

INSTRUCTION MANUAL

SUPER TROUPER II

Xenon Follow Spotlight

24000-5 (2 kW)

24000-6 (1, 1.6 kW)

Rev. January 2003



**STRONG
INTERNATIONAL**

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PREFACE

THE STRONG SUPER TROUPER II SYSTEM consists of an advanced design lens mechanism and direct current xenon lamphouse constructed and aligned on a common base rail. Operator controls are easily accessible from either side of the unit. The spotlight head includes a six-color, self-canceling color boomerang, and mounts to a collapsible base stand and yoke assembly. A switching type, solid-state xenon power supply with a keyed quick-disconnect lamphouse cable receptacle completes the follow spotlight system.

ONLY THE SPECIAL POWER SUPPLIES manufactured by Strong International can be used with the xenon spotlight. Current level adjustments (DC output to the xenon bulb) are made at the power supply by means of (2) output potentiometers. For information regarding installation and operation of the xenon power supply, see the instruction manual furnished separately.

THE XENON LAMPHOUSE utilizes a deep ellipse dichroic metal reflector designed to operate in a fixed position with a horizontally mounted xenon bulb as the light source. The DC Pulse Igniter requires no AC control circuit. A coated glass heat filter is located at the front opening of the lamphouse to reduce the radiant heat at the optical system and color boomerang.

THE LAMPHOUSE INSTRUMENT PANEL is equipped with a LCD digital display volt/ammeter and running time meter. The display continuously indicates the operating DC current (A), voltage at the arc (V), and the actual wattage (W). The lower line of the LCD display reads out the elapsed hours of the currently-installed xenon bulb (BLB) and the total number of hours the spotlight has operated (HR). In the event of an ignition failure, the display screen reads out sequential diagnostic messages.

ONLY XENON BULBS designed for horizontal operation should be used in this spotlight. The presently approved ratings for bulbs used in this spotlight are 1000, 1600, and 2000 watt. See the listing in this manual for the approved types and necessary adapters.

ADJUSTMENT CONTROLS for positioning the xenon bulb inside the elliptical reflector are located above the instrument panel at the rear of the lamphouse. The adjustments control the horizontal, vertical, and focal position of the bulb.

THE BULB is ignited and extinguished through use of the LAMP switch mounted on the instrument panel. A MODE switch provides circuitry required for remote or automatic bulb ignition control.

THE LAMP BLOWERS, internally wired in the lamp, operate on 115 V.AC and are required to keep the seals on the bulb at a safe operating temperature. These blowers will operate continuously until power is turned off at the main line switch to the xenon power supply. An air flow switch at the rear lamphouse blower prevents operation of the xenon lamp if the blower is not operating, or if the airflow is inadequate. The Super Trouper II lamphouse, *when using a factory-approved, ozone-free xenon bulb*, requires no external exhaust system.

AN ARC STABILIZATION MAGNET, as required by bulb manufacturers for the operation of 2000 watt bulbs, is mounted to the base of the lamphouse below the reflector. The magnet may be left in place for operation of 1000 and 1600 watt bulbs. The SOUTH pole of this permanent magnet is marked with paint, and must be pointed toward the left (off-operator) side of the lamphouse.

PREFACE (continued)

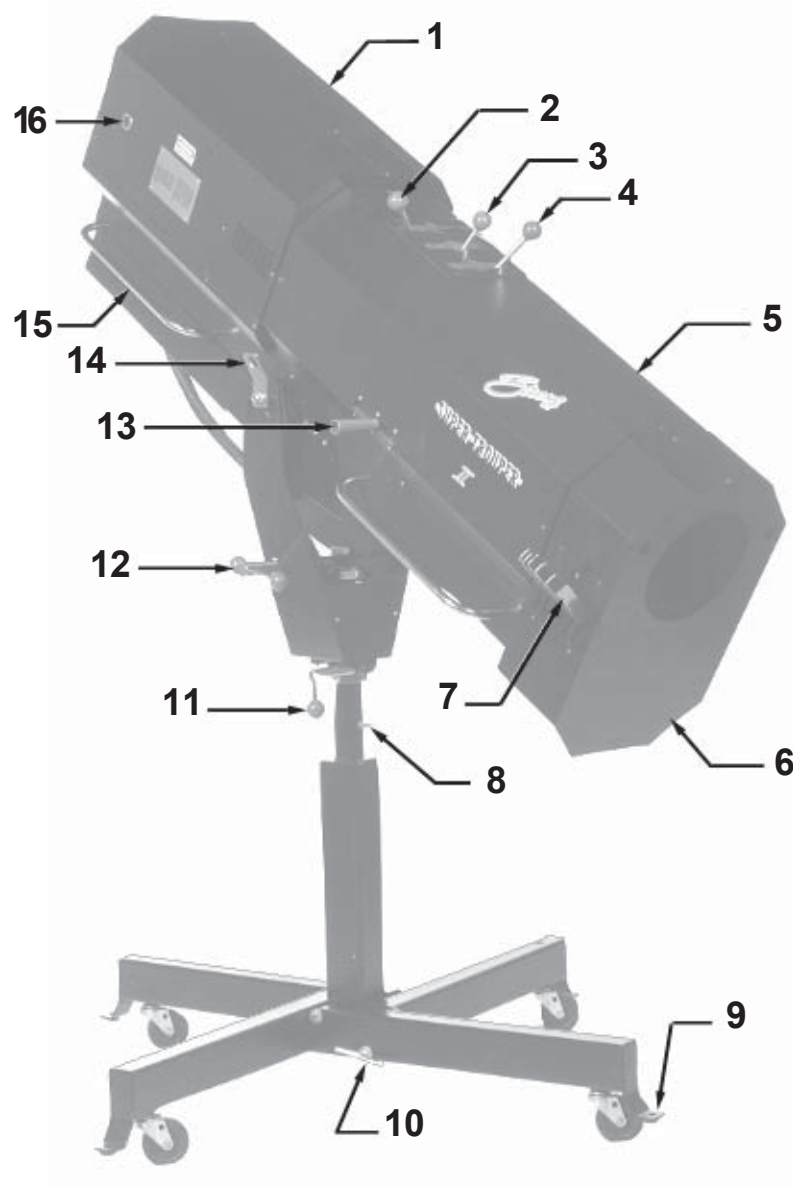
THE LAMPHOUSE is supplied with a 13 foot (4 meter) cable assembly containing the two DC leads, the ground wire, and all AC control leads. The cable assembly is terminated with (2) multiple pin, keyed MS connectors which mate to receptacles on the lamphouse and xenon power supply cabinet. The AC hook-up to the xenon power supply is detailed in the power supply manual; AC connectors must comply with all local electrical codes.

THE OPTICAL SYSTEM incorporates a newly-designed lens mechanism. Spotlight operators familiar with earlier type Strong spotlights are urged to study the section following in this manual entitled OPERATION OF THE OPTICAL SYSTEM and to practice the operation of the Super Trouper II prior their first performance. The spot size control (“trombone”) handle is drawn *back* to “spot” and pushed *forward* to “flood,” which is the reverse of earlier type Strong optical systems. The spot edge is focused by rotating the focus knobs located behind the boomerang on the left and right sides of the optical system.

FADE-OUT, CHOPPER, AND IRIS CONTROLS are positioned in the same configuration as earlier Strong spotlights. All optical system controls are accessible for right- or left-hand operation. The color boomerang is easily reversed to position the color arms on either side. Operation of the self-canceling boomerang remains unchanged, and standard Strong nine-inch gel frames are used.

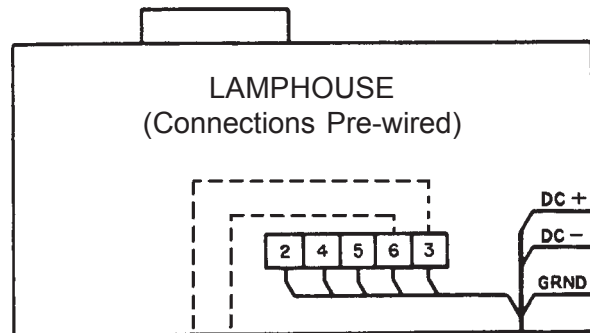
WHEN TRANSPORTING the spotlight, it is recommended that the xenon bulb be removed and placed in its original shipping carton with the cover on the bulb to insure against breakage. The bulb, after cooling to room temperature, may remain mounted in the lamphouse if moving the spotlight from one position to another within the arena or auditorium. Reasonable care should be exercised; breakage caused in handling is *not* covered by the xenon bulb warranty.

IF AT ANY TIME you have a suggestion, or desire aid in securing anticipated results, please feel free to write directly to STRONG INTERNATIONAL, 4350 McKinley Street, Omaha, Nebraska 68112.



- | | |
|------------------------------------|---|
| 1. Cover, Lamphouse Compartment | 9. Mounting Bracket, Leveling Foot |
| 2. Fade-Out Control Lever | 10. "T" Bolt, Folding Leg |
| 3. Masking Blade Control Lever | 11. Horizontal Swing Friction Adjust |
| 4. Iris Control Lever | 12. Horizontal Tilt Friction Adjust |
| 5. Cover, Optical System | 13. Spto Size Control (Trombone) Handle |
| 6. Disc Housing, Color Boomerang | 14. Lifting Strap |
| 7. Color Selector Lever, Boomerang | 15. Hand Rail |
| 8. Height Adjusting Pin | 16. Arc Viewing Port |

LAMPHOUSE - POWER SUPPLY Interconnection Diagram

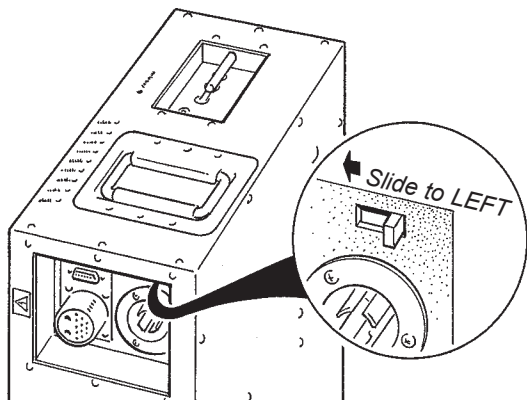


Conduit —

Remote - Auto
Sustained 5 Amp.
Dry Contact
(by Installer
as req'd.)

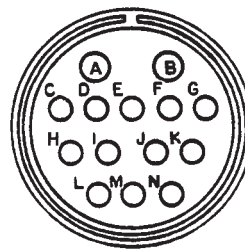
SYSTEM MUST BE GROUNDED
All wiring must conform to local codes;
shield lamphouse cable in conduit if
required.

Check Slide Switch (below) on Power
Supply for correct positioning.

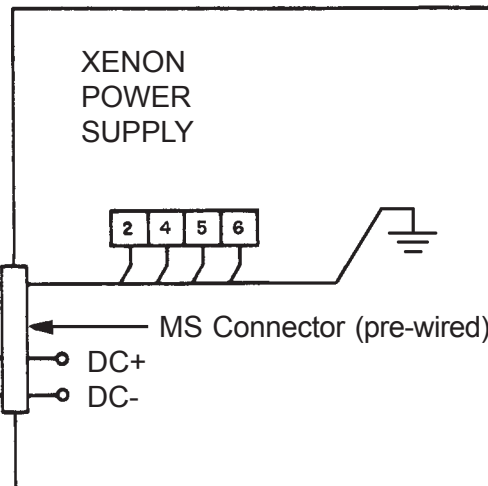


MS CONNECTOR

Pin	Wire No.
A	DC-
B	DC+
C	2
D	3
E	4
F	5
G	6
I	7
J	8
M	Grnd



Lamphouse
Cable Assembly



INSTALLATION AND SETTING UP SPOTLIGHT

THE SUPER TROUPER II is shipped in sections which must be assembled. Lifting straps mounted to the yoke pivot studs (see Figure 6, Item 2) are designed to bear the weight of the spotlight and base. This permits assembling the spotlight on the floor and later hoisting it to an overhead spotlight position.

THE FOLDING BASE ASSEMBLY is shipped collapsed, and requires only folding the base legs down and pinning the legs using the four T-bolts (Figure 6, Item 17) supplied. Screw the four leveling feet and locknuts (Figure 6, Item 15) into the brackets at the end of each leg.

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

THE INNER TUBE below the support yoke is drilled with 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 of the base column and one of the holes in the inner tube. The leveling feet may be adjusted through an additional two-inch range.

THE HORIZONTAL PAN and vertical tilt locking knobs are on the right hand (from rear) side of the yoke assembly. The yoke saddle is marked to indicate FRONT. Tighten both of these locking devices securely before attempting to place the spotlight head (lamphouse and lens system) on the support yoke.

PLACE THE LAMPHOUSE and lens system on the yoke assembly, with the operator's side of the lamphouse (with arc viewing port) to the *right* side of the yoke saddle, the same as the yoke locking controls. Line up the four mounting holes in the bottom plate of the support brace with the four slotted holes in the saddle of the yoke assembly. Secure using the four 5-16/18 wing head screws and flatwashers. After mounting the boomerang, loosen the tilt lock and test the spotlight balance at the desired projection angle. Loosen the (4) wing head screws and slide the spotlight head in the slotted holes in the yoke saddle to achieve optimum balance.

MOUNT THE COLOR BOOMERANG to the front of the optical system with the color arms facing the desired operation side. Align the three keyholes in the boomerang housing to the three mounting studs on the front of the optical system housing. Lower the boomerang housing to engage the slots. Secure the bottom of the boomerang housing to the support bracket on the bottom of the base rail using the thumbscrew provided.

ATTACH THE LAMPHOUSE CABLE CONNECTORS to the mating receptacles on the lamphouse and 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.

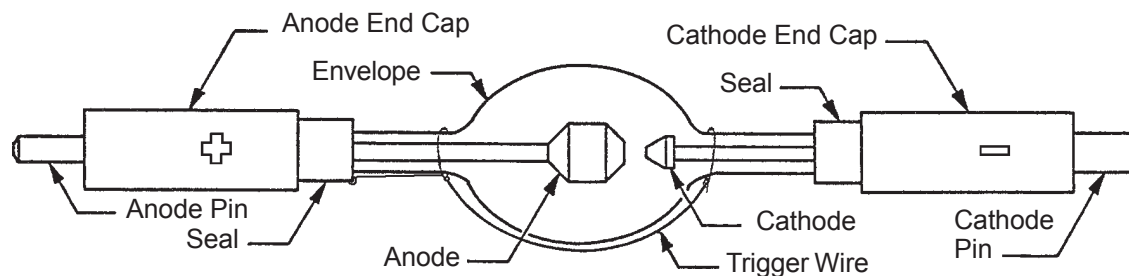
THE SUPER TROUPER II is wired for operation with the "compact" model Strong xenon power supply Equipment Type 62-80106. If installing the Super Troupers II with an older model or type Strong xenon power supply, a ground wire must be connected to the power supply's MS connector Pin M. Operation of the Super Troupers II with a xenon power supply other than a Strong 62-80106 will void UL compliance.

SAFETY PROCEDURES

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.

REFER ALL 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 blower in good operating condition. Keep the blower inlet clean for unrestricted air flow.
8. To insure maximum bulb life, operate the lamphouse blower and the exhaust system 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.**



BULB INSTALLATION

CAUTION: OBSERVE ALL SAFETY PROCEDURES. Put on protective face mask. Wear clean cotton gloves to prevent marking the quartz envelope of the bulb with fingerprints. Turn the circuit breaker on the side of the xenon power supply cabinet OFF.

REMOVE THE LAMPHOUSE ACCESS COVER by removing the (3) phillips head screws and finish washers; (2) near the arc viewing port, and (1) adjacent to the front door louvers. Open the key lock after removing the hex head security screw.

THE SUPER TROUPER II SYSTEM is shipped from the factory complete with a xenon bulb and a compatible xenon power supply. The desired bulb wattage and desired input voltage of the spotlight system shipped is specified by the customer when placing the original equipment order. Three wattages are available (1000, 1600, or 2000 watt). The 115 V.AC xenon power supply (62-80114) is capable of operating 1000 and 1600 watt bulbs throughout their specified current ranges, and the 220 V.AC supply (62-80106) operates all three available wattages. Bulbs approved by Strong International for use in the Xenon Super Trouper II include:

<u>Wattage</u>	<u>HANOVIA Part No.</u>	<u>OSRAM Part No.</u>	<u>LTG. TECH. INT'L. Part No.</u>	<u>Nominal Current</u>	<u>DO NOT EXCEED</u>
1000	XH1000HS	XBO1000W/HS OFR	LTIX-1000W-HS	50 A.	58 A
1600	XH1600HS	XBO1600W/HS OFR	LTIX-1600W-HS	65 A.	70 A.
2000	XH2000STII	XBO2000W/HS OFR	LTIX-2000W-HS	75 A.	90 A.

