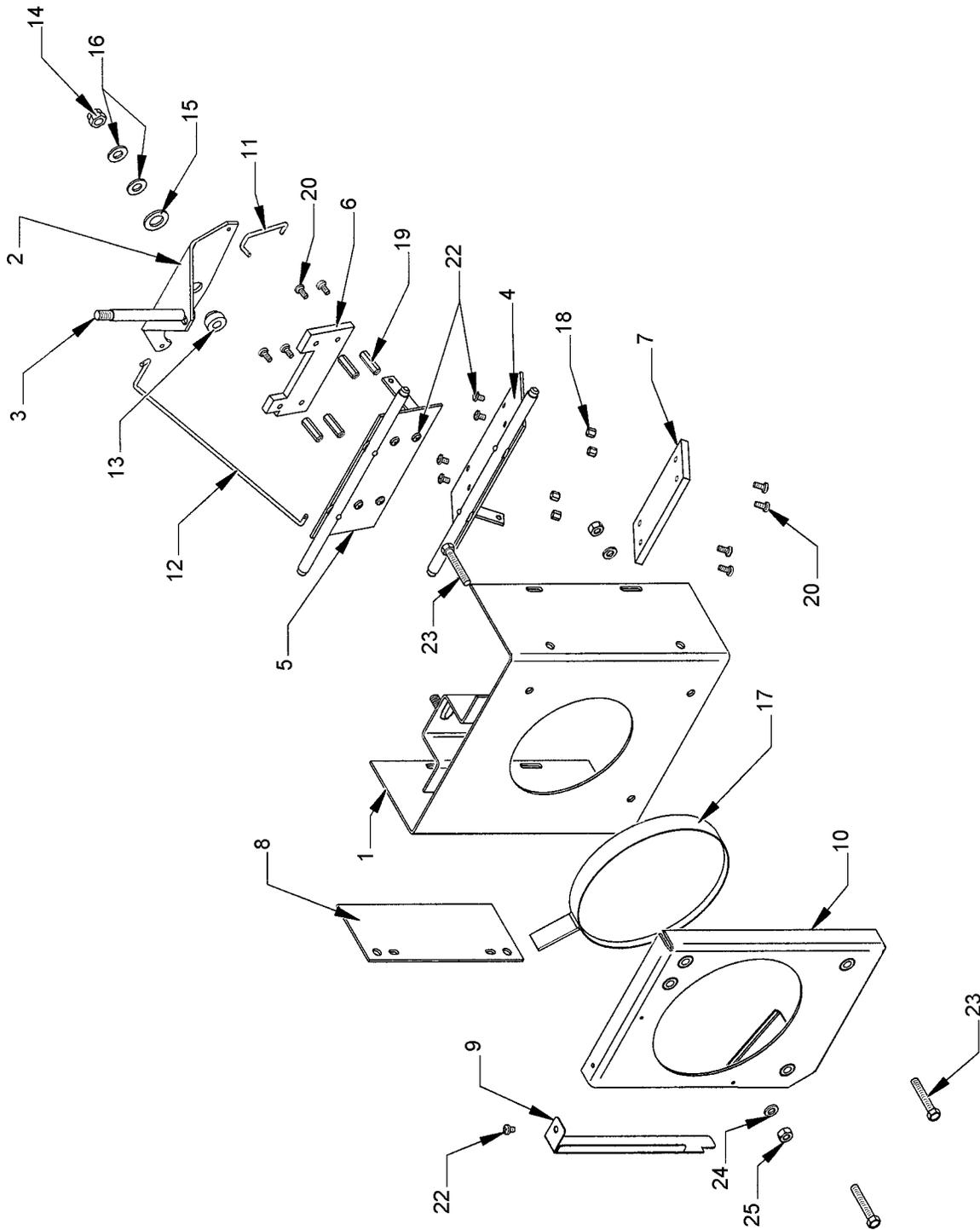


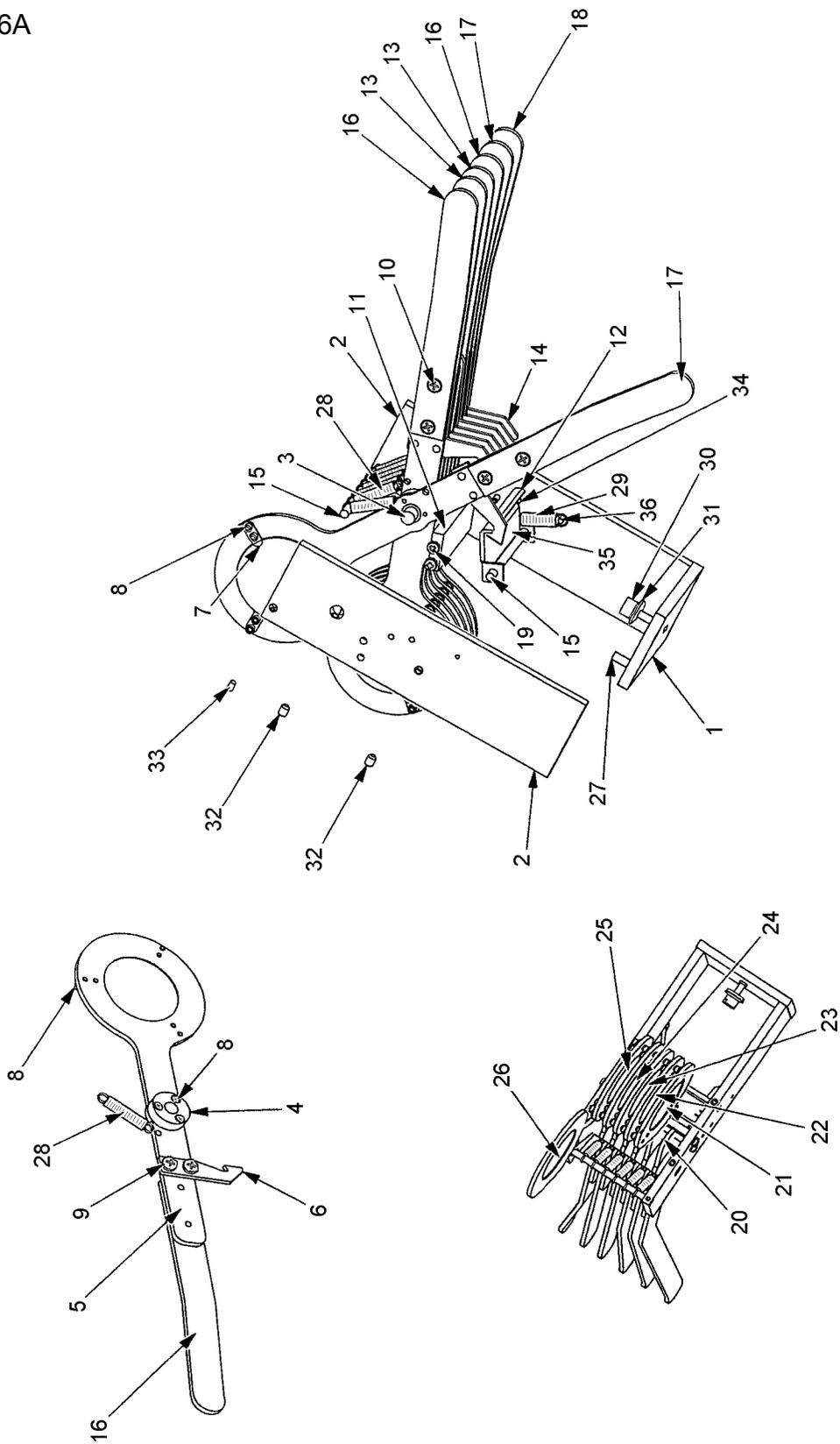
FIGURE 5

## PARTS LIST

Figure 5

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	7200212	Fade Out Housing, Welded Assembly
2	7200262	Bell Crank, Fade Out Doublers
3	51155000	Control Lever, Fade Out
-	4257102	Flatwasher, 1/4" SAE
-	4258001	Hexnut, 1/4-20
4	7200268	Lower Douser Blade Assembly
5	7200265	Upper Douser Blade Assembly
6	7200272	Heat Shield, Upper Blade
7	7200271	Heat Shield, Lower Blade
8	83351000	Pivot Adjusting Plate, Douser Blades
-	4100503	Mounting Screw, 10-32 x 1/2"
9	24332000	Cover Shield, Heat Filter
10	81847000	Heat Filter Holder, Welded Assembly
11	7200273	Pull Rod, Short
12	7200274	Pull Rod, Long
-	01704000	Hitch Pin, Pull Rods (not shown; 4 req'd.)
13	51153000	Spacer Bushing
14	4318004	Lock Nut, 5/16-18 Hex
15	4507106	Washer, 1/2" Brass
16	4317102	Washer, 5/16" SAE (2 req'd.)
17	7200504	Heat Filter & Ring Assembly
18	4198003	Stand-Off, 1/4" Hex (4 req'd.)
19	5156016	Stand-Off, 7/8" (4 req'd.)
20	4080375	Mounting Screw, 8-32 x 3/8" Pan Head
22	4080250	Mounting Screw, 8-32 x 1/4" Pan Head
23	4251500	Mounting Screw, 1/4-20 x 1-1/2" Hex Head (3 req'd.)
24	4257001	Lockwasher, 1/4"
25	4258001	Hexnut, 1/4-20

