

Film-Tech

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PREFACE

THE STRONG SUPER 80 is a reflector type, direct current projection lamphouse using a horizontally-mounted xenon bulb as the light source. Only xenon bulbs expressly designed for horizontal operation should be used. The reflector is a metal, deep ellipse type, with “cold” (dichroic) coating to reduce aperture heat and prolong bulb life. The reflector is designed to operate in a fixed position at 34 inches from the projection film plane.

THE SPECIAL POWER SUPPLIES manufactured by Strong International are the only power source that can be used with the Super 80 lamphouse.

THE ADJUSTMENT CONTROL to position the xenon bulb in relation to the reflector is located on the rear of the lamphouse behind the cover panel. This control permits horizontal and vertical movement and focus control of the xenon bulb.

A TERMINAL STUD located near the bulb anode support, on the base of the lamphouse, is provided as a connecting point for the lamphouse positive DC lead and the anode lead from the bulb.

THE LAMPHOUSE is equipped with a DC ammeter to indicate the operating current of the lamp. A push-button switch, above the meter, changes the reading to indicate the voltage at the arc. This capability permits immediate calculation of the lamp power (wattage) while the lamp is operating.

AN ELAPSED TIME METER indicates the total number of hours the lamphouse has been in service and provides a means of recording the number of hours each xenon bulb has been operating.

THE LAMP BLOWER, internally wired to the lamphouse, operates on 115 V.AC and is required to maintain the bulb seals at a safe operating temperature. This blower will operate continuously until power is turned off at the main line switch to the xenon power supply.

AN AIR FLOW SWITCH, attached to the blower, will prevent ignition of the lamp if the blower is not operating. It will also stop operation of the lamp if the blower fails to maintain an adequate air flow to hold the switch closed.

THE LAMPHOUSE has an interlock switch on the side door and one under the plastic igniter cover on the top of the lamphouse. Opening the side door or removing the plastic igniter cover will open the AC control circuit and prevent operation or ignition of the xenon bulb. The side door has a small viewing port to permit observation of the xenon arc.

A KEY LOCK on the lamphouse door insures that only authorized personnel can gain access to the bulb compartment. As an additional safety feature, the lock must be further secured with a screw before bulb ignition is enabled.

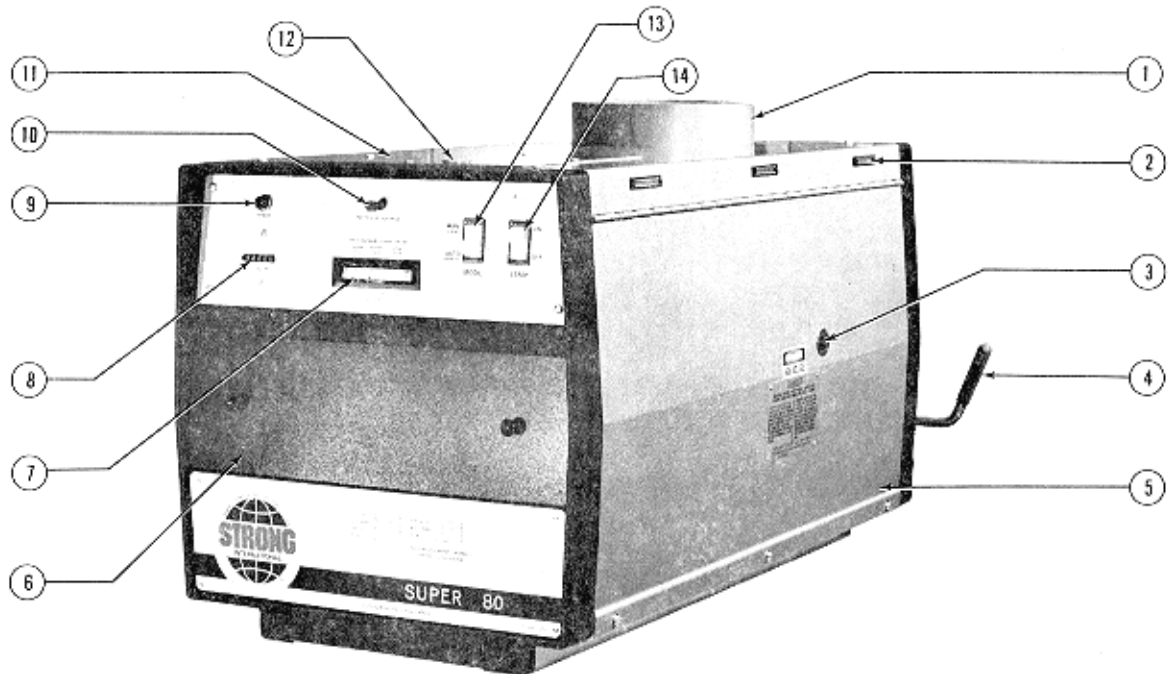
THE IGNITER is equipped with an emergency ignition switch, located under the plug button on the igniter access panel on the top of the lamphouse.

THE "MODE" rocker type switch on the rear of the lamphouse provides the means of operating the equipment from a remote AUTO system, or when placed in the "MAN." position, from the lamphouse.

THE LAMP "ON-OFF" SWITCH on the rear of the lamphouse is used for bulb ignition when the MODE switch is in the "MAN." position. The switch is left "ON" when used with an automation system, and set in "AUTO" mode.

A MANUALLY OPERATED DOUSER permits shutting off the light to the projector. The douser is normally left in the OPEN position when the lamphouse is used in conjunction with an automation system. To prevent deterioration of the douser plate, do not operate the lamphouse for a prolonged period with the douser closed. Do not, under any circumstances, operate the lamphouse in excess of (25) minutes with the douser closed. The douser is designed to permit changing from right hand to left hand operation.

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.



SUPER 80 XENON LAMPHOUSE

- | | |
|------------------------------------|---------------------------------|
| 1. Exhaust Stack | 8. Elapsed Time Meter |
| 2. Magnetic Door Catch | 9. POWER Indicator Light |
| 3. Arc Viewing Port | 10. Voltage Test Switch |
| 4. Douser Handle | 11. Igniter Access Cover |
| 5. Access Door | 12. Emergency Ignition Switch * |
| 6. Cover, Bulb Adjustment Controls | 13. MODE Switch (AUTO. - MAN.) |
| 7. DC Volt/Ammeter | 14. LAMP Switch (ON - OFF) |

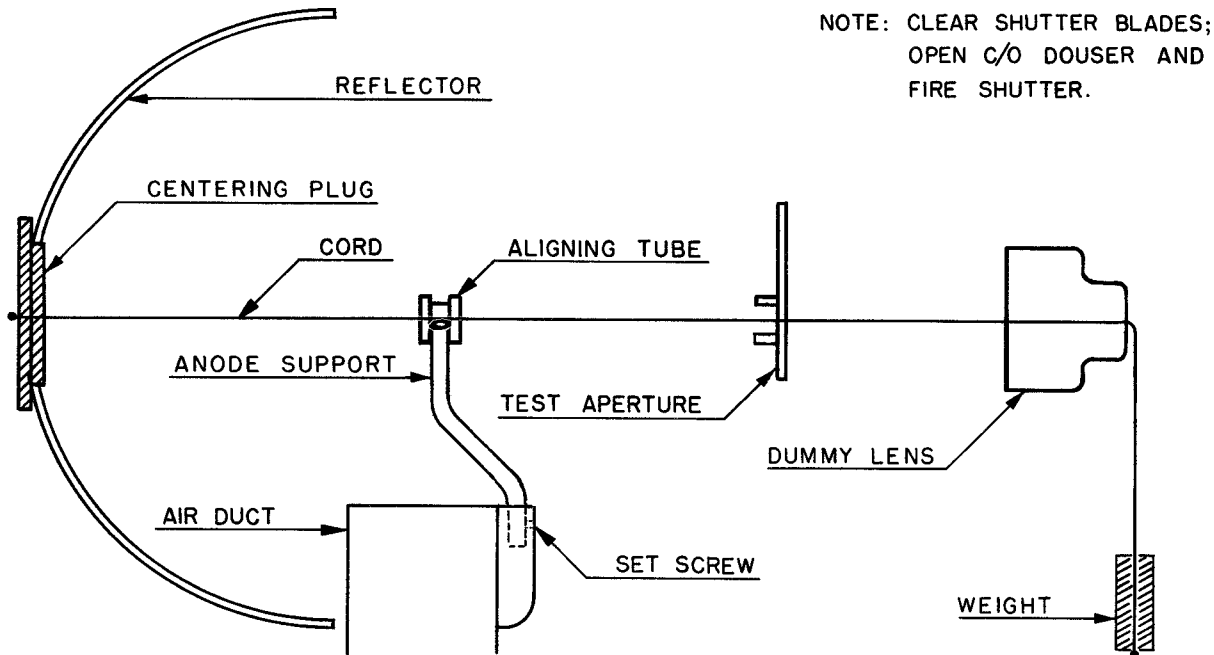
* Emergency Ignition Switch is located below the chromed plug button.

MECHANICAL LAMPHOUSE ALIGNMENT

ONE ALIGNING KIT consisting of an aligning cord, aperture plate, dummy lens, and centering plug is supplied with each lamphouse to provide an accurate and reliable method of optical alignment of the lamphouse to the projector mechanism. Because of the relatively small arc produced by the xenon bulb, good screen results can be obtained *only* by the careful use of this aligning kit.

PLACE THE LAMPHOUSE on the projection pedestal, making certain that it is centered between the ways. Open the side access door.

WHEN USED for 70mm projection, the beam spread lens kit should be installed onto the lamphouse before aligning the lamphouse to the projector. Do not insert the lens until the following aligning procedure has been completed.



POSITION THE LAMPHOUSE on the table so the center of the reflector measures as near 34 inches from the projector aperture as the projector design will permit.

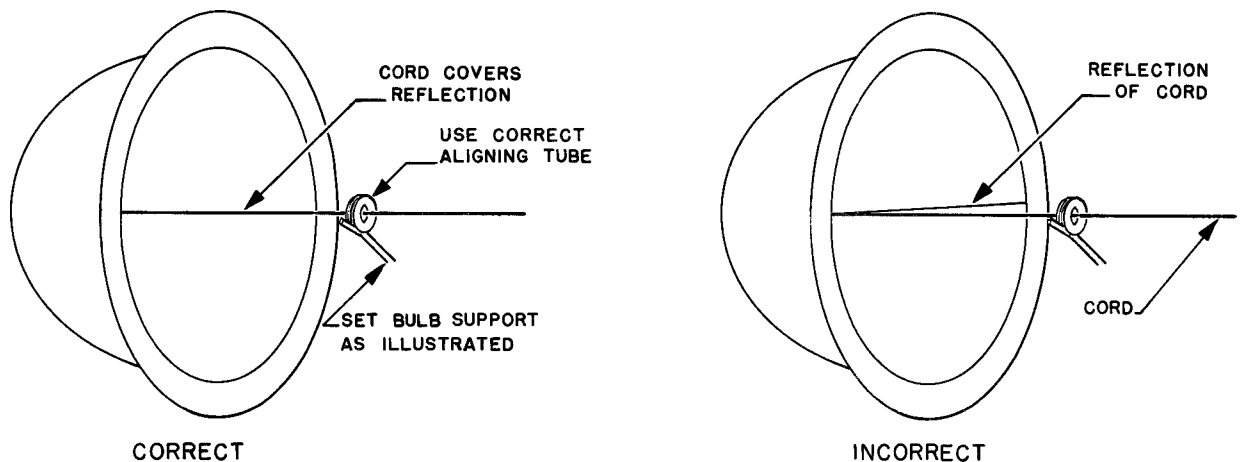
IN PREPARATION for optical alignment, bolt the lamphouse temporarily to the pedestal table using the 5/16-18 cap screws shipped with the lamphouse accessory kit.