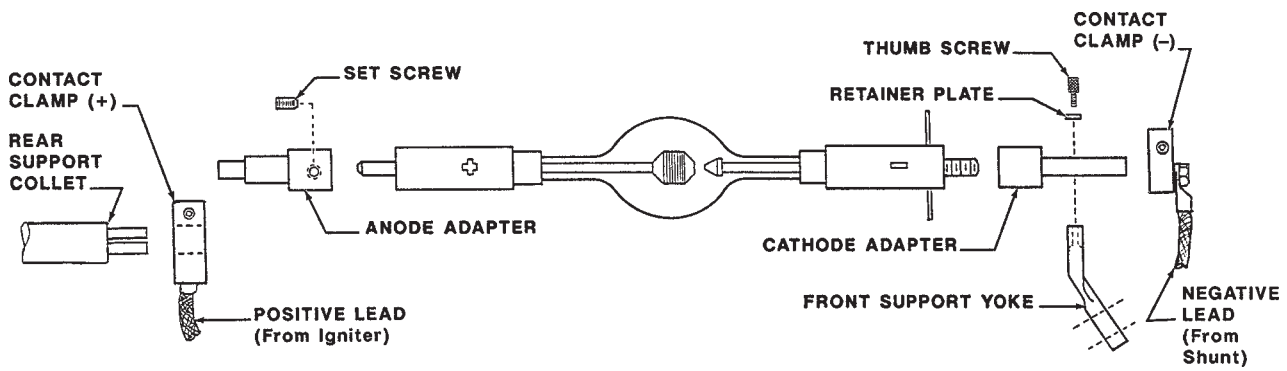
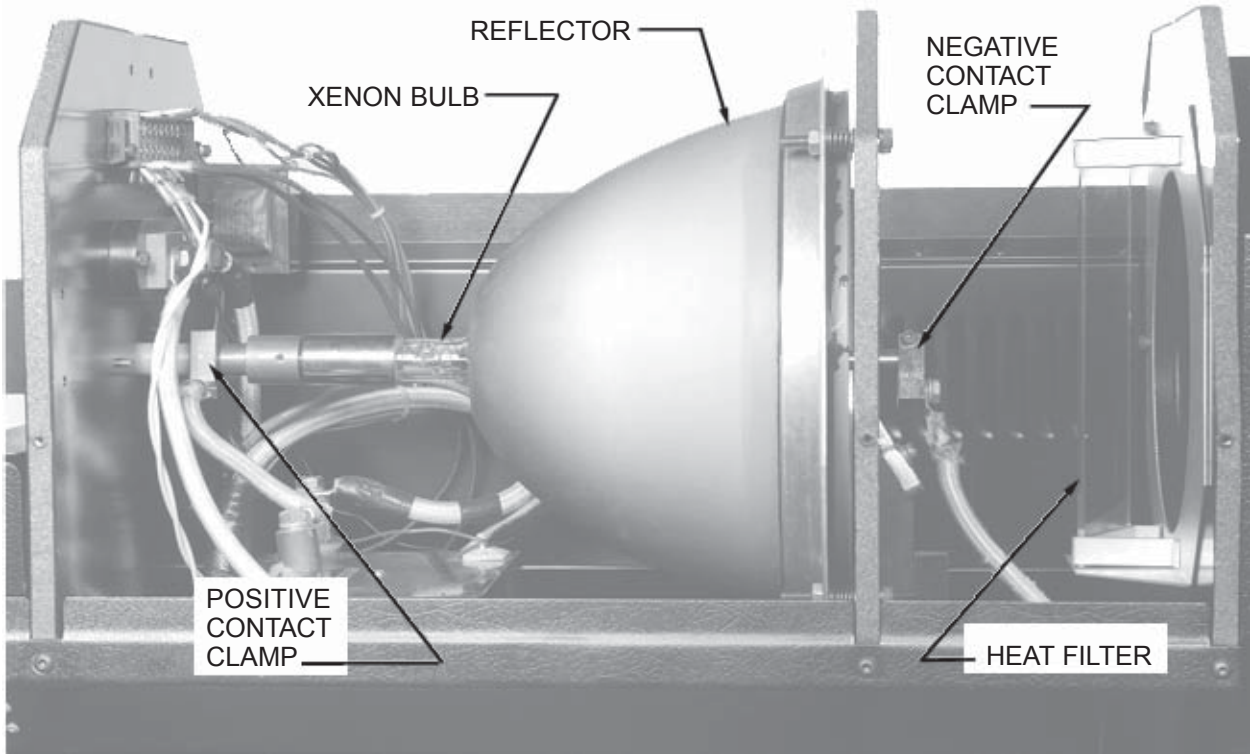
THE ABOVE XENON BULBS are designated OZONE FREE, and replacement bulbs other than the above must be certified by their manufacturer as being 100% interchangeable. The warranty on the xenon bulb supplied is administered by the bulb manufacturer and is separate from the spotlight warranty issued by Strong International. Retain the warranty documentation packed with the xenon bulb.

WHEN ORDERED for 1000 or 1600 watt operation, the adapters required to install either of these smaller bulbs in the Super Trouper II lamphouse are supplied in the accessory kit. The front bulb support for the 1000 and 1600 watt lamphouses is a cast yoke (65117) which holds the stem of the cathode adapter. A retainer plate (65151) and two thumb screws (65152) clamp the stem of the cathode adapter into the yoke.

THE 2000 WATT type "HS" bulb mounts into the lamphouse without adapters. The front bulb support for the 2000 watt bulb (83747) is a cushioned ring which encircles the cathode (-) end cap of the bulb. The negative contact (24269) clamps either on the end of the 1000/1600 watt cathode adapter (as shown) or mounts directly to the .312" (8mm) cathode pin of the 2 kW "HS" bulb. A trigger wire, encircling the bulb envelope and attached to the *anode* end cap (as illustrated on the facing page), must be present.

IF IT IS DECIDED subsequent to the initial installation to change bulb wattages, it is necessary to verify that the original xenon power supply will operate the replacement bulb throughout its range. The 115 volt, Type 62-81000 power supply is *not* recommended for use with a 2000 watt bulb, and should be replaced with a 220 volt, Type 62-80000 unit. Make certain that the correct front bulb support is installed; 65117 Yoke for 1000 and 1600 watt, or 83747 Ring Support for 2000 watt. The rear bulb support collet (24266) accommodates either the anode pin of the 2000 watt "HS" bulb or the stem of the anode adapter.

XENON BULB INSTALLATION



NO ADAPTERS REQUIRED FOR 2000 WATT TYPE "HS" BULB

See Parts List, Figure 2 for 2000 Watt Bulb Mounting

1000, 1600 Watt Bulb Installation

ASSEMBLE THE REQUIRED ADAPTERS to the 1000 or 1600 watt bulb as illustrated prior to inserting the bulb into the lamphouse. Be very careful **not** to apply any mechanical strain to the quartz envelope when installing adapters. Note the (2) different anode adapters; the *longer* anode adapter (24271) is for the 1000 watt Hanovia XH1000HS bulb *only*.

SCREW THE CHROMED, THREADED CATHODE ADAPTER (24270) onto the bulb stud so it seats firmly against the shoulder of the cathode (-) end cap. Slip the correct brass anode adapter with set screw over the stud of the positive end cap in contact with the shoulder of the anode (+) end cap. Tighten all threaded fasteners securely to insure firm mechanical fit and good electrical conduction.

LOOSEN THE THUMB SCREWS on the top of the front bulb support yoke and swing the retainer plate clear of the yoke. Slide the contact clamp of the igniter lead over the brass socket of the rear bulb support collet.

REMOVE THE PLASTIC PROTECTIVE COVER from the bulb after putting on the face shield. *DO NOT* touch the clear quartz envelope of the bulb with bare fingers. Natural skin oils will rapidly burn into the quartz and shorten bulb life. The xenon bulb warranty does *not* cover damage of this nature. If the quartz is accidentally fingermarked, thoroughly remove the fingerprints with isopropyl alcohol before igniting the bulb.

INSERT THE BULB into the lamphouse, between the reflector support and the front of the lamphouse. Pass the anode (+) end of the bulb into the reflector and through the center hole of the reflector. Take care **not** to touch or scratch the surface of the reflector.

INSERT THE ANODE ADAPTER STEM into the rear support collet. The stem must be inserted as far into the socket as possible to insure good conduction and to permit full focus travel of the bulb. Place the cathode adapter stem into the bulb support yoke, pivot the retaining plate to its closed position, and tighten both thumb screws. Using a 9/64" allen wrench, firmly tighten the socket head clamping screw in the positive (+) contact to insure a good electrical contact.

INSTALL THE NEGATIVE (-) LEAD CONTACT CLAMP over the end of the cathode adapter. Slide the contact up to seat its shoulder firmly against the tip of the cathode adapter. Dress the negative lead directly in front of the bulb support yoke to minimize the shadow. Tighten the socket head clamping screw securely using a 9/64" allen wrench.

2000 Watt Bulb Installation

REMOVE THE PLASTIC PROTECTIVE COVER from the xenon bulb only if necessary. Slide the contact clamp of the igniter lead over the brass socket of the rear bulb support collet. If the bulb is supplied by the manufacturer with an anode lead attached, cut off or otherwise remove the factory-installed anode lead. Remove any fingermarks from the bulb envelope with alcohol.

INSERT THE 2000 WATT BULB into the lamphouse, passing the anode (+) end through the hole in the reflector. Handle the bulb by the metal end caps *only*. Pass the anode pin as far as possible to the rear of the lamphouse to allow clearance between the cathode (-) pin and the front bulb support. Take care **not** to touch or scratch the surface of the reflector; do not touch the quartz envelope of the bulb. Slide the cathode (-) end cap through the spring-cushioned ring of the bulb shock mount.

2000 Watt Bulb Installation (continued)

NOTE THE TWO NOTCHES at the center hole of the reflector. These notches allow additional clearance between the grounded reflector and the energized bulb trigger wire. Rotate the bulb to align the trigger wire with one of these two notches to prevent the trigger wire from arcing to the grounded reflector.

INSERT THE ANODE (+) PIN of the bulb into the rear support collet. The pin must be inserted as far into the socket as possible to insure good conduction and permit full focus travel of the bulb. Make certain the bulb's trigger wire is aligned to the upper or lower reflector notch, and firmly tighten the socket head clamping screw. Slide the negative contact clamp over the cathode (-) pin and dress the negative lead directly in front of the front bulb support to minimize the shadow. Securely tighten the negative clamp.

AN ALTERNATE METHOD of installing the 2000 watt bulb is to dismount the shock mount ring and cushion spring from the front bulb support assembly by removing the socket head screw. Slide the ring over the cathode (-) end cap of the bulb, and install the bulb by inserting the anode (+) end cap through the reflector center hole and seating the anode pin into the rear support collet. Re-mount the ring to the base bracket of the front bulb support using the socket head screw. Secure the anode (+) clamping screw; install and tighten the cathode (-) contact clamp.

THE SOCKET HEAD SCREW which mounts the bulb support ring to its support bracket must be tightened securely enough to *clamp* the upright bulb support ring in a vertical (90°) position and prevent its tilting forward or back as the bulb is focused. The end cap of the bulb should touch only the coils of the shock mount spring to allow the bulb to slide forward and back with a minimum of friction and *no stress* on the envelope.

All Bulb Wattages

INSERT THE STRIP HEAT FILTER into the bracket in front of the xenon bulb. This filter is a narrow glass strip that covers only the center portion of the beam. One surface of the glass is coated, and marked "XX" and/or imprinted "This Surface Toward Bulb." The coated glass surface **must** face the bulb or damaging radiant heat energy will be transmitted to the optical system. DO NOT operate the spotlight with the glass strip heat filter missing or reversed.

CHECK THE ARC STABILIZATION MAGNET mounted to an "L" bracket below the reflector. The SOUTH pole of the magnet is marked with paint, and should be pointed toward the off-operator side of the lamphouse (*left* side, as viewed from rear). If the magnet is reversed, the arc will burn *high* on the face of the anode electrode, creating severe light flicker and causing ignition problems. This magnet is *required* for 2000 watt operation, and is in no way detrimental to the operation of 1000 and 1600 watt bulbs.

REMOVE THE PLASTIC COVER from the xenon bulb. *Do not* ignite the lamp with the cover on the bulb. Retain the plastic cover and store in a secure location at or near the spotlight.

REPLACE THE LAMPHOUSE COVER. Replace and tighten all (3) phillips head retaining screws and washers. The lamphouse cover must be correctly installed and secured to close the cover interlock switches and enable bulb ignition and operation.

IT IS RECOMMENDED to establish a routine for periodically checking all electrical connections for tightness, particularly those at the bulb. A loose connection in the DC circuit may cause overheating of contacts and leads, and may damage or destroy the bulb. The xenon bulb warranty does *not* allow credit for heat-related damage of this nature.

BULB ALIGNMENT & LAMPHOUSE OPERATION

PRIOR TO OPERATING THE SPOTLIGHT, verify the following conditions:

- ✓ The plastic protective cover has been removed from the xenon bulb.
- ✓ The strip heat filter is installed with the **coated** surface *facing the bulb*.
- ✓ The lamphouse access cover is in place and secured using all (3) phillips head screws; key lock secured and hex head security screw installed.

SEE THE PRECEDING “BULB INSTALLATION” SECTION for instructions detailing the above. Failure to remove the plastic bulb cover will damage or destroy the xenon bulb. A missing or reversed heat filter will cause damage to the lens system. The lamphouse cover must be installed correctly and secured to actuate the interlock switches and permit lamp ignition.

ENERGIZE THE XENON POWER SUPPLY by switching the circuit breaker on the side panel ON. The red light adjacent to the circuit breaker will glow, indicating that the power supply is ready for operation. The lamphouse blowers will start and actuate the blower interlock switch to permit bulb ignition. The lamp blowers will operate continuously until the xenon power supply is de-energized. Place the lamphouse MODE switch in the “MAN.” (manual) position. This is the normal setting for the MODE switch, as it permits ignition control of the spotlight at the unit, and not from a remote location. REMOTE/AUTO operation is outlined in the section following, and illustrated on the Lamphouse-Power Supply Interconnection Diagram.

PLACE THE **LAMP SWITCH** in the ON position and the bulb will ignite. Allow a few minutes for the current to stabilize, and read the lamphouse ammeter. The bulb must be operated within the current range specified by the bulb manufacturer. The ranges for the xenon bulb supplied are as follow:

<u>Wattage</u>	<u>Nominal Current</u>	<u>DO NOT EXCEED</u>
1000	50 A.	58 A.
1600	65 A.	70 A.
2000	75 A.	90 A.

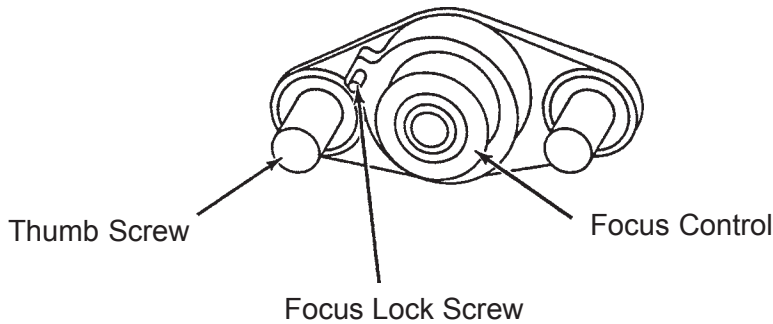
ADJUST THE XENON POWER SUPPLY as instructed in the power supply manual for the correct operating current. A new xenon bulb is normally operated at “nominal” current. After prolonged use, the light output will decrease because of normal bulb aging. At this time, the current output setting may periodically be increased to compensate for bulb aging, but **do not**, at any time, exceed the maximum current level specified.

DISMOUNT THE COVER PLATE located above the lamphouse instrument panel by removing the three black phillips head screws and finish washers. This exposes the control mechanism for adjusting the position of the xenon bulb.

THE CENTER SECTION of the control is a threaded member that focuses the bulb in relation to the reflector. Turning this adjustment moves the bulb on the horizontal plane, into or out of the reflector. Rotating this section *clockwise* moves the bulb *away from* the reflector. The small knurled screw to the left of this section can be tightened to lock the focusing mechanism in place after the bulb alignment procedure has been completed.

THE TWO LARGE THUMB SCREWS to the left and right of the focusing control secure the horizontal and vertical position of the bulb. These two large thumb screws are spring-loaded to provide a degree of friction against the cast section of the control mechanism.

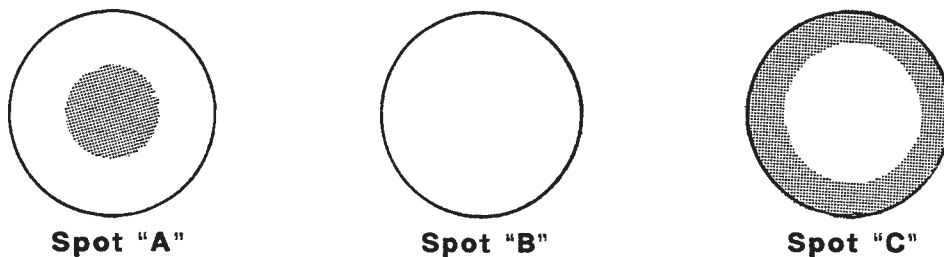
BULB ADJUSTMENT CONTROLS



THE FOLLOWING METHOD is recommended to position the xenon bulb inside the reflector in order to project the best light to the stage.

SLIDE THE SPOT SIZE CONTROL HANDLE (“Trombone”) *back* to its stop at the the rearmost position to project the smallest spot possible. Place the iris, choppers, and dimming controls in their full *open* positions. Project the spot to a wall or similar flat perpendicular surface opposite the spotlight.

TURN THE CENTER “FOCUS CONTROL” section of the bulb adjustment control, as illustrated above, fully clockwise until a small dark spot is projected on the wall (Spot “A”). At this point, the bulb is defocused at its extreme forward position. Then rotate the focus control counterclockwise until a center “hot” spot is defined (Spot “C”).



LOOSEN THE TWO THUMB SCREWS to the left and right of the focus control just enough to permit manual motion of complete control assembly. Move the control assembly around the two thumb screws and observe the movement of the brighter “hot” area within the projected spot.

MOVE THE CONTROL ASSEMBLY around the thumb screws until the brightest portion of the “hot” area is at, or slightly above, the center of the projected spot. It may be necessary to again rotate the bulb focus control to clearly define and identify the “hot” spot. Positioning the brightest light *above* the center of the spot highlights the head and shoulders of a live performer. This effect is particularly desirable for television and video taping.

AFTER THE “HOT” SPOT is correctly positioned, tighten the two thumb screws to lock this adjustment in place. To verify that the bulb is at the optical centerline, turn the focus control clockwise to again project Spot “A.” The dark spot should remain centered in the spot projection as shown.

