Film-Tech

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INSTRUCTION MANUAL

STRONG HIGHLIGHT

XENON PROJECTION CONSOLE

71000
4-82

Strong Electric Corporation
87 City Park Avenue, Box 1003, Toledo, OH 43697 U.S.A.
419/248-3741, Telex 286033

PREFACE

THE STRONG HIGHLIGHT is a unitized projection console suitable for both 35 and 70mm presentations.

OPTIONAL ITEMS include a Beam Expanders Lens Kit for 70mm projection, a Sound and Automation drawer for only the Ballantyne system and another one for projectors other than Ballantyne.

THE CONSOLE incorporates a horizontal bulb xenon lamphouse, an interference coated, deep ellipse, metal reflector designed to operate at 33-1/8 inches from the projection film plane and an adjustable mounting arm compatible with most soundheads and projectors.

SERVICE AND MAINTENANCE are accommodated by three hinged access doors and one removable side panel. Interlock switches at each of the three doors insure operator safety, and key locks assure access only to authorized personnel. All electrical components are protected by a built-in, prewired circuit breaker panel.

AIRFLOW SAFETY INTERLOCK SWITCHES are installed at the console exhaust stack and the bulb seal blower. Inadequate air flow to close either one or both of these switches will interrupt the A. C. control circuit and prevent ignition of the xenon bulb.

THE LAMPHOUSE SECTION of the console is equipped with a D. C. ammeter to indicate the operating current of the lamp and an elapsed time meter to show the number of hours the lamp has operated. Below the ammeter is a push button switch which changes the meter to indicate the voltage at the arc.

ADJUSTMENT CONTROLS to position the xenon bulb in relation to the reflector are located along the right side of the console, below the lamphouse door. The two rear controls allow horizontal and vertical movement of the bulb. The front control adjusts the focus of the bulb in relation to the reflector.

INDICATOR LIGHTS are provided to show that A. C. power is "On" from the power supply to the lamp housing, the air interlock switches are closed and when the Auto-Man. switch is in the "Auto" position.

IF AT ANY TIME you have a suggestion, or desire aid in securing anticipated results, please feel free to write directly to STRONG ELECTRIC, P.O. Box 1003, 87 City Park Ave., Toledo, Ohio 43697.

RECEIVING AND INSTALLATION

INSPECT THE SHIPMENT immediately and report any damage to the freight carrier. It is the responsibility of the consignee, not the shipper, to press these claims.

MOVE THE CONSOLE on its base pallet as far as possible to its intended location. After removing the console from the pallet, install the four leveling pads and level the console to the booth floor. NOTE: If the booth floor is a soft material, such as linoleum, it is advisable to obtain four 4" x 4" x 1/4" steel plates to place under the leveling feet to prevent "settling".

REMOVE THE BLOWER PANEL on the lower left (non-operator) side of the console by loosening the six captive quarter-turn screws and unplugging the blower lead cord(s) at the blower housing(s). The main distribution panel terminal board is mounted to the base of the console frame at this location, and all electrical inputs are made to this board.

ON CONSOLES shipped with pre-wired sound and automation, the distribution panel terminal board is located on the panel along with the sound and automation terminals.

REFER to the power supply manual for the AC input requirements of the xenon power supply. This information is also furnished on the data plate on the power supply chassis.

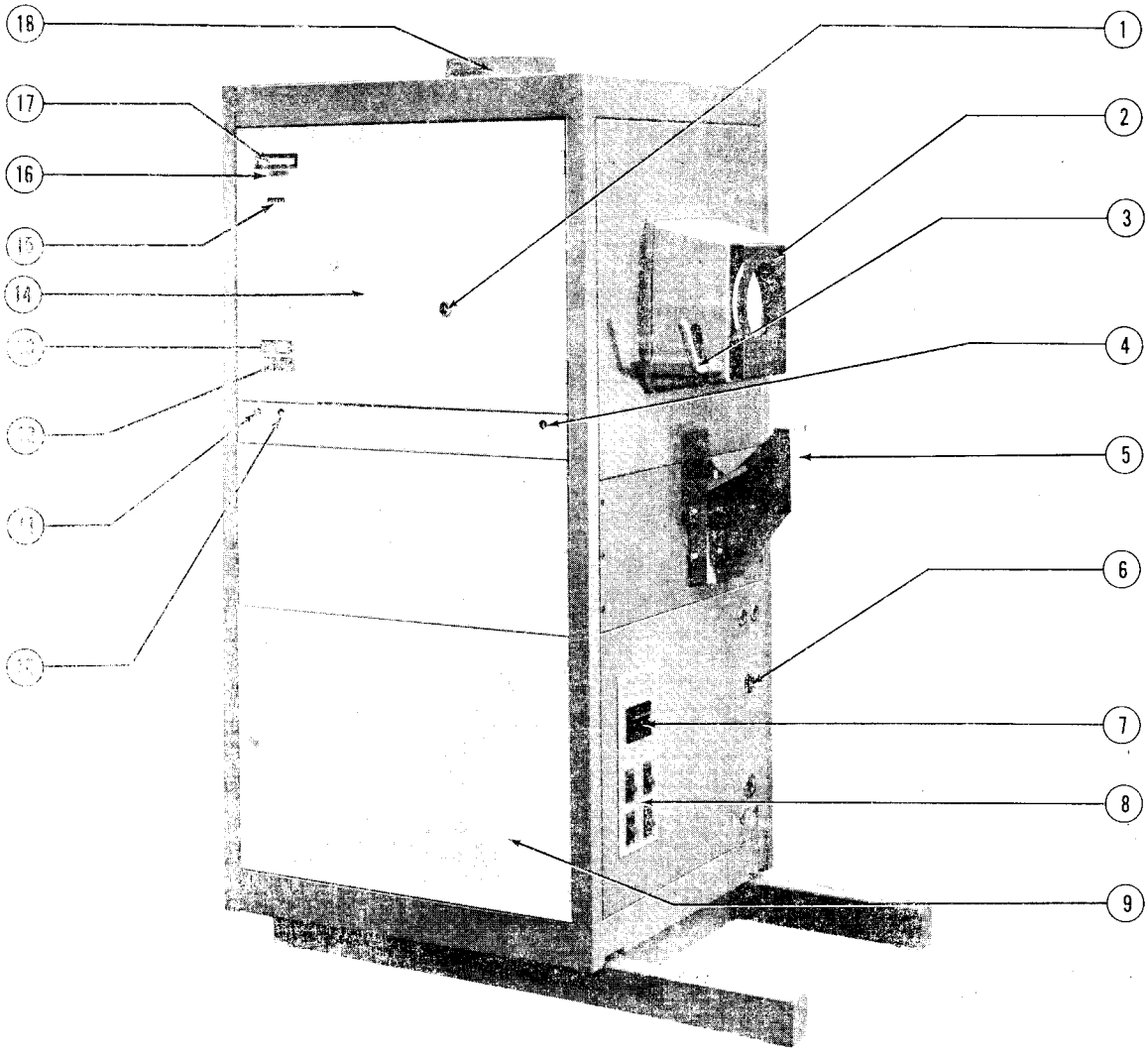
RUN ALL WIRING from the power source through conduit, and use wire sizes acceptable to local electrical codes.

WIRE THE TERMINAL BOARD as illustrated on one of the following diagrams, depending on the power requirements of the xenon power supply, and the type of service provided by the power source.

A GROUND LUG is mounted to the power supply chassis. This lug must be connected to an adequate earth ground.

TERMINALS 7, 8, 9, and 10 provide 115 V.AC output to the projector motor, sound power amplifier, and automation devices. Terminal 7 is the common (AC "low"), and 8, 9, and 10 are hot (AC "high") outputs to sound (8), automation (9), and projector (10). Each of these circuits is protected by circuit breakers; 10 Amp. for the projector motor, and 5 Amp. for sound and automation.

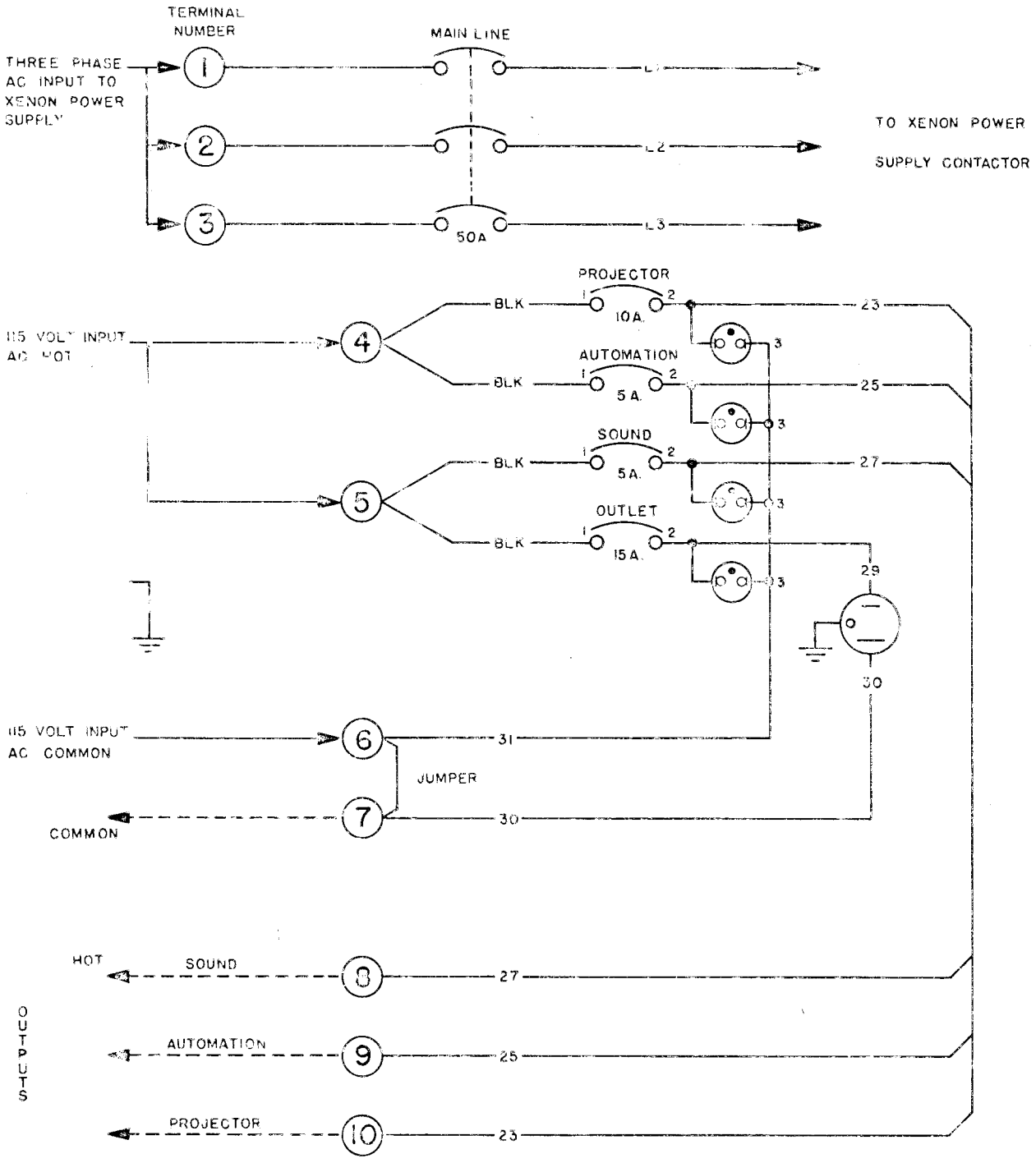
THE PRE-WIRED CONVENIENCE OUTLET on the front of the console is protected by a 15 Amp. circuit breaker.