SELECT THE CORRECT ALIGNING TUBE. The tubes are identified by bulb type and wattage, and the correct tube must be used to correctly locate the anode support yoke on optical center.

INSERT THE CENTERING PLUG into the reflector opening, and secure the cord behind it as illustrated. Place the aligning tube on the anode support yoke and run the cord through it. Open the douser.

REMOVE THE PROJECTION LENS and pull the cord through the lens barrel. Pass the cord through the dummy lens and tie the cord to an object of sufficient weight to hold the cord taut. Position the test aperture as illustrated in the film trap of the projector. Close the film gate to hold the test aperture in place.

MOST PROJECTOR BASES have adjustable lamphouse tables so the lamp can be brought into optical alignment with the projector mechanism. If the lamphouse table is not adjustable, use shims or washers at the front, rear, or at both ends of the lamphouse to obtain optical alignment to the projector.



ALIGN THE LAMPHOUSE in relation to the projector so the cord passes through the center of the hole in the test aperture, and the correct cord image is seen on the reflector. Set the anode support yoke as illustrated and tighten the set screw in the air duct. DO NOT reposition the reflector, as it is factory prealigned for maximum optical efficiency.

ONCE CORRECT ALIGNMENT is achieved, tighten the lamphouse mounting screws to secure the lamphouse to the table. Remove the cord and associated fixtures and restore the operation of the fire shutter.

STORE THE ALIGNING KIT in a secure location in the projection booth. If the Super 80 reflector is ever removed or replaced, it is necessary to repeat the entire cord alignment procedure. Likewise, if a different type or wattage bulb is used in a subsequent relampment, it may be necessary to re-align the anode yoke to position it for the optical center of the replacement bulb.

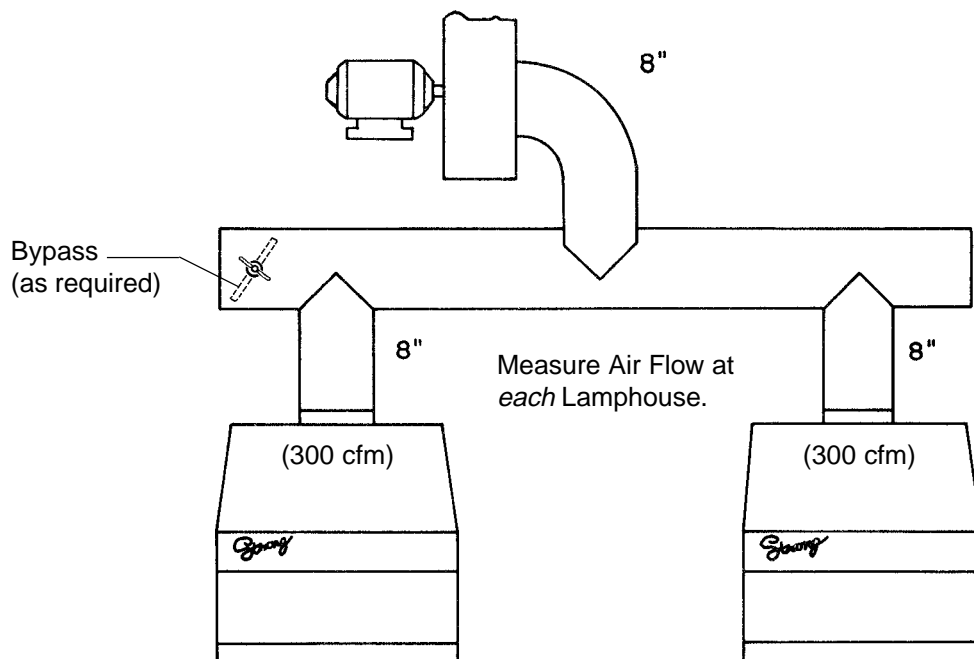
ORDERING NUMBERS for replacement aligning tubes are **40145** (Osram 3000 Watt), **40151** (Hanovia 4200 Watt), and **40156** (Osram 4000 Watt and Hanovia 3000 Watt).

EXHAUST SYSTEM INSTALLATION

THE EXHAUST DUCT of the Super 80 is designed to fit an eight inch diameter exhaust duct. This size ducting, either rigid or heat-resistant flexible, must be used throughout the complete exhaust system. The exhaust system must be vented to outside air, and installed in such a manner as to eliminate any possibility of downdraft or rain dripping into the lamphouse.

THE EXHAUST FAN must be capable of removing 300 cubic feet per minute (cfm) of air, as measured at the exhaust outlet of the lamphouse. If more than one lamphouse is connected to a common exhaust system, each individual lamphouse must meet the 300 cfm requirement.

IF THE EXHAUST AIR FLOW must be restricted for any reason, install bypasses rather than dampers in the exhaust line.



CHECK EACH LAMPHOUSE for correct exhaust air flow. Insufficient exhaust draft can severely shorten bulb life, and *no credit* will be allowed bulbs damaged in this manner. Inadequate exhaust may also cause possible injury to personnel by overheating the lamphouse enclosure.

THE XENON BULBS approved for use in the Super 80 are designated as **ozone free**. See "BULB INSTALLATION AND OPERATION."

WIRING INSTALLATION

THE LAMPHOUSE LEADS must be connected to the xenon power supply as illustrated on the Installation Diagram (following page). A pair of heavy-gauge ring terminals are attached to the lamphouse cable assembly for use with those xenon power supplies with screw terminal DC outputs.

CONNECT THE TWO HEAVY FIBREGLASS INSULATED LEADS to the DC outputs in the power supply. **Observe correct polarity**; red to positive (+), black to negative (-). Tighten connections securely to prevent overheating. Leads 2, 4, 5, and 6 provide the AC control circuit between the lamphouse and power supply. Connect them to their corresponding numbered terminals on the barrier strip in the power supply cabinet.

COLOR CODE:

Brown	#2
Red	#3
Orange	#4
Blue	#5
Yellow	#6

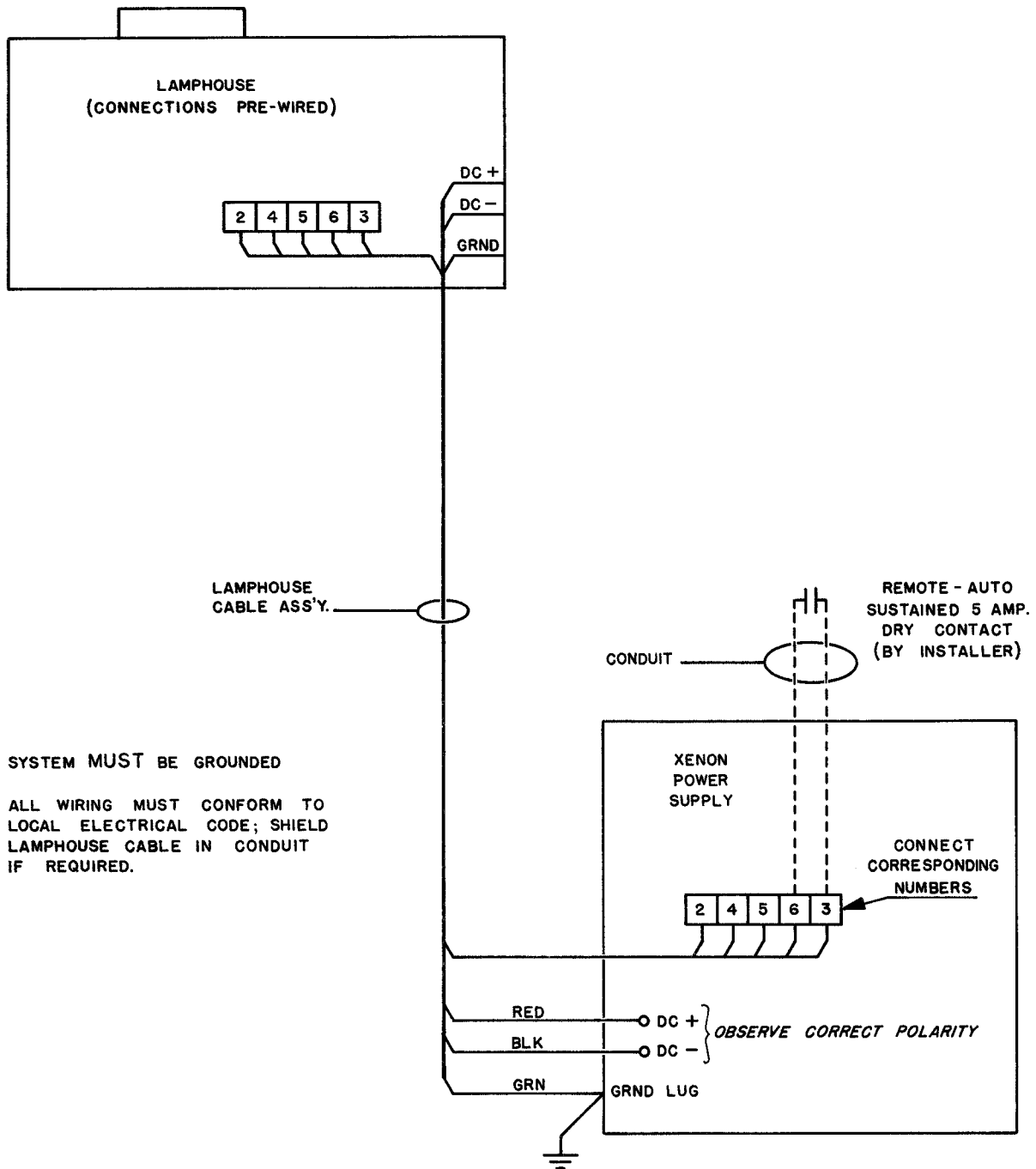
BECAUSE OF HIGH VOLTAGES impressed during the ignition cycle, the xenon lamphouse **must** be grounded. Connect the ground lead in the cable assembly (#8 AWG green) to the terminal lug in the power supply cabinet. Make certain that the power supply is connected to an adequate earth ground.

IF AUTOMATED or remote lamphouse switching is desired, it is generally more convenient to make such connections to the power supply barrier strip (3 & 6) as illustrated. See the "AUTOMATION SYSTEMS" section following for detailed instructions.

ALL LEADS may be run in conduit or greenfield if desired, or if required by local code. This may also be necessary as shielding to prevent electrical interference in the theatre sound system.

IT IS RECOMMENDED to establish a routine of periodically checking all electrical connections for tightness. Loose connections, particularly in the DC circuit, are subject to hazardous overheating.

LAMPHOUSE - POWER SUPPLY Interconnection Diagram



SYSTEM MUST BE GROUNDED

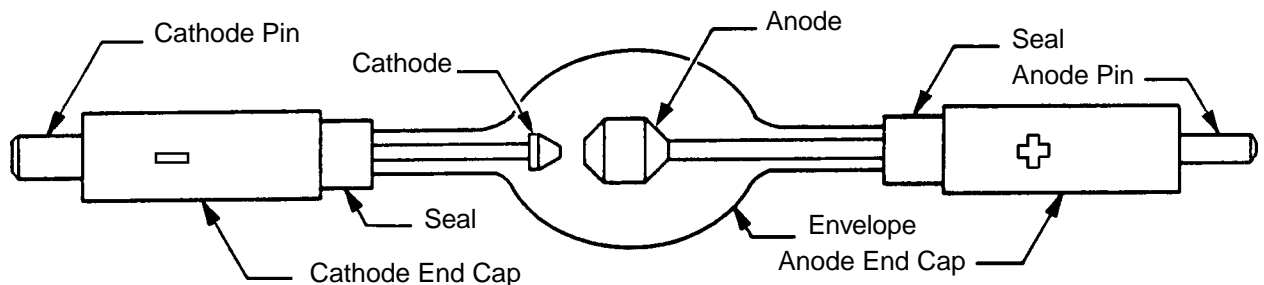
ALL WIRING MUST CONFORM TO
LOCAL ELECTRICAL CODE; SHIELD
LAMPHOUSE CABLE IN CONDUIT
IF REQUIRED.