FIGURE 6A



Color Boomerang  
Assembly No. 7200264

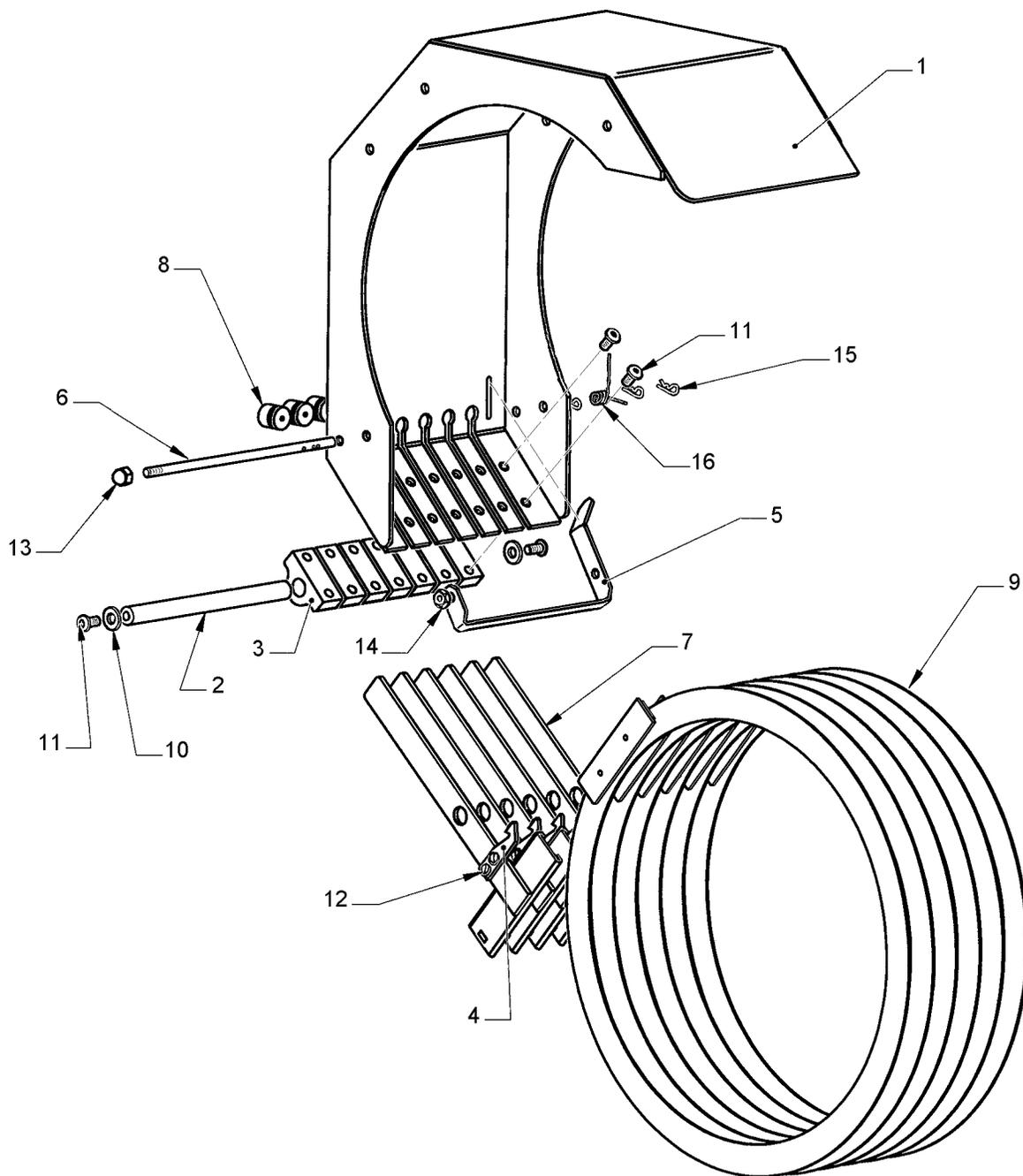
## PARTS LIST

Figure 6A

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	7200196	Bottom Plate
2	7200195	Side Plate (2 req'd.)
3	7200186	Pivot Rod
4	7200176	Bronze Bearing (7 req'd.)
5	7200181	Color Holder (6 req'd.)
6	51396000	Color Holder Catch Hook (6 req'd.)
7	7200260	Retainer Clip (18 req'd.)
8	4040252	Screw, 4-40 x 1/4" Socket Head
9	4080250	Screw, 8-32 x 1/4" Pan Head
10	4080255	Screw, 8-32 x 1/4" Flat Head
11	7200177	Stop Plate
12	7200194	Color Arm Catch Plate
13	7200180	Color Arm, 0° (2 req'd.)
14	7200183	Color Arm Release
15	7200185	Spring Pivot Rod
16	7200179	Color Arm, 10° (2 req'd.)
17	7200178	Color Arm, 20° (2 req'd.)
18	7200184	Color Arm, 30°
19	4060500	Screw, 6-32 x 1/2" Pan Head
20	7200259	Release Arm
21	7198011	Dichroic Filter, Flame Red
22	7198014	Dichroic Filter, Lavender
23	7198012	Dichroic Filter, Wheat Yellow
24	7198012	Dichroic Filter, Jade Green
25	7198010	Dichroic Filter, Navy Blue
26	7198009	Dichroic Filter, Magenta Purple
27	4100623	Screw, 10-32 x 5/8" Flat Head
28	5158018	Expansion Spring (7 req'd.)
29	2158011	Expansion Spring
30	7200657	Captive Screw
31	4257106	Seal Washer, Neoprene (as req'd.)
32	4100252	Set Screw, 10-32 x 1/4"
33	4060256	Set Screw, 6-32 x 1/4"
34	2137033	Roll Pin, 1/8" Dia. x 5/8"
35	51505000	Bumper Pad (NOTE: Cut to fit)
36	8220385	Spring Stud, Threaded 4-40

Additional 50mm dichroic color filters available through most theatrical supply dealers.