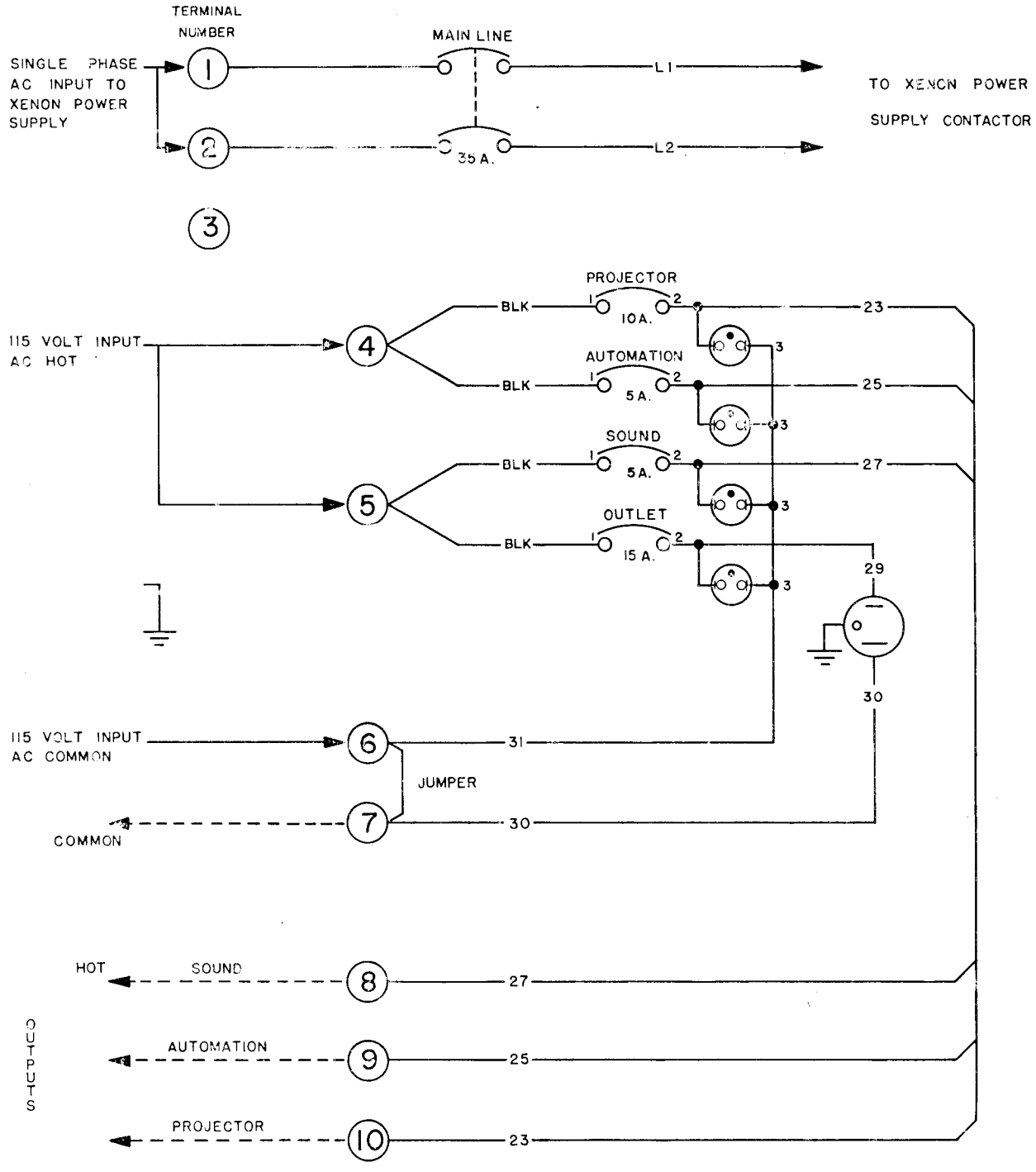
1. Arc Viewing Port
2. 70mm Beam Adapter
3. Douser Handle
4. Bulb Focus Control
5. Projector/Soundhead Mounting Arm
6. Convenience Outlet
7. Circuit Breakers - Xenon Power Supply
8. Circuit Breakers - Console Functions
9. Access Door - Power Supply
10. Vertical Bulb Adjust
11. Horizontal Bulb Adjust
12. Switches - "Auto-Man" and "Lamp On"
13. Indicator Lights - "Power" and "Air"
14. Access Door - Lamphouse
15. Elapsed Time Meter
16. Voltage Indicator Switch
17. Ammeter
18. Exhaust Stack

INSTALLATION DIAGRAM

THREE PHASE UNIT

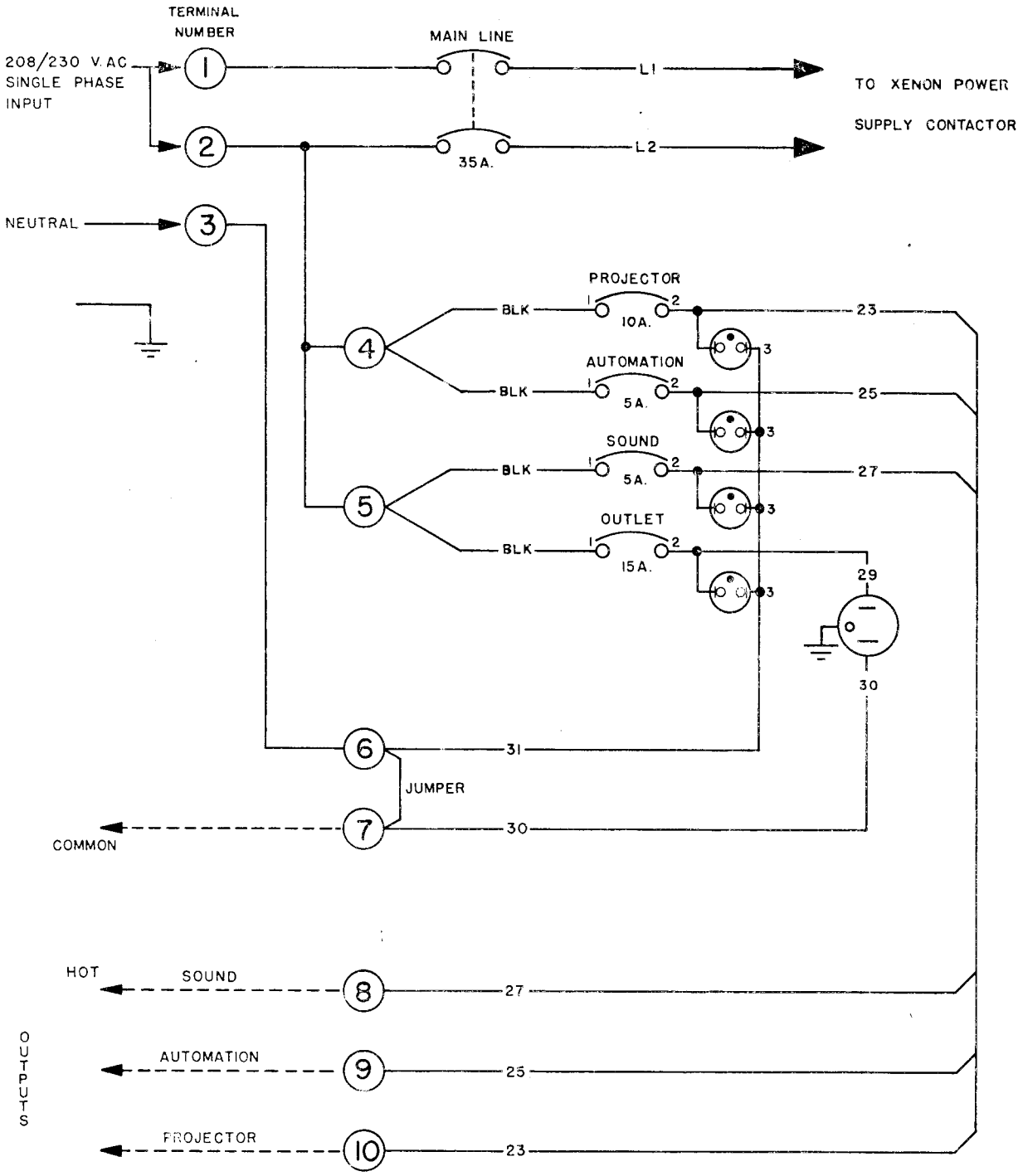


INSTALLATION DIAGRAM
SINGLE PHASE UNIT



INSTALLATION DIAGRAM

208/230 V. AC THREE WIRE (WITH NEUTRAL)



THE HIGHLIGHT CONSOLE is delivered set at 0° projection angle. Two pivot locks are furnished in the base of the console frame to allow establishment of the correct projection angle (±10°) required for the installation.

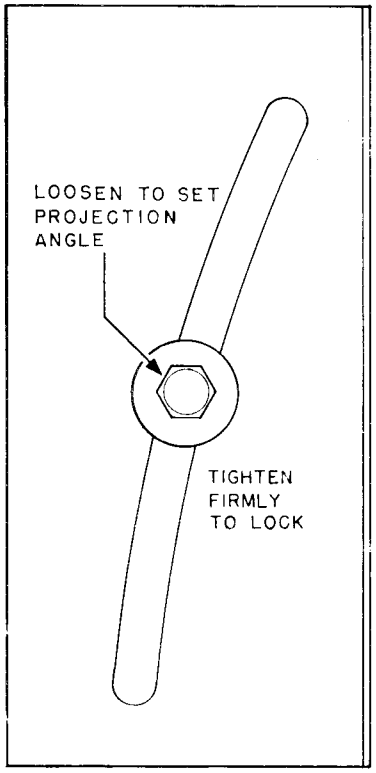
TO GAIN ACCESS to the pivot locks, open the power supply access door on the right side, and remove the blower panel on the lower left side by loosening the six captive quarter-turn screws. The blower(s) can be easily unplugged by disconnecting the lead cord(s) at the blower housing(s).

IT IS ADVISABLE to first mount the soundhead and projector to the console before pivoting the console; the balance of the console is enhanced by the weight of the soundhead and projector.

MOUNT THE 70mm spread beam adapter (if ordered) to the front of the douser housing using the 1/4" hardware furnished. Note that the fasteners are screwed in from inside the lamphouse. While the adapter bracket remains mounted to the console at all times, the spread beam lens is to be inserted only for 70mm projection.

IF THE SPREAD BEAM ADAPTER is not utilized, insert the 35mm nose cone light shield included in the kit. The nose cone mounts on its own clips and requires no hardware.

THE TWO ANGLE BRACKETS inside the lamphouse connecting the reflector frame to the lamphouse base pan are provided for shipping only. Remove both brackets prior to aligning.



PROJECTOR MOUNTING AND WIRING

EACH HIGHLIGHT CONSOLE is supplied with a soundhead spacer block to correctly position the projector film trap at the specified 33-1/8 inch working distance from the center of the lamphouse reflector. Do not alter the position of the reflector. It is optically pre-aligned at the factory. The make and model of soundhead and projector to be used must be specified at the time of ordering to enable Strong Electric to furnish the correct spacer block. The correct mounting hardware is supplied with each spacer.

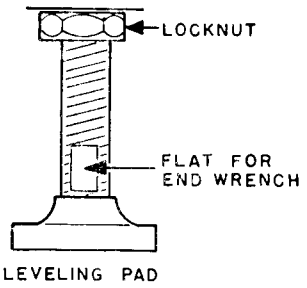
THE SPACER BLOCKS are as follows:

Mfgr. - Model Proj. - S'head	Spacer Strong Part No.
Ballantyne Pro 35 or 70 Projector Model VII Soundhead	71229
Century SA, C, CC, JJ Projector R3, TR4, R50 Soundhead	71231
Simplex XL, 35 Projector XL, 35 Soundhead	71231
RCA 9030	71924

USING THE CORRECT SPACER BLOCK and the soundhead mounting bolts provided, mount the soundhead to the projector mounting arm on the front of the console. This is most easily accomplished by starting the top two bolts, through the washers and spacer block, into the top two threaded holes in the back of the soundhead casting. The soundhead can then be lifted into place; the top two bolts into the soundhead casting can be lowered into the slotted holes in the projector mounting arm. In this manner, the mounting arm will bear the weight of the soundhead while the two bottom bolts are started.

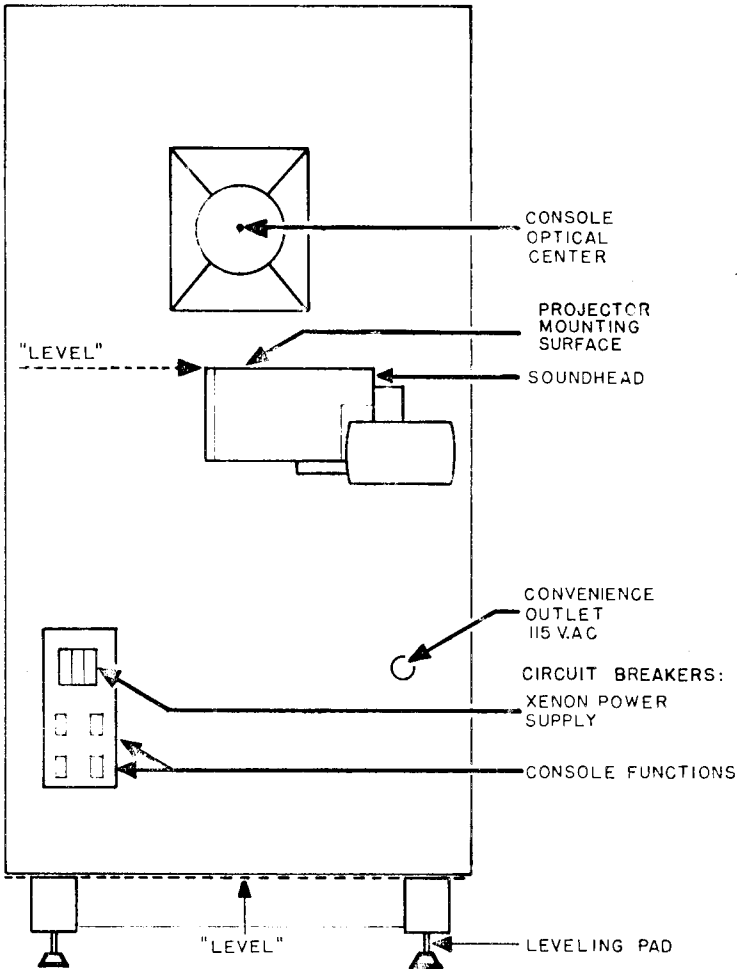
TO AVOID CROSSTHREADING, the soundhead mounting bolts should be screwed in fingertight as far as possible. Before tightening the bolts, check first the console, and then the projector mounting surface face for level.

THE LEVELING FEET on the bottom of the console are adjustable by loosening the locknut with a 7/8 inch end wrench and raising or lowering the corner by turning the stud of the leveling foot with a 3/8 inch end wrench. Retighten the locknut after leveling the console.



THE SOUNDHEAD will "rock" to a slight degree before the soundhead mounting bolts are fully tightened. Make sure the soundhead is level before securing the bolts.

PLACE A 24 INCH (or longer) carpenter's level across the console base legs and adjust the front leveling feet to level the console left-to-right. After leveling the front of the console, bottom the rear leveling feet to stabilize the entire unit.



NEXT, move the level to the top surface face (machined) of the soundhead. Make sure that this surface is level left-to-right before tightening the soundhead mounting bolts.

MOUNT AND ALIGN THE PROJECTOR in accordance to the manufacturer's instructions. 115 V. AC supply to the framing light, or framing light transformer, may be derived from either the convenience outlet or any of the 115V. AC inputs to the distribution panel terminal board.