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 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 AND OPERATION



Only qualified and trained professional technical personnel are allowed to operate the equipment. Refer all service and maintenance to trained personnel. Untrained personnel are not allowed in the projection booth during operation, service, or maintenance.



OBSERVE ALL SAFETY PROCEDURES. Bulb installation and replacement must be performed by AUTHORIZED PERSONNEL with protective clothing and face shield.

THE SUPER 80 is shipped with one of two rear bulb support collet assemblies to accommodate the different pin diameters of the bulbs used. If ordered for 3000 watt operation, the lamphouse contains a 40929 bulb collet and a 40966 cathode clamp for the .550 inch (14mm) pin of the 3000 watt bulb. For use with the 4000 or 4200 watt bulbs, the 40930 collet and 40965 clamp are incorporated to mate with the .312 inch (8mm) diameter of these bulb pins. Bulbs mounted in the Super 80 include anode leads, and require no adapters.

THE FOLLOWING BULBS are approved for use in the Super 80:

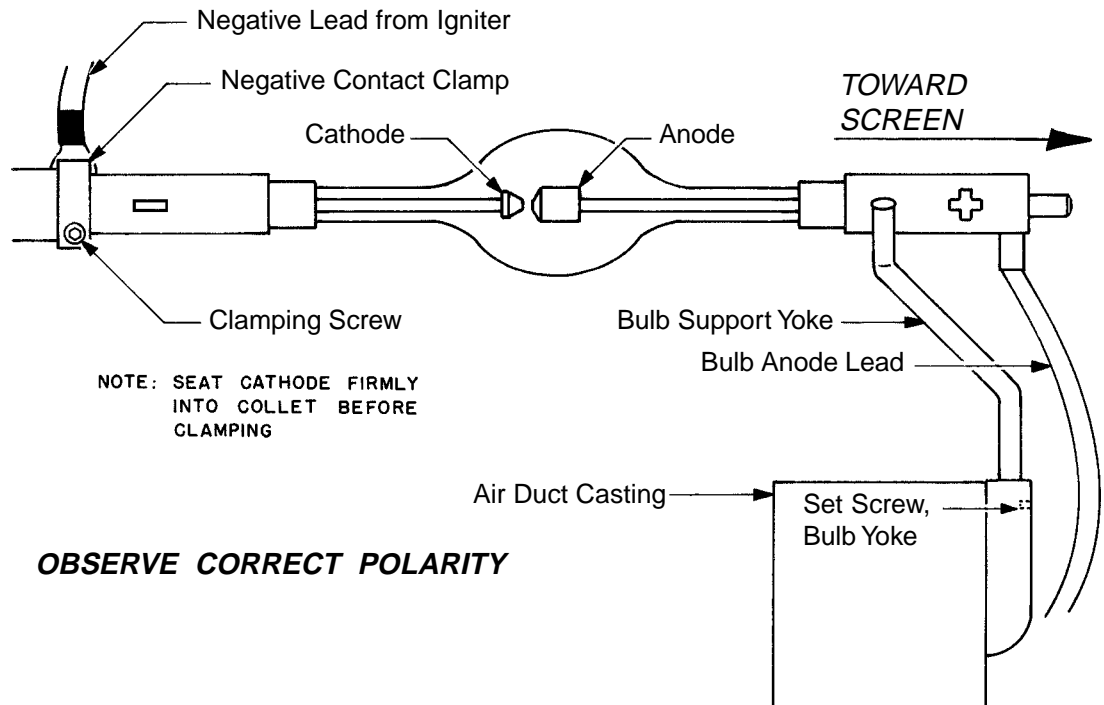
<u>Manufacturer</u>	<u>Mfr. Part No.</u>	<u>Wattage</u>
Hanovia	XH3000HW	3000
Osram	XBO3000W/H OFR	3000
Hanovia	XH4200HS	4200
Osram	XBO4000W/HS OFR	4000

ATTACH THE ANODE (+) LEAD, if furnished separately, to the bulb stem prior to installation. Do not apply mechanical stress to the bulb envelope when attaching the lead. If using an Osram bulb with a short anode lead, the anode lead extension 81829 may be attached to the Osram lead by cutting off the lead ring terminal and splicing the extension to the bulb lead with the 81349 connector. Firmly tighten the (2) connector set screws. Insulate the bulb lead using the 71289 silastic rubber tubing. This lead extension, available through Strong International Dealers, may be *necessary* to permit bulb rotation.

THE BULB SUPPORT YOKE must be aligned to accommodate the xenon bulb used. This operation correctly takes place in the course of the cord alignment procedure. See the preceding "MECHANICAL LAMPHOUSE ALIGNMENT" section.

INSERT THE CATHODE (-) end of the bulb through the hole in the reflector. Seat the bulb stem into the cathode collet as far as possible to permit full focus travel of the bulb. Rest the anode (+) stem in the support yoke and dress the anode lead directly in front of the air duct. Securely tighten the socket head screw in the cathode clamp, taking care not to put any mechanical strain on the bulb. Remove the hexnut, lockwasher, and flatwasher from the anode binding post stud in front of the reflector. Connect the anode lead to the binding post and tighten firmly.

SUPER 80 BULB INSTALLATION



REMOVE THE PLASTIC PROTECTIVE COVER from the bulb. Close and secure the lamphouse access door. Place the MODE switch to the "MAN." position. Close the douser.

TURN ON THE MAIN LINE SWITCH to energize the xenon power supply. The POWER light will glow, the blower will start, and the air vane switch will be actuated to permit lamp ignition. The lamp blower will operate until the main line switch to the xenon power supply is opened.

TURN ON THE EXHAUST BLOWER.

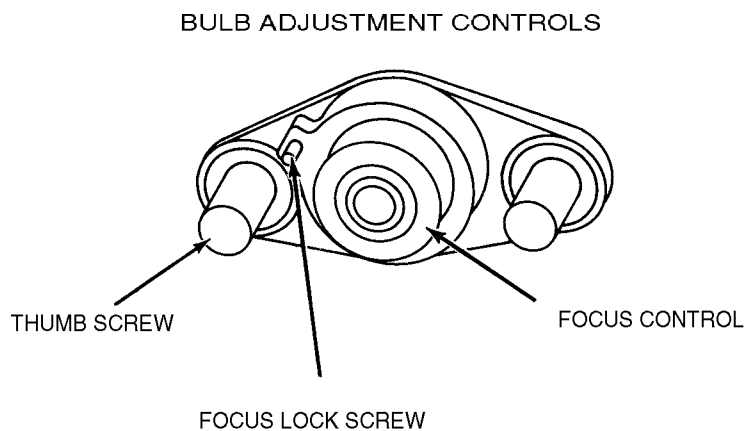
PLACE THE **LAMP SWITCH** in the "ON" position and the bulb will ignite. If ignition does not occur, or if the high ignition pulse is not apparent, press the Emergency Ignition switch located under the plug button on the top of the lamphouse. Do not hold for more than *one second*; release immediately on bulb ignition. Use of the Emergency switch indicates an abnormal condition; see the following TROUBLESHOOTING section.

DO NOT EXCEED at any time the maximum current recommended by the xenon bulb manufacturer. Always adjust the power supply to first operate the bulb at the low end of the recommended range. Then increase the current to the suggested nominal current, which is approximately ten amperes below the maximum established by the bulb manufacturer. Most xenon power supplies have the capability to over-drive any given rated xenon bulb.

THE SMALL PUSH-BUTTON SWITCH located directly above the ammeter may be pressed while the lamp is operating to convert the meter reading to indicate the DC voltage at the arc. This permits immediate calculation of the power at which the lamp is operating (wattage equals volts times amperes). Holding this switch in at ignition will briefly indicate the DC “No Load” voltage applied to the bulb for ignition.

REMOVE THE REAR COVER PANEL using the two pull type knobs to expose the bulb position adjustment controls.

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 in only one plane, into or away from the reflector. Clockwise rotation 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, after the following procedures have been completed.

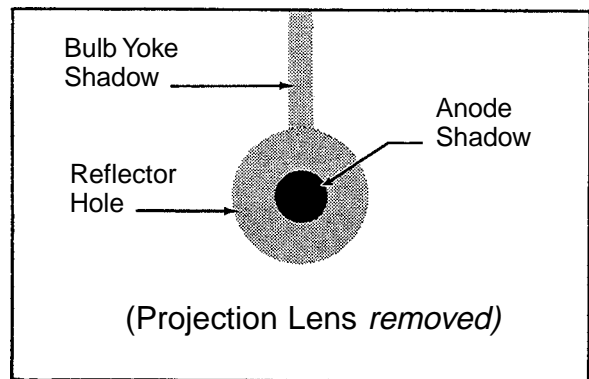


THE THUMB SCREWS on either side of the focusing control lock the horizontal and vertical adjustment mechanism in position.

REMOVE THE PROJECTION LENS, start the projector motor and open the lamp-house douser. Since a xenon light source can be focused to a small intense spot at the projector lens, **do not operate the lamp without the projector running.**

TURN THE CENTER FOCUSING SECTION of the bulb positioning control until the smallest black spot obtainable is focused on the projection screen. It may be best to run this adjustment both directions to permit positive identification of the spot. The position of the spot may be to the right, left, top or bottom of the screen, and not necessarily at the center.

LOOSEN the two thumb screws, one on either side of the focusing section just enough to permit manual movement of the complete assembly. The bulb adjustment control will now move about these two thumb screws, and as this control is shifted, the smooth shadow of the electrode can be seen extending beyond the projected hole in the reflector. The electrode shadow must be centered in the projected hole of the reflector.



MOVE THIS CONTROL SECTION around the two thumb screws until the black spot is as round as possible to project. It may be necessary to again adjust the focus control to project a sharp spot. After the black spot is as even around the outside as possible to project, tighten the two thumb screws to lock the adjustment section. This adjustment has now centered the projected image of the electrode shadow and the hole in the reflector on the aperture and screen.

IF THE PROJECTED IMAGE is not centered on the screen as illustrated, move the pedestal or adjust the lamphouse/projector tilt to correct.

REPLACE THE PROJECTION LENS and install a CinemaScope aperture plate. Turn the center focus adjustment until the desired light distribution is projected to the screen. Avoid running the projector in this manner for an extended period of time without *frequently* closing the lamphouse douser. Without film, the heat from the xenon bulb can damage the projection lens.

THIS ADJUSTMENT should not be disturbed until it is necessary to replace or rotate the xenon bulb. Then, only the bulb adjustments outlined above may have to be repeated; do not disturb or adjust the optical alignment of the lamphouse on the projector table.

REPLACE THE REAR COVER PANEL over the bulb adjustment control mechanism. Secure with the two plungers.

BECAUSE OF MANUFACTURING TOLERANCES on any given xenon bulb, and normal aging, it may be necessary to operate one lamp of a two-machine installation at slightly higher or lower current to obtain equal light balance on the screen. This is done by adjusting the output of the xenon power supply.

TO EXTINGUISH THE ARC, place the LAMP switch in the "OFF" position. The lamphouse blower will continue to operate until the main line switch in the AC power line to the xenon power supply is opened. To prolong bulb life, leave the lamphouse blower and the exhaust fan operate for at least ten minutes after turning off the lamp.