ROTATE THE BULB FOCUS CONTROL (center section) to obtain the brightest light with even, flat light distribution (Spot “B”). To sharpen the edge of the spot, rotate the spot fine focus control (large knurled knob) located immediately behind the color boomerang.

A SECOND METHOD of aligning the xenon bulb is to project the spot to the stage, and using the bulb adjustment controls, obtain a “hot” spot in the projected spot. Center this “hot” spot in the projected spot by moving the entire control section around the two thumb screws. Once the “hot” spot is centered, or slightly above center in the projected spot, lock the adjustment control in position with the two thumb screws and rotate the focus control (center section) to obtain a bright spot with an even distribution of light. To sharpen the edge of the spot, rotate the knurled focus control knob located on the side of the lens mechanism.

THIS BULB POSITIONING ADJUSTMENT should not be disturbed until the xenon bulb is either rotated or replaced. At this time it will be necessary to repeat the above bulb alignment procedure.

REPLACE THE REAR COVER PLATE over the bulb adjustment control mechanism. Secure in place with the (3) phillips head screws and finish washers.

BECAUSE OF MANUFACTURING TOLERANCES and normal bulb aging, it may be necessary to operate one lamp at slightly higher or lower current than others to obtain equal light balance between two or more units. These current adjustments are made at the xenon power supply.

TO EXTINGUISH THE ARC, place the LAMP switch in the OFF position. The blowers in the lamphouse will continue running until the xenon power supply is de-energized. Allow the blower to operate and cool the bulb for *at least* ten minutes after extinguishing. This measure is required to comply with the bulb manufacturer’s warranty conditions.

TO PROLONG BULB LIFE, and to encourage rapid bulb starts, it is recommended to douse out using the choppers or the fade-out blades rather than extinguishing the bulb during “dark” periods between cues. Multiple ignition pulses and “warm” re-starts consume more power and cause more bulb electrode wear than sustained operation. While repeated ignitions are frequently unavoidable, and within design parameters, a (20) minute delay between ignitions is desirable.

COMPLY WITH THE BULB MANUFACTURER’S INSTRUCTIONS regarding rotation of the xenon bulb at specified intervals. To rotate the bulb, loosen both the positive and negative clamps. Grasping the metal end caps, rotate the bulb 180° and align the trigger wire to the opposite reflector notch. Securely re-tighten both clamps. Adjust the xenon power supply to increase the DC current to a setting at or just below the maximum level specified for the bulb. Project a white spot to check for an even field; correct the bulb positioning as required. Operate the xenon bulb at this higher current level for one or two performances, and then return the power supply setting to its previous level. This temporary operation of the xenon bulb at high current following bulb rotation will restore the cathode tip and enhance ignition at the new arc position.

RETURN BULBS upon which a warranty claim is being made to the theatre equipment dealer through whom the unit was purchased. Pack the bulb in its original shipping carton with the protective cover over the bulb. Complete and enclose all warranty forms supplied by the bulb manufacturer. Warranty credit will *not* be allowed if the bulb failure is related to mishandling, incorrect installation, faulty supporting equipment, or abuse.

DIGITAL DISPLAY

UPON ENERGIZING the LAMP circuit, the backlighting will illuminate the LCD screen. When the blower is operating and all access covers are closed and correctly secured, the display will appear as shown:

**000V 000A 0000W
1234BLB 12345HR***

FOR PURPOSES OF ILLUSTRATION, the above display indicates a non-operating bulb with 1,234 hours of use installed into a spotlight with 12,345 hours of operation. The asterisk (*) at the end of the second line, when flashing, indicates that the display is active and awaiting input. Upon bulb ignition, the upper line will display the arc voltage (V), the DC current (A), and the operating wattage (W) of the bulb. The figures will shift for the first few moments of bulb operation, but will stabilize after the bulb reaches normal operating temperature and pressure. A plus sign (+) will replace the asterisk.

IN THE EVENT of an open interlock switch, the lower line will display the appropriate diagnostic measure, i.e. CHECK COVER or CHECK BLOWER. The diagnostic messages are sometimes abbreviated, and defined as follows:

- CHECK TOP COVER:** Make certain the lamphouse top cover is correctly positioned and secured using all (3) phillips head screws.
- CHK COVER (LEFT):** The interlock switch below the left (off-operator) side of the top cover is open; check tightness of locking screws.
- CHK COVER (RIGHT):** The interlock switch below the right (operator) side of the top cover is open; check tightness of locking screws.
- CHECK BLOWER:** Make certain the squirrelcage blower below the lamphouse is energized and operating, and that the ducting to the bulb compartment not obstructed.

WHEN THE INTERLOCK CIRCUIT is complete, closure of the LAMP switch, or the remote/auto closure, will energize the contactor of the xenon power supply. The high open circuit ("no load") DC voltage will be displayed. When the open circuit voltage reaches 140 V.DC, the igniter will generate a RF pulse to bridge the gap between the bulb electrodes. This pulse, coupled with the high open circuit DC voltage, will ignite the bulb. The voltage reading (V) will then fall to the bulb's sustaining level, and the DC amperes (A) and wattage (W) will be displayed continuously until the bulb is extinguished.

ELAPSED HOURS will begin counting upon bulb ignition. Bulb hours (BLB) are limited to four digits, and are re-set when the xenon bulb is replaced. To re-set bulb hours, press the RESET button accessible through marked hole below the LCD screen. The 5/64" allen wrench supplied with the accessory kit is the correct diameter to clear the hole.

NOTE: WHEN RECORDING start-up and removal hours on the Xenon Bulb Record, use the **total elapsed hours (HR)** figures. The (BLB) figure, re-set upon installation of the bulb, is a convenience feature **ONLY**. Basing records of the lamp system on the total hours (HR) figures permits an accurate and ongoing history of bulb usage.

IF THE XENON BULB fails to ignite, additional diagnostic messages will display on the lower line of the LCD screen:

CHECK PWR SUPPLY: If no DC current is sensed, and voltage does not exceed 125 V.DC, check the xenon power supply. Repair or replace as required.

CHECK IGNITER: If the DC open circuit voltage reaches and exceeds 140 V.DC and the igniter fails to pulse, replace the igniter.

CHECK XENON BULB: Look through the arc viewing port. If the high voltage is shorting to ground, and not arcing between the bulb electrodes, locate and correct (insulate) the short circuit. If the high voltage arc appears between the bulb electrodes, and the bulb fails to ignite, replace the bulb.

DIAGNOSTIC MESSAGES serve as prompts and suggestions but do not replace traditional troubleshooting procedures. If the top cover is closed and secured but transmits an error message, check the subject cover interlock switch with an ohmmeter and replace if defective. Dirt or dust fouling an air vane switch will cause a “blower” error message. A “power supply” or “igniter” error message might be caused by a loose or oxidized connection.

HANDLING THE SPOTLIGHT

THE SUPER TROUPER II can be operated from either side. Generally, the best position for the operator to stand is near the center of the spotlight, on the right hand side. The angle of tilt and the size or location of the porthole may alter the position for the most convenient operation. Each operator will, after a few minutes of operation, generally develop his or her own system and position for operating the unit.

POSITION THE COLOR BOOMERANG with the color arms facing the desired operating side. The boomerang housing can be reversed by removing the thumb screw securing the bottom of the housing to the base rail bracket, lifting the housing out of the three keyed studs, and pulling the boomerang forward. Reverse the boomerang, and re-mount using the (3) keyholes on the opposite side. Replace and secure the thumb screw. It is advisable to check the sequence of color filters and to place the more dense colors (red, green) in the front positions of the boomerang (furthest away from the arc). See the following OPERATION OF THE COLOR BOOMERANG section for detailed instructions.

THE HORIZONTAL PAN and vertical tilt tension adjustment levers are located on the yoke assembly. Each can be separately set to give the desired degree of friction on spotlight swing, from complete release to total lock-down, to suit the spotlight's application and the individual operator.

THE LENS SYSTEM "ZOOM" BRAKE, which controls the degree of force required to slide the spot size control handle ("trombone"), is located on the outrider of the movable projection lens carriage. Alternately tightening or loosening the nylon brake tension screw will increase or decrease the force required to operate the spot size control handle. Requirements may vary, and the braking can be adjusted to both accommodate the angle of tilt and to suit the individual operator. See the following OPERATION OF OPTICAL SYSTEM section for details regarding accessing and setting the friction brake.

REMOTE/AUTO OPERATION

TO OPERATE THE SPOTLIGHT from a remote location or an automation controller, the lamphouse must be equipped with a rocker switch labeled MODE. With the MODE switch in the "AUTO" position, and the LAMP switch "ON," the lamp will ignite by means of a dry contact across switching terminals 3 and 6 in the lamphouse or power supply. Do not apply voltage to these terminals; use only a dry contact rated at 5 amperes as illustrated on the Lamphouse-Power Supply Interconnection Diagram.

THIS TYPE OF INSTALLATION is intended for use *only* if the spotlight is "locked down" and to be used as a fixed spot without an operator at the unit. Manual operation is restored by placing the MODE switch in the "MAN." position. Likewise, placing the MODE switch in "MAN." and switching the spotlight ON or OFF using the LAMP switch will override a faulty remote contact or defective automation controller.

OPERATION OF OPTICAL SYSTEM

THE IRIS CONTROL is the front lever which projects through the slots on 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 right.

THE SPOT SIZE CONTROL HANDLES (“Trombone”) are located on the right and left sides 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 trombone handle is in the extreme rear position.

THE MAXIMUM FLOOD SPOT is obtained with the iris control lever to the left (away from the normal operating side) for the largest aperture and with the trombone handle moved as far forward as possible.

SMALLER SIZED SPOTS are projected as the trombone handle is pulled back. Most of the spot sizes needed will be produced with the iris in its maximum open position. A “diffused” spot (reduced intensity with a soft edge) is projected by moving the trombone handle forward toward “flood” while closing the iris control.

TO ADJUST the degree of force required to slide the spot size control handle, the nylon brake screw in the outrider of the projection lens carriage must be loosened or tightened. The lens mechanism housing (see Figure 3, Item 27) must be dismantled to perform this adjustment.

TIGHTEN THE YOKE TILT LOCK and dismount the color boomerang. Remove the (2) spot size control handles and the (2) focus knobs. These items are mounted using socket head screws which can be removed using a 3/16" allen wrench. Unscrew the (3) plastic knobs from the optical system control levers. Remove the (6) phillips head screws retaining the lens mechanism housing. Lift the housing from the spotlight, slightly spreading the bottom of the cover to clear the protruding shafts.

THE FRICTION BRAKE is a hex head nylon screw (see Figure 3, Item 4) which bears against the slide rod. Tightening the screw applies tension and loosening the screw relieves tension. A spotlight operated at an extreme down angle will require more brake tension than one operated at a more level angle. Furthermore, the preferred degree of tension may vary between individual operators. Secure the lock nut after setting the desired brake tension; re-install the lens mechanism housing and the color boomerang.

THE EDGE OF THE PROJECTED SPOT is focused by rotating the focus control knob. This focus control alters the relative distance between the lenses to adjust the optical system for differing lengths of throw. The degree of torque required to rotate the focus control is adjustable by tightening or loosening the friction screws (Figure 4, Item 17) on the off-operator side of the focus mechanism. When making an focus adjustment, observe the spot and rotate the focus knob until the sharpest edge on the projected spot is obtained.

FOR A “HEAD” SPOT, or any spot smaller than can be obtained with the trombone handle in its extreme rear position, shift the iris control lever to the right (toward operating side) for a smaller aperture. The iris control lever should always be returned to its extreme left (open) position before the spot size control (trombone) handle is again moved forward 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 out to full cutoff. The disengaged (full open) position of the masking shutter lever is to the extreme right (viewed from rear). Varying degrees of masking to complete cutoff are obtained by moving the lever to the left.

THE ANGLE of the masking shutter blades closure is adjustable and can be set to compensate for an offset horizontal projection angle, for example, if the spotlight is positioned to the left or right of center stage. An unbalanced condition will exist while adjusting the blades; lock down the spotlight tilt clamp before preceding.

REMOVE THE COLOR BOOMERANG and lens mechanism housing as instructed on the preceding page. Loosen the slotted head screws holding each of the masking shutter blades enough to allow adjustments. Ignite the bulb and project a spot. Adjust the angle of the *bottom* blade by tapping it 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 against the bottom blade, and tighten the screw.

THE FADE-OUT 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 fade-out (douse) when the lever is to the left, to full intensity when the lever is to the right.

ROTATING THE LARGE KNURLED KNOBS located on the sides of the optical system immediately behind the boomerang adjusts the fine focus of the lenses and sharpens the edge of the spot. It may be necessary to re-focus the edge of the spot after zooming from flood to small spot, and from spot to flood.

OPERATION OF COLOR BOOMERANG

THE COLOR BOOMERANG is equipped with six two-part filter holders (51928 gel frame with slide channel and 51376 cover plate). Six sheets of assorted color gels are included in the spotlight accessory kit. Additional colors and filter holders can be supplied by your Strong International Dealer. Specify ROSCOLUX® or equivalent *high temperature* gels.

TO OPERATE INDIVIDUAL COLOR FILTERS, lower the desired filter selector lever. A rocker catch located in the color disc housing holds the filter in position. To release a color, push the filter release arm in or engage another color, thus releasing the previous color automatically.

TO REPLACE FILTER HOLDERS, open the front cover of the color disc housing by removing the thumb screw on the top of the housing. The upper portion of the housing is hinged to allow access to the color holders. Slide the filter holders up and off the color arms. Replace gel frames as required and secure the front cover of the disc housing cover when finished.

NOTE: WHEN PLACING COLOR FILTERS in the boomerang, the **less** dense colors (pink, amber) should be placed in the holders toward the *rear* of the boomerang (toward 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). Remember to reverse the gel sequence if reversing the boomerang for left/right operation.

COLOR TEMPERATURE CORRECTION FILTERS, required for use with television and videotape, can be installed in place of one or more colors. They are available from theatrical supply dealers.

MAINTENANCE

THE SUPER TROUPER II SPOTLIGHT SYSTEM requires very little maintenance to keep it in good working order. Routine cleaning is generally sufficient.

THE REFLECTOR and the heat filter should be cleaned periodically with a clean, soft, lint free cloth to remove any dust from the coated surfaces. If excessively soiled, use a commercial liquid glass cleaner (i.e. Windex). **Do not** use Bon Ami or other abrasive cleaners.

THE XENON BULB should be checked occasionally for presence of any foreign material on the envelope. Any dirt or other foreign material will rapidly burn into the quartz material and possibly shorten bulb life. Use isopropyl alcohol and a clean, lint-free cotton cloth to remove dirt, fingermarks, and other contaminants. **CAUTION:** Observe all safety procedures when working around the exposed bulb.

CHECK ALL ELECTRICAL TERMINATIONS periodically for tightness. Note especially the xenon bulb connections and other leads in the DC circuit. All connections to the MS receptacle on the xenon power supply are accessible below the small panel adjacent to the receptacle.

THE INSIDE OF THE LAMPHOUSE COMPARTMENT and the lamphouse cover louvers should be cleaned periodically, depending on the dust conditions at each installation. The blower air inlets in the bottom panel may require cleaning to remove dust build-up which accumulates over a period of time. If dust build-up impedes the blower impellers, or if obstructed air flow allows the squirrelcage blower motor to over-heat, a thermal switch in the blower motor will shut down the blower. This will open the air flow interlock switch and extinguish the xenon bulb. If the squirrelcage blower shuts down repeatedly, it is necessary to dismount it from the spotlight base rail for a thorough cleaning. Vacuum or blow out the (2) impellers and lubricate the blower motor in the marked oil holes. The six-inch box fan at the rear of the lamphouse requires no lubrication.

THE OPTICAL SYSTEM LENSES must be kept clean to prevent any light reduction in the projected spot. To gain access to the lenses, tighten the horizontal pan and vertical tilt locking clamps, and remove the color boomerang and optical system housing.

CLEAN THE OPTICAL SYSTEM LENSES using lint-free lens tissues with any cleaner approved for use on coated projection lenses. If the projection lens assembly is removed from its barrel for cleaning, the end of the lens with the "FL" marking ring must be inserted toward the iris when replaced.

WHEN TRANSPORTING the spotlight from one venue to another, it is recommended that the xenon bulb be removed and placed in its original shipping carton with the cover on to insure against breakage. If the spotlight is moved from one position to another within the same venue, the unit may be transported with the bulb installed, assuming reasonable care is exercised. *DO NOT* move the spotlight until the bulb has cooled to room temperature.

TROUBLESHOOTING

NORMAL OPERATION

WHEN THE SAFETY SWITCH in the main AC supply line to the xenon power supply is in the ON position, and the 30 ampere circuit breaker on the switching power supply is ON, the POWER light on the xenon power supply will glow. The blowers in both the lamphouse and the xenon power supply will start.

OPERATION OF THE LAMPHOUSE BLOWERS will actuate and close the air flow interlock switch. If the lamphouse top cover is correctly installed and locked, the (4) cover interlock switch closures will complete the control circuit to the LAMP switch.

THE MODE SWITCH, located on the lamphouse instrument panel, should be in the "MAN." (manual) position. This is the *normal* setting for this switch, as it permits the operator to control lamp ignition from the spotlight's instrument panel.

WHEN THE "LAMP" SWITCH is placed in the ON position, the 115 V.AC control circuit (wires 5 & 6) in the lamphouse will energize the power supply circuitry providing DC current to the igniter and bulb. The green "GO" indicator light on the xenon power supply will glow. The power supply will then deliver high open circuit (approximately 180-200 V.DC "no load") voltage to the lamphouse. This high DC voltage will actuate the DC Pulse Igniter.

THERE WILL BE a distinctly audible high voltage arc "ping" at the igniter spark gap and across the bulb electrodes. The bulb should ignite immediately after one or two of these high RF voltage pulses. Once bulb ignition is sustained, the lamp current will adjust to the output setting of the xenon power supply. The DC voltage will fall to the xenon bulb's sustaining voltage level (30 V.DC or less), and the DC Pulse Igniter will cease generating the RF pulse.