IF THE CONSOLE is not equipped with Strong/Ballantyne sound and automation options, outputs to 115 V. AC console functions are connected to the distribution panel terminal board. The projector motor is powered by terminals 10 (hot) and 7 (common); automation by terminals 9 (hot) and 7 (common); and sound by terminals 8 (hot) and 7 (common).

THESE OUTPUTS are constant as long as their corresponding circuit breakers are closed, and appropriate line switching to each function should be furnished by the installer.

DRESS ALL WIRES away from the cooling fan; wiring must not contact fan blades or obstruct air flow.

ON CONSOLES factory equipped with Strong/Ballantyne sound and automation, most connections are pre-wired. Refer to the SPA automation manual furnished separately for installation instructions.

SAFETY PROCEDURES

THE XENON BULB has high internal pressure. Therefore extreme care should be taken when handling the bulb. Refer servicing to qualified service personnel. To minimize any danger, the following rules should be followed.

1. CAUTION: BULB EXPLOSION HAZARD. Relamping to be done only by QUALIFIED SERVICE PERSONNEL with protective clothing and face shield.

2. Turn power off at main line switch before opening the door or rear access panel.

3. The xenon bulb when outside the lamphouse must be encased in its plastic protective cover.

4. The lamphouse must be properly vented to the outside atmosphere. See Exhaust Systems installation in this manual.

5. The bulb shall be inserted into the lamphouse while still encased in its protective cover. The cover should be removed only after all the necessary cable connections have been made and the door is ready to be closed. When removing the bulb from the lamphouse, it should be encased in the cover before the bulb cables are disconnected from the anode feed-through connector and igniter.

6. Clean the bulb only after it has cooled to room temperature. Never touch the glass envelope of the bulb; fingerprints will burn in and dull the bulb. If fingerprints are made, they should be carefully removed from the bulb with methyl alcohol and cotton.

7. Do not open the lamphouse when the bulb is in operation. Wait at least 20 minutes for the bulb to cool after turning off power.

8. Never look directly at the ignited bulb - TO DO SO MAY CAUSE BLINDNESS.

9. Encase the bulb in its protective cover when cleaning the lamphouse interior.

10. Dispose of expended bulbs that are beyond warranty immediately in the following manner. Wrap the bulb with several layers of canvas or heavy cloth, and smash with a hammer, before depositing in a refuse container.

XENON LAMPHOUSE

OBSERVE ALL SAFETY PROCEDURES. The xenon bulb operates with high internal pressure. Servicing should be referred to QUALIFIED PERSONNEL with protective clothing and face shield.

THE STRONG HIGHLIGHT incorporates a reflector type, direct current lamphouse using a xenon bulb as the light source, and only xenon bulbs designed for horizontal operation should be used. The lamphouse accommodates bulbs ranging from 1000 to 4200 watts.

THE REFLECTOR is an interference coated deep ellipse type, designed to operate in a fixed position at 33-1/8 inches from the projection film plane.

USE ONLY the special xenon power supply and igniters manufactured by Strong Electric Corporation.

ADJUSTMENT CONTROLS to position the xenon bulb in relation to the reflector are located on the right side of the lamphouse section. The rear two controls provide for the horizontal and vertical movement of the bulb and the control at the front adjusts the focus of the bulb in relation to the reflector. These controls are operated with a flat bladed screwdriver.

THE LAMPHOUSE is equipped with a volt- and ammeter to indicate the operating voltage and current of the lamp. The meter normally registers the amperage. Pressing the button below the meter will indicate the arc sustaining or ignition "No Load" voltage. An elapsed time meter shows the number of hours the lamp has operated. These hours must be recorded when a bulb is changed (or rotated, if required by the bulb manufacturer). A "Xenon Bulb Record" is included on the inside back cover of this manual for maintaining an accurate log of bulb life.

CURRENT CONTROL for the lamphouse is located in the power supply section. A tap panel is provided for this adjustment. See the power supply manual for adjustment instructions.

THE LAMPHOUSE BLOWER is internally wired and operates on 115 V.AC. This blower is required to keep the bulb seals at a safe operating temperature.

AIRFLOW SAFETY INTERLOCK SWITCHES are installed at the lamphouse exhaust stack and at the bulb seal blower. Inadequate air flow to close either one or both of these switches will interrupt the AC control circuit and prevent ignition of the xenon bulb.

SAFETY INTERLOCK SWITCHES are located at the rear access door and at both side doors. All doors must be closed and locked before the bulb will ignite.

THE "LAMP ON" push button switch, when depressed, energizes the AC supply circuit to the elapsed time meter, the igniter, and completes the circuit for ignition of the xenon bulb.

THE "MODE" push button switch provides the means of operating the console from a remote station, or an automation module; or when placed in the "MAN" position, from the console. When the switch is pressed in, the console is in "AUTO" mode, as indicated by the "AUTO" light glowing.

EXHAUST SYSTEM INSTALLATION

THE EXHAUST STACK of the console lamphouse is designed to fit an eight inch diameter duct. This size duct must be used throughout the entire system and installed to eliminate any possibility of downdraft or rain dripping on the xenon bulb. The exhaust fan must be capable of removing 700 lineal feet of air per minute. A minimum of 650 lineal feet is required to actuate the lamphouse exhaust air vane switch.

IF IT IS NECESSARY to limit the air flow through the exhaust system, install bypasses rather than dampers. A dampered exhaust system will not adequately remove the ozone generated by some xenon bulbs. This gas can be injurious to health if inhaled in heavy concentration for prolonged periods. Do not install the xenon bulb until the exhaust system has been correctly adjusted.

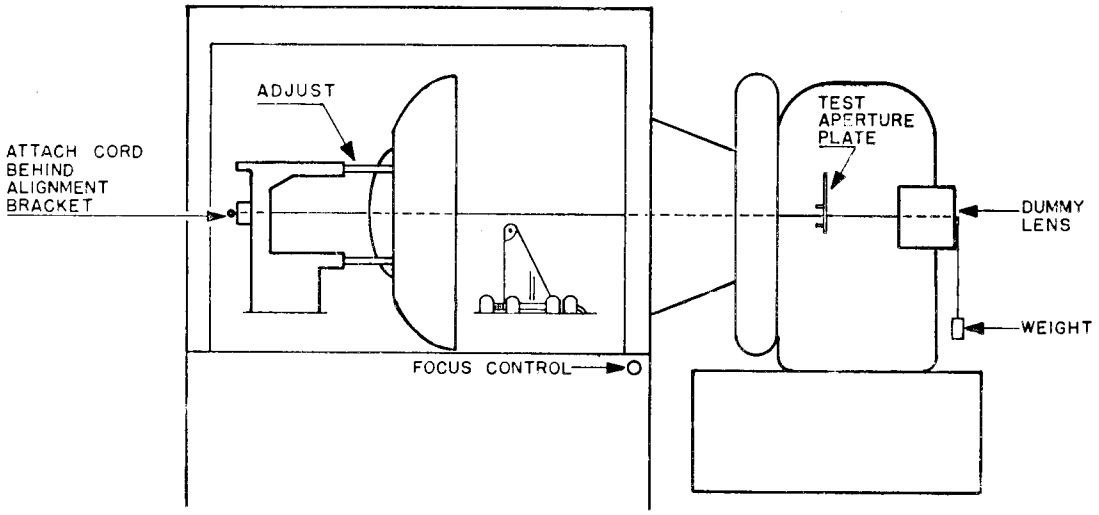
ONE DRAFT GAUGE is enclosed in an envelope attached to this manual. The gauge is designed for 700 lineal feet per minute. Follow the instructions for use printed on the gauge. If the exhaust system holds the draft gauge when the lamphouse access door is closed, it is meeting the air flow requirements.

AN EXHAUST SYSTEM that has proven effective for 150 ampere carbon arc operation will be suitable for the xenon installation providing it has been thoroughly cleaned and tested with the draft gauge to verify the draft is meeting the 700 lfm requirement.

MECHANICAL ALIGNMENT

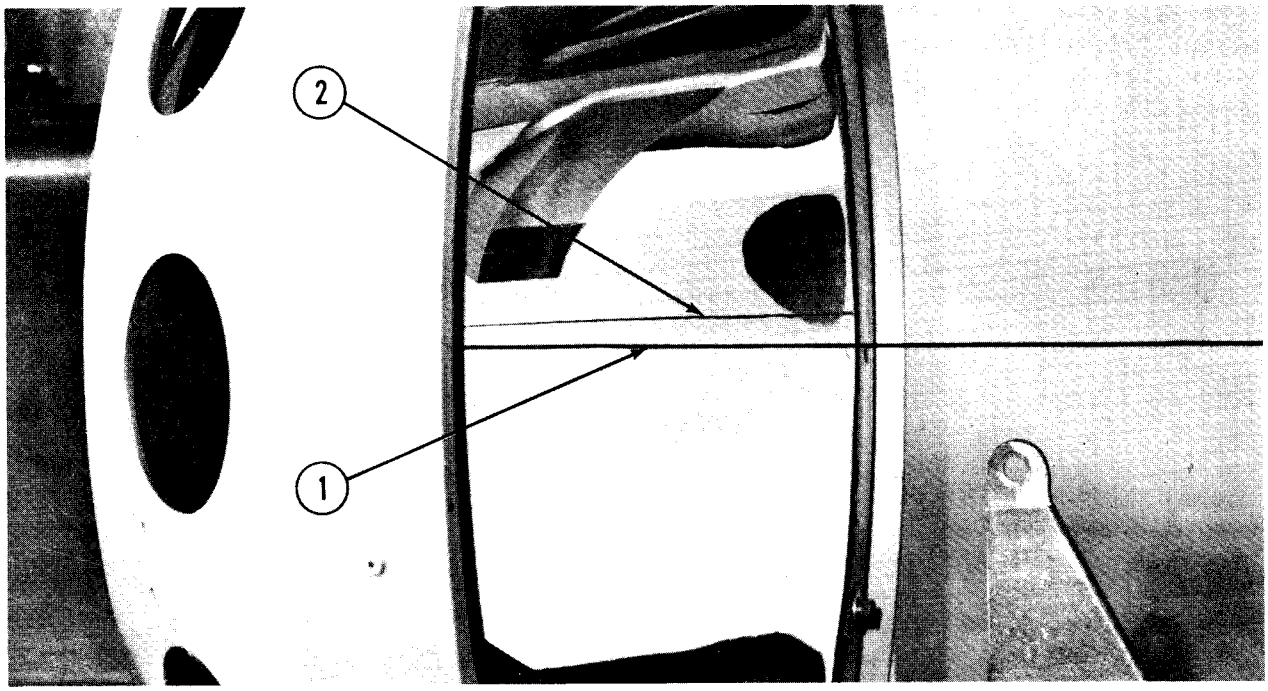
TURN THE PROJECTOR mechanism by hand (inching knob or flywheel) to clear the shutter blades from the aperture. Open the changeover douser and fire shutter and fix them in the open position. This can be done with a rubber band, paper clip, or tape.

OPEN THE LAMPHOUSE access door and install the string alignment kit as illustrated. Make certain that the cord is tied off securely behind the alignment bracket before opening the douser and running the cord into the projector head.

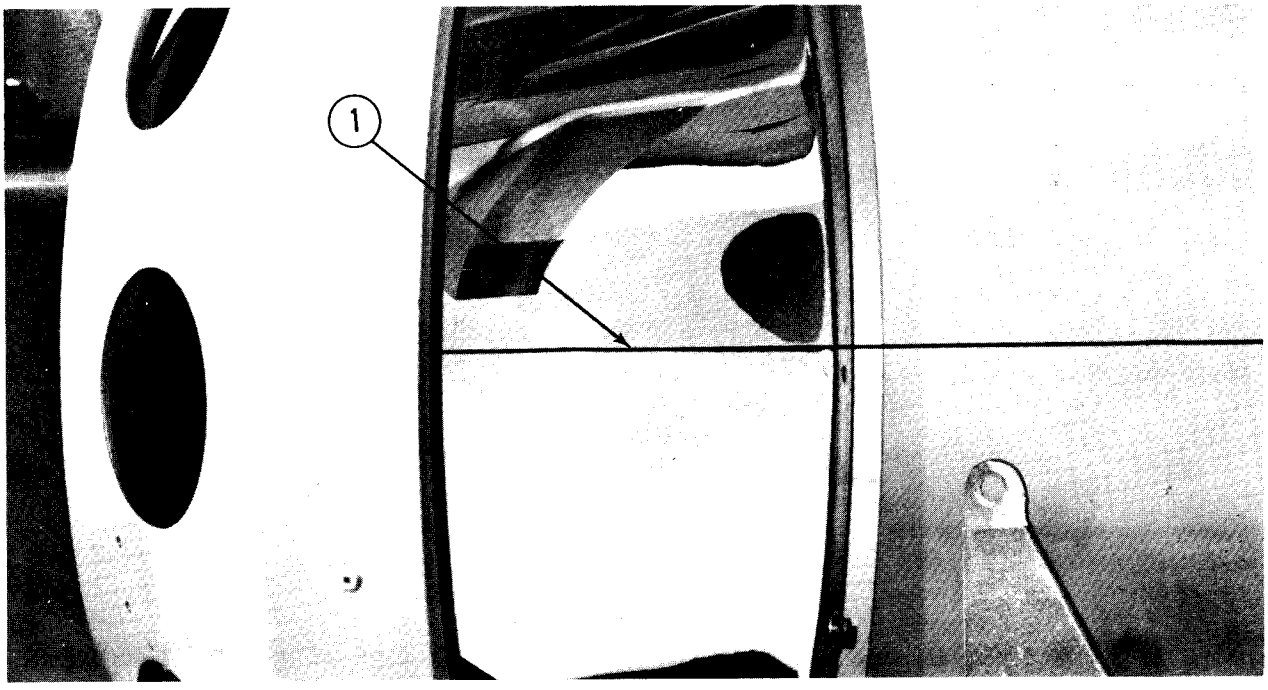


PLACE THE DUMMY LENS in the lens barrel and lock it in place. Insert the test aperture plate into a CinemaScope aperture plate and hold it in place by closing the film gate. Use a weight heavy enough to hold the cord taut.