RECORD THE INSTALLATION of each xenon bulb on the Xenon Bulb Record chart located on the back cover of this manual. It is recommended to replace the bulb on expiration of warranty. In the event of a bulb explosion, the reflector might sustain damage, and if the subject bulb is out of warranty, the bulb manufacturer will allow **no credit** on a replacement reflector.

RETURN BULBS on which a warranty claim is being made to the theatre equipment dealer through whom the bulb 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.

DAMAGED REFLECTORS should be forwarded to the **bulb** manufacturer or dealer, with an invoice copy authenticating the cost of the replacement reflector.

A PERMANENT MAGNET is mounted to the dust cover behind the reflector to stabilize the arc between the electrodes of the xenon bulb. The magnet requires no adjustment. If the magnet is removed for any reason, it must be replaced with the SOUTH (painted) pole directed toward the lamphouse access door. Use of this magnet is *required* by the bulb manufacturer in order to comply with bulb warranty requirements.

AUTOMATION SYSTEMS

TO INTERCONNECT the Super 80 to an automation system, two 16 gauge wires (not supplied by Strong) must be customer-installed as illustrated in the Installation Diagram. These wires must be shielded to prevent interference in the theatre sound system.

NOTE: Lamp ignition in “AUTO” mode is effected by a sustained dry contact closure of terminals 3 and 6. DO NOT apply voltage to these terminals. Refer to instructions furnished by the manufacturer of the automation controller.

TO OPERATE with an automation system, place the MODE switch in “AUTO,” and the LAMP switch to “ON.” When the xenon power supply is energized, the lamphouse POWER light will glow, and the blower will operate. The bulb will not ignite until provided a dry contact between 3 and 6 by the automation controller. Opening this contact will extinguish the bulb, and allow the POWER light and the blower to continue to operate.

IN THE EVENT of an automation failure, manual control of the lamphouse can be restored by placing the MODE switch in “MAN.” and switching “ON” or “OFF” with the LAMP switch.

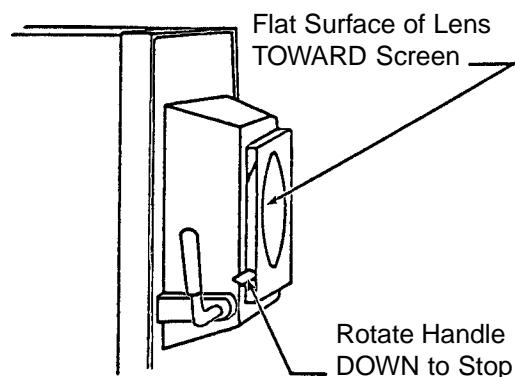
70mm OPERATION

BECAUSE OF THE LARGER APERTURE AREA of a 70mm projector, it is necessary to incorporate a Beam Expander Lens to insure proper coverage of the screen. The Beam Expander Kit No. 40959 is factory installed when ordered with new equipment, or may be added to an existing installation at a later date.

THE KIT consists of a lens holder (81847) which mounts to the front casting of the lamphouse with three 1/4-20 x 1-1/8" hex head screws (00705) and three 1/4" washers (00863), a lens assembly (81848), and a nose cone (40960). The nose cone attaches to the lens holder with three 6-32 x 1/8" pan head screws (01412).

ALL SUPER 80 front castings are drilled and tapped to accommodate field installation of the Beam Expander Kit. The nose cone can be trimmed with tin snips to fit as required without disturbing the 34 inch working distance of the lamphouse reflector to the projector aperture.

THE BEAM EXPANDER LENS is inserted as illustrated ONLY for 70mm operation; DO NOT insert the lens for 35mm projection.



MINOR REFOCUSING of the bulb may be required after insertion of the beam expander lens. Prior to projecting the 70mm film, project a white light to the screen with the projector running. Adjust the center member of the bulb adjustment mechanism until the desired light distribution is projected to the screen. Again, avoid running the projector in this manner for a prolonged period without occasionally closing the douser to cool the projection lens.

THE BEAM EXPANDER LENS should be cleaned periodically with lens tissue and a lens cleaning solution suitable for coated lens.

LENS HOLDER 81847, as illustrated above, can also be used with a Heat Filter & Ring Assembly (40939) when running 35mm prints. This optional heat filter may be desirable if a high wattage bulb (4500-5000 watt) is routinely used for 35mm projection.

MAINTENANCE

THE SUPER 80 LAMPHOUSE requires very little maintenance to keep it in good working order. Cleanliness is the most important element.

THE REFLECTOR should be cleaned periodically with a soft, clean, lint-free cloth to remove any dust from the reflecting surface. If excessively soiled, use of a mild commercial glass cleaner (Windex® or equivalent) is acceptable; USE NO ABRASIVE CLEANERS.

THE XENON BULB should be checked occasionally for the presence of foreign material on the envelope. Any dirt or other foreign material should be removed promptly. Use only alcohol and a clean cloth to clean the bulb; rinse with distilled water and dry carefully. DO NOT touch the bulb with bare fingers, and observe all safety procedures when working around the bulb.

THE INSIDE OF THE LAMPHOUSE and the impeller blades of the blower should be cleaned periodically, depending on the dust conditions at each installation. The grille over the air intake can be removed for cleaning; do not allow dirt or dust to build up on the grille or in the fan impeller.

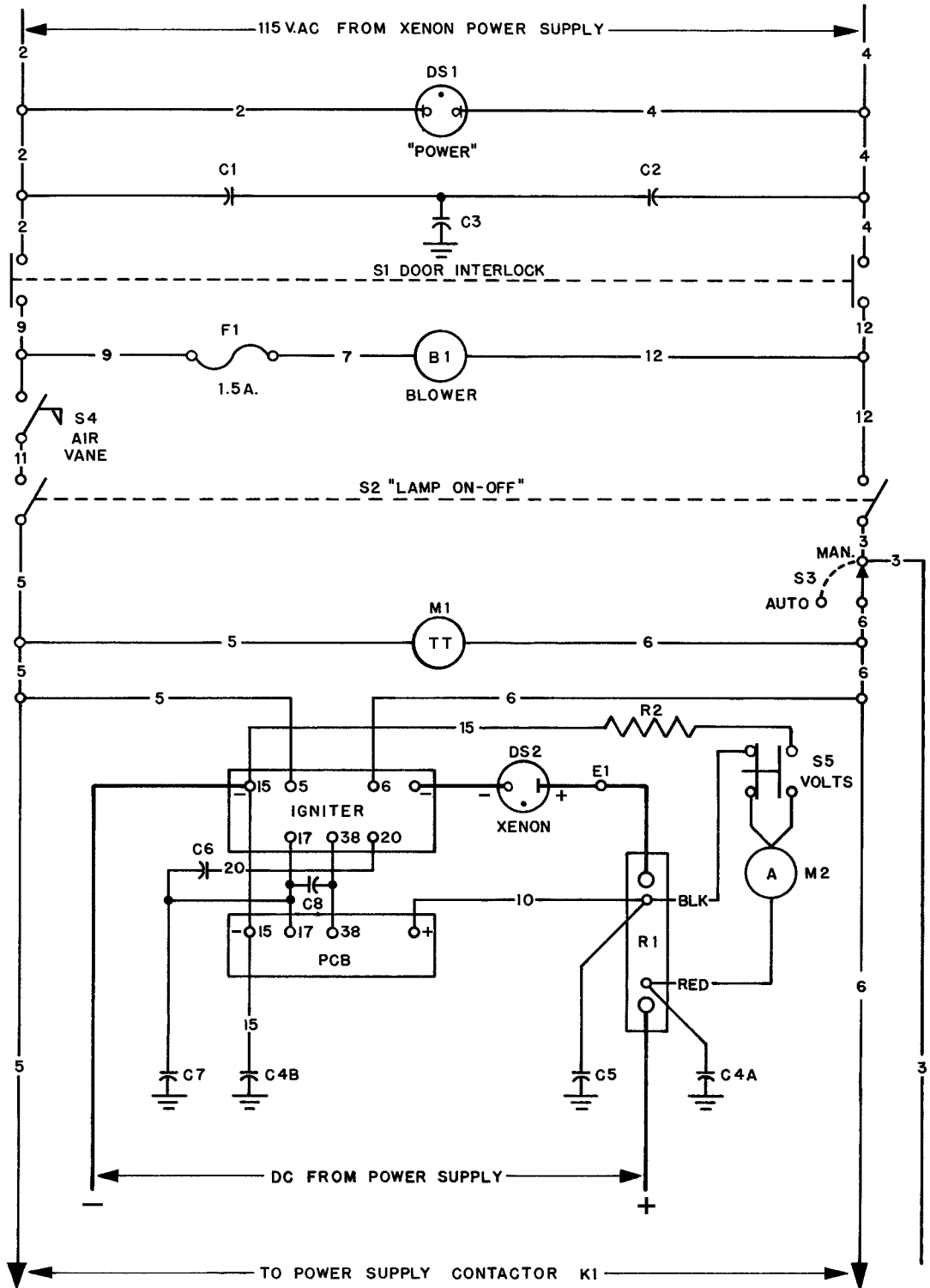
THE XENON LAMPHOUSE does not require any lubrication other than at the blower. This should be lubricated with two or three drops of non-detergent motor oil every four to six months. The oil holes are located on top of the motor.

CHECK ALL ELECTRICAL CONNECTIONS periodically for tightness, especially the DC leads at the xenon bulb and at the shunt and igniter.

FOLLOW THE RECOMMENDATIONS of the xenon bulb manufacturer regarding periodic bulb rotation. It is a general practice to rotate the bulb 180° at 50% of warranty life. After rotating a bulb, increase current to the maximum allowable level. Operate the bulb at this elevated level for three or four shows, and then return the power supply to its previous setting. This measure restores the tip of the cathode, and enhances ignition at the new arc position.

ALWAYS allow the lamphouse blower and the exhaust system to operate for *at least* ten minutes after extinguishing the bulb. Failure to do so may void the bulb manufacturer's warranty, and will shorten bulb life.

SUPER 80 Lamphouse Schematic



WIRING DIAGRAM
Parts List

<u>Ref.</u>	<u>Part No.</u>	<u>Description</u>
<u>Desig.</u>		
B1	40982	Blower, 115 V.AC, 50/60 Hz.
C1,2	76132	Capacitor, .005 μ f, 600 WVDC
C3	76133	Capacitor, .01 μ f, 400 WVDC
C4A,B	76323	Capacitor, 1.0-1.0 μ f, 600 WVDC
C5	81947	Capacitor Assembly, .05 μ f, 500 WVDC
C6,7	88263	Capacitor, .05 μ f, 600 WVDC
C8	39956	Capacitor Assembly, .05 μ f, 2000 WVDC
DS1	78984	POWER Indicator Light
DS2	---	Xenon Bulb (by Customer)
E1	40987	Binding Post, DC Positive
-	40131	Fibre Insulator
F1	39198	Fuse, 1.5 Amp. 250 V. Std.
-	39199	Fuse Holder
M1	40971	Elapsed Time Meter, 60 Hz.
-	40963	Elapsed Time Meter, 50 Hz.
M2	40923	Ammeter, 0-200 Amp.
PCB	40913	Igniter Printed Circuit Board Assembly
R1	81247	Shunt, 200 Amp. 50 mV.
R2	71283	Resistor, 90.9k Ohm, 1/4 W. 1%
S1	80168	Door Interlock Switch
S2	81275	LAMP Switch, "ON-OFF"
S3	81276	MODE Switch, "AUTO-MAN."
S4	39955	Air Vane Switch, Blower
S5	72275	Voltage Test Switch
-	39999A	Igniter Assembly
-	40972	Lamphouse Wire Harness Assembly
-	40969	Lamphouse/Power Supply Interconnect Cable Assembly

Specify Equipment Type and Serial Number when ordering replacement parts.