FIGURE 6B



Color Boomerang  
Assembly No. 7200709

## PARTS LIST

Figure 6B

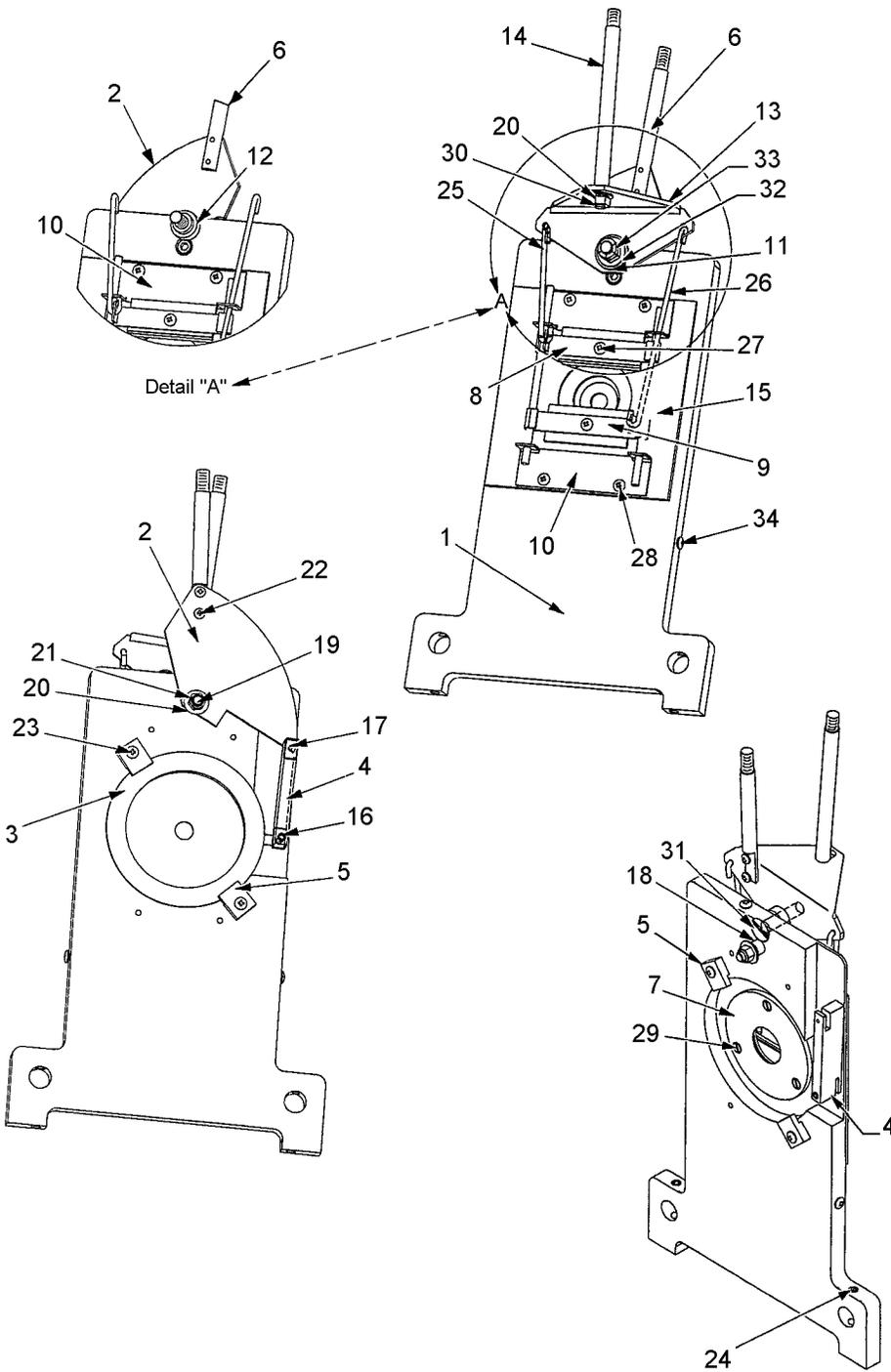
<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	7200710	Shroud Assembly
2	7200714	Pivot Shaft
3	7200713	Bearing Block (7 req'd.)
4	51396000	Color Holder Catch Hook (6 req'd.)
5	7200715	Lock & Release Lever
6	7200716	Lock/Release Lever Shaft
7	7200721	Color Arm Assembly (6 req'd.)
8	7158003	Rubber Bumper (6 req'd.)
9	7200717	Gel Ring, 13½" Diameter; Welded Assembly (6 req'd.)
10	4257102	Flatwasher, 1/4" SAE (2 req'd.)
11	4250504	Screw, 1/4-20 x 1/2" Button Head (16 req'd.)
12	4080183	Screw, 8-32 x 3/16" (12 req'd.)
13	4268003	Acorn Nut, 1/4-28
14	2468006	Jam Nut, 1/4-28 Hex
15	01704000	Hitch Pin (3 req'd.)
16	7158004	Torsion Spring

### NOT SHOWN

7134001	Magnetic Label, Dry-Erase
3198642	Lanyard, Safety Cable

A wide selection of color and color correction media (gels, filters) are available from theatrical supply dealers. Specify Roscoelux® (or equivalent) *high temperature* media.