LOOK through the lamphouse access door and locate the reflected image of the cord on the reflector. If the reflected image is not superimposed on the cord, that is, if it appears above or below the cord, the projector is not aligned with the lamphouse reflector.



INCORRECT ALIGNMENT



CORRECT ALIGNMENT

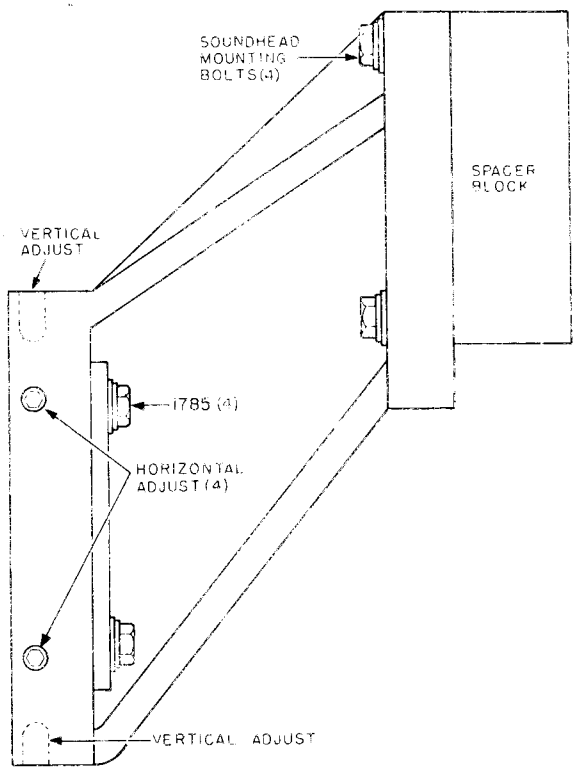
ILLUSTRATIONS INDICATING the correct and incorrect string alignment of the lamphouse and projector appear on the preceding page. The first illustration shows the incorrect position, with the reflected image of the string offset from the string. Number 1 indicates the cord, and number 2, the reflection of the cord. The other shows the cord (Number 1) covering its reflected image.

TO ALIGN THE projector with the lamphouse reflector, loosen the four 1785 bolts one-half turn with a 9/16 inch wrench. The soundhead projector can now be relocated horizontally and vertically by alternately tightening and loosening the adjusting screws with a 3/16 inch allen wrench.

WHEN re-checking alignment, the four 1785 bolts must be re-tightened.

WHEN THE CORD passes through the exact center of the test aperture plate, and appears as a single image on the lamphouse reflector, correct alignment has been established.

RE-CHECK the relative level between the console and projector by placing the level on an accessible machined surface face, such as the reel arm mounting surface on the top of the projector, and check for level left-to-right.



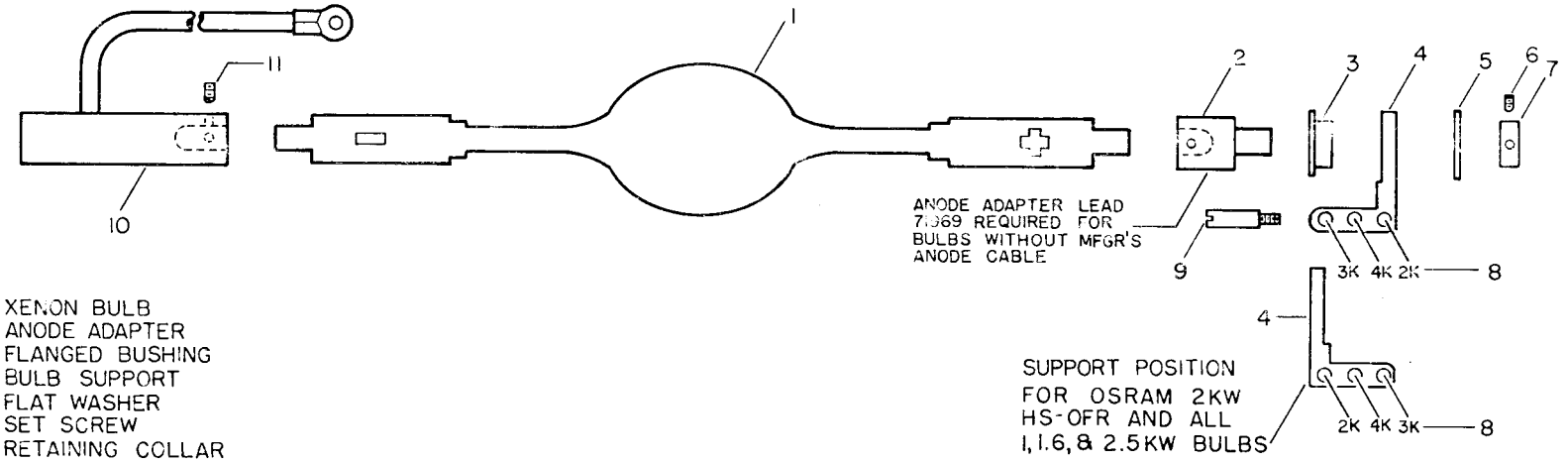
ADJUSTING SCREWS FOR FINE ALIGNMENT

IF THE CORD passes through the center of the test aperture, but the single cord image (as illustrated) is not seen, it is necessary to adjust the position of the reflector. This adjustment is to be done ONLY after the cord alignment indicates that the aperture is on optical center.

THE HEX SPACERS mounting the reflector frame to the pedestal casting are threaded into the casting to permit repositioning the reflector to the optical center indicated by the aligning cord. Loosen the lock nuts at the casting and adjust the spacers until the "CORRECT ALIGNMENT" cord image is seen. Firmly re-tighten the lock nuts after alignment is achieved.

THE CORD and associated fixtures can now be removed. Restore the operation of the fire shutter. Move the anode support column to its extreme forward position by turning the focus control clockwise to its stop; this is necessary to accommodate installation of the xenon bulb.

HIGHLIGHT XENON BULB ADAPTERS



ITEM
1 XENON BULB
2 ANODE ADAPTER
3 FLANGED BUSHING
4 BULB SUPPORT
5 FLAT WASHER
6 SET SCREW
7 RETAINING COLLAR
8 HINGE PIN LOCATION
9 HINGE PIN
10 CATHODE ADAPTER
11 SET SCREW

MFGR. WATTS NUMBER	HANOVIA 1000 993 C0010	HANOVIA 1600 992C0020	HANOVIA 2000 L5330-000	HANOVIA 2500 995C0010	HANOVIA 3000 DL 528-000	HANOVIA 4200 D-996 C0010	OSRAM 1000 XBO 1000W HSC-OFR	OSRAM 1600 XBO 1600W HSC-OFR	OSRAM 2000 XBO 2000W H OFR N-C	OSRAM 2000 XBO 2000W HS-OFR	OSRAM 2500 XBO 2500W HS-OFR	OSRAM 3000 XBO 3000W H-OFR	OSRAM 4000 XBO 4000W HS-OFR	DUROTEST 4000 XE 349-21 XE 4500 A
ITEM NO.														
1	65247	65404	65273	65274	81390	81391	65357	65358	65255	65406	65260	81344	81339	81918
2	71244	71239	—	—	—	—	71243	71243	—	—	—	—	—	—
3	71242	71242	71242	71242	81346	81342	71242	71242	71242	71242	71242	81346	81342	—
4	81501	81501	81501	81501	81501	81501	81501	81501	81501	81501	81501	81501	81501	—
5	71241	71241	71241	71241	81347	81343	71241	71241	71241	71241	71241	81347	81343	—
6	1598	1598	1598	1598	1598	1598	1598	1598	1598	1598	1598	1598	1598	—
7	81389	81389	81389	81389	81389	81341	81389	81389	81389	81389	81389	81345	81341	—
8	3K	3K	2K	4K	3K	4K	3K	3K	2K	4K	4K	3K	4K	4K
9	81129	81129	81129	81129	81129	81129	81129	81129	81129	81129	81129	81129	81129	81129
10	71970	71970	71245	71966	—	81901	71970	71970	71967	71966	71966	81901	81901	—
11	721	721	721	721	721	721	721	721	721	721	721	721	721	—

XENON BULB INSTALLATION

CAUTION: OBSERVE ALL SAFETY PRECAUTIONS WHEN WORKING WITH THE XENON BULB. Be sure the bulb is in its protective case before handling. Wear clean cotton gloves when handling the bulb to prevent fingermarking the quartz envelope.

LOCATE THE HINGE PIN (Bulb Chart, Item 9) packed with the bulb kit, and place it close at hand in or near the lamphouse.

BENCH ASSEMBLE the bulb and adapters before inserting the bulb in the lamphouse. Keep the bulb in its protective cover.

--Install the anode adapter (if required). See preceding chart. Make all electrical connections TIGHT.

--Place the flanged teflon bushing on the anode (+) stud with the flat side of the bushing against the bulb.

--Place the bulb support casting over the teflon bushing. Consult the bulb chart to determine the correct position of the bulb support.

--Slip the flat teflon washer over the stud on the bulb, up against the support casting.

--Install the retaining collar and secure to the bulb stem with the set screws.

--If installing an Osram 2000W/OFR N-C (Strong part no. 65255) or an Osram 3000W/H OFR (81344), cut the anode (+) lead on the bulb so it extends four inches from the bulb stem. Attach the wire connector to the 4" lead from the bulb. Then, insert the rubber covered anode cable extension into cable connector and securely tighten both set screws in the connector.

--If using a smaller wattage bulb without anode cable, install anode adapter lead 71969 to anode adapter.

--Slip the piece of silastic rubber tubing over the anode lead.

--Slip the cathode (-) adapter and lead assembly over the cathode stem of the bulb. At this time, tighten the set screw just enough to hold the lead assembly to the bulb. Assemble so both the anode and cathode leads come off the same side of the bulb. Rotate the bulb support casting so that when the bulb is placed in the lamphouse, both leads will extend toward the access door of the lamphouse.

--The brass spacer washer (71293) supplied with bulb kits for bulbs with threaded cathode pins is not required for initial bulb installation, but is necessary for bulb rotation. Store it in a secure place in or near the console. Instructions detailing use of the washer follow in this section.

PLACE THE XENON BULB and adapters in the lamphouse (with protective cover in place) with the cathode (-) end in the "V" of the insulated support block behind the reflector frame. Position the anode (+) end, with the bulb support casting, over the anode support column. Insert and tighten the hinge pin in the correct hole (see "Bulb Chart", Hinge Pin Position). It is necessary to use the correct hole to provide the amount of movement required to properly focus the bulb in relation to the reflector. The bulb must float and pivot on the support column to allow for movement by the vertical and horizontal adjustment controls. Both leads from the bulb should extend toward the access door of the lamphouse.

CONSOLE LAMPHOUSES using a 1-2.5KW bulb utilize a single insulated cathode "V" block (71237) mounted to the rear of the cathode adjusting casting. Those lamphouses using higher wattage bulbs (3-4.2KW) are fitted with a 81135 "V" block and a 81336 aluminum cathode block spacer mounted in front of the cathode adjusting casting. The correct cathode block assembly must be used with their corresponding bulbs to insure correct positioning to the reflector and adequate travel for focus adjustments.

CONNECT THE ANODE (positive) lead from the bulb to the feed-through connector located on the lamp base pan. Remove one nut, lockwasher and flat washer. Place the positive terminal against the nut remaining on the connector and replace the flat washer, lockwasher and nut in that order. Tighten securely to prevent the connection from overheating. Lay the lead so it does not shadow the reflected light any more than absolutely necessary.

REMOVE THE HEXHEAD BOLT, lockwasher and flat washer from the negative terminal of the igniter, located directly behind the reflector frame. Run the cathode lead from the bulb, out toward the side door and form the lead to curve up to the negative terminal on the igniter. Try to position the lead so that it does not touch any structural part of the lamphouse. Replace the flat washer, lockwasher and hex head bolt, in that order, on the negative terminal and tighten securely. Tighten the set screw holding the negative lead and adapter to the stem of the bulb.

NOTE: Hanovia 3000W. (Strong Part No. 81390)

Follow the same bench assembly procedure as specified for the other bulbs. Use the parts listed on the bulb chart; note particularly the smaller center hole diameter of the retaining collar.

Because of the leads coming off opposite sides of the Hanovia bulb, installation in the lamphouse will be different from that of the other bulbs.

Install the Hanovia bulb in the lamphouse with the anode (+) lead extending to the right side of the lamphouse to the feed-through connector located on the right front of the lamphouse base.

The cathode (-) lead will then extend off the bulb to the left side of the lamphouse. Form the lead up over the top of the bulb stem to the negative post of the igniter. Note also that this bulb does not require a cathode adapter.

NOTE: Durotest 4000W. (Strong Part No. 81918)

This bulb does not require any adapters or lead extensions to permit mounting and use in this lamphouse. The following changes do have to be made in the lamphouse.

--Because of the larger diameter of the cathode (-) end of the Durotest bulb, it is necessary to remove the aluminum spacer block from the cathode support casting, and mount "V" block 81135 directly to the front of the cathode adjusting casting. This will lower the cathode end of the bulb to the optical centerline of the lamphouse.

--Remove the small sheet metal air deflector (71927) from the anode air duct at the front of the lamphouse. It cannot be used with this bulb.

--Attach the bulb to the anode support column with the hinge pin (81129) and secure the leads from the bulb to the feed-through connector (+) and to the igniter (-), as instructed for the other bulbs. Make certain all electrical connections are tight.