MULTIPLE IGNITION PULSES prior to bulb ignition usually indicate a low DC output setting. Adjust lamphouse DC current according to the INSTALLATION - OPERATION section of the Xenon Power Supply manual to the correct level specified by the bulb manufacturer. Operating a xenon bulb *below* its rated current will *not* prolong bulb life; sustained operation below rated current will cause ignition problems as the bulb ages. A "warm" or aged xenon bulb might require multiple strikes. A short delay between ignition pulses is normal. The capacitors in the xenon power supply must re-charge between each high voltage "no load" discharge.

THE DC PULSE IGNITER will remain out of circuit while the xenon bulb is operating normally. No further ignition pulses will be generated until the xenon power supply again delivers open circuit DC voltage in excess of 140 V.DC.

ELAPSED HOURS will begin counting up when the xenon bulb sustains ignition. Hours are recorded as "BLB" and "HR." "BLB" indicates the operating hours of the installed bulb, and is limited to (4) digits. Total accumulated hours of use are displayed by the "HR" figure, and the "HR" figure should be used when entering bulb hours in a permanent record of the spotlight system.

IF THE XENON BULB does not ignite within eight seconds, the LCD display will read out operational sequences for assistance in locating and isolating the trouble area. See the following TROUBLE CHART for detailed information.

TROUBLE CHART

THE LCD DISPLAY SCREEN, when energized, will be backlit and display electrical data (volts, amperes, watts) on the upper line, and elapsed hours (BLB & HR) on the lower line. An asterisk (*) following the "HR" display will flash when the display is active, and turn into a plus sign (+) after bulb ignition. Electrical data will read zeros until the bulb is ignited.

AN OPEN INTERLOCK SWITCH (lamphouse cover or blower) will disable bulb ignition. The open switch will be identified on lower line of the LCD display (i.e. CHECK TOP COVER). After the problem is corrected, the lower line will again display the elapsed hour figures.

IF THE "MODE" SWITCH is in the "AUTO" position, the lamp will *not* ignite until (a) a closure is made across switching terminals 3 & 6 and (b) the LAMP switch is ON. This mode of operation is to be employed *only* when the spotlight is fixed and locked down. See the preceding section entitled REMOTE-AUTO OPERATION for detailed information.

WITH THE "LAMP" SWITCH in the "ON" position, and with all interlock switches closed, a distinct high voltage arc ping should be heard at the spark gap in the igniter. The flash of the xenon bulb should be visible through the arc viewing port as a high DC voltage pulse is applied across the bulb electrodes. Suppression capacitors on the Voltage Divider printed circuit board assembly (mounted to the lamphouse shunt) will prevent RF interference in the theater sound system.

AN IGNITION FAILURE at this point will cause additional diagnostic messages to be displayed on the lower line of the LCD screen:

CHECK PWR SUPPLY: If no DC current is sensed, or if the open circuit voltage fails to reach 140 V.DC, the igniter will *not* pulse. Repair or replace the xenon power supply.

CHECK IGNITER: If the DC voltage reaches and exceeds 140 V.DC, and the igniter fails to pulse, replace the igniter.

CHECK XENON BULB: Look through the arc viewing port. If the high voltage is shorting to ground, and not arcing between the bulb electrodes, locate and correct (insulate) the short circuit. If the high voltage arc appears between the bulb electrodes, and the bulb fails to ignite, replace the bulb.

BEFORE PRECEDING with the following Trouble Chart, check first that (a) the red indicator light on the xenon power supply is glowing, showing that AC power is present, and (b) the MODE switch is in the "MAN." position. Allow the xenon bulb to thoroughly cool to room temperature before opening the lamphouse enclosure, and allow capacitors to drain stored energy. The lamphouse control circuit operates on 120 V.AC; *exercise extreme caution when taking voltage measurements in a power ON condition.* Measure xenon power supply voltages at the MS connector or below the (2) small access panels *only*; DO NOT remove the large power supply cover plate.

EXCHANGE OF COMPONENTS (i.e. bulbs, igniters, power supplies) between similar Strong Super Trouper II's to aid in diagnosis of a problem is encouraged. This will not lead to equipment damage, and will not void equipment warranty.

TROUBLE CHART (continued)

Bulb Fails To Ignite

1. No DC current. Switch xenon power supply breaker ON.
2. DC output level too low. Increase power supply output to rated bulb current.
3. Low DC no load voltage from xenon power supply. Check no load voltage on digital display. Repair or replace power supply if no load voltage does not reach 140 V.DC.
4. Defective xenon bulb. Check for damaged or scorched electrodes, discolored quartz envelope or end caps. Replace if defective.
5. Faulty igniter. Arc at spark gap should be audible, and arc across bulb electrodes should be visible through arc viewing port. Repair or replace.
6. Loose or faulty terminal connection. Visually inspect connections, particularly in AC circuit (5 & 6) and all DC connections.
7. Ignition pulse arcing to ground. Dress all igniter and bulb leads one-half inch (13mm) or more away from grounded metal lamphouse components.
8. Inadequate AC supply line. Brown-out protection circuit in switching power supply disables operation if line voltage falls below 100 V.AC (120 volt models) or below 195 V.AC (220 volt models). Phase loss (220 volt models) will also disable power supply operation. Check AC voltage at power supply terminals L1 & L3 (see Xenon Power Supply manual, INSTALLATION section).

Bulb Goes Out During Operation

1. Blocked bulb seal blower intake or defective blower motor. Clean or replace.
2. Air flow switch sticking or faulty. Clean or replace.
4. Overheated thermal switch in xenon power supply. Switch opens at 190° Fahrenheit (88° Celsius). Check for unobstructed air flow through power supply; loose DC connection(s).
5. Blower motor overheated, internal thermal switch open. Allow to cool; clean as required.
6. Faulty xenon bulb. Check for sagging or damaged electrodes, darkened envelope, instability in operating voltage or current. Replace if defective.
7. Drop in AC supply voltage or AC phase loss. See Item 8 in section above.

Excessive Light Flicker

1. Defective xenon bulb. Check for cracked and/or sagging electrode.
2. Arc stabilization magnet missing or reversed. Replace or correct; NORTH pole toward right (operator's) side.
3. Excessive ripple in power supply DC output. **Consult factory.**

Reduced Light Output

1. Normal bulb aging. Increase current output at xenon power supply. **Do not exceed** maximum current rating specified by bulb manufacturer.
2. Defective bulb. Check for discoloration or premature darkening of envelope.

TROUBLE CHART (continued)

Reduced Light Output (continued.)

3. Bulb defocused or misaligned. Repeat bulb positioning adjustments.
4. Soiled optics. Clean reflector, bulb, heat filter and lenses as outlined in MAINTENANCE section.

Excessive Heat (Gels Burning)

1. Xenon bulb misfocused. Focus bulb for even field at small spot (trombone handle *back*) with iris **fully open**; do not “hot spot.”
2. Glass strip heat filter missing or reversed. Filter **must** be installed, with *coated* surface *facing* bulb.
3. Dichroic coating on reflector or heat filter peeled. Replace as required.

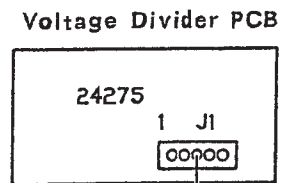
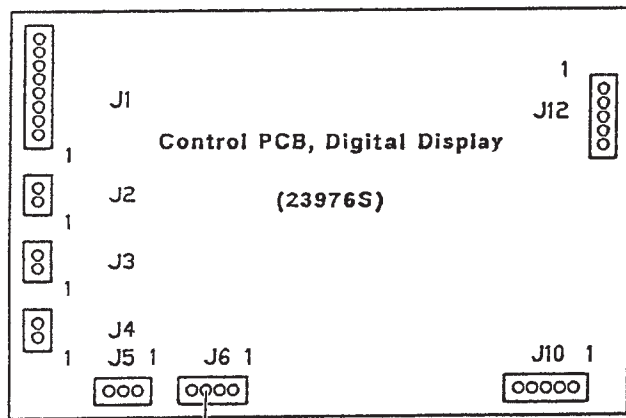
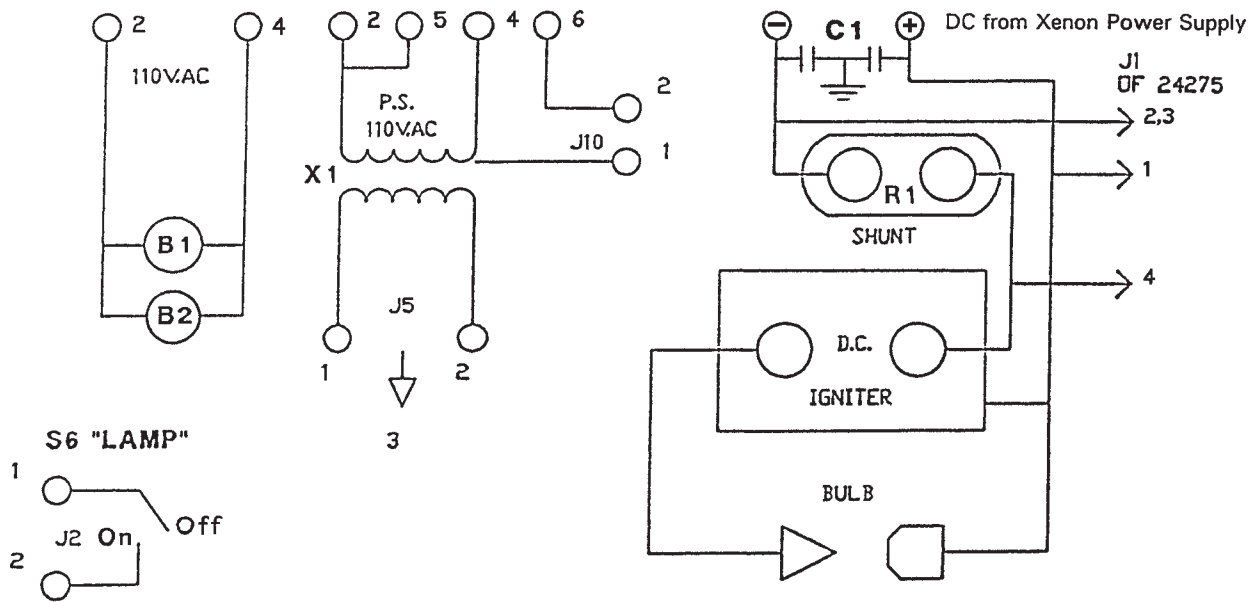
Noise in Theater Sound System During Bulb Ignition or Operation

1. Defective lamphouse RF suppression capacitor. Replace Voltage Divider PCB or check individual capacitors with capacitor tester. Replace as required.
2. Spotlight, xenon power supply, or sound system not correctly grounded. Connect to adequate earth ground.

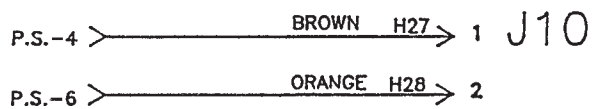
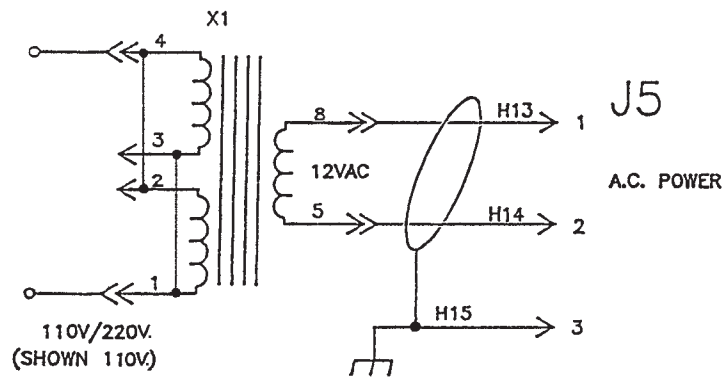
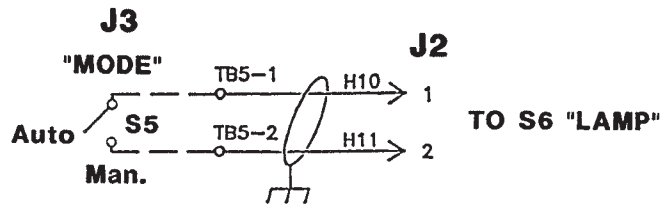
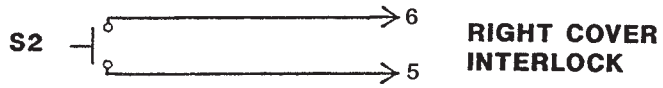
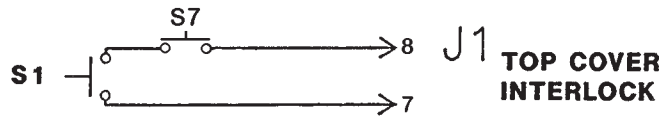
NOTICE

The Strong DC Pulse Igniter is a sealed assembly and contains **no user serviceable components**. The Strong switching-type Xenon Power Supply employs solid state circuitry requiring sophisticated diagnostic equipment not generally available to field service personnel. If an ignition problem in the TROUBLE CHART section is traced to either of these units, contact an authorized Strong International Dealer for further information.

Super Trouper II Lamphouse



Xenon Bulb Ignition
& Monitor Circuit

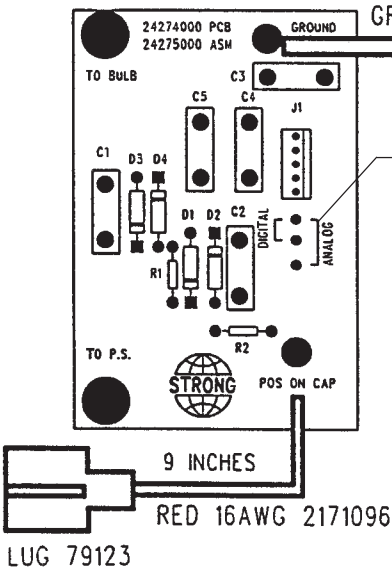


Super Trouper II
 Control Circuit

PARTS LIST
Wiring Diagrams

Ref.		
<u>Desig.</u>	<u>Part No.</u>	<u>Description</u>
B1	23939	Blower, Dual Squirrelcage; 115 V.AC, 50/60 Hz.
B2	25011	Blower, 6" Box Fan, Modified; 115 V.AC, 50/60 Hz.
C1	80177	RF Suppression Capacitor, 2 x 1.0 μ f, 600 WVDC
J1	21-37058	Connector, (8) Position
J3	21-37055	Connector, (2) Position
J5	21-37056	Connector, (3) Position
J10	21-37057	Connector, (5) Position
J12	21-37057	Connector, (5) Position
R1	81247	Shunt, 200 Ampere, 50 mV.
S1	21-98544	Reed Switch, Lamphouse Top Cover Interlock
S2	21-98544	Reed Switch, Lower Right Lamphouse Cover Interlock
S3	21-98544	Reed Switch, Lower Left Lamphouse Cover Interlock
-	21-98545	Magnetic Actuator, Reed Switch (3 req'd.)
S4	39955	Air Flow Switch, Blower Interlock
S5	24086	MODE Switch, Wired Assembly
S6	24086	LAMP Switch, Wired Assembly
S7	39260	Cam Lock Security Screw Interlock Switch, Pushbutton
-	21-61228	Rocker Switch, SPDT
X1	24356	Transformer, 115/220 V.AC
-	65503	DC Pulse Igniter Assembly
-	24275	Printed Circuit Board Assembly, Voltage Divider (Mounts to R1 Shunt; see separate Parts List following)
-	24087	LCD Display Screen
-	23976S	Printed Circuit Board Assembly, LCD Display Control
-	25023	Lamphouse/Power Supply Interconnect Cable Assembly