PRINCIPLE OF IGNITER OPERATION

THE IGNITER is energized through the 115 V.AC control circuit when the LAMP “ON-OFF” switch (S2) is depressed and all interlocks and air flow switches are closed.

CAUTION: Do not use the Emergency Ignition switch (S102) in the igniter until it is determined that the polarity of the xenon bulb is correct. Use of the S102 switch bypasses the polarity sensing diode (CR201) on the igniter printed circuit board; if polarity is not correct, the bulb will be seriously damaged or destroyed. *No credit* is allowed on bulbs damaged by reversed polarity.

THE IGNITER supplies a high RF voltage pulse to the bulb, together with the high “No Load” DC voltage from the xenon power supply, to ignite the xenon bulb. After the arc is sustained, the AC circuit in the igniter is interrupted by the opening of K201 relay contacts on the signal of the timer circuit on the PC board. The DC output of the xenon power supply is automatically lowered to the power level required to maintain the arc. The DC power to the bulb is dependent upon the bulb characteristics and the setting of the output of the xenon power supply.

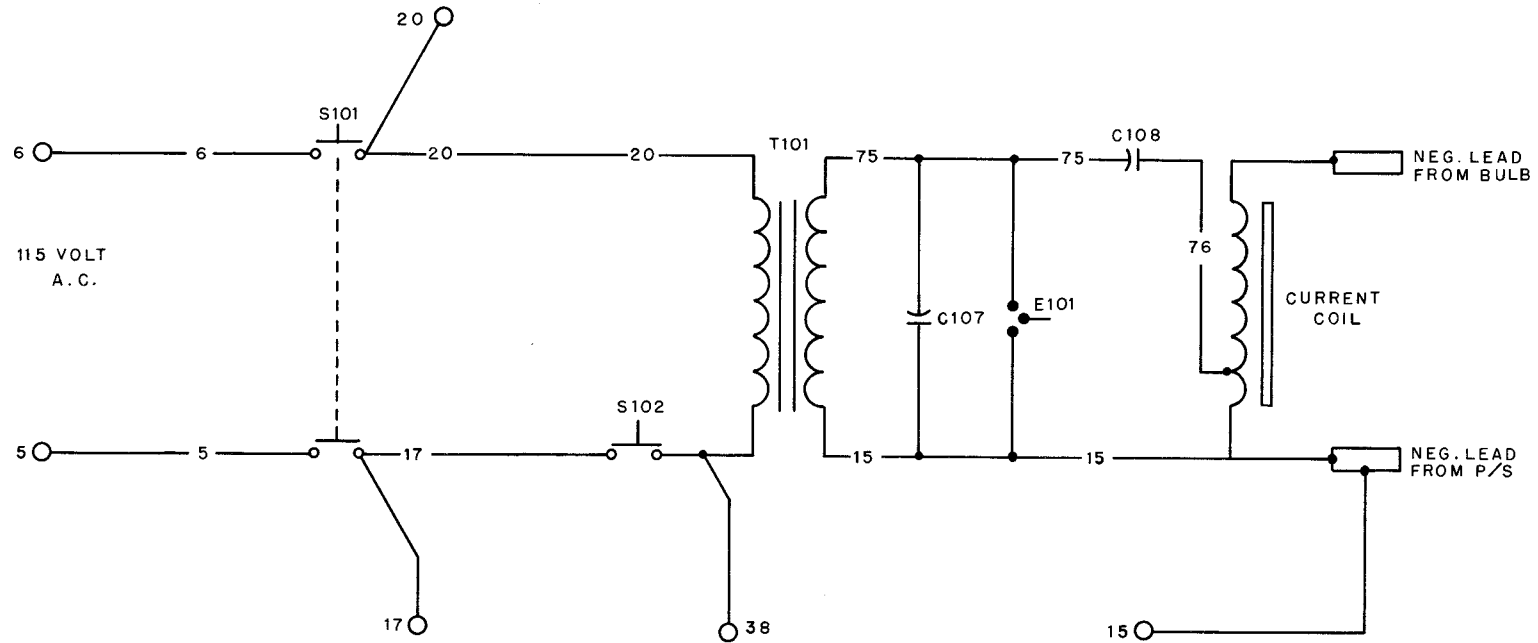
DC VOLTAGE is applied to the printed circuit board from the xenon power supply, energizing the 12 V.DC coil and closing the contacts of K201 relay, completing the AC circuit through the igniter to the T102 high voltage (10 kV.) transformer. High voltage boost capacitor C107 is charged to a voltage sufficient to cause breakdown across the E101 spark gap. Approximately 35 kV. is supplied to the xenon bulb for ignition.

S101 is the igniter cover interlock switch and S102 is the Emergency Ignition switch, which is a bypass for the K201 relay contacts and CR201 polarity sensing diode on the PC board. Components C101, 102, and 103 function as RF bypass capacitors on the igniter. The C108 capacitor serves as a coupling capacitor to the current coil.

THE PC BOARD operates on DC voltage from the xenon power supply. Capacitor C201 across the positive #10 and negative #15 is an RF suppression capacitor. Resistor R201 and zener diodes VR201 and 202 drop the DC voltage to 12 volts for the K201 relay coil. CR201 is the polarity sensing diode. C204 is a polarized capacitor used for arc suppression at the K201 relay coil, and CR202 functions as a transient protection diode.

THE FOLLOWING COMPONENTS are parts of the timing circuit on the PC board: Timer chip U201, resistors R202, 203, and the polarized capacitor C203. The C203 capacitor functions as the timing control, and CR203 serves as the “ON” time control diode. C202 is the control voltage isolation capacitor.

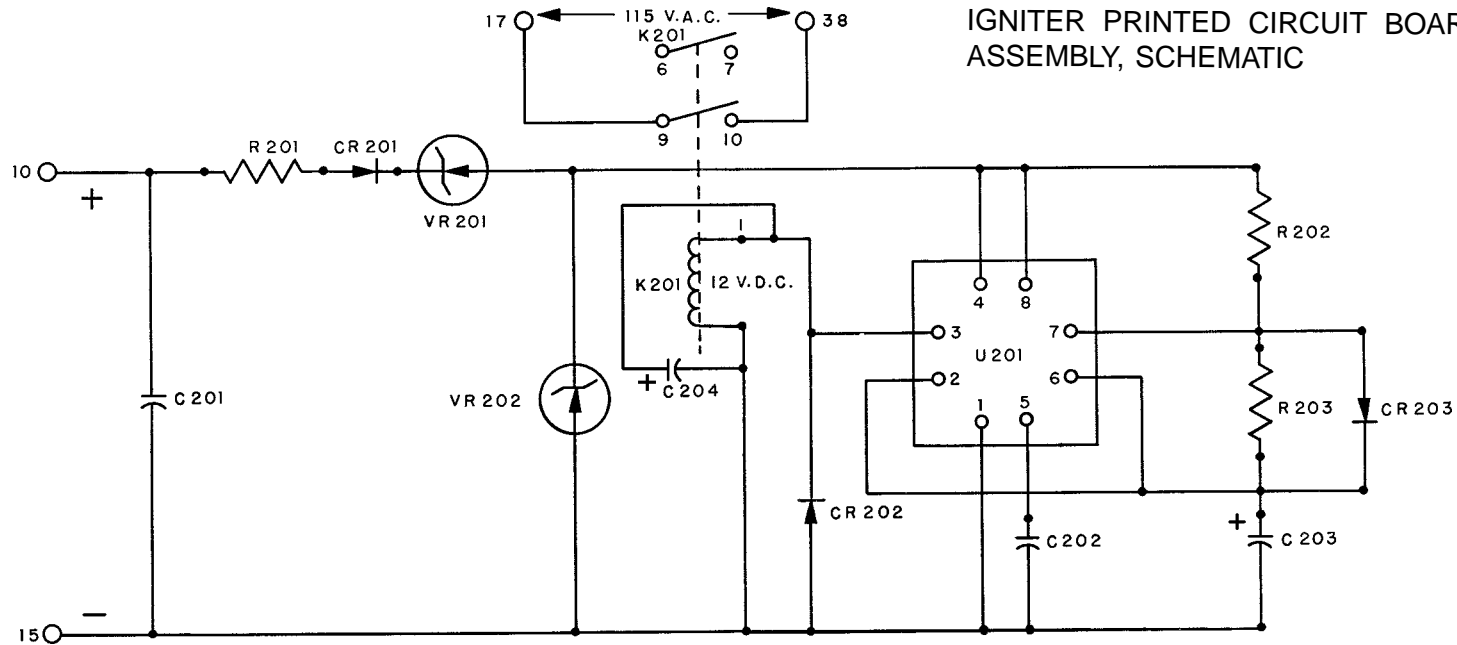
IGNITER ASSEMBLY, SCHEMATIC



S80/020

Ref.	Part No.	Description
<u>Desig.</u>		
C107	39110	Capacitor, 2400 pf, 20 kV.DC
C108	39110	Capacitor, 2400 pf, 20 kV.DC
E101	39923	Spark Gap Assembly
S101	80168	Cover Interlock Switch
S102	80168	Emergency Ignite Switch
T101	39937	High Voltage Transformer
-	39998	Case & Coil, Potted Assembly

S80/21



IGNITER PRINTED CIRCUIT BOARD ASSEMBLY, SCHEMATIC

WIRE MARKERS

- A = 10
- B = 15
- C = 17
- D = 38

Ref. Desig.	Part No.	Description
C201	88263	Capacitor, .05 μ f, 600 WVDC
C202	79127	Capacitor, .01 μ f, 600 WVDC
C203	39156	Capacitor, 15 μ f, 30/35 WVDC
C204	88249	Capacitor, .1 μ f, 600 WVDC
CR201	85112	Diode, 2.5 A. 1000 PRV
CR202	85112	Diode, 2.5 A. 1000 PRV
CR203	85112	Diode, 2.5 A. 1000 PRV
K201	39154	Relay, P&B R10-E1-W2S800
-	39160	Relay Socket
-	39161	Relay Hold-Down Spring
R201	39157	Resistor, 1k Ohm, 12 Watt
R202	39158	Resistor, 100k Ohm, 1/2 Watt

Ref. Desig.	Part No.	Description
R203	39159	Resistor, 200k Ohm, 1/2 Watt
U201	72185	Timer IC, Motorola MC11455P1
-	39164	IC Socket, (6) Pin
VR201	39211	Zener Diode, 1N5377A (40913*)
VR201	81519	Zener Diode, 1N5361 (40984*)
VR202	39162	Zener Diode, 1N4742
-	39145	PC Board (less Components)
*	40913	PCB Assembly, Standard
*	40984	PCB Assembly (Older Models using High Reactance Power Supply)

Assembly Number written on Component Side of PCB.

TROUBLE CHART

NOTE: When working inside the lamphouse, enclose the bulb in its protective covering and/or wear protective clothing and face shield. Do not touch the quartz envelope of the bulb with bare fingers.

ALLOW THE LAMPHOUSE to cool, with all blowers operating, for at least (20) minutes before opening the access door.

Normal Operation:

When the switch in the main AC supply line to the xenon power supply is placed in the "ON" position, with the door interlock switch closed, the lamphouse POWER light will glow and the lamphouse blower will operate. The lamphouse blower will close the S4 air vane switch, completing the circuit to the S2 LAMP "ON-OFF" switch.

Place the lamphouse MODE switch S3 in the "MAN." position. When the lamphouse LAMP switch S2 is in the "ON" position, the elapsed time meter will operate and the AC circuit (5 - 6) to the xenon power supply will energize the circuitry necessary to supply DC voltage to the igniter and bulb.

There will be an audible high voltage arc ping at the spark gap in the igniter and at the xenon bulb. The bulb should ignite immediately after one or two of these high voltage pulses, and the lamp current will adjust to the sustaining level set at the xenon power supply.