If the bulb manufacturer recommends bulb rotation after a specified period of operation, as indicated on the elapsed time meter, refer to the following procedure. OBSERVE ALL SAFETY PRECAUTIONS, AND WEAR PROTECTIVE CLOTHING AND FACE SHIELD.

--Bulbs with threaded cathode pins must be unscrewed from the cathode adapter. Remove the anode connection from the feed-through connector on the base pan before unscrewing the bulb. after unscrewing the bulb, place the 71293 spacer washer furnished with the bulb kit over the threaded pin and screw the bulb back into the cathode adapter firmly. With the washer in place between the bulb and the cathode adapter, the bulb has been rotated 180°. Dress the anode cable back to the feed-through connector and tighten securely. Note: After installing the spacer washer, the bulb must be re-focused to obtain desired light distribution. See "Optical Alignment" and "Operation".

--To rotate bulbs without threaded cathode pins, loosen the set screw in the cathode adapter and remove the anode connection at the feed-through connector on the base pan. Rotate the bulb 180°, form the anode lead to the feed-through connector and tighten securely. Then form the cathode lead and re-tighten the set screw in the adapter.

In either procedure, it should not be necessary to loosen or remove the cathode connection at the igniter.

DO NOT EXCEED the bulb manufacturer's recommended initial starting current or maximum current for aged bulbs. The recommended initial current is 80-85% of the maximum rated current.

A XENON BULB can be focused to a small hot spot at the aperture or projection lens and if this is done the film may be damaged or the projection lens broken. The projector must be running whenever the bulb is ignited and the douser is open. Adjust the focus of the bulb in relation to the reflector to obtain a flat field, with the corners of the screen evenly lighted. It is possible to obtain nearly 100% coverage. Check the film for damage or high temperature and if running hot, reduce the current at the bulb or adjust the focus for a flatter field.

WHEN A NEW BULB is installed it is necessary to reduce the current to the bulb by resetting the transformer/rectifier coarse tap leads to tap "A" and the output leads to tap #1. This is advisable because each bulb operates at a slightly different voltage due to manufacturing tolerances. The current can now be adjusted to operate within the specified range. See power supply manual.

RETURN BULBS on which a warranty claim is being made in original shipping carton with protective plastic cover over bulb. Include the following information: Number of hours bulb was used, amperage bulb was burned, date bulb was installed, date bulb was removed and reason for removing.

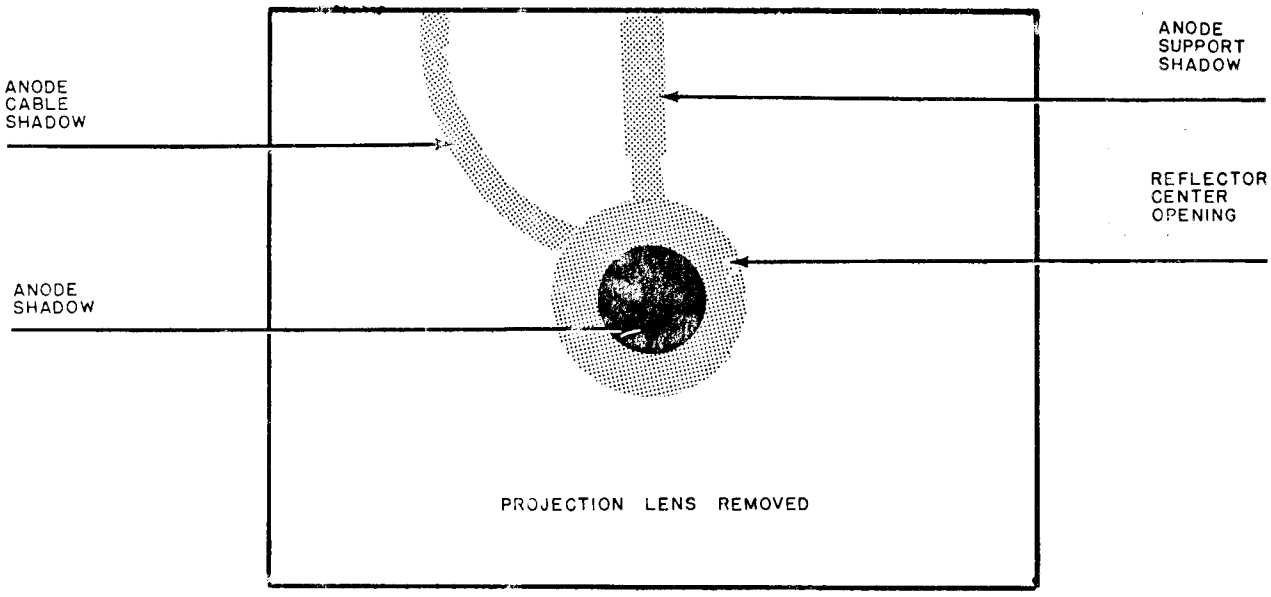
OPTICAL ALIGNMENT

INSTALL THE XENON BULB according to the instructions in the preceding section. Observing all safety procedures, remove the protective cover from the bulb. Adjust the focus control to move the anode support column to the approximate center of its travel.

CLOSE AND LOCK the lamphouse access door. Make certain that all access doors are closed and locked; all interlock switches must be engaged. Turn on exhaust system. REMOVE THE PROJECTION LENS.

PLACE THE MODE SWITCH in the "MAN" position ("AUTO" light OFF), and TURN ON THE PROJECTOR. Make certain the changeover douser is open.

IGNITE THE LAMP by pressing the "LAMP ON" button. Open the douser. The center opening of the reflector and the shadow of the anode will appear as dark spots on the screen.

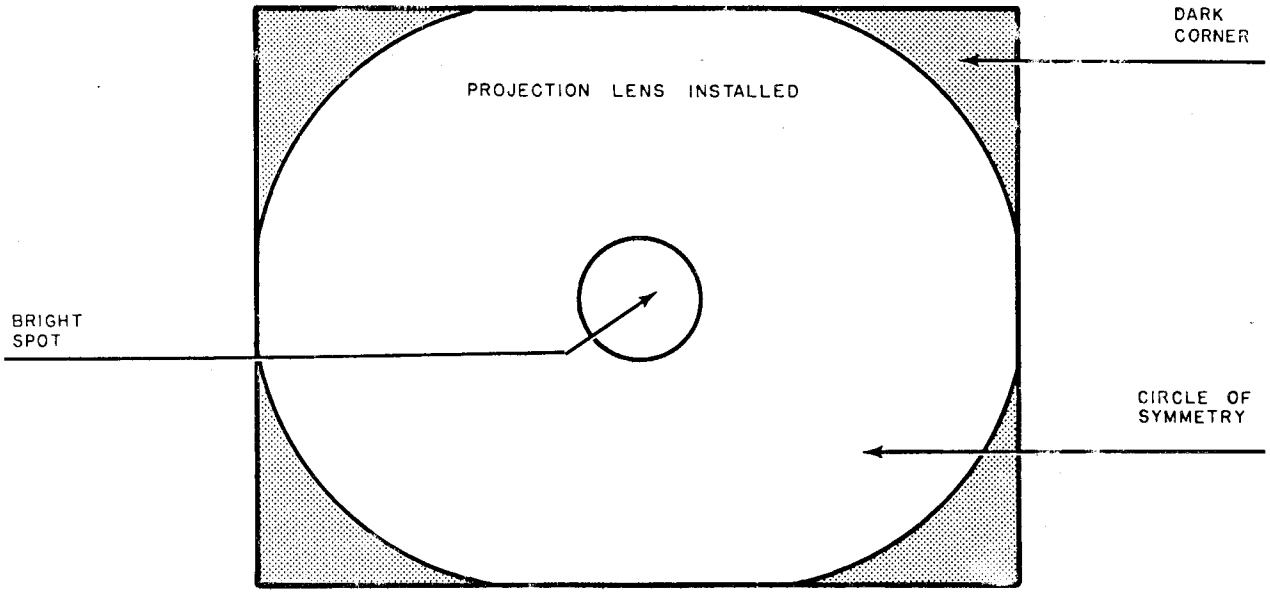


OPERATE the VERTICAL and HORIZONTAL bulb adjustment controls to superimpose the two spots as nearly symmetrical as possible.

IF THE SUPERIMPOSED SPOTS are not in the center of the screen, move and/or tilt the console to center the spots. (See illustration.)

OPERATE the FOCUS control until the spots fill the screen from top to bottom. If the spots lose their symmetrical configuration during this operation, re-adjust the VERTICAL and HORIZONTAL controls until the bulb can be focused forward and back, keeping the spots symmetrical.

CLOSE THE DOUSER and install the projection lens and aperture plate (preferably CinemaScope). Re-open the douser and adjust the focus control until a bright spot appears on the screen. At this point, the bright spot does not need to be in the center of the screen, but it must be relatively symmetrical. If it is not symmetrical, adjust the VERTICAL and HORIZONTAL bulb adjustment controls. It is very important that a symmetrical bright spot is projected to the screen.



CAUTION: DO NOT LEAVE THE BRIGHT SPOT ON TOO LONG AS THE HEAT GENERATED BY THE XENON BULB COULD CRACK THE PROJECTION LENS. Periodically close the douser to allow the lens to cool.

ADJUST THE FOCUS CONTROL until the proper flat light distribution is obtained on the screen.

AFTER MAKING CERTAIN that the flattened field is centered on the screen, firmly tighten the console pivot locking bolts and leveling pad locknuts. File aperture plates as required to fill the screen. NOTE: Aperture filing can be simplified with use of SMPTE No. 35-IQ test film.

INSERT THE BEAM EXPANDER LENS (if ordered) for 70mm operation. A slight change of the FOCUS adjustment may be required when changing from 35mm to 70mm operation. Do not leave the beam expander lens in position when projecting 35mm film.

TO EXTINGUISH the bulb, reset (press) the "LAMP ON" button. Allow the cooling fans to run at least ten minutes after extinguishing the bulb. This measure aids in extending bulb life.

AUTOMATIC SYSTEMS

INSTALLATION:

To install the lamp in an automatic system follow the same instructions presented for manual type operation. Two 16 AWG wires (not supplied by manufacturer) must be installed to permit operation by the automatic system (See Schematic Lamphouse or Power Supply). The wires must be shielded to prevent interference from feeding into the theatre sound system.

OPERATION:

The operation of the lamp in an automatic system is the same as outlined in the manual with the exception that the "Auto-Man" switch, must be placed in the "Auto" position. When the lamp "ON-OFF" switch is turned on the lamp will be ready to operate from the remote station. The cooling blowers will operate until the main A. C. line switch to the power supply is placed in the "OFF" position.

Attach the automation ignition cue or tab on the film far enough in advance of the projection cue, to permit a few ignition pulses. The ignition pulse is timed at approximately one second on and two to three seconds off. This pulse is controlled by the timer circuit in the igniter.

OPERATION

REMOVE THE PROTECTIVE COVER from the bulb. Do not ignite the bulb with the cover in place. Secure all access doors of the console to actuate the interlock switches.

THE PROJECTION BOOTH exhaust system must be operating to close the lamphouse exhaust draft air flow interlock switch.

CLOSE THE LAMPHOUSE DOUSER and place the MODE switch in the "MAN" position ("AUTO" light OFF).

TURN ON THE AC LINE SWITCH from the power source to energize the power supply. The red indicator lamp will glow, and the cooling fans will run, closing the bulb seal blower air vane switch. The amber indicator light will glow, indicating all interlock switches are closed.

IGNITE THE LAMP by pressing the "LAMP ON" button. The recommended initial current range is 80-85% of the maximum current stated by the bulb manufacturer. The lamp current should never exceed the maximum rating of the xenon bulb.

AFTER REPLACING or rotating the xenon bulb, ignite the lamp, open the douser WITH THE PROJECTOR RUNNING and adjust the horizontal and vertical controls to center the light on the screen. Insert the (optional) beam expander lens only for 70mm operation. Adjust the focus control to obtain the desired light distribution for 35mm or 70mm.

WAIT A FEW MINUTES for the current or arc to stabilize, then adjust the power supply to obtain the desired current as indicated on the ammeter. See power supply manual.

TO MAINTAIN screen light balance in a two-machine booth, it may be necessary to operate one lamp at a slightly higher current than the other. Because of manufacturing tolerances of different bulbs, and to normal aging, increase the current of the lamp giving low light output, or adjust the current of both lamps.

ALWAYS allow the blowers to operate for at least ten minutes after extinguishing the arc to cool the bulb. Failure to do so may cause premature bulb failure.

ARC STABILIZING MAGNET ADJUSTMENT

THE ARC STABILIZING MAGNET is located on the lamp base pan in front of the reflector frame. This magnet is preset at the factory and should not require adjustment.

IF IT SHOULD BECOME NECESSARY to adjust the magnet, the following procedure must be followed. Observe all safety procedures when working inside the lamp.

THE NORMAL ARC, when viewed thru the arc viewing port, will appear as in Figure A. When this condition exists, the magnet is set properly.

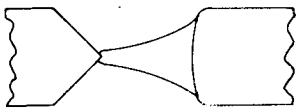


FIGURE A

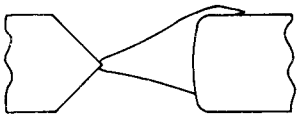


FIGURE B

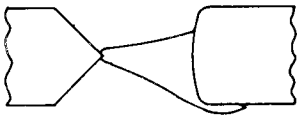


FIGURE C

FIGURE B shows the position of the arc when the magnet is too low. To correct this condition the magnet must be raised (moved toward the bulb). To do this, loosen one of the 2 screws in the slot, about 3 turns. Loosen the other screw in the slot, just enough so that the magnet assembly can be moved upward about 1/8 inch. After adjusting the magnet, tighten both screws. Repeat this step until the arc looks like Fig. A.