VOLTAGE DIVIDER ASSEMBLY

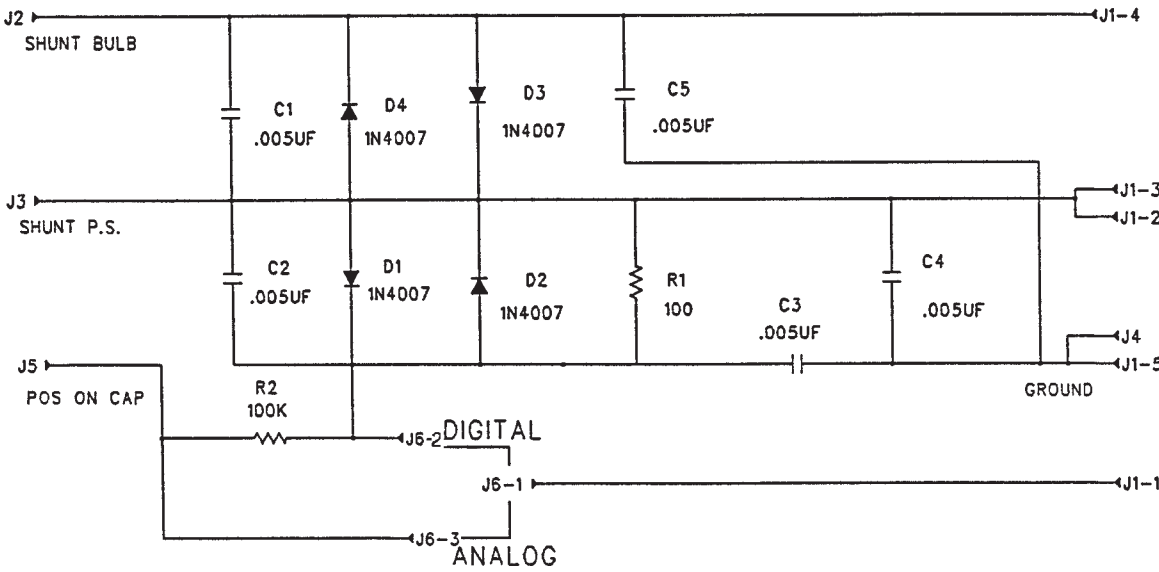


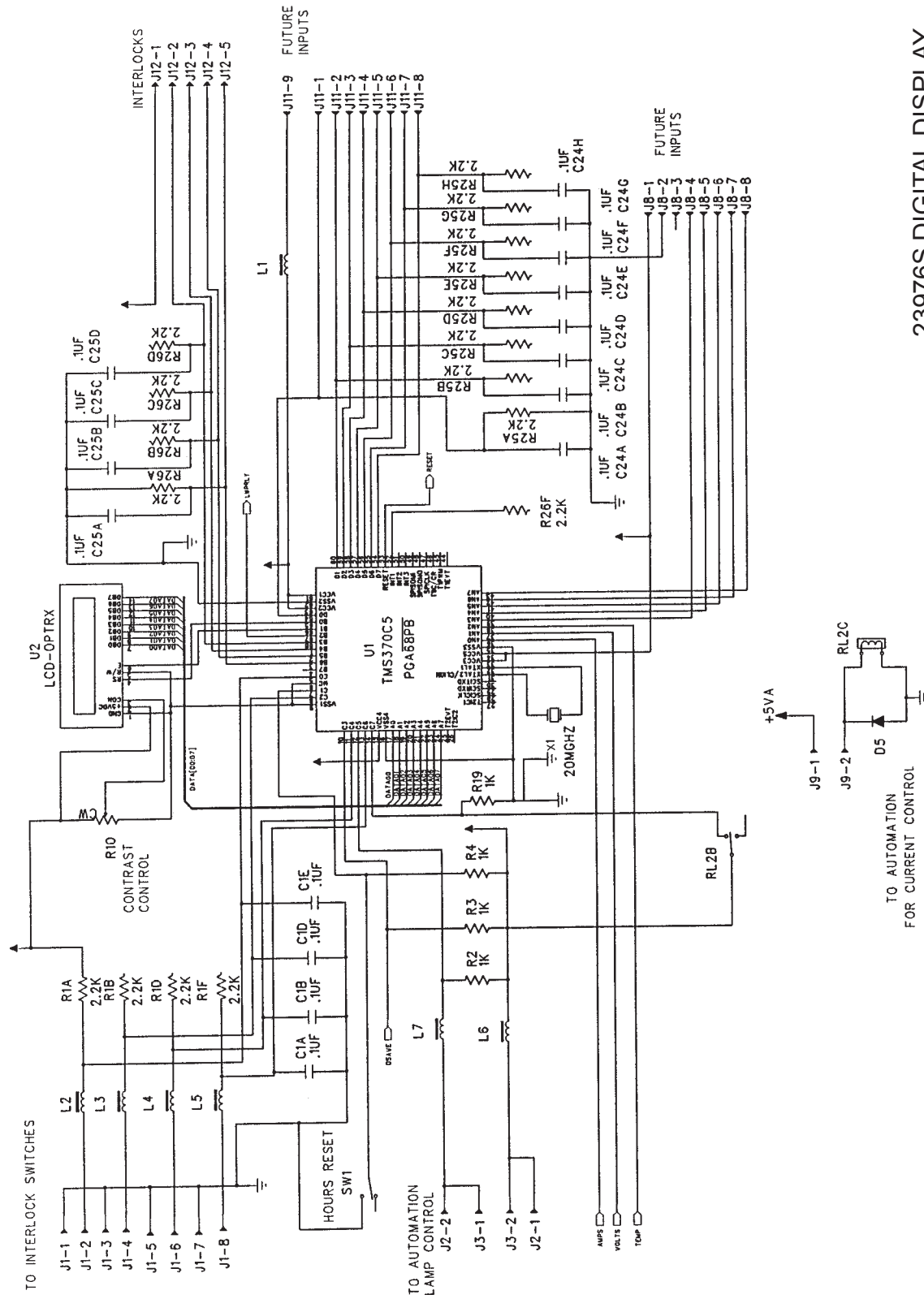
Cut this Jumper Wire when using 24275 PC Board in Super Trouper II Lamphouse

24275 VOLTAGE DIVIDER BOARD *mounts to R1 Shunt*

Ref. Desig.	Part No.	Description
C1-C5	61-08025	Capacitor, .005μf, 3 kV.
D1-D4	51-17001	Diode, 1N4007
R1	61-46002	Resistor, 100 Ohm, ¼ W. 5%
R2	61-46045	Resistor, 100k Ohm, ¼ W. 5%
J1	21-37051	Connector, (5) Position

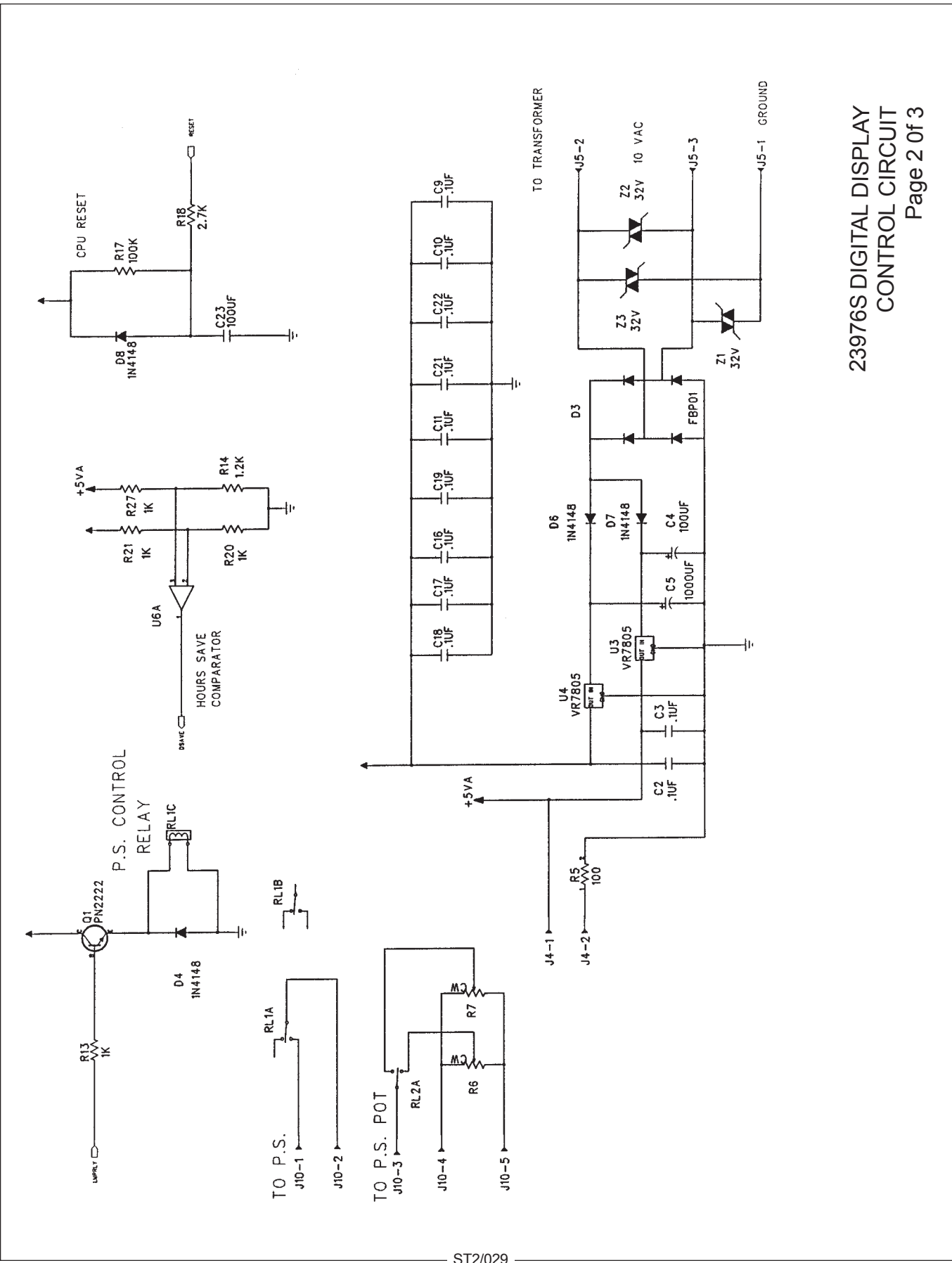
NOTE: Replacement Board must be modified as shown above (cut jumper) or board will not function!

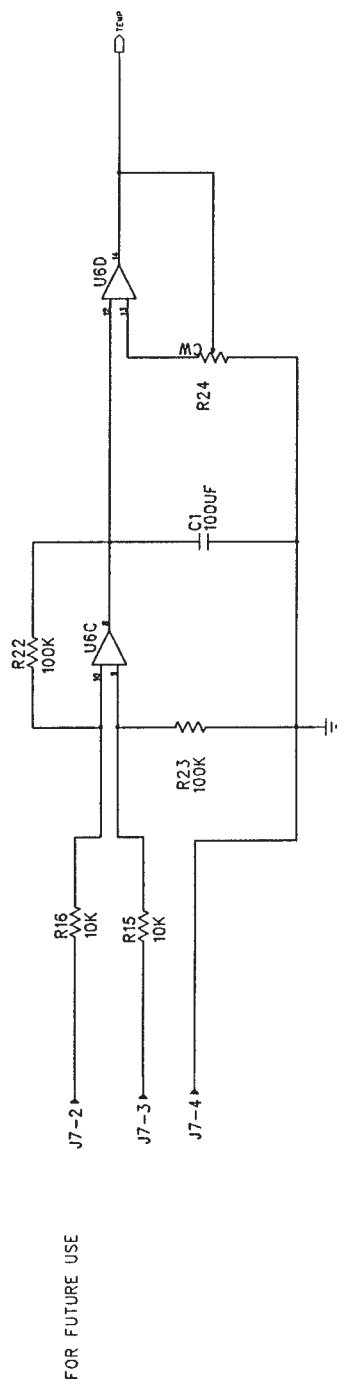
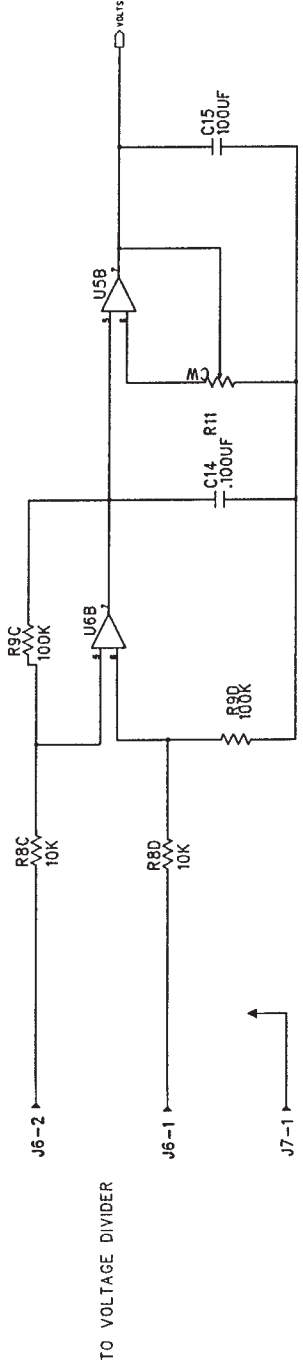
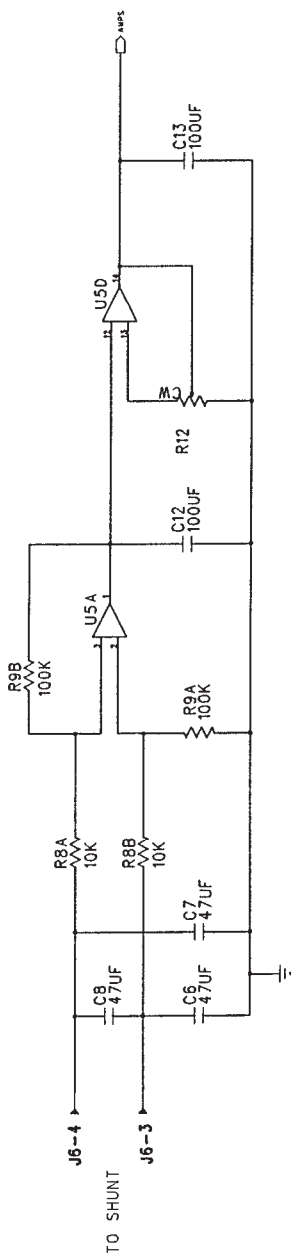




23976S DIGITAL DISPLAY
CONTROL CIRCUIT
Page 1 of 3

TO AUTOMATION
FOR CURRENT CONTROL





SUPER TROUPER II Parts List

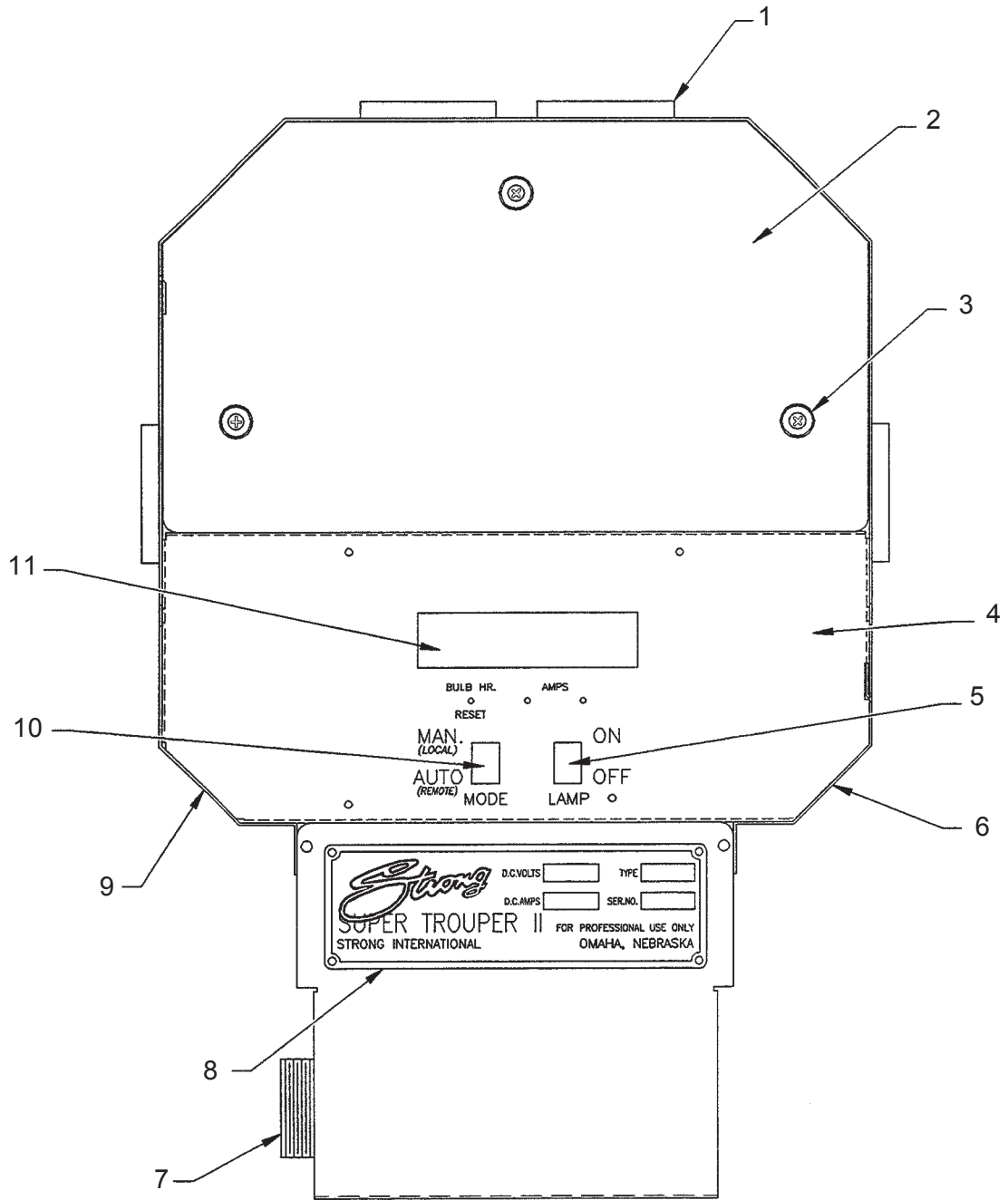


FIGURE 1

PARTS LIST

Figure 1

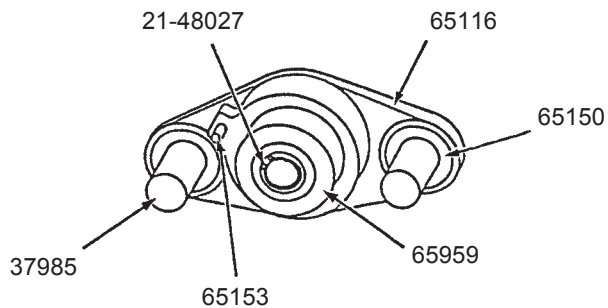
<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	24021	Door & Top Cover, Welded Assembly
-	48930	Arc Viewing Port
-	4100503	Screw, 10-32 x 1/2" Phillips Head (3 req'd.)
-	4107101	Finish Washer, #10
-	71284	Cam Lock & Keys
-	25372	Security Screw, Hex Head
2	24150	Cover Plate, Bulb Adjust Mechanism
3	4100503	Screw, 10-32 x 1/2" Phillips Head
-	4107101	Finish Washer, #10
4	24418	Instrument Panel & LCD Display Assembly
-	24149	Instrument Panel (less Components), Welded Assembly
5	24086	LAMP Switch Assembly (incl. with 24418)
-	21-61228	Rocker Switch, SPDT
6	24029	Lamphouse Base Panel, Lower Right
-	4080504	Screw, 10-32 x 1/2" Phillips Head
7	25024	MS Connector, Wired Assembly
-	88319	MS Connector, (14) Pin Female
8	24160	Name & Data Plate
9	24025	Lamphouse Base Panel, Lower Left
-	4100503	Screw, 10-32 x 1/2" Phillips Head
10	24086	MODE Switch Assembly (incl. with 24418)
-	21-61228	Rocker Switch, SPDT
11	24087	LCD Display Screen (incl. with 24418)
-	24254	Window, Display Screen
-	23976S	Control PC Board Assembly, LCD Display

NOT SHOWN

- 25023 Lamphouse/Power Supply Interconnect Cable Assembly
(Assembly includes MS Connectors 88318 & Cable Clamps 62153)

65827 Bulb Adjustment Assembly (see Figure 2, Item 28)

- 37985 Thumb Screw (2 req'd.)
- 15010 Compression Spring (2 req'd.)
- 65116 Casting, Adjustment Mechanism
- 65150 Fender Washer (2 req'd.)
- 65153 Focus Lockscrew
- 65154 Nylon Locking Ball
- 65959 Focus Screw & Bearing Assembly
- 21-48027 Snap Ring, Collet Retaining
- 24266* Collet



* Order separately; not included with 65827 Assembly.