Troubleshooting:

If the xenon bulb does not ignite, observe the following operational sequences for assistance in locating and isolating the trouble area.

When operating with a xenon power supply equipped with the red indicator light, and the light is "ON," the AC circuit in the power supply is trouble free up to the terminal block (L1, L2, L3) in the power supply.

The blower in the lamphouse and the POWER light on the instrument panel should operate. If this does not occur, the trouble is in either the door interlock switch, the blower, the indicator lamp, a loose connection, a broken #2 or #4 lead, or a defective stepdown transformer in the xenon power supply. The Super 80 has an in-line fuse in the blower lead; check the fuse and replace if blown. Do not overfuse; use 1.5 A. standard.

CAUTION: To prevent bulb ignition when checking the AC control circuit, remove the #6 lead running from the igniter at the terminal post on the lamphouse base pan. Tape the exposed lead to prevent shorting out the circuit.

Check the 115 V.AC control circuit in the lamphouse at the door switch, then the blower leads at terminals #9 and #12. The door interlock switch must be manually actuated to energize the blower circuit.

The vane on the air flow switch should move, completing the circuit to the LAMP switch. With the MODE switch in the "MAN." position, and the LAMP switch in the "ON" position, the elapsed time meter should start to indicate elapsed time. If this meter does not operate, check for continuity at the LAMP and MODE switches. Check continuity of the air flow switch; should read 0 Ohms between "NO" and "COM" when actuated. A defective elapsed time meter will *not* prevent bulb ignition. Replace lead #6.

With the LAMP switch in the "ON" position, a distinct high voltage arc ping at the igniter spark gap should be heard, and a flash from the xenon bulb should be visible through the ammeter, as DC voltage is applied to the bulb electrodes.

If the high voltage ping or the flash at the ammeter is not apparent, check the DC "No Load" voltage between the lamphouse and power supply. Again disconnect lead #6 running from the igniter at the terminal strip on the lamphouse base. Tape the end of the disconnected lead and close and secure the lamphouse door.

Press the switch above the ammeter, and the meter will indicate the "No Load" DC voltage supplied to the lamphouse when the LAMP switch is turned "ON." This voltage will vary between different types of power supplies. See your power supply manual for its correct "No Load" rating.

The standard 40913 igniter printed board in the Super 80 is designed for use with a high DC "No Load" voltage. Consult the factory if using an older high reactance xenon power supply with normally lower DC "No Load" voltage.

If the correct voltage for the power supply being used is not indicated on the meter, the problem is in the lamphouse/power supply interconnecting cable, or in the power supply. See the troubleshooting guide in the power supply manual for additional instructions and tests. Replace lead #6 on the terminal strip on the lamphouse base.

If the high voltage arc is audible at the lamphouse, and the bulb does not flash, replace the bulb and attempt ignition with the new bulb.

Using the new bulb, if the high voltage arc is audible at the lamphouse, the flash of the bulb is visible in the ammeter, and ignition is *not* sustained, the problem is in the power supply.

If the high voltage arc is *not* audible or the flash of the bulb visible, the trouble is in the igniter or the igniter printed circuit board.

SUPER 80 TROUBLESHOOTING

Bulb fails to ignite.

1. AC power not on to lamphouse. If 115 V.AC not read at 2 & 4, see power supply manual.
2. Door interlock switch S1 open. Close and secure lamphouse access door. Tighten all three screws.
3. Faulty door interlock switch. Check for 115 V.AC at 9 & 12; replace switch if defective.
4. Air vane switch S4 not closing. Check for unobstructed operation; clean if required. Check continuity between "NO" and "COM"; replace if defective.
5. Faulty S2 "ON-OFF" switch. Check for voltage at 3 & 5; check for loose wiring. Replace if defective.
6. Automation fault. Override automation by switching MODE to "MAN." and placing LAMP switch in "ON."

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.
2. 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.

No high voltage ping audible; MODE switch in "MAN." and 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. Little or no DC "No Load" voltage. Measure DC "No Load" voltage at 10 & 15. See power supply manual.
3. Faulty igniter printed circuit board. If bulb ignites by pressing Emergency Ignition switch, replace printed circuit board.
4. Faulty igniter. Check for 115 V.AC at 5 & 6; adequate DC "No Load" at 10 & 15. Replace igniter if defective.

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 blower B1 failed or obstructed. Clean dust and dirt from blower inlet grille. Check for 115 V.AC at 9 & 12; replace blower if defective.
3. Blower fuse F1 blown. Replace if defective (1.5 A. Std.).

Bulb goes out during operation (continued)

4. Lamphouse air vane switch S4 faulty. Check for vane actuation; adjust or replace as required.
5. Backdraft from exhaust system. Check exhaust system installation; increase exhaust draft as required.

Power supply does not energize when actuated.

1. S1 door interlock switch, B1 blower, S4 air vane switch, S2 power switch, S3 MODE switch. Check for 115 V.AC at each station; replace defective component.
2. Automation fault. Check for continuity between 3 & 6. See Automation Controller manual. Use "MAN." mode to override.

SEE POWER SUPPLY TROUBLESHOOTING UNDER SAME HEADING.

Noise in theatre sound as bulb ignites.

1. Faulty RF suppression capacitor(s). Remove and test C1, C2, C3, C4A or C4B. Replace if defective.
2. Lamphouse, power supply, or sound system not properly grounded. Connect to adequate earth ground.
3. Leads between lamphouse and automation contact not shielded. Shield leads in conduit.

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. Projector shutter mistimed. See projector manual.

Reduced light output.

1. Normal bulb aging. Increase output current. DO NOT EXCEED MAXIMUM CURRENT SPECIFIED BY BULB MANUFACTURER.
2. Soiled reflector. Clean using commercial glass cleaner. USE NO ABRASIVES.
3. Soiled projection lens or port glass. Clean as required.

Extremely long duration between ignition pulses.

1. Low DC "No Load" from xenon power supply. Check "No Load" voltage; see power supply manual.
2. Defective spark gap E101. A "Ping" sound is normal; excessive "Hissing" is abnormal. Replace if defective.
3. Low AC voltage to lamphouse. Check for 115 V.AC at 2 & 4; if below 95 volts, check stepdown transformer in xenon power supply. See power supply manual.
4. Faulty K201 relay or U201 timer chip on igniter printed circuit board. Remove and test PCB; replace if defective.

Igniter continues to fire after bulb ignites.

1. Faulty igniter printed circuit board. Replace if defective.

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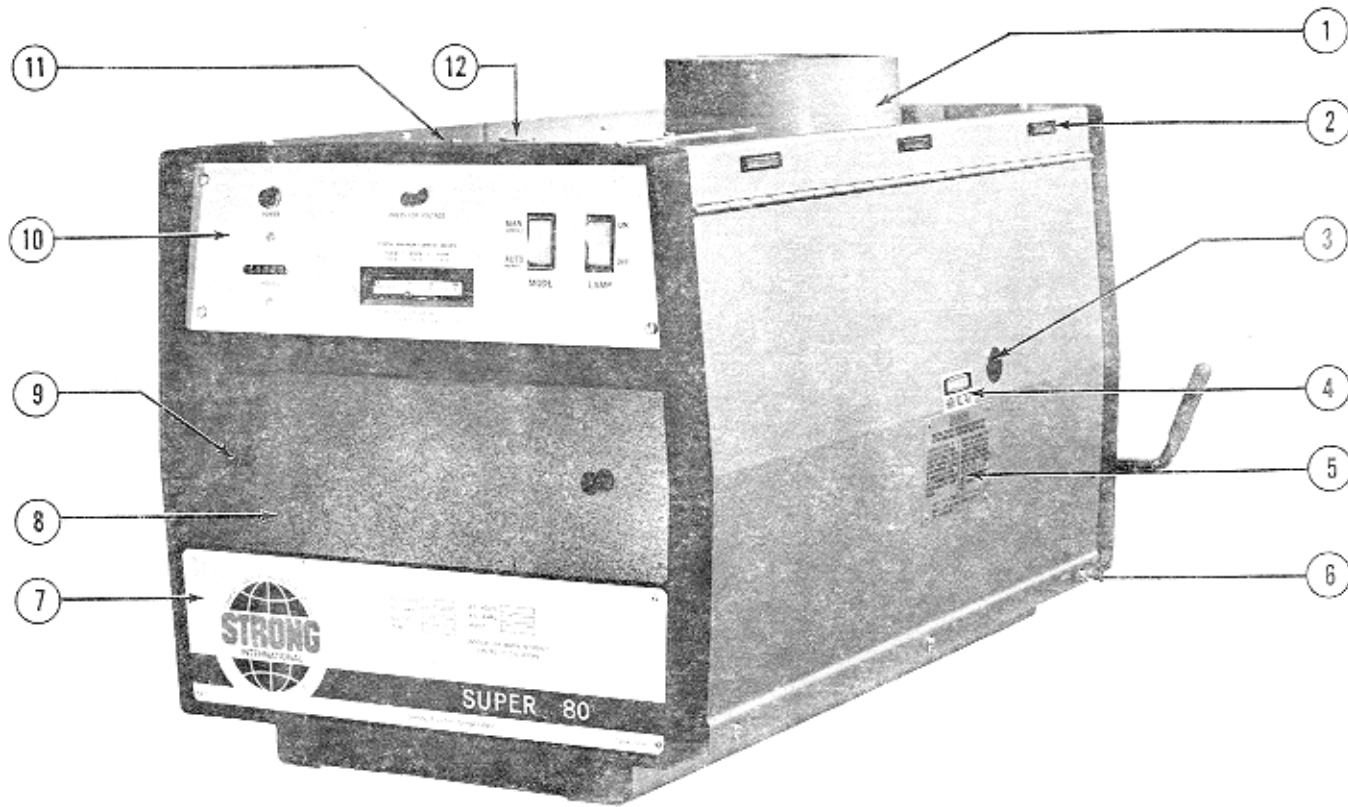


FIGURE 1

FIGURE 1
Parts List

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	40990 *	Top Cover & Door Welded Assembly
-	01345	Screw, 10-32 x 1/2" Pan Head
-	00885	Lockwasher, #10
2	39139	Magnetic Door Catch
3	48930	Arc Viewing Port
-	48285	Frame
-	48284	Glass
-	48331	Screen
4	65353	"DANGER" Sticker
5	81282	Warning Plate
-	01639-5	Domed Rivet, 3/32"
6	01736-1	Tamperproof Screw, 10-32 x 1/2" Holt Head
-	65149	Screwdriver (for above)
-	01715	Flatwasher, #10
7	40100	Name & Data Plate
-	01639-3	Domed Rivet, 1/8"
8	40119	Bulb Adjustment Cover Plate
9	65166	Plunger
-	65167	Grommet
-	40992	Cover Plate Assembly (Items 8 & 9)
10	40989	Instrument Panel Assembly (see Figure 2 for components)
-	01423	Screw, 10-32 x 5/16" Pan Head
11	39122	Cover Plate, Igniter Access
-	01304	Screw, 8-32 x 5/16" Pan Head
-	00891A	Lockwasher, #8
12	57275	Plug Button

NOT SHOWN

40970 *	Off-Operator Side Panel & Heat Shield, Welded Assembly
01345	Screw, 10-32 x 1/2" Pan Hd.
00885	Lockwasher, #10

* Do not dismount 40990 and 40970 simultaneously; optical alignment may be affected.