FIGURE C shows the position of the arc when the magnet is too high. To correct this condition the magnet must be lowered. To do this loosen the magnet as described in above paragraph and lower magnet 1/8 inch. After adjusting the magnet, tighten both screws. Repeat this step until the arc looks like Fig. A.

THE MAGNET must always be installed with the longest portion of the magnet facing the bulb, and with the South (S) Pole pointing to the side door.

IN NEW EQUIPMENT the magnet normally is in the center of the adjustment range. Changes in magnet position must only be made when the arc is burning improperly as shown in Figure B and C.

WHEN A NEW MAGNET is installed it should be set in the center of the adjustment range and then adjusted if necessary to obtain results shown in Figure A.

MAINTENANCE

THE XENON LAMP requires very little maintenance to keep it in good working order.

THE REFLECTOR should be cleaned with a clean soft dry cotton cloth every two weeks. Care should be taken when handling the reflector so as not to fingermark the coated surface.

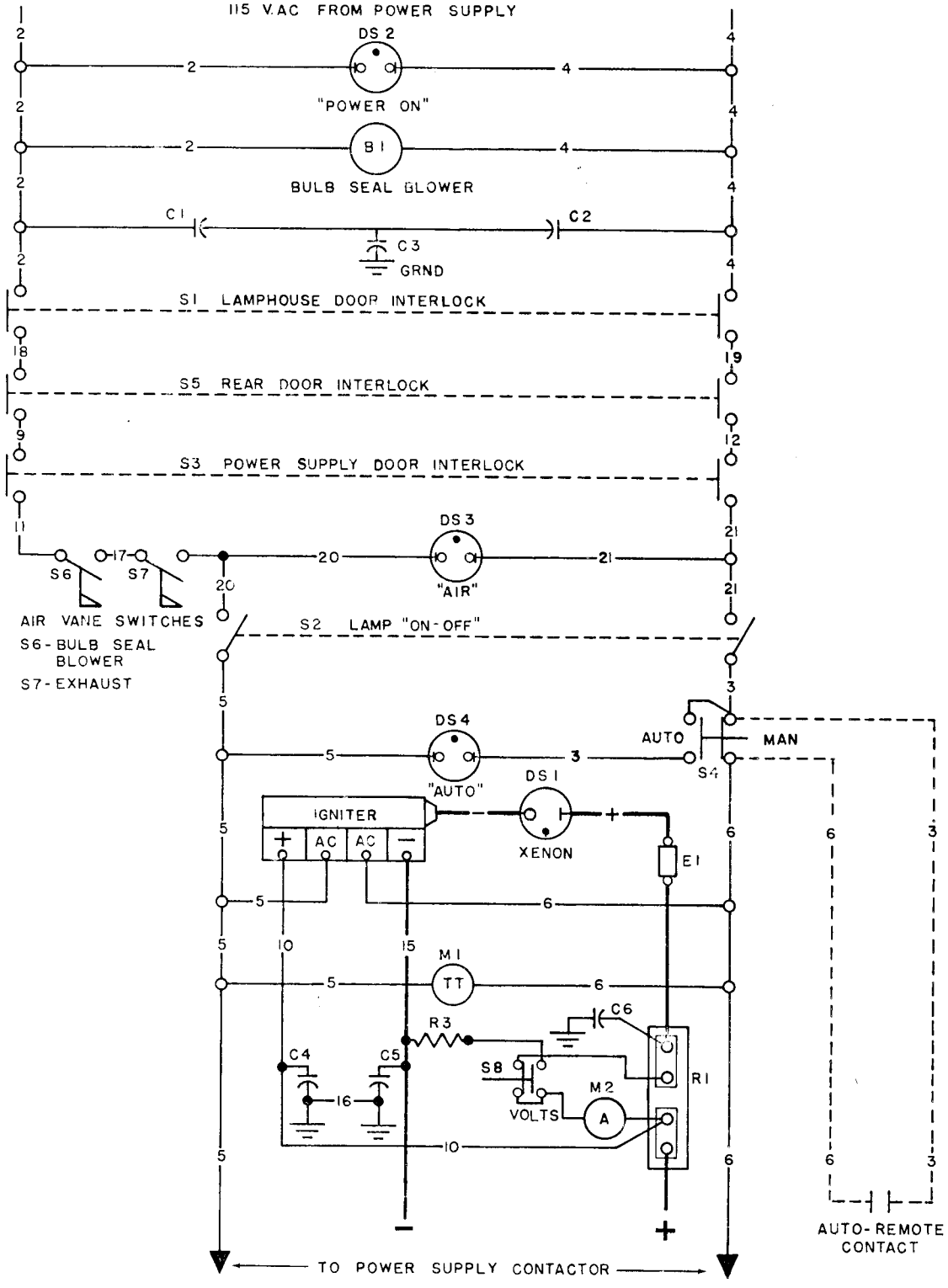
IF THE REFLECTOR is removed for cleaning or for any other purpose, check to see that the bulb is adjusted for maximum light output after replacing the reflector.

CHECK ALL ELECTRICAL CONNECTIONS periodically for tightness. Particularly the D.C. connections on the shunt inside the rear access door and the bulb connections at the igniter, and at the positive feed-through connector.

OCCASIONALLY THE BULB should be checked for presence of foreign material on the envelope. Any dirt or other foreign material should be removed promptly. CAUTION: Observe all safety procedures when working around the bulb.

THE INSIDE OF THE LAMPHOUSE and the fan blades should be cleaned periodically, depending on the dust conditions at each installation. Make sure the blower inlet screen on the side of the console is clean and free of any obstruction.

HIGHLIGHT CONSOLE LAMPHOUSE SCHEMATIC



WIRING DIAGRAM
PARTS LIST

Ref. Desig.	Part No.	Description
B1	71220	Bulb Seal Blower (115 V.AC, 50/60 Hz.)
C1,2	76132	Capacitor, .005 MFD, 600 V.DC
C3	76133	Capacitor, .01 MFD, 400 V.DC
C4,5	76323	Capacitor, 8 MFD, 150 V.AC
C6	79127	Capacitor, .01 MFD, 1000 V.DC
E1	81920	Feed-Through Connector & Cable Assy.
DS1	-	Xenon Bulb (See Bulb Chart)
DS2	71124	Indicator Light - "Power On"
DS3	71125	Indicator Light - "Air"
DS4	71109	Indicator Light - "Auto" (with S4)
M1	71946	Elapsed Time Meter (60 Hz.)
--	71930	Elapsed Time Meter (50 Hz.)
M2	81280	Ammeter
R1	81247	Shunt
R3	71283	Resistor, 91K Ohm (with S8)
S1	80168	Lamphouse Door Interlock Switch
S2	71110	"Lamp On-Off" Switch
S3	80168	Power Supply Door Interlock Switch
S4	71109	"Auto-Man" Switch (with DS4)
S5	80168	Rear Door Interlock Switch
S6	75187	Air Vane Switch, Bulb Seal Blower
--	71918	Air Vane (for S6)
S7	75187	Air Vane Switch, Exhaust Stack
--	81914	Air Vane (for S7)
S8	72275	Pushbutton Switch, "Press for Voltage"
--	71953	Igniter & PC Board Assy. (1-2.2 KW)
--	71954	Igniter & PC Board Assy. (2.5 KW)
--	71955	Igniter & PC Board Assy. (3-4.2 KW)

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 interlock 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 P. C. board; if polarity is not correct, the bulb will be seriously damaged or destroyed.

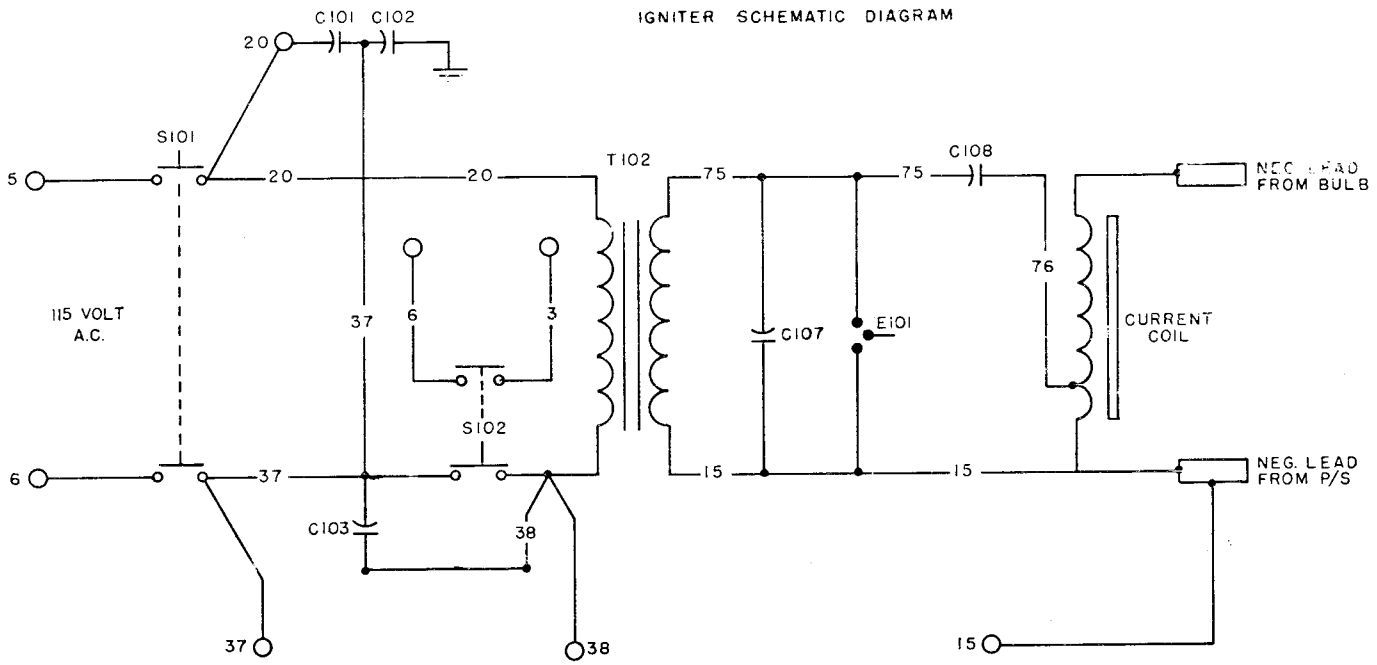
THE IGNITER supplies a high RF voltage pulse to the bulb, together with the high "No Load" voltage from the power supply, to ignite the xenon bulb. After the arc is sustained, the AC circuit in the igniter is interrupted by the opening of K201 relay contacts on the signal of the timer circuit on the P. C. board. The DC output of the 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 line and output taps in the power supply.

DC VOLTAGE is applied to the printed circuit board from the 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 bulb for ignition.

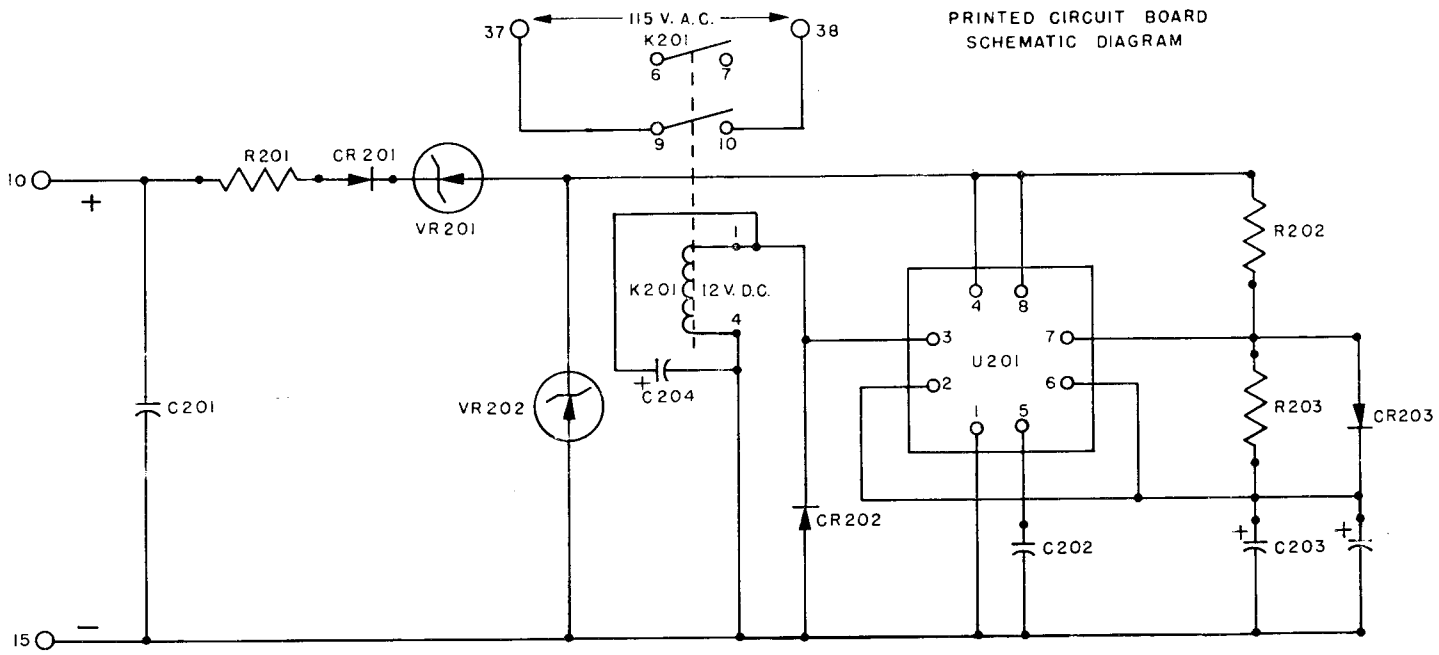
S101 is the igniter cover interlock switch and S102 is the emergency ignition switch which is a bypass for the K201 relay contacts and CR201 polarity sensing diode on the P. C. board. Components C101, 102, and 103 function as RF bypass capacitors in the igniter. The C108 capacitor serves as a coupling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

THE P. C. BOARD operates on DC voltage from the 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 are parts of the timing circuit on the circuit board: Timer chip U201, resistors R202, R203, and the C203 polarized capacitor. The C203 capacitor functions as the timing control and CR203 serves as the "On" time control diode. C202 is the control voltage isolation capacitor.