FIGURE 7



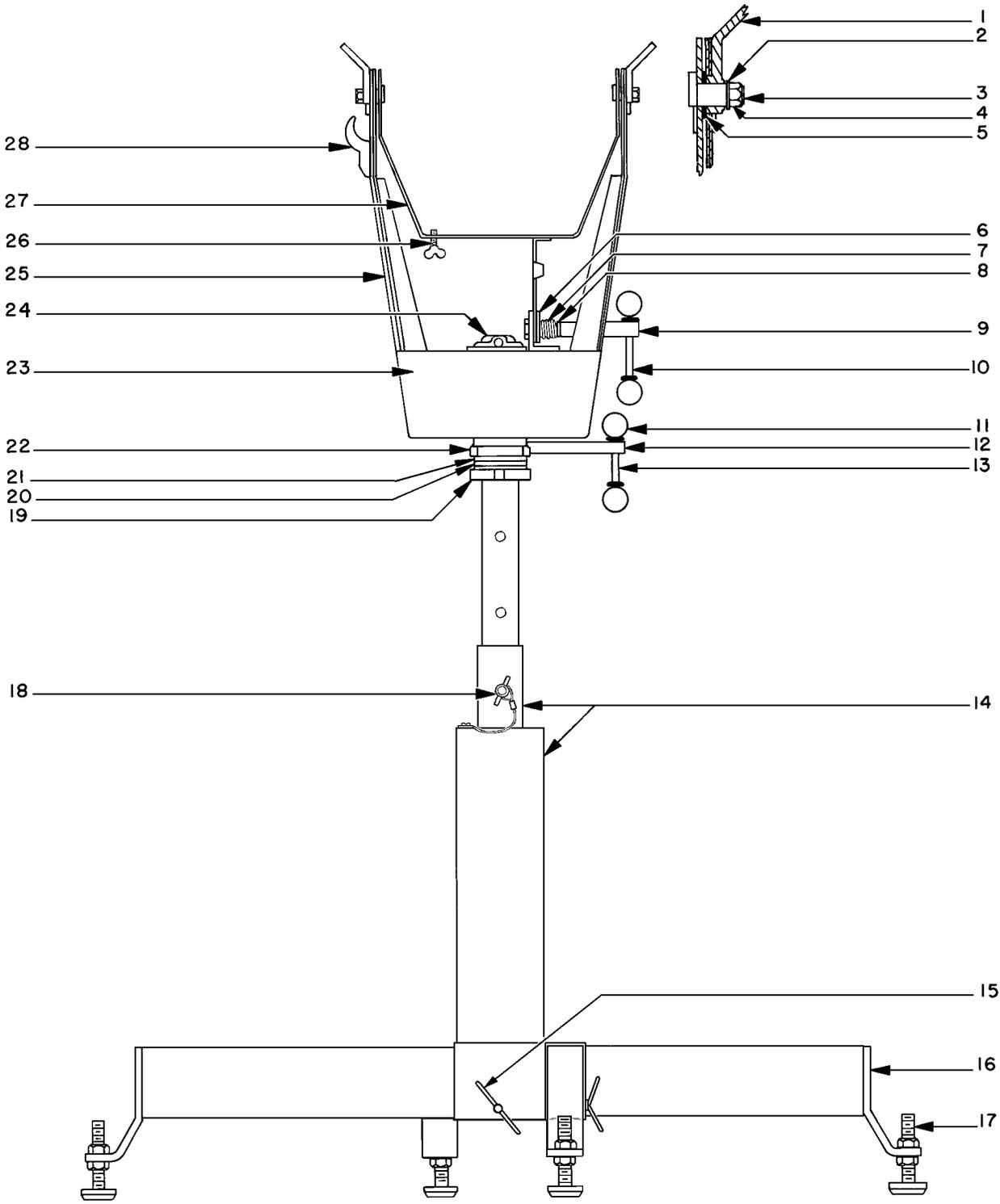
Iris, Chopper & Aperture Assembly

## PARTS LIST

Figure 7

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	7200201	Iris Mount
2	7200263	Iris Bell Crank
3	24374000	Iris
4	7200075	Iris Linkage
5	7200199	Iris Clamp (2 req'd.)
6	48402000	Iris Lever
-	4257002	Flatwasher, 1/4" SAE
-	4258001	Hexnut, 1/4-20
7	7200200	Iris Back Plate
8	47972000	Upper Chopper Blade Assembly
9	47973000	Lower Chopper Blade Assembly
10	7200197	Guide Plate (2 req'd.)
11	4507106	Washer, 1/2" Brass
12	51153000	Spacer Bushing, Chopper Blade
13	51520000	Bell Crank, Chopper Blades
14	51452000	Chopper Control Lever
15	7200198	Gobo Holder
16	81432000	Shoulder Screw, 10-24
17	2137011	Roll Pin, 3/32" x 9/16"
18	25017000	Shim Spacer
19	4251002	Screw, 1/4-20 x 1" Socket Head
20	4257102	Flatwasher, 1/4" SAE (2 req'd.)
21	5135013	Stop Nut
22	4060250	Screw, 6-32 x 1/4" Pan Head (2 req'd.)
23	4080501	Screw, 8-32 x 1/2" Flat Head (2 req'd.)
24	4250251	Set Screw, 1/4-20 x 1/4" (2 req'd.)
25	7200275	Chopper Blade Pull Rod, Short
26	7200276	Chopper Blade Pull Rod, Long
27	4080181	Screw, 8-32 x 3/16" Pan Head (2 req'd.)
28	4080310	Screw, 8-32 x 5/16" Pan Head (4 req'd.)
29	4060252	Screw, 6-32 x 1/4" Flat Head (3 req'd.)
30	4258007	Stop Nut
31	4311251	Screw, 5-16-18 x 1-1/4" Flat Head
32	4317102	Flatwasher, 5/16" SAE
33	4318004	Hex Nut, 5-16-18 FlexLock
34	4080250	Screw, 8-32 x 1/4" Pan Head (3 req'd.)