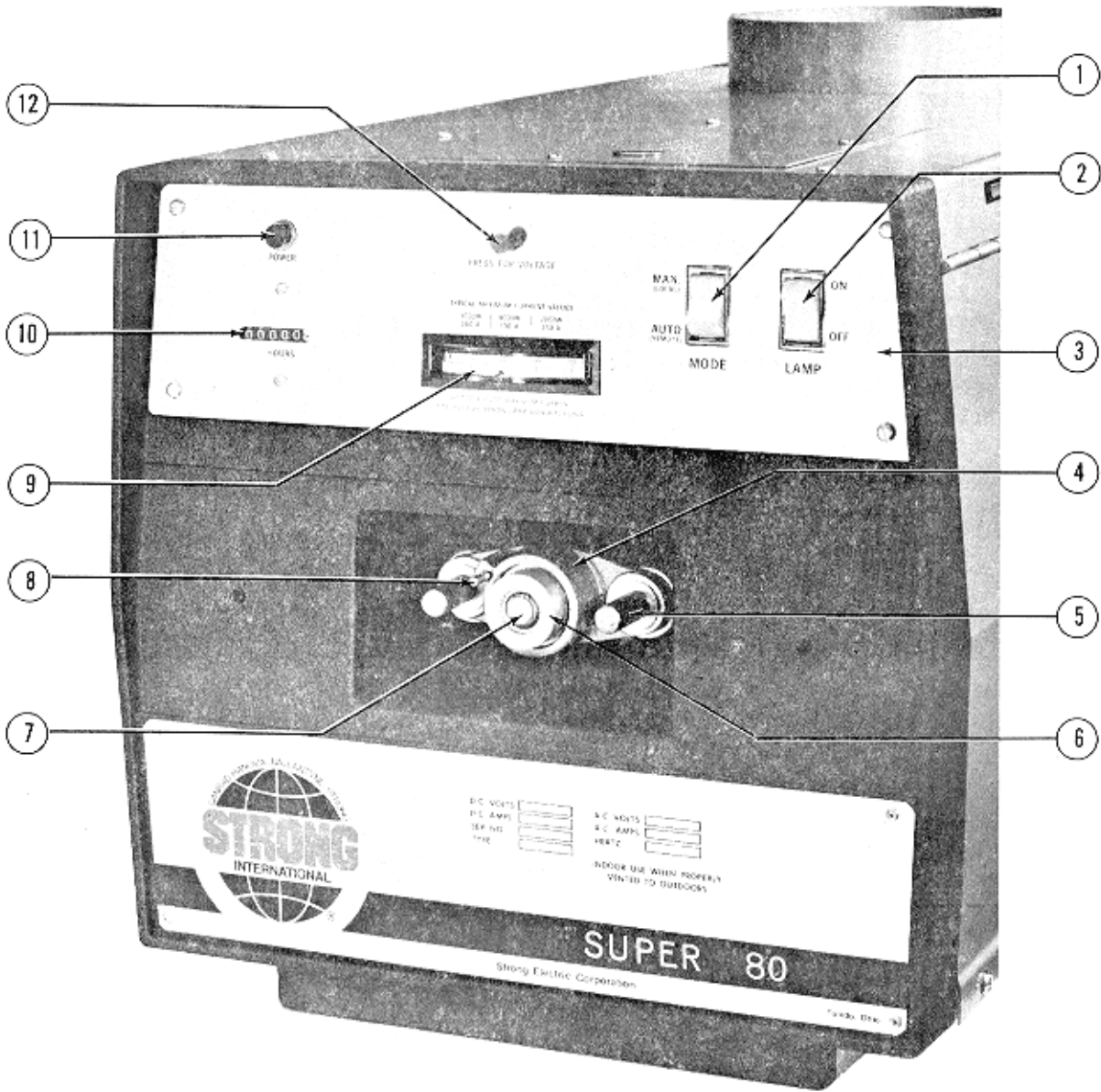


FIGURE 2

FIGURE 2
Parts List

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	81276	MODE Switch (S3)
2	81275	LAMP Switch (S2)
3	40102	Plate, Instrument Panel
-	01423	Screw, 10-32 x 5/16" Pan Head
4	65116	Casting, Bulb Adjustment Mechanism
5	37985	Thumb Screw
-	15010	Compression Spring
-	65150	Outer Fender Washer
-	65197	Inner Fender Washer
6	65959	Focus Screw & Bearing Assembly
7	40929	Bulb Collet, 3 kW
7	40930	Bulb Collet, 4, 4.2 kW
-	21-48027	Collet Retaining Ring
8	65153	Thumb Screw, Focus Lock
-	65154	Nylon Locking Ball
9	40923	Ammeter, 0 - 200 A. (M2)
-	71531	Ammeter Mounting Plate, Outer
-	71532	Ammeter Mounting Plate, Inner
10	40971	Elapsed Time Meter (M1) 60 Hz.
-	40963	Elapsed Time Meter (M1) 50 Hz.
11	78984	POWER Indicator Light (DS1)
12	72275	Voltage Test Switch (S5)
-	71283	Resistor (R2)

S80030

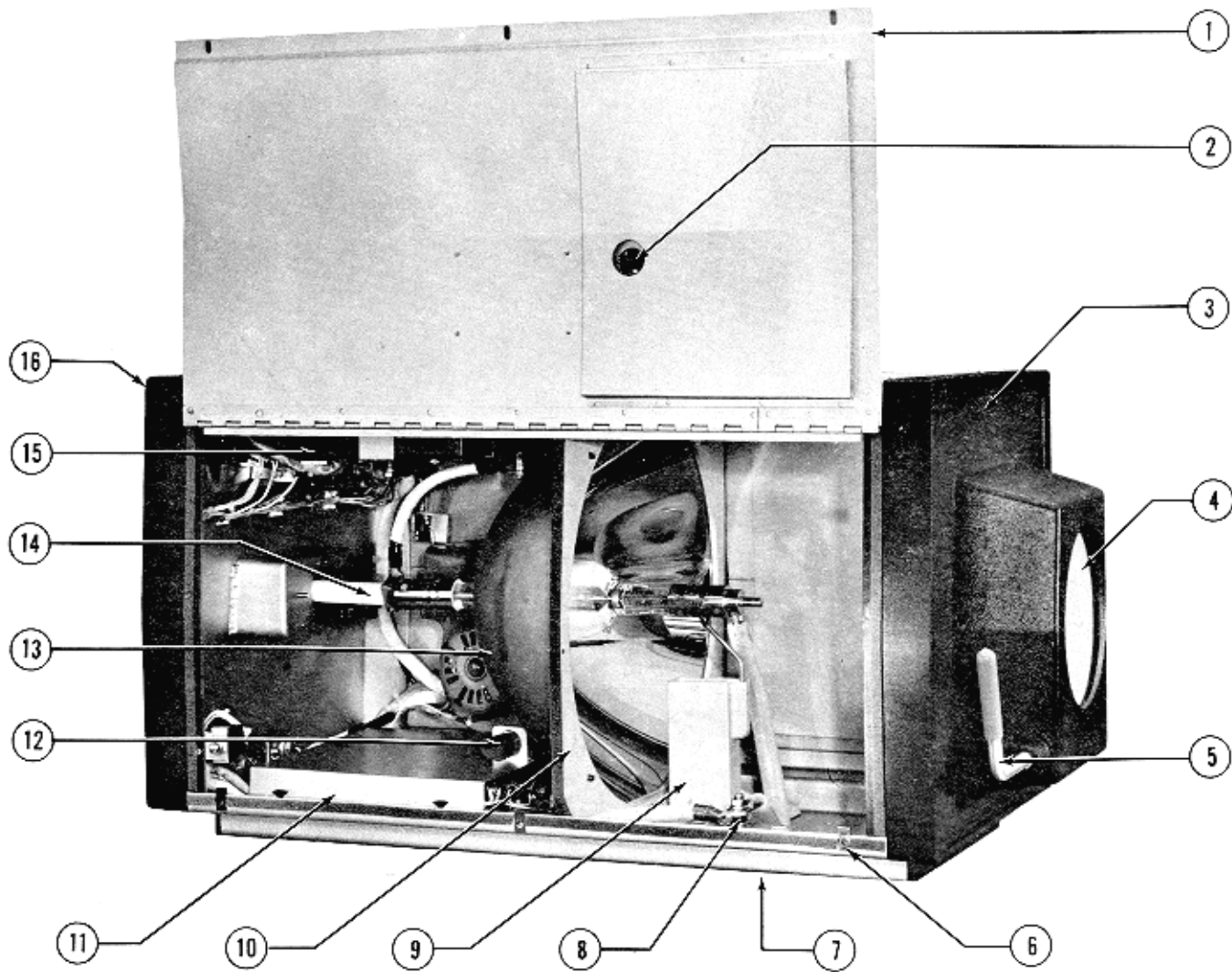


FIGURE 3

FIGURE 3
Parts List

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	40990	Door and Top Cover Welded Assembly
-	01345	Screw, 10-032 x 1/2" Pan Head
-	00885	Lockwasher, #10
2	48930	Arc Viewing Port
-	48285	Frame
-	48284	Glass
-	48331	Screen
3	40994	Front Casting Assembly (with Douser and Heat Shield)
-	40106	Front Casting
-	11-39012	HEAT Warning Plate
-	40137	Front Heat Shield
-	01794	Screw, 8-32 x 3/8" Hex Head
4	81148	Douser Plate
-	81432	Shoulder Screw, Dog Point
-	81234	Bumper Stop
-	81187	Torsion Spring
-	00721	Set Screw, 10-32 x 3/16" Allen Head
5	40115	Douser Cross Shaft
-	45150A	Handle Grip
6	01507	Tinnerman Nut, #10
7	40985	Base Pan Welded Assembly
8	40987	Anode Binding Post (E1)
-	40130	Block
-	00642	Screw, 3/8-16 x 1-1/2" Flat Head
-	00809	Jam Nut, 3/8-16
-	00854	Flatwasher, 3/8"
-	40131	Fiber Insulator
-	00492	Screw, 1/4-20 x 3/4" Flat Head
-	00876	Split Lockwasher, 1/4"
-	00805	Hex Nut, 1/4-20
9	40107	Air Duct Casting
-	40999	Bulb Support Yoke
-	00 781	Set Screw, 8-32 x 1/4" Allen Head
-	40116	Fiber Insulator, Air Duct
-	01796	Screw, 5/16-18 x 3/4" Nylon
10	40104	Reflector Bulkhead Casting
-	01794	Self-Clinching Stud, 1/4-20
-	40142	Bulkhead Tie Rod
-	00805	Hex Nut, 1/4-20

FIGURE 3, Parts List (con'd.)

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
11	40120	Dust Cover
-	01742	Screw, 8-32 x 1/4" Pan Head
-	00891A	Lockwasher, #8
12	M15315	Arc Stabilization Magnet
-	81137	Magnet Clamp
-	00781	Set Screw, 8-32 x 1/4" Allen Head
-	01710	Screw, 8-32 x 1/4" Hex Head
13	23754	Flanged Reflector, 15" Dichroic *
-	01432	Screw, 1/4-20 x 1/2" Socket Head
-	00852	Lockwasher, 1/4"
14	40929	Bulb Collet, 3 kW
-	40966	Contact Clamp, 3 kW
14	40930	Bulb Collet, 4 - 4.2 kW
-	40965	Contact Clamp, 4 - 4.2 kW
-	01532	Clamping Screw, 8-32 x 7/8" Socket Head
-	00685	Screw, 1/4-20 x 3/8" Hex Head
-	00876	Split Lockwasher, 1/4"
-	40979	Cable Assembly (Igniter to Contact Clamp)
-	21-48027	Collet Retaining Ring
15	39999A	Igniter Assembly (see Figure 5)
16	40105	Rear Casting

NOT SHOWN

71284	Cam Lock & Keys, Access Door
40175	Door Catch Plate, Slotted
40174	Upper Bracket, Door Catch
40176	Lower Bracket, Door Catch
40173	Stud, Door Catch
40145	Aligning Tube, 3 kW Osram
40151	Aligning Tube, 4.2 kW Hanovia
40156	Aligning Tube, 4 kW Osram, 3 kW Hanovia

* NOTE: Repeat cord alignment procedure after replacing Reflector Assembly. See "MECHANICAL LAMPHOUSE ALIGNMENT" section in this manual.