Ref. Desig.	Part No.	Description
C101, 102	81858	Capacitor Ass'y., .05 uF, 600V. DC
C103	81853	Capacitor Ass'y., .05 uF, 2000 V. DC
C107, 108	39110	Capacitor, 2400 uF, 20K V. DC
E101	39923	Spark Gap (see Igniter illustration)
S101	80168	Cover Interlock Switch
S102	80168	Emergency Ignition Switch
T102	39937	High Voltage Transformer
--	39998	Current Coil (see Igniter illustration)



The Highlight Console lamphouse igniter utilizes one of three printed circuit boards, depending on the wattage of the xenon bulb used. Should a replacement PC board be required, it must be replaced by one of the same type.

Bulb Wattage	Igniter	Igniter PCB Ass'y.
1000, 1600, 2000	71953	71951
2500	71954	71952
3000, 4000, 4200	71955	81861A

See following page for itemized parts list.

NOTE: The second C203 illustrated is present only on the 81861A board.

IGNITER PRINTED CIRCUIT BOARD
PARTS LIST

71951 PCB Assembly

Ref. Desig.	Part No.	Description
-	39145	Printed Circuit Board
C201	88263	Capacitor, .05 uf, 600WVDC
C202	79127	Capacitor, .01 uf, 600WVDC
C203	39156	Capacitor, 15 uf, 30 or 35 WVDC
C204	88249	Capacitor, 0.1 uf, 600 WVDC
CR201, 202, 203	85112	Diode, 2.5 A., 1000 PRV
K201	39154	Relay, P&B R10-E1-W2S800
-	39160	Relay Socket
-	39161	Relay Bail
R201	39157	Resistor, 1000 Ohm, 12 W.
R202	39158	Resistor, 100K Ohm, 1/2 W.
R203	39159	Resistor, 200K Ohm, 1/2 W.
U201	72185	I.C. Timer Chip, Motorola MC1455P1
-	39164	I.C. Socket, 8 pin
VR201	39163	Zener Diode, IN 5374A, 75 V.
VR202	39162	Zener Diode, IN 4742, 12 V.

71952 PCB Assembly

-	39145	Printed Circuit Board
C201	88263	Capacitor, .05 uf, 600 WVDC
C202	79127	Capacitor, 01 uf, 600 WVDC
C203	39156	Capacitor, 15 uf, 30 or 35 WVDC
C204	88249	Capacitor, 0.1 uf, 600 WVDC
CR201, 202, 203	85112	Diode, 2.5 A., 1000 PRV
K201	39154	Relay, P&B R10-E1-W2S800
-	39160	Relay Socket
-	39161	Relay Bail
R201	39157	Resistor, 1000 Ohm, 12 W.
R202	39158	Resistor, 100K Ohm, 1/2 W.
R203	39159	Resistor, 200K Ohm, 1/2 W.
U201	72185	I.C. Timer Chip, Motorola MC1455P1
-	39164	I.C. Socket, 8 pin
VR201	39167	Zener Diode, IN 5369A, 51 V.
VR202	39162	Zener Diode, IN 4742, 12 V.

81861A PCB Assembly

Ref. Desig.	Part No.	Description
-	39145	Printed Circuit Board
C201	88263	Capacitor, .05 uf, 600 WVDC
C202	79127	Capacitor, .01 uf, 600 WVDC
C203	39156	Capacitor, 15 uf, 30 or 35 WVDC (2 re.)
C204	88249	Capacitor, 0.1 uf, 600 WVDC
CR201, 202 203	85112	Diode, 2.5 A., 1000 PRV
K201	39154	Relay, P&B R10-E1-W2S800
-	39160	Relay Socket
-	39161	Relay Bail
R201	81518	Resistor, 2.7K Ohm, 10 W.
R202	39158	Resistor, 100K Ohm, 1/2 W.
R203	39159	Resistor, 200K Ohm, 1/2 W.
U201	72185	I.C. Timer Chip, Motorola MC1455P1
-	39164	I.C. Socket 8 pin
VR201	81519	Zener Diode, IN 5361, 27 V.
VR202	39162	Zener Diode, IN 4742, 12 V.

TROUBLE CHART

NORMAL OPERATION:

The projection booth exhaust system must be operating to close the air vane interlock switch in the lamphouse exhaust stack.

When the switch in the AC line from the power source is ON, the red indicator on the lamphouse will glow, indicating that the 115V. AC control circuit to the console is energized.

The power supply access door, the lamphouse access door, and the rear access door interlock switches must be closed to complete the circuit to the "LAMP ON" switch.

All console cooling fans will start, closing the bulb seal blower air vane switch. The amber indicator light will glow, showing the lamphouse safety interlock switches are closed and the AC control circuit through the lamphouse is energized.

Place the lamphouse MODE switch in the "MAN" position. When the "LAMP ON" switch is pressed ON, the elapsed time meter will indicate running time, the line contactor in the xenon power supply will close, and the bulb will ignite. There will be a distinct buzzing sound at the moment the bulb ignites. This is caused by the spark gap in the igniter, and the high voltage arcing in the bulb.

IGNITER NORMAL OPERATION:

When the "LAMP ON" switch is pressed ON, the power supply is energized, supplying a high DC voltage charge to the igniter. This voltage will range from 85 to 120 V. DC, no load, depending on the type and setting of the xenon power supply. This voltage is necessary to ignite the xenon bulb.

The igniter has a polarity sensing device that determines polarity is correct before energizing the voltage level sensor and timer circuit.

This voltage is then applied to a timer circuit in the igniter which actuates a relay to turn the R. F. pulse section of the igniter on and off. This timed circuit is one second ON, two - three seconds OFF.

When the bulb ignites, the DC voltage drops to normal bulb operating voltage. The voltage sensor in the igniter stops operation of the timer circuit and the R. F. pulsing circuit.

The igniter is equipped with a normally open push button switch (S102, Emergency Ignition Switch) to bypass the timer circuit and the polarity sensing device. It is to be used only if a fault is found in the timer circuit, and only until repairs can be made, or a replacement igniter PC board is installed. This switch is located on the igniter behind the plug button on the rear access door. When the switch is pressed, the xenon bulb should ignite immediately. DO NOT HOLD for more than ONE SECOND.

TROUBLE SHOOTING

BEFORE PROCEEDING with the following trouble shooting procedures, observe the following visual indications of trouble. Place the MODE switch in the "MAN" position.

(1) Red indicator light not ON

--AC line switch not ON

--"Main Line" circuit breakers open

--Circuit Breaker in power supply open

(2) Amber indicator light not ON

--Booth exhaust system not operating or lamphouse exhaust air vane switch not closed

--MODE switch not in "MAN" position

--Power supply access door interlock switch not actuated

--Rear access door interlock switch not actuated

--Lamphouse access door interlock switch not actuated

--Bulb seal blower not operating or blower air vane switch not closed

CAUTION: The console control circuit operates on 115 V. AC and a shock hazard exists when voltage readings are being taken inside the console. DC voltage readings can be made at the meter ("Press for Voltage"), or A. C. and D. C. voltage at the terminal blocks located behind the rear access door.

TROUBLE	PROBABLE CAUSE	TEST	REMEDY
Bulb fails to ignite (Red neon light not ON).	AC power not on to lamphouse.		See power supply manual.
Bulb fails to ignite (Amber neon light not ON).	Door interlock switch(s) not actuated.	Check for open access door(s).	Shut and lock access door(s).
	Faulty door interlock switch(s).	Check for 115 V. AC at wires #11 & #21.	If voltage is not measured, check loose wiring or replace interlock switch(s).
	Exhaust air vane in lamp not actuated (pulled up).	Visually check exhaust air vane switch.	Turn on exhaust system; increase air velocity if necessary (See Exhaust System Installation in this manual).
	Faulty bulb seal blower.	With power on, check for bulb seal blower operation.	Check for loose or faulty wiring to bulb seal blower; if none, replace blower.
	Faulty air vane switch (bulb seal or exhaust).	Check voltage between terminals 17 & 20.	If voltage is NOT measured, S6 (seal) faulty or inoperative; if voltage is measured, S7 (exhaust) faulty or inoperative.
	Faulty "LAMP ON" switch.	Check voltage between wires 5 & 3.	Check for loose wiring; replace switch if voltage is not measured.

TROUBLE	PROBABLE CAUSE	TEST	REMEDY
Bulb fails to ignite (amber and red neon lights ON).	Wrong DC polarity to lamp.	Check polarity.	Connect properly.
	Faulty xenon bulb.	Visually check for cracked anode or cathode; darkened envelope.	Replace.

CAUTION: Check polarity before proceeding with following test.

Defective relay or timer circuit on igniter PC board.	Remove hole plug from rear access door, press emergency ignition switch on igniter.	If bulb ignites, repair or replace igniter PC board.
Low boost ("No Load") voltage.	Measure DC voltage with "Press for Voltage" button and press "LAMP ON" switch. See power supply manual for required "No Load" voltage.	If voltage is less than that "No Load" voltage specified, check power supply (See power supply manual)
Faulty auto-remote contact.	With power OFF, place in "AUTO" position, close auto-remote contact, and check continuity between wires 3 & 6.	If continuity is not read, repair or replace contact.
Power supply	(See power supply manual)	
Defective igniter.		Replace.

TROUBLE	PROBABLE CAUSE	TEST	REMEDY
Buzzing in theatre sound system only at time of ignition for one second.	Defective capacitors C4 & C5.	Check capacitors with capacitor tester.	Replace if defective.
	Unshielded auto-remote leads.		Shield in conduit.
Popping in theatre sound system when bulb is ignited.	Defective capacitor on R.F. suppression assy.	Remove and check capacitors with capacitor tester.	Replace defective capacitor or R.F. suppression assy.
MODE switch in "AUTO" position but operating in "MAN" mode.	Defective MODE switch.		Replace.
High voltage arc seen in ammeter during ignition.	Defective C6 capacitor.		Replace.
Reduced light.	Bulb aging.		Increase current (See power supply manual)
Excessive light flicker.	Projector shutter mis-timed.		(See projector manual)
	Faulty bulb.	Visually inspect for cracked anode or cathode, darkened envelope.	Replace.
	Power supply.		(See power supply manual)