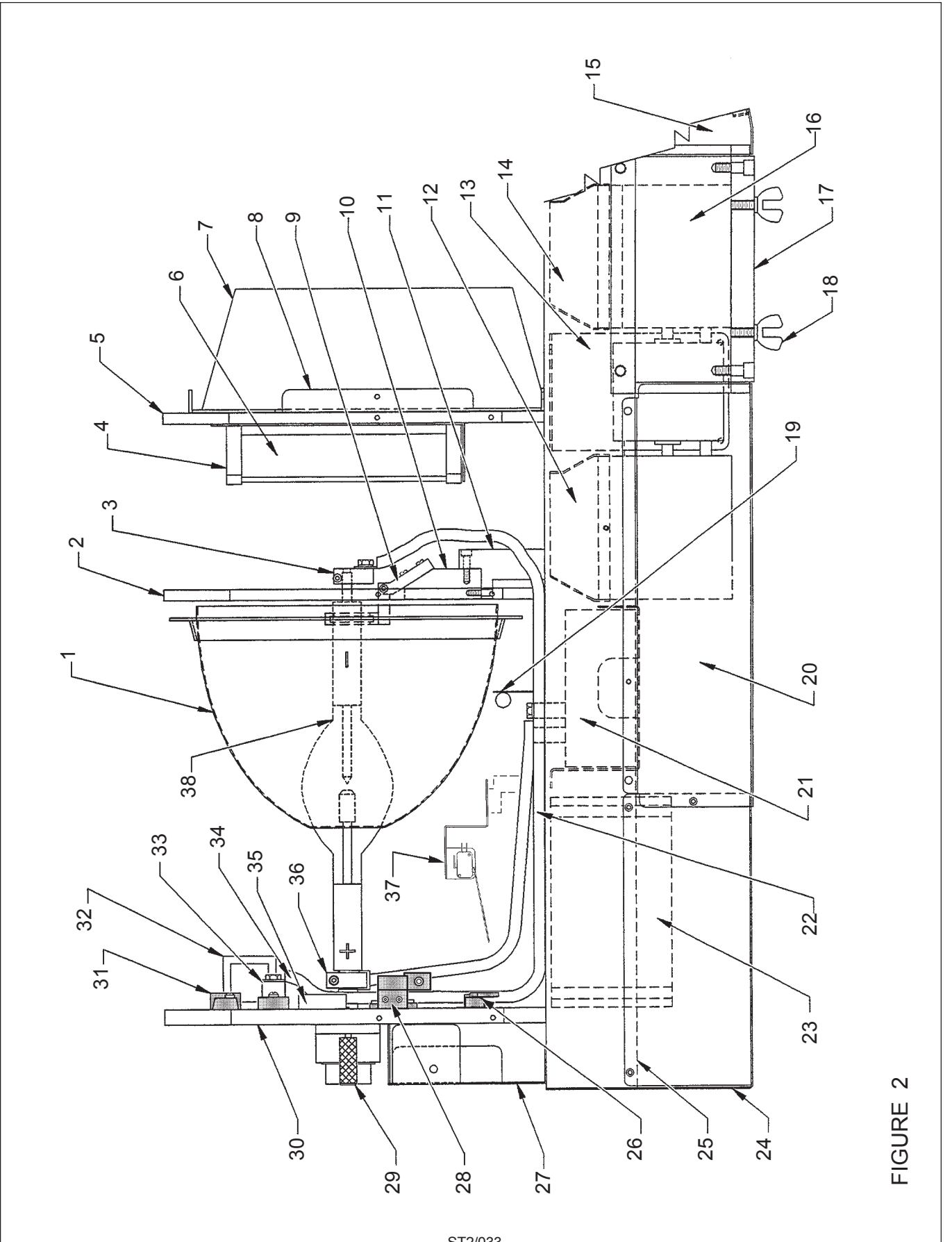


FIGURE 2

PARTS LIST

Figure 2

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	24317	Reflector, Dichroic Coated, 10" Diameter
-	4251250	Screw, 1/4-20 x 1-1/4" Socket Head (4 req'd.)
-	P-3055	Compression Spring (4 req'd.)
-	4258001	Lock Nut, 1/4-20 Hex (4 req'd.)
2	24073	Bulkhead, Reflector Support
3	39191	Negative Contact Clamp, Bright Chrome
-	4080870	Clamping Screw, 8-32 x 7/8" Socket Head
-	24327	Negative Lead, Clamp to Shunt
-	4250373	Screw, 1/4-20 x 3/8" Hex Head
4	24366	Heat Filter Mounting Bracket, Welded Assembly
5	24072	Bulkhead, Lamphouse Front
6	65122A	Heat Filter, Coated Glass
7	24337	Lamphouse Nose Cone (Light Shield)
8	24071	Bracket, Lens Housing Mount
9	83747	Front Bulb Support Assembly, 2 kW (as shown)
-	83364	Mounting Bracket
-	4110501	Mounting Screw, 10-24 x 1/2" Pan Head (2 req'd.)
-	83748	Ring Assembly, Shock Mount
-	4100620	Clamping Screw, 10-32 x 5/8" Socket Head
-	83410	Coil Spring, Shock Mount Ring
9*	65117	Front Bulb Support Yoke (not shown), 1 - 1.6 kW
-	65151	Yoke Retainer Plate, 1 - 1.6 kW Bulb Adapter
-	65152A	Thumb Screw, Retainer Plate (2 req'd.)
-	4110501	Mounting Screw, 10-24 x 1/2" Pan Head (2 req'd.)
10	24040	Front Bulb Support Mount
-	4100620	Screw, 10-32 x 5/8" Socket Head (2 req'd.)
11	24039	Insulator Post, Front Bulb Support
12	24003	Air Duct (same as Item 14)
13	24077	Spacer, Saddle Mount (not shown; Early Models, 2 req'd.)
-	4372503	Mounting Screw, 3/8-16 x 2-1/2" Socket Head (Early Models; 4 req'd.)
14	24003	Air Duct (same as Item 12)
15	24008	Front Bottom Cover, Welded Assembly (early models)
16	24368	Blower Assembly, Dual Squirrelcage (incl. Items 12, 14)
-	23939	Blower (B1), 115 V.AC, 50/60 Hz.
-	24367	"L" Bracket, Blower Mount
-	4100621	Mounting Screw, 10-32 x 5/8" Pan Head
-	41-98041	Rubber Grommet, Blower Shock Mount (replacement)
-	4108007	Hex Nut, 10-32
17	25223	Mounting Brace, Bottom Plate (Side Plates: 25229 & 25230)
18	4310753	Wing-Head Screw, 5/16-18 (4 req'd.)
19	39215	Permanent Magnet (Install with <i>painted</i> end toward <i>off-operator</i> side)
-	65409	"L" Bracket, Magnet Mount
-	11-10004	Magnet Clamp

* See XENON BULB INSTALLATION illustration for depiction of 1 kW & 1.6 kW bulb mounting.

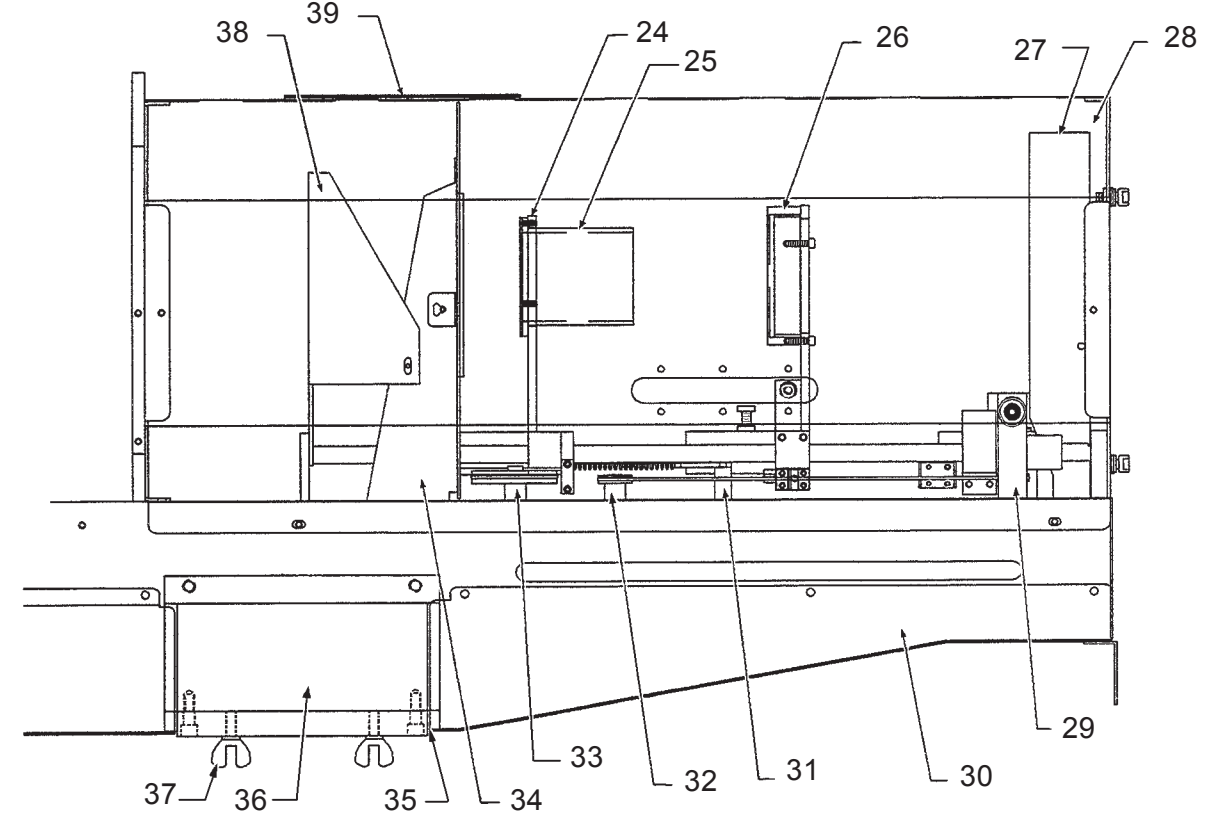
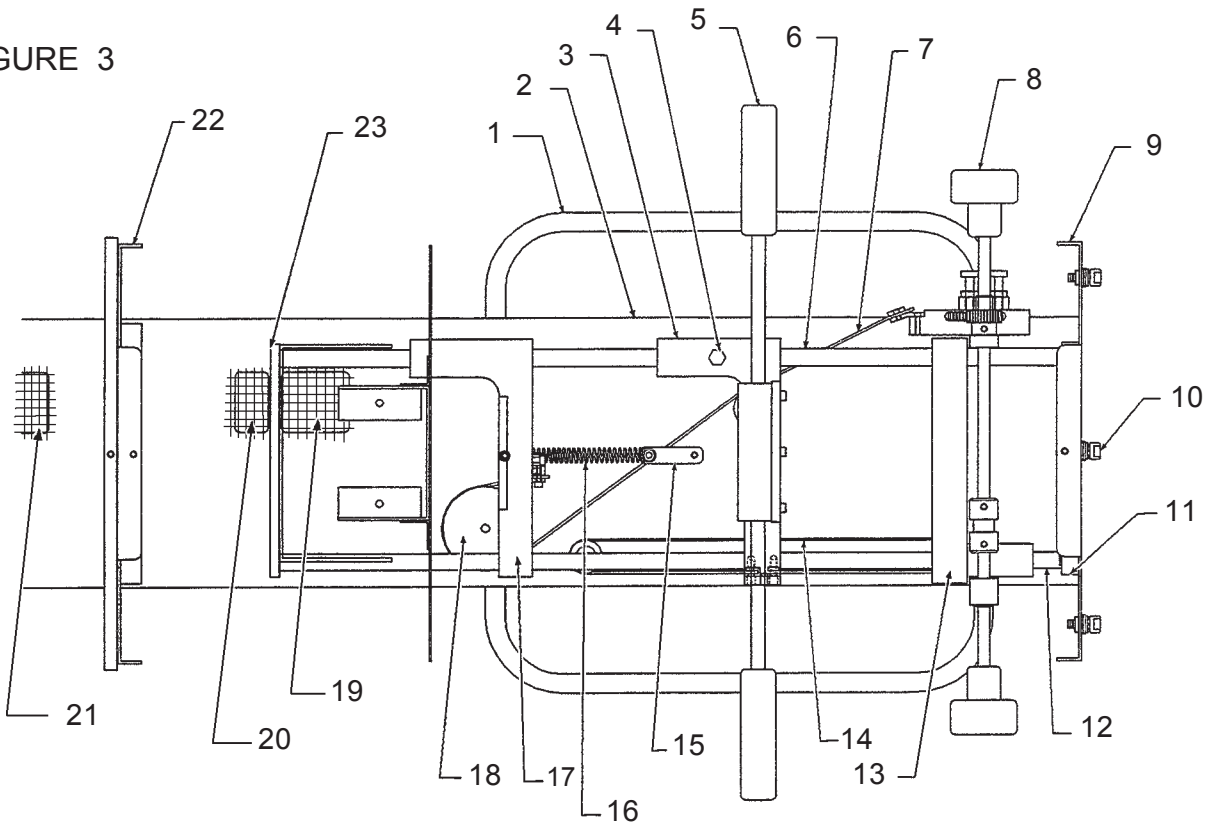
FIGURE 2 Parts List
(continued)

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
20	24364	Bottom Cover, Center (Igniter Access)
21	65503	DC Pulse Igniter Assembly
-	24360	Mounting Bracket, Igniter
-	24361	Nylon Insulator, Igniter Post (2 req'd.)
22	24827	Negative Lead, Shunt to Cathode Contact Clamp
23	25011	Blower (B2), 6" Box Fan, Modified; 115 V.AC, 50/60 Hz.
24	24338	Rear Bottom Cover, Welded Assembly (with 83131 Grille)
25	25051	Channel, Base Rail
26	21-98544	Cover Interlock Switch (S2; S1 & S3 not shown)
-	24135	Switch Mounting Bracket
-	21-98545	Magnetic Switch Actuator (not shown, 3 req'd.)
-	24134	Actuator Mounting Bracket
27	24149	Instrument Panel, Welded Assembly (see Figure 1, Item 4)
28	39622	Switch Bracket
-	25374	Mounting Block, Switch Bracket
-	4100500	Mounting Screw, 10-32 x 1/2" Socket Head (4 req'd.)
-	39260	Interlock Switch (S7), Pushbutton
29	65827	Bulb Adjustment Mechanism (see Figure 1 "Detail" for Components)
-	24266	Bulb Support Collet (Nylon Rod & Brass Socket Pinned Assembly)
30	24074	Bulkhead, Lamphouse Rear
31	21-62012	Barrier Strip, (10) Terminal
-	4080750	Mounting Screw, 8-32 x 3/4" Socket Head (2 req'd.)
32	24356	Transformer (X1)
-	4080502	Mounting Screw, 8-32 x 1/2" Socket Head (2 req'd.)
33	81247	Shunt (R1), 200 Amp. 50 mV.
-	4250755	Mounting Screw, 10-32 x 3/4" Socket Head (2 req'd.)
-	24275	Printed Circuit Board Assembly, Voltage Divider (not shown)
34	24827	Negative Lead, Shunt to Cathode Contact Clamp (same as Item 20)
35	80177	RF Suppression Capacitor, 2 x 1.0 μ f, 600 WVDC
-	4080502	Mounting Screw, 8-32 x 1/2" Socket Head (2 req'd.)
36	65343	Positive Contact Clamp, Brass
-	4080870	Clamping Screw, 8-32 x 7/8" Socket Head
-	24326	Positive Lead, Clamp to Igniter Post
-	4250373	Screw, 1/4-20 x 3/8" Hex Head
37	7200130	Mounting Bracket, Air Flow Switch
-	39955	Air Flow Switch (S4)
38	- -	Xenon Bulb (per Customer Order; Figure 2 depicts typical 2 kW "HS")
-	24270	Cathode (-) Adapter, Threaded 5/16-18 for 1 - 1.6 kW Bulbs *
-	24300	Anode (+) Adapter for 1 kW LTI, Osram & ORC and All 1.6 kW *
-	24271	Anode (+) Adapter for Hanovia XH1000HS *
-	4100180	Set Screw, Anode Adapter; 10-32 x 3/16" *

No Adapters Required for 2000 Watt Type "HS" Bulbs

* See XENON BULB INSTALLATION illustration for depiction of 1 kW & 1.6 kW bulb adapters.