FIGURE 8



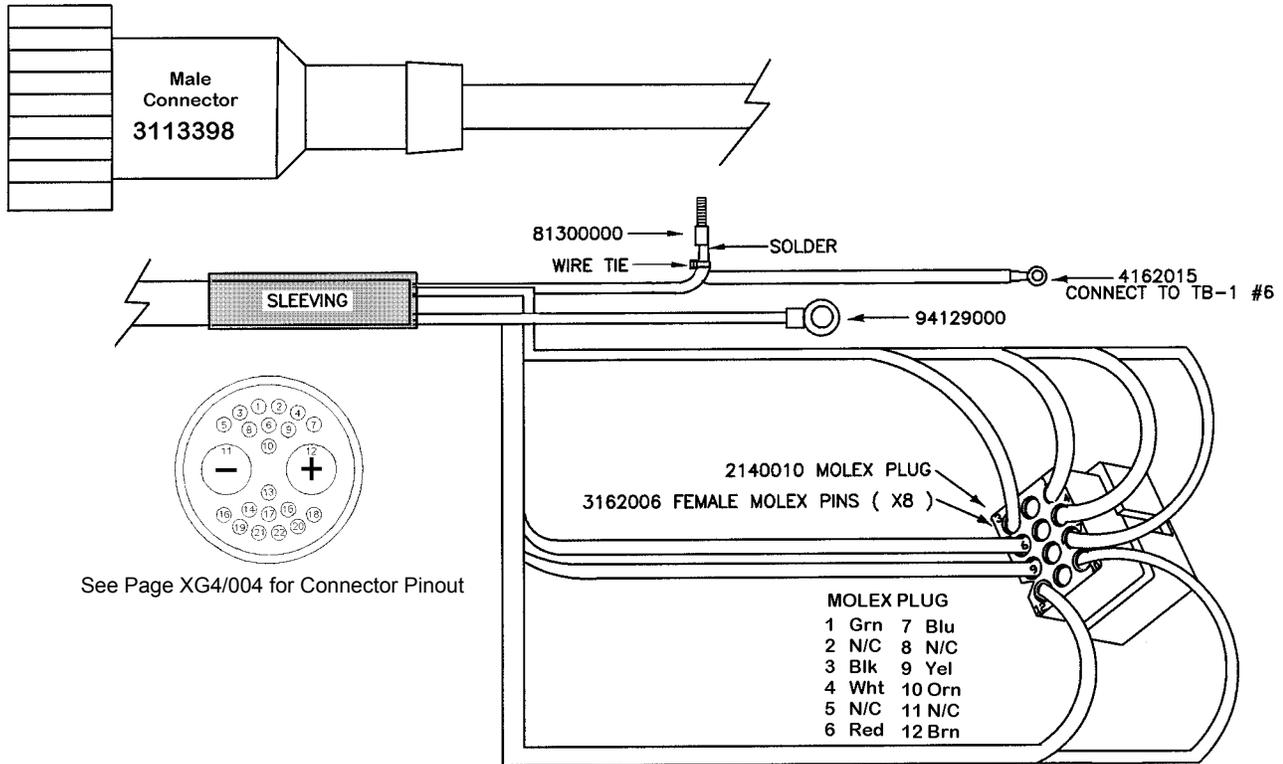
## PARTS LIST

Figure 8

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	49943000	Lifting Strap
2	4377102	Flatwasher, 3/8"
3	49120000	Tilt Axis Bolt
4	4378002	Locknut, 3/8-16 Hex
5	02411000	Washer, .640" I.D. x 1-1/4" O.D.
6	7201021	Clamp Plate
7	49125000	Compression Spring, Tilt Clamp
8	49124000	Spring Bushing
9	49223000	Clamp Shaft
10	49130000	Clamp Handle
11	10048A00	Knob, Round Plastic
-	4198027	Grommet, Black Rubber
12	49290000	Swivel Clamp Shaft
-	49291000	Stop Plate, Horizontal Swing
-	4872500	Bolt, 3/8-16 x 2-1/2" Square Head
13	49130000	Clamp Handle
14	7200957	Base Column, Welded Assembly
15	83745000	T-Bolt, Base Leg
-	4377003	Flatwasher, 7/16"
16	83797000	Base Leg, Welded Assembly
-	1109013	Caster, Locking (not shown)
17	49226000	Leveling Foot
-	4508001	Locknut, 1/2-13 Hex
18	83294A00	Height Adjustment Pin, 7/16" Dia.
-	2171187	Lanyard (Wire Rope, 9" req'd.)
-	1198230	Lanyard Clamp (2 req'd.)
19	83794000	Tube & Collar Assembly
20	83113000	Needle Bearing
21	83114000	Race, Needle Bearing
22	49213000	Swivel Clamp Collar
-	4250503	Screw, 1/4-20 x 1/2" Hex Head
-	4257000	Lockwasher, 1/4" Split Ring
23	83357000	Yoke Cover Plate
-	4080375	Screw, 8-32 x 3/8" Pan Head
-	4087004	Lockwasher, #8 (as req'd.)
24	83112000	Collar, Inner Tube
-	4250377	Set Screw, 1/4-20 x 3/8" Dog Point
25	47951000	Yoke Assembly
26	4310753	Screw, 5/16-18 x 3/4" Wing Head
-	4317001	Lockwasher, 5/16"
-	4317102	Flatwasher, 5/16"
27	25236000	Saddle & Quadrant Assembly
28	83341000	Cable Clamp
-	4250623	Screw, 1/4-20 x 5/8" Hex Head
-	7200299	Floor Stand Assembly (Items 1-28 Complete)

FIGURE 9

LAMPHOUSE CABLE ASSEMBLY  
Part No. 7200251



POWER SUPPLY CABLE ASSEMBLY  
Part No. 6270025