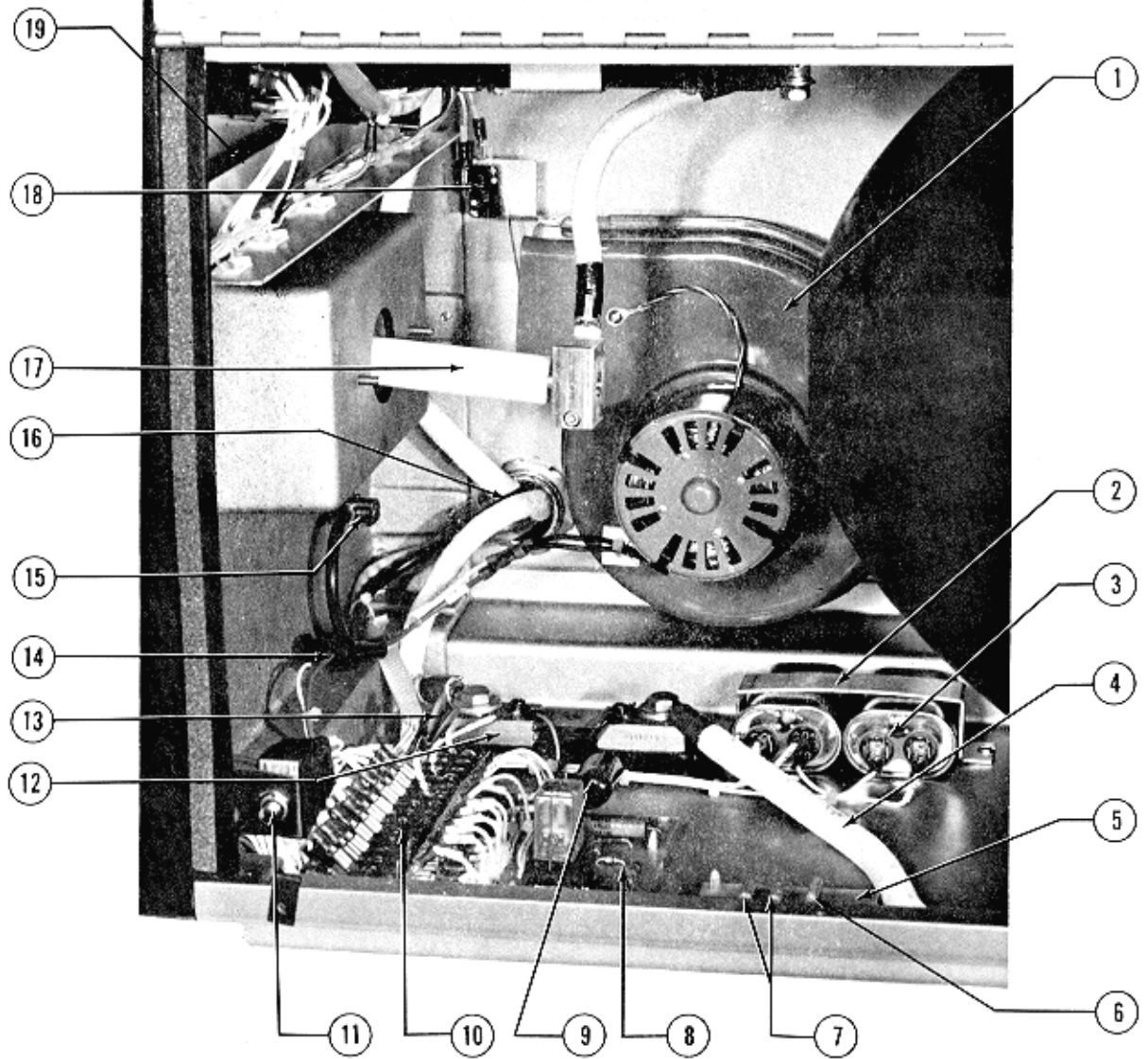


FIGURE 4

FIGURE 4
Parts List

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	40982	Blower Assembly (B1) 115 V.AC, 50/60 Hz. (Mounting hardware supplied with blower)
-	40993	Blower Inlet Grille
-	01311	Screw, 8-32 x 3/8" Pan Head
-	00891A	Lockwasher, #8
2	40136	Capacitor Clamp
-	01382	Screw, 8-32 x 3/16" Pan Head
-	00891A	Lockwasher, #8
3	76323	Capacitor (C4A, C4B) 2 req'd.
4	40981	Positive Cable Assembly (R1 to E1)
5	40983	RF Capacitor Assembly (C1, C2, C3)
-	39153	Nylon Standoff
6	76133	Capacitor (C3); Order 81823
7	76132	Capacitor (C1, C2); Order 81823
8	40913	Igniter Printed Circuit Board Assembly
-	39154	Relay (K201)
-	39153	Nylon Standoff
9	40974	Capacitor Ass'y. (C8)
10	40103	Barrier Strip, 14 Terminal
-	40138	Insulated Marker Strip
-	01799	Screw, 8-32 x 9/16" Pan Head
-	00891A	Lockwasher, #8
11	80168	Door Interlock Switch (S1)
12	81247	Shunt (R1)
-	01312	Screw, 8-32 x 1/2" Pan Head
-	00891A	Lockwasher, #8
13	40973	RF Bypass Capacitor Assembly (C6, C7)
14	39199	Fuse Holder
-	39198	Fuse (F1) 1.5 A. Std.
15	81274	Ground Lug
-	01423	Screw, 10-32 x 5/16" Pan Head
-	00885	Lockwasher, #10
16	40969	Lamphouse/Power Supply Interconnect Cable Assembly
-	81143	Cable Connector, 90°
17	---	Collet (see Figure 3, Item 14)
18	39955	Air Vane Switch (S4)
-	00953	Screw, 4-40 x 1/2" Round Head
-	01343	Lockwasher, #4
19	40164	Light Baffle
-	01566	Screw, 10-24 x 5/16"
-	00885	Lockwasher, #10

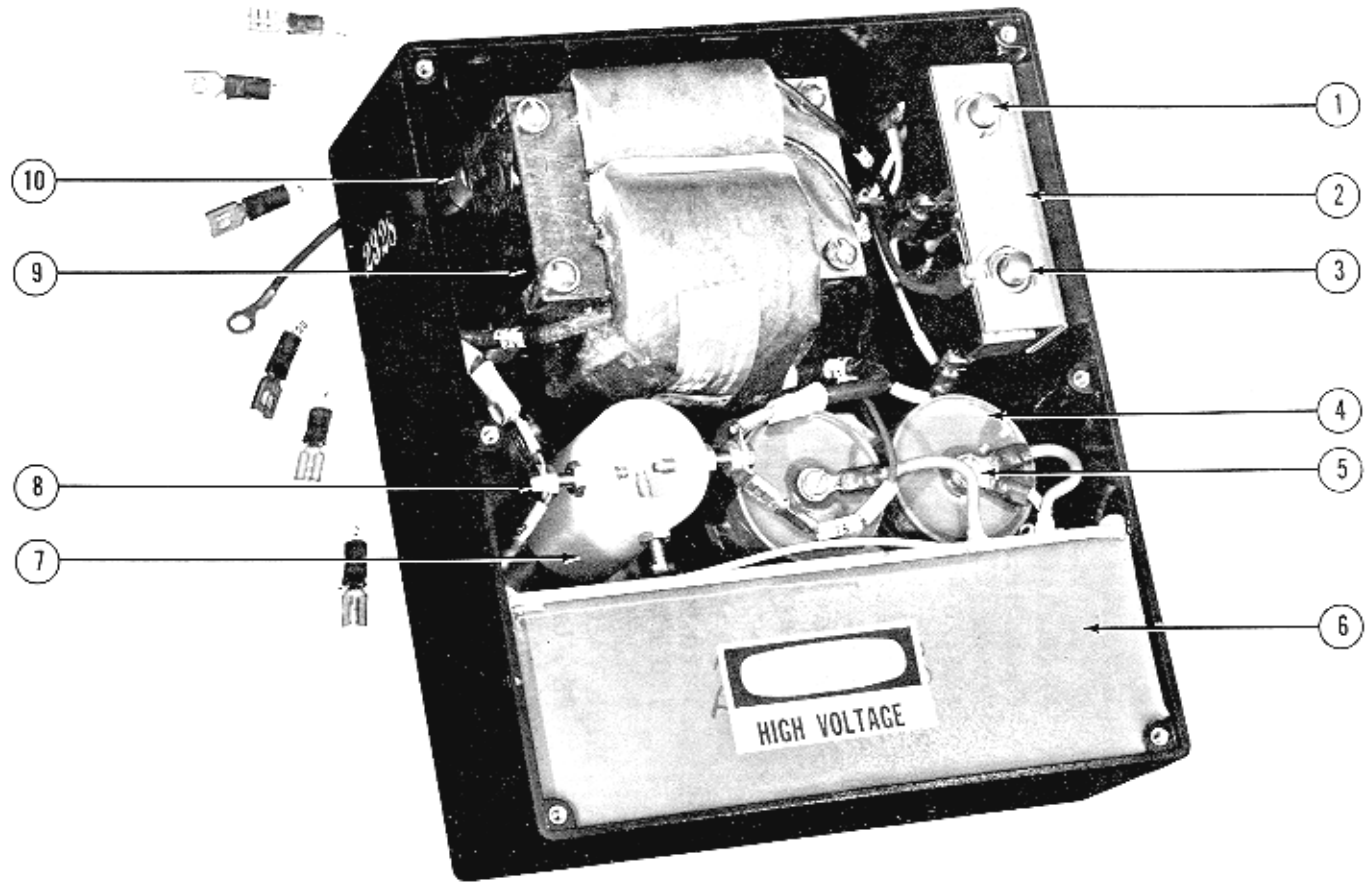


FIGURE 5

FIGURE 5
Parts List

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
-	39999A	Igniter Assembly, 115 V.AC, 50/60 Hz.
1	39260	Cover Interlock Switch (S101)
2	39113	Switch Bracket
-	00343	Screw, 10-32 x 1/4" Flat Head
3	39260	Emergency Ignition Switch (S102)
4	39110	High Voltage Capacitor (C107, C108)
-	00254	Screw, 8-32 x 1/4" Fillister Head
-	00891A	Lockwasher, #8
-	39112	Capacitor Mounting Bracket
-	01752	Screw, 1/4-20 x 1" Hex Head Nylon
-	01754	Hex Nut, 1/4-20 Nylon
5	01742	Screw, 8-32 x 1/4" Pan Head
-	00981A	Lockwasher, #8
6	39998	Case & Coil Potted Assembly
-	65353	DANGER Label
6	39201 *	Spark Gap Body, Nylon
-	01567	Screw, 10-24 x 1/2" Pan Head
8	39107 *	Contact Screw, Tungsten
-	39109	Terminal Tab (Order KT-74)
-	00831	Flatwasher, #10, Brass
-	00795	Hex Nut, 8-32
9	39937	High Voltage Transformer (T102)
-	01582	Flatwasher, #8
-	00795	Hex Nut, 8-32
10	39204	Transformer Spacer (4 req'd.)
*	39923	Spark Gap Assembly (Items 7 & 8, assembled and gapped)

NOT SHOWN

39101	Igniter Box Cover, Plastic
01305	Screw, 6-32 x 1/4" Pan Hd.

INSTRUCTION MANUAL

SUPER 80

Xenon Lamphouse

Type 40000

Rev. 5/98



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