FIGURE 3



PARTS LIST

Figure 3

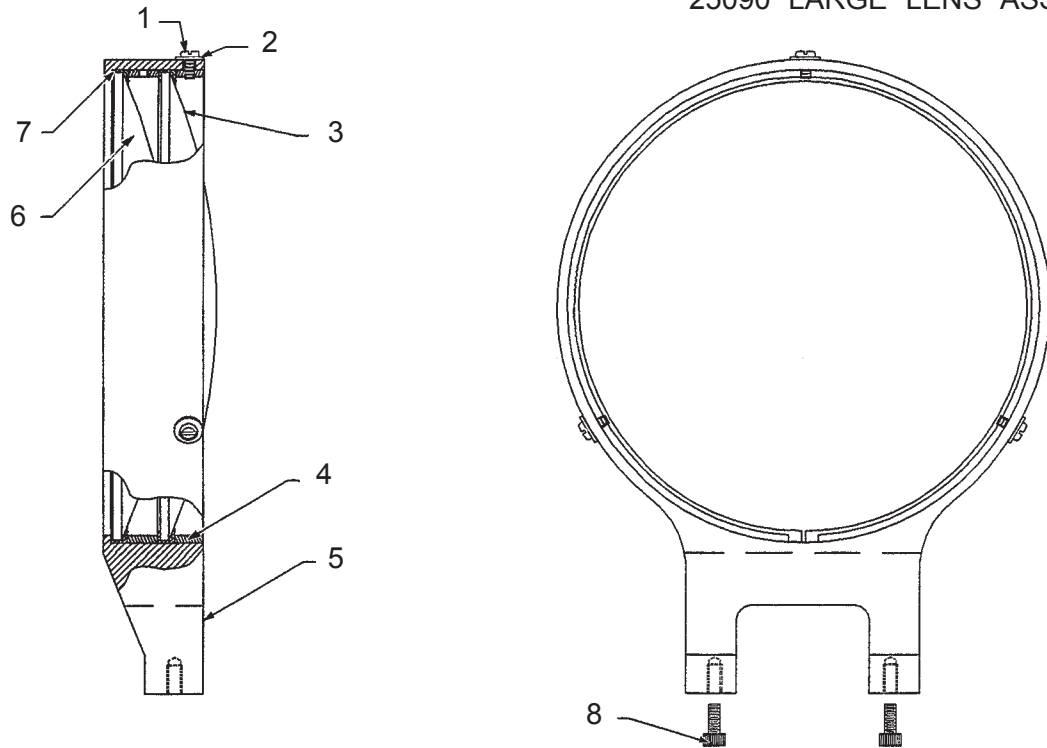
<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	25221	Hand Rail, Chromed (4 req'd.)
-	4310752	Screw, 5/16-18 x 3/4" Hex Head
-	4317000	Lockwasher, 5/16" Split Ring
2	25051	Base Channel
3	25081	Negative Lens Carriage Assembly (incl. Items 4 & 5)
-	25089	Small Pulley, Focus Control
4	4251001	Nylon Screw, Friction Brake; 1/4-20 x 1" Hex Head
-	4258015	Locknut, Friction Brake Screw; 1/4-20 Nylon
5	25063	Handle, Spot Size Control (2 req'd.)
-	25053	Shaft, Spot Size Control Handle
-	4251002	Handle Mounting Screw, 1/4-20 x 1" Socket Head
6	23987	Slide Rod (same as Item 12)
7	21-71187	Braided Wire Rope, Focus Control (Order 22 in.)
8	25064	Knurled Knob, Spot Focus Control
-	25079	Spot Focus Mechanism (incl. Item 8); See Figure 4
9	24071	Front Mounting Bracket, Lens Mechanism Housing
10	24115	Mounting Stud, Color Boomerang (3 req'd.)
-	4518001	Hex Nut, 1/4-20
11	24042	Slide Rod End Rail, Front
12	23987	Slide Rod (same as Item 6)
13	25078	Counterweight Assembly
14	21-71187	Braided Wire Rope, Lens Movement (Order 34 in.)
15	25076	Spring Retaining Plate
-	25075	Post, Spring Retaining Plate (Item 30)
16	25074	Expansion Spring
17	25080	Projection Lens Carriage
18	25088	Large Pulley, Focus Control
19	25245	Blower Outlet Grille
20	25246	Blower Outlet Grille
21	25134	Blower Outlet Grille
22	24071	Rear Mounting Bracket, Lens Mechanism Housing
23	24041	Slide Rod End Rail, Rear
24	25080	Projection Lens Carriage
25	83144	Projection Lens Barrel
-	24288	Projection Lens, Compound; 1.5" F.L.
-	24323	Lens Stop Ring, Rear
-	4080502	Ring Mounting Screw, 8-32 x 1/2" Socket Head (3 req'd.)
-	83155	Spring Clip, Lens Retaining; Front

FIGURE 3 Parts List
(continued)

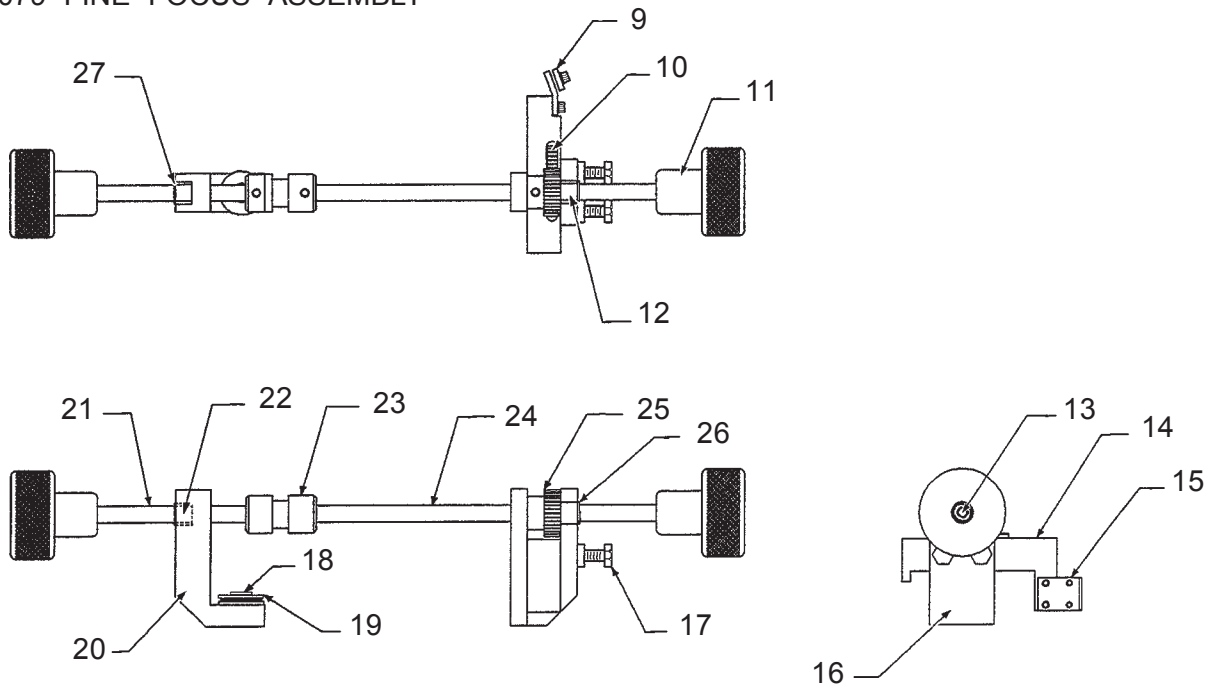
<u>Item</u>	<u>Part No.</u>	<u>Description</u>
26	24095	Mounting Ring, Negative Lens
-	24161	Negative Lens, Pyrex; 3.5" Diameter
		<i>(NOTE: Install 24161 Lens with FLAT Surface facing Front Lens Assembly.)</i>
-	24094	Lens Seal, Neoprene
-	4080502	Screw, 8-32 x 1/2" Socket Head
27	25090	Front Lens Assembly (see Figure 4, 25090 Assembly)
-	4250755	Mounting Screw (Ring Casting to Base Channel), 1/4-20 x 3/4"
28	25077	Lens Mechanism Housing, Welded Assembly
-	4100503	Mounting Screw, 10-32 x 1/2" Phillips Head, Black Oxide
-	4107102	Finish Washer, #10 Black
-	23059A	STRONG Insignia
-	51459	SUPER TROUPER Insignia
-	45237	Insignia, Roman Numeral "II"
29	25079	Spot Focus Mechanism (see Figure 4)
30	24008	Bottom Cover, Welded Assembly (early models)
31	25075	Post, Spring Retainer (ref. Item 15)
-	4080502	Screw, Post Mounting; 8-32 x 1/2" Socket Head
-	41-51371	Screw, Plate Mounting; 8-32 x 1/2" Button Head
32	24035	Spacer, Small Pulley
-	4080502	Mounting Screw, Spacer
-	25062	Pulley
-	52-20506	Screw, Pulley Axle
33	24035	Spacer, Large Pulley
-	4080502	Mounting Screw, Spacer
-	25088	Pulley (ref. Item 18)
-	51160	Screw, Pulley Axle
34	24076	Aperture Bracket (as shown; see Figure 5A for current configuration)
35	25247	Blower Grille
36	25229	Right Brace, Side Plate
-	25230	Left Brace, Side Plate (not shown)
-	25223	Bottom Plate, Mounting Brace (see Figure 2, Item 17)
37	4310753	Wing-Head Screw, 5/16-18 (4 req'd.)
38	48877	Fade-Out Bracket (see Figure 5, Item 31)
39	24037	Cover Plate, Optical System Controls (2 req'd.)
-	24093	Light Baffle, Rubber
-	4080378	Mounting Screw, 8-32 x 3/8" Pan Head, Black Oxide

FIGURE 4

25090 LARGE LENS ASSEMBLY



25079 FINE FOCUS ASSEMBLY



PARTS LIST

Figure 4

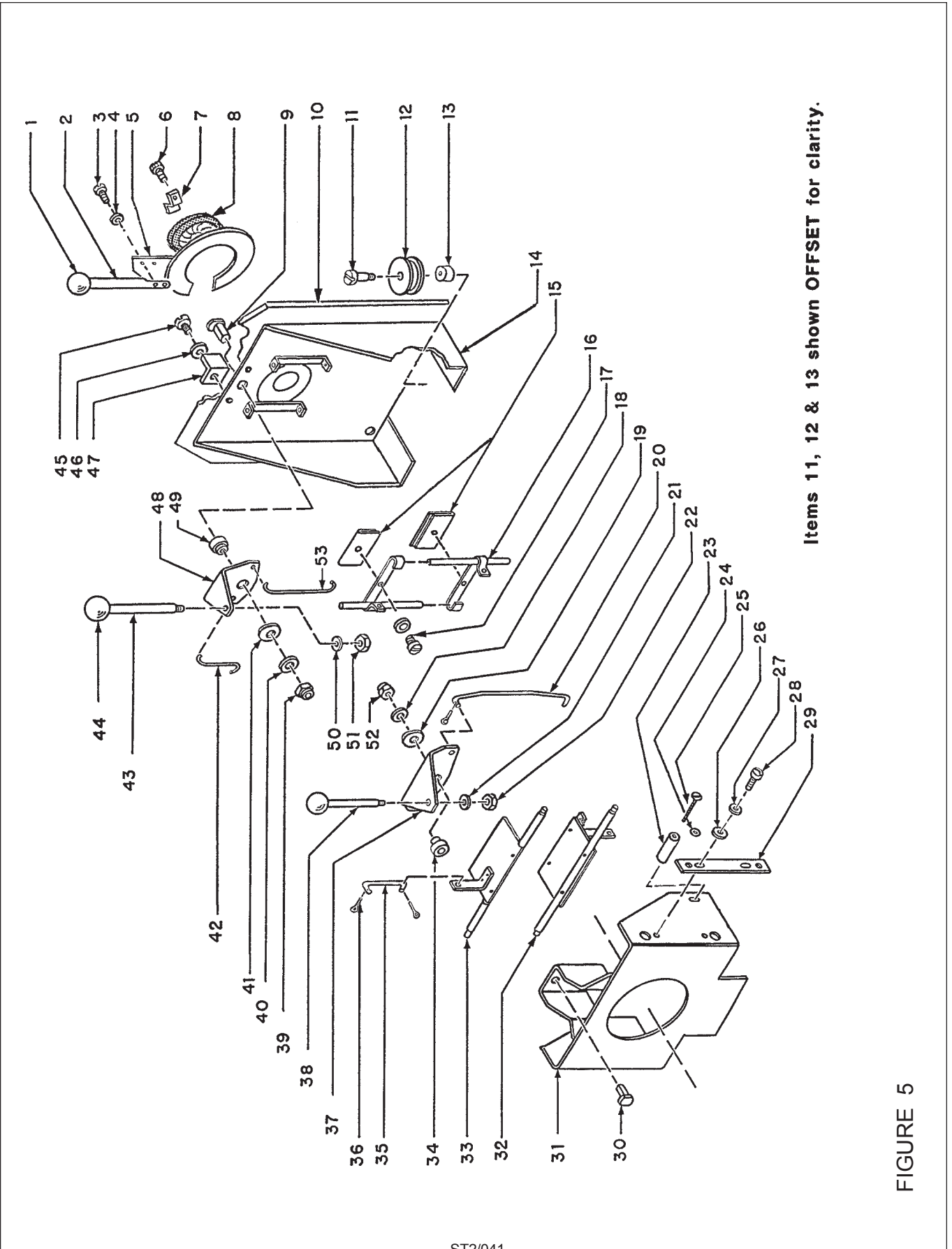
25090 FRONT LENS ASSEMBLY (ref. Figure 3, Item 26)

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	4080375	Screw, 8-32 x 3/8" Pan Head (3 req'd.)
2	4087101	Flatwasher, #8 (3 req'd.)
3	25037	Lens, 8" Diameter, 30" F.L.*
4	24234	Lens Gasket (2 req'd.)
5	25087	Casting, Large Lens Ring
6	25037	Coated Lens, 8" Diameter, 30" F.L.*
7	24233	Lens Ring (2 req'd.)
8	4250755	Mounting Screw, 1/4-20 x 3/4" Socket Head (2 req'd.)

* Install 8 inch Lenses with *FLAT* Surfaces facing Lamphouse.

25079 SPOT FINE FOCUS ASSEMBLY (ref. Figure 3, Item 28)

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
9	25067	Clamp, Focus Cable
-	4080374	Screw, 8-32 x 3/8" Socket Head
10	25091	Rack Gear
11	25064	Knurled Knob, Spot Focus Control (2 req'd.)
12	25083	Bronze Bearing
13	4251002	Knob Mounting Screw, 1/4-20 x 1" Socket Head
14	25072	Slide, Rack Gear Mount
15	25066	Bracket, Cable Clamp
-	4060502	Screw, 6-32 x 1/2" Socket Head
16	25071	Mounting Bracket, Focus Mechanism
17	4250507	Friction Screw, 1/4-20 x 1/2" Nylon Hex Head
-	4258015	Locknut, 1/4-20 Nylon
18	P-4968	Pulley Axle
19	25062	Pulley
20	25070	Mounting Bracket, Focus Mechanism
21	25055	Focus Shaft, Short
22	25083	Bronze Bearing
23	25082	Flex Coupler, Focus Shaft
24	25054	Focus Shaft, Long
25	24062	Spur Gear
26	21-48011	Snap Ring, External
27	21-48011	Snap Ring, External



Items 11, 12 & 13 shown OFFSET for clarity.

FIGURE 5

PARTS LIST

Figure 5

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	10048A	Knob, Red Plastic
2	48402	Shaft, Iris Control Lever
3	4060310	Screw, 6-32 x 5/16" Fillister Head
4	00862	Lockwasher, #6 Shakeproof
5	24369	Bell Crank
-	41-51530	Shoulder Screw, Bell Crank Pivot
-	25017	Bushing, Shoulder Screw
-	24371	Linkage Arm, Bell Crank to Iris
6	4080623	Screw, 8-32 x 5/8" Socket Head
7	25034	Iris Clamp (2 req'd.)
8	24374	Iris, 101mm (4") Diameter
-	24372	Iris Back Plate, Split Ring
		<i>See Figure 5A for Iris Front View</i>
9	51226	Pivot Stud
10	24138	Light Shield, Aperture Bracket
11	51-51048	Pulley Stud
12	18106	Rear Pulley (see Figure 3, Item 26)
13	24034	Stand-Off Spacer, Pulley
-	4080502	Mounting Screw, Pulley Spacer
		<i>(Items 11, 12, 13 mount IN FRONT of Item 14 Aperture Bracket)</i>
14	24076	Aperture Bracket, Welded Assembly (as shown; see Figure 5A)
15	47191	Chopper Blade (Upper & Lower)
16	47982	Slide Assembly, Lower Chopper Blade
-	47983	Slide Assembly, Upper Chopper Blade
17	4080375	Screw, 8-32 x 3/16" Pan Head
-	4087001	Lockwasher, #8 Shakeproof
18	4257102	Flatwasher, 1/4" S.A.E.
19	4507106	Friction Washer, Brass
20	51602	Pull Rod, Long
21	4257000	Lockwasher, 1/4" Split Ring
22	4258001	Hex Nut, 1/4-20
23	51517	Spacer (2 req'd.)
24	4107101	Flatwasher, #10
25	4101500	Screw, 10-32 x 1-1/2" Pan Head
26	4107100	Flatwasher, #10, .036" Thick Brass
27	4107001	Lockwasher, #10 Shakeproof
28	4100250	Screw, 10-32 x 1/4" Pan Head
29	51443	Pivot Shaft Retainer Plate
30	1640-9	Pivot Stud, Fade-Out Control (welded to Item 31; Order 48877)
31	48877	Fade-Out Bracket, Welded Assembly
-	4080754	Stop Screw, Fade-Out Blade; 8-32 x 3/4"
-	4088001	Lock Nut, Stop Screw; 8-32 Hex

FIGURE 5 Parts List
(continued)

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
32	48878	Lower Fade-Out Blade
33	48879	Upper Fade-Out Blade
34	51153	Spacer Bushing
35	51515	Pull Rod, Upper Fade-Out Blade
36	00919	Cotter Pin, 1/16 x 1/2"
37	51520	Bracket, Fade-Out Control Lever
38	51452	Handle, Fade-Out Control Lever
-	10048A	Knob, Red Plastic
39	4318004	Hex Nut, 5/16-18 FlexLock
40	4257102	Flatwasher, 1/4" S.A.E.
41	4507106	Friction Washer, Brass
42	51498	Chopper Pull Rod, Short
43	51155	Handle, Chopper Control Lever
44	10048A	Knob, Plastic
45	4080250	Screw, 8-32 x 1/4" Pan Head
46	4087004	Lockwasher, #8 Shakeproof
47	47170	Iris Stop Bracket (2 req'd.)
48	48406	Bracket, Chopper Control Lever
49	51153	Spacer Bushing
50	4257000	Lockwasher, 1/4" Split Ring
51	4258001	Hex Nut, 1/4-20
52	4318004	Hex Nut, 5/16-18 FlexLock
53	51497	Chopper Pull Rod, Long

Part No.	Description
21-37011	Roll Pin, 3/32 x 9/16"
21-70029	Spring Washer
24369	Bell Crank
24372	Adapter Ring
24374	Iris
25017	Bushing (with 41-51350)
25034	Iris Clamp
25225	Base, Aperture Plate
25244	Aperture Plate
406037B	Screw, 6-32 x 3/8"
4080621	Screw, 8-32 x 5/8"
4100500	Screw, 10-32 x 1/2"
41-51530	Shoulder Bolt
48402	Iris Control Handle
81432	Shoulder Screw
72-00075	Link

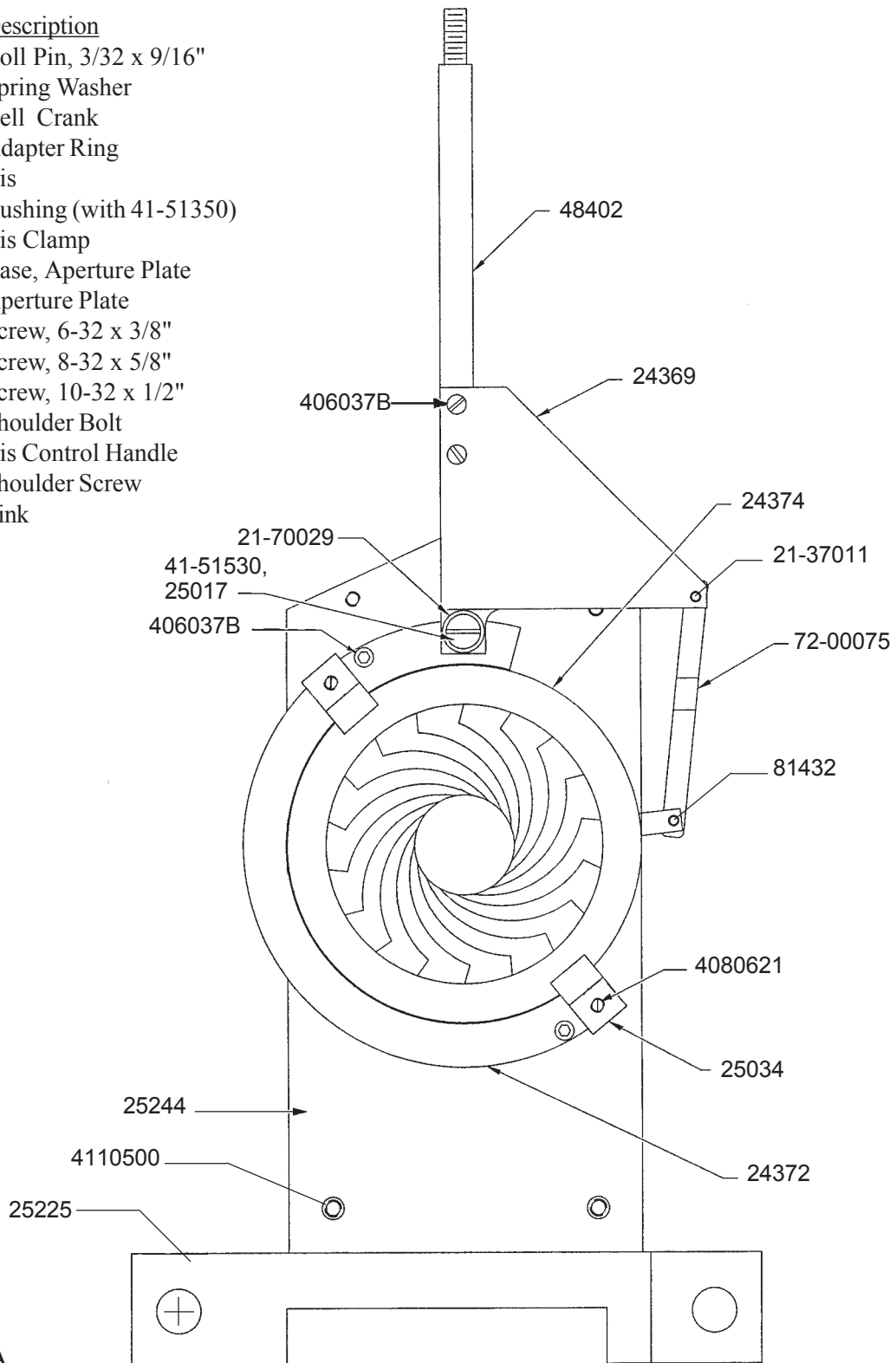
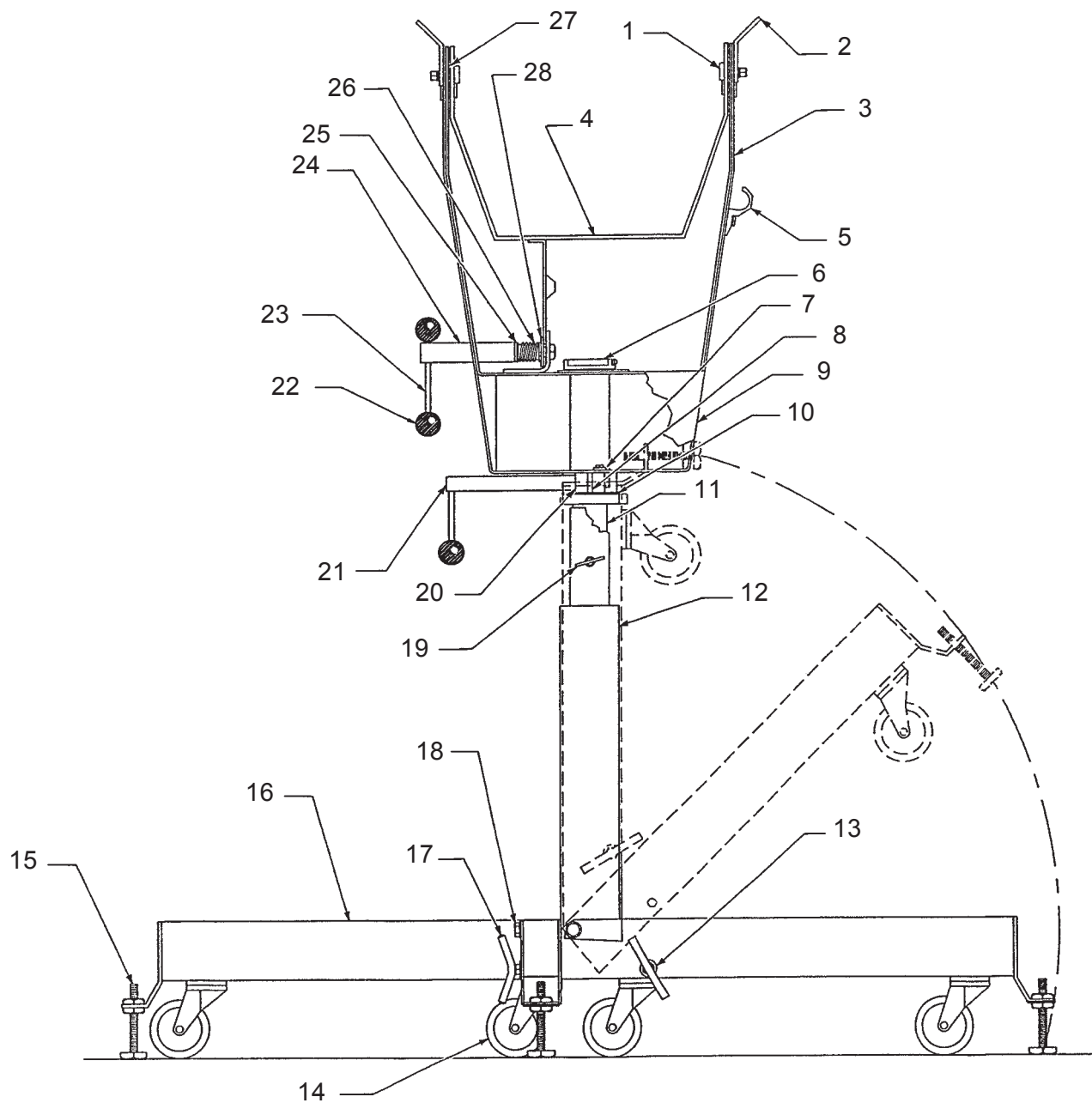


FIGURE 5A

FIGURE 6



24084 YOKE & STAND ASSEMBLY

PARTS LIST

Figure 6

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	49120	Tilt Axis Bolt
-	4378002	Hex Nut, 3/8-16
2	49943	Lifting Strap (2 req'd.)
3	83743	Yoke, Welded Assembly
4	25236	Saddle & Quadrant, Welded Assembly
5	83341	Cable Clamp
-	4250623	Mounting Screw, 1/4-20 x 5/8" Hex Head
6	65431	Upper Retaining Collar, Inner Tube
7	21-56003	Spacer Washer, 1/8" Thick
8	49291	Pan Swivel Stop
9	83357	Yoke Cover Plate (2 req'd.)
10	83386	Thrust Bearing
-	83388	Bearing Race
11	65824	Inner Tube, Welded Assembly
12	83742	Base Support Column, Welded Assembly
13	4377103	Flatwasher, 3/8" S.A.E. (4 req'd.)
14	49208	Caster (4 req'd.)
15	49226	Leveling Foot (4 req'd.)
-	4508001	Lock Nut, 1/2-13 Hex (4 req'd.)
16	83744	Base Leg, Welded Assembly (4 req'd.)
-	83293	Socket (for Item 16 Caster, 4 req'd.)
17	83745	Leg T-Bolt, Welded Assembly (4 req'd.)
18	4433000	Screw, 7/16-14 x 3" Hex Head
-	4377103	Flatwasher, 7/16"
-	4438002	FlexLock Nut, 7/16-14 Hex
19	48395	Height Adjusting Pin, 3/8" Diameter
20	83381	Swivel Clamp Collar
21	49290	Clamping Shaft, Pan Tension
-	49114	Handle Shaft, Clamping Shaft
22	10048A	Knob, Red Plastic (3 req'd.)
23	49130	Handle Shaft, Quadrant Clamp
24	49129	Quadrant Clamping Shaft
25	49124	Clamp Bushing
26	49125	Compression Spring, Quadrant Clamp
27	25131	Nylon Washer (2 req'd.)
28	49126	Clamping Plate
-	24084	Yoke & Stand Assembly, Complete (Items 1 - 28)

24124 COLOR BOOMERANG ASSEMBLY

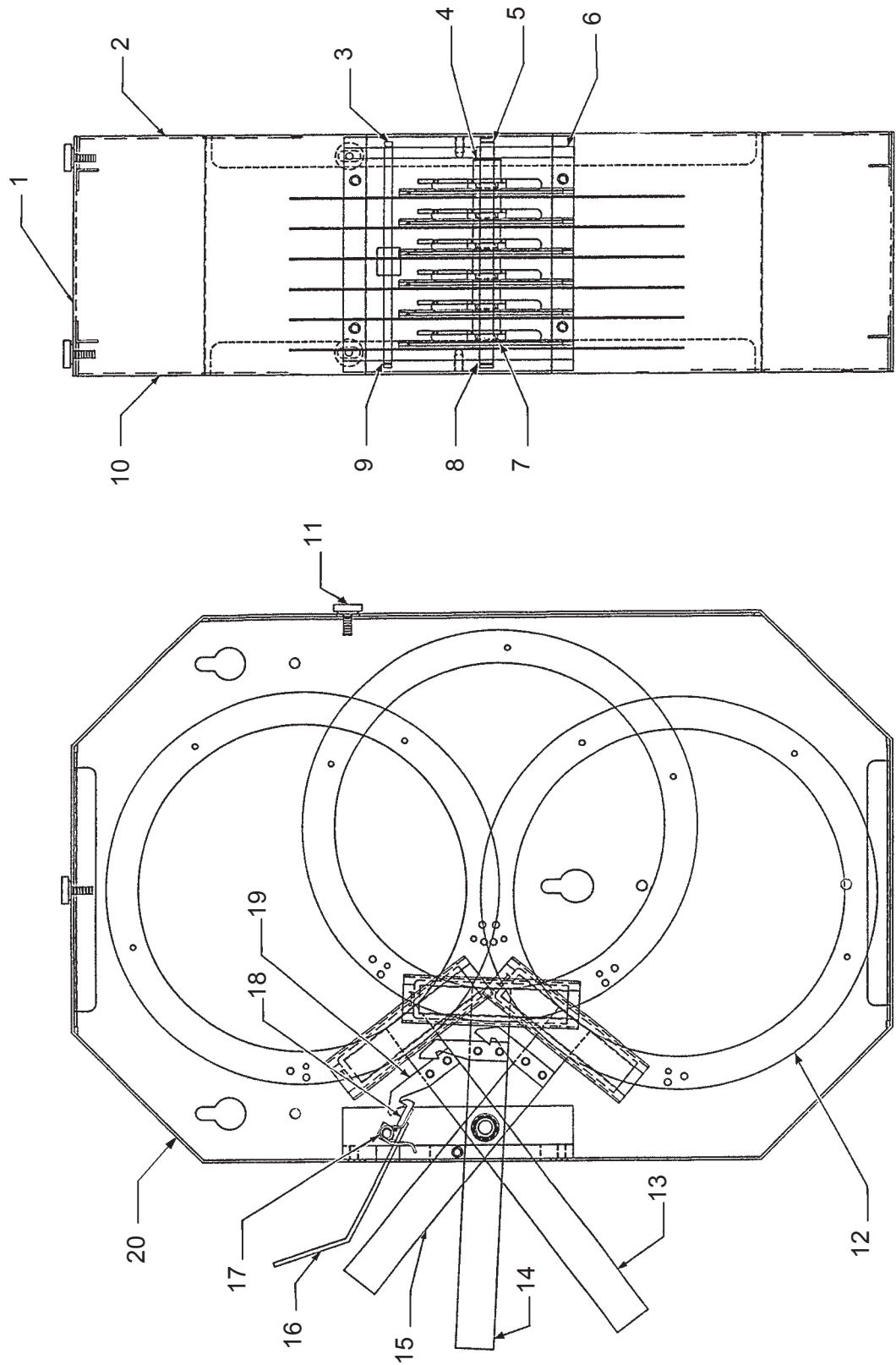


FIGURE 7

PARTS LIST

Figure 7

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	24141	Outer Panel, Welded Assembly
2	24130	Front Panel, Welded Assembly
3	51526	Rocker Catch Pivot Shaft
4	51398	Spacer Washer (6 req'd.)
5	51527	Pivot Shaft, Color Frames
6	24113	Mounting Frame, Color Discs
7	51399	Spacer
8	91199	Snap Ring, Truarc #5133-31 (2 req'd.)
9	45209	Snap Ring, Truarc #5144-18S (2 req'd.)
10	24131	Rear Panel, Welded Assembly
11	31875	Thumb Screw (4 req'd.)
12	51928	Color Frame & Slide Channel, Welded Assembly (6 req'd.)
-	51376*	Cover Plate for 51928 (not shown; 6 req'd.)
-	01456*	Fastener, Cover Plate to Color Frame (not shown)
13	24123	Color Disc Arm (8-3/4"), Welded Assembly (2 req'd.)
14	24122	Color Disc Arm (8-1/4"), Welded Assembly (2 req'd.)
15	24121	Color Disc Arm (7-3/4"), Welded Assembly (2 req'd.)
16	24117	Color Arm Release Lever
17	24140	Torsion Spring (2 req'd.)
18	24116	Rocker Catch, Color Arm
-	51505	Rubber Pad, Rocker Catch
19	51396	Catch Hook, Color Arm (6 req'd.)
-	4080377	Hook Mounting Screw, 8-32 x 3/8" (2 per Hook req'd.)
-	4087004	Lockwasher, #8 (2 per Hook req'd.)
20	25159	Side Panel, Welded Assembly
-	24124	Color Boomerang Assembly (Items 1 - 19)

* 51376 & 01456 not included with 24124; *order separately.*

Spotlight Accessory Kit Includes:

47215	Color Gel, Light Red (RoscoLux #26)
47216	Color Gel, Primary Blue (RoscoLux #80)
47217	Color Gel, Sky Blue (RoscoLux #68)
47218	Color Gel, Daylight Blue (RoscoLux #65)
47219	Color Gel, Flesh Pink (RoscoLux #34)
47220	Color Gel, Golden Amber (RoscoLux #21)

Theatrical Supply Dealers generally stock a complete selection of color media and color temperature correction filters. Specify ROSCOLUX® or equivalent *high temperature* gels.