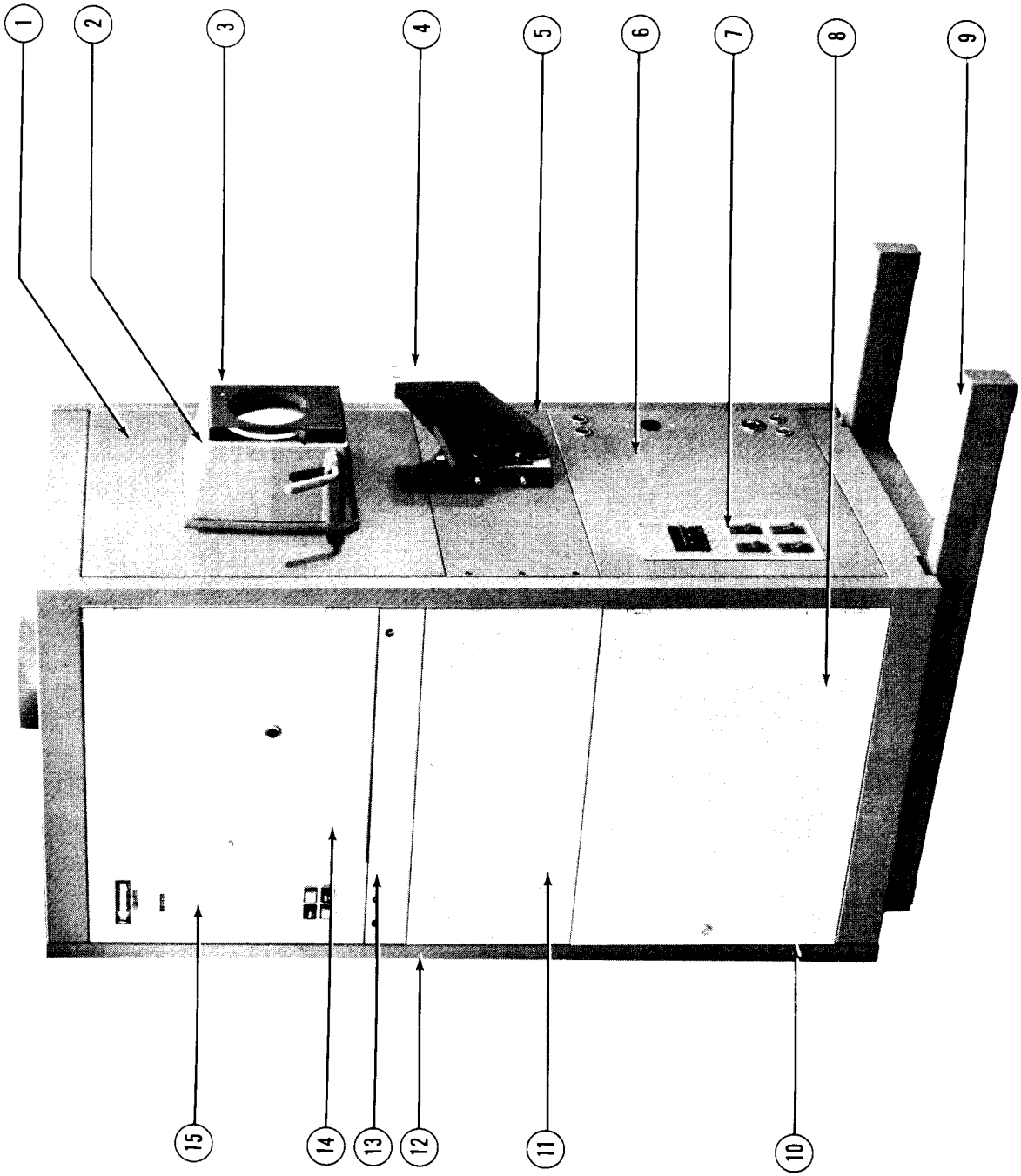


FIGURE 1

FIG. 1
PARTS LIST

Item	Part No.	Description
1	71990	Front Panel & Heat Shield Welded Assy.
	71187	Spacer
	1740	Screw, 10-24 x 5/8" Pan Hd.
	1622	Screw, 10-32 x 1/2" Hex Hd.
	885	#10 Lockwasher, Bronze
	1344	#10 Lockwasher, Shakeproof
	831	#10 Flatwasher
2	71962	Douser Housing Assy.
	71252	Casting, Housing
	81148	Douser Plate, Cast
	81433	Cross Shaft, Douser
	81187	Tension Spring
	81234	Bumper Stop
	81432	Shoulder Screw
	721	Set Screw, 10-24 x 3/16" Allen
	1566	Screw, 10-24 x 5/16" Pan Hd.
	1344	#10 Lockwasher
	45150A	Handle Grip
3	71940	70mm Spread Beam Adapter (Optional)
	39959	Nose Cone Assy.
	71936	Lens Holder Welded Assy.
	81848	Lens Holder Assy. (with lens)
	81514	Lens
	695	Screw, 1/4-20 x 1" Hex Hd.
	876	1/4" Lockwasher, Split
	1412	Screw, 6-32 x 1/8" Pan Hd.
4	71226	Projector/Soundhead Mounting Arm
	1784	Set Screw
	1785	Bolt, 3/8-16 x 1-3/8" Hex Hd.
	878	3/8" Split Lockwasher
	71240	Slide Bar
5	71225	Mounting Plate, Projector/Soundhead Arm
	71221	Nut Plate, Projector/Soundhead Arm
	1778	Screw, 5/16-18 x 1-3/4" Soc. Flt. Hd.
	807	5/16-18 Hexnut
	853	5/16" Flatwasher
	877	5/16" Split Lockwasher
	1544	Screw, 1/4-20 x 1" Soc. Hd.
	805	1/4-20 Hex Nut
	876	1/4" Split Lockwasher
	852	1/4" Flatwasher

Item	Part No.	Description
6	71991	Front Panel
	71202	Hole Plug, Small
	71203	Hole Plug, Large
	1622	Screw, 10-32 x 1/2" Hex Hd.
	885	#10 Lockwasher
	831	#10 Flatwasher
7	71222	Plate, Distribution Panel (As shown; 3 Ph.)
	71250	Plate, Distribution Panel (1 ph.)
	-	Circuit Breakers (See Fig. 2, Items 4 & 5)
	1307	Screw, 10-32 x 3/8" Pan Hd.
	1344	#10 Lockwasher
8	71988	Door & Hinge Welded Assy.
	71178	Lock
	1311	Screw, 8-32 x 3/8" Pan Hd.
	795	8-32 Hexnut
	886	#8 Split Lockwasher
	1582	#8 Flatwasher
9	71998	Base, Console Frame
	71184	Leveling Pad (Not Shown)
	71133	Pivot Bracket, Long
	71134	Pivot Bracket, Short
	689	Screw, 1/4-20 x 5/8" Hex Hd.
	876	1/4" Split Lockwasher
10	71994	Cabinet Frame, Console
	71253	Pivot Bracket, Long
	71254	Pivot Bracket, Short
	71199	Pivot Shaft
	1783	Hitch Pin, Pivot Shaft
	689	Screw, 1/4-20 x 5/8" Hex Hd.
	805	1/4" Hexnut
	876	1/4" Split Lockwasher
	1730	Screw, 1/2-13 x 1-1/4" Hex Hd. (Pivot Lock)
	71212	Washer (Pivot Lock)
11	71943	Side Panel (As shown; Sound & Automation, See Fig. 2)
	71175	1/4 Turn Fastener
	71176	Retaining Ring, 1/4 Turn Fastener
	71177	Tinnerman Nut, 1/4 Turn Fastener
12	71985	Rear Access Door Assy.
13	71165	Filler Panel (Bulb Adjust Controls, See Fig. 3)
	71260	Stabilizer Bracket
	1622	Screw, 10-32 x 1/2" Hex Hd.
	1307	Screw, 10-32 x 3/8" Pan Hd.
	800	10-32 Half Nut
	831	#10 Flatwasher
	875	#10 Split Lockwasher

Item	Part No.	Description
14	71987	Access Door & Hinge, Welded Assy.
	1311	Screw, 8-32 x 3/8" Pan Hd.
	891	#8 Lockwasher
	830	#8 Flatwasher
	795	8-32 Hexnut
15	71983	Instrument Panel (Components, see Fig. 2)
	1316	10-32 Tinnerman Nut

Parts Not Listed Above

71989	Top Panel (Left Side)
1622	Screw, 10-32 x 1/2" Hex Hd.
831	#10 Flatwasher
875	#10 Split Lockwasher
71185	Blower Panel, Console (2 Blowers)
71186	Blower Panel, Console (1 Blower)
71971	Mounting Panel, Blower
1781	Screw, 8-32 x 2-3/8" Pan Hd.
891	#8 Lockwasher
795	8-32 Hexnut
1312	Screw, 8-32 x 1/2" Pan Hd.
71220	Blower (115 V. AC, 50/60 Hz)
71929	Lead Cord, Blower

FIGURE 2

FIG. 2
PARTS LIST

Item	Part No.	Description
1	71145	Speaker, Booth Monitor
	71196	Speaker Grill
	1311	Screw, 8-32 x 3/8" Pan Hd.
	795	Hexnut, 8-32
	891-A	#8 Lockwasher
2	-	Automation Control Switches
	71104	"Power On-Off" (Red)
	71105	"Start" (Green)
	71106	"Stop" (Amber)
	71126	"Intermission" (Rocker, 3-position)
	71285	Indicator Lamp, "Timer Cycle" (not shown)
3	65288	Convenience Outlet
4	-	Circuit Breaker, "Main Line"
	71102	35A. Double (For Single Phase)
	71103	50A. Triple (For three phase) #71268 for 35A 3φ
5	-	Circuit Breaker, Console Function
	71206	10A. (Projector)
	71207	5A. (Sound, Automation)
	71101	15A. (Convenience Outlet)
6	-	Manual Control Switches
	71107	"Projector"
	71108	"Changeover"
	71111	"Film"
	71112	"Tape"
	71114	"Curtain Open"
	71115	"Curtain Close
	71116	"Mask In"
	71117	"Mask Out"
	71118	"Dim Down"
	71119	"Dim Up"
	71120	"C/O Open"
	71121	"C/O Close"
	71113	Blank
7	*	Volume, Control, Amplifier
	71183	Knob
	71179	Handle, Drawer
8	71123	Indicator Lamp, Exciter Supply
9	71122	Indicator Lamp, Amplifier
10	-	Lamphouse Control Switches
	71109	Mode "Auto-Man" (Lighted) (S4, DS4)
	71110	"Lamp On" (S2)

Item	Part No.	Description
11	-	Lamphouse Indicator Lamps
	71124	"Power On" (DS2)
	71125	"Air" (DS3)
12	71946	Elapsed Time Meter, 60 Hz. (M1)
	71930	Elapsed Time Meter, 50 Hz. (M1)
13	72275	Switch, "Press for Voltage" (S8)
	71283	Resistor (R3)
14	81280	Ammeter

Parts Not Listed Above

71982	Drawer, Sound/Automation Compartment
71150	Drawer Slides (1 pair)
237	Screw, 8-32 x 3/8" Flat Hd.
795	Hexnut, 8-32
891-A	#8 Lockwasher
71175	Quarter-Turn Fastener, Slot Hd.
71176	Retaining Ring, Quarter-Turn
71979	Automation & Sound Front Panel
71200	Bracket, Drawer Slides
71933	Distribution Panel Terminal Board

* See parts list, Power Amplifier.

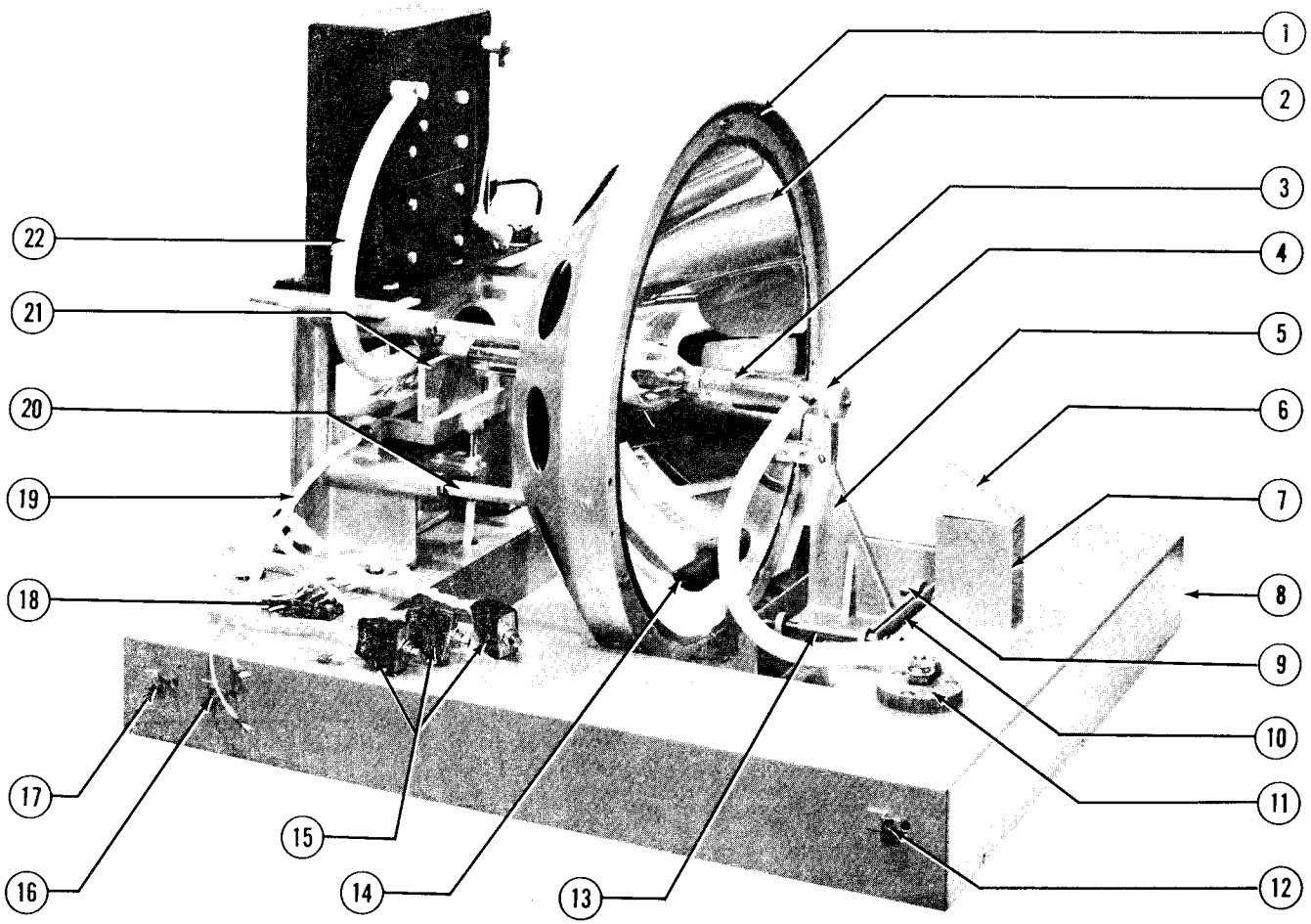


FIGURE 3

Plate 3435

FIG. 3
PARTS LIST

Item	Part No.	Description
1	81872	Reflector Frame Assy.
2	81871-A	Reflector Assy.
-	1534	Screw, 10-32 x 5/8" Soc.Hd.
-	866	#10 Flatwasher
-	1304	Screw #8-32 x 5/16 Pan Hd.
3	-	Xenon Bulb (DS1) (See Bulb Chart)
-	71968	Bulb Adapter Kit (1 & 1.6 KW)
-	71964	Bulb Adapter Kit (2 KW)
-	71965	Bulb Adapter Kit (2.5 KW)
-	81883	Bulb Adapter Kit (3 KW)
-	81888	Bulb Adapter Kit (4-4.2 KW)
-	71289	Insulator Tube, Anode Lead
-	71928	Anode Cable Extension (For Hanovia 2.5KW, Osram 3KW and all 2 KW Bulbs)
-	71289	Anode Cable Extension (For Osram 2.5KW)
-	81349	Cable Connector
4	81501	Bulb Support (Bulb Chart, Item 4)
-	81129	Hinge Pin (Bulb Chart, Item 9)
5	81122	Anode Support Column
6	71927	Air Deflector
7	71255	Air Duct
8	71972	Base Pan, Welded Assy.
-	71211	Bottom Plate, Base Pan
9	71214	Outrider Shaft
10	71215	Bracket, Anode Support Column
-	1304	Screw, 8-32 x 5/16" Pan Hd.
11	81920	Feed-Through Connector & Cable Assy. (E1)
-	81919	Lead Wire & Stud (Pos.)
-	1678	Hex Jamnut, 3/8-16
-	839	Flatwasher, 3/8"
-	81301	Insulator Body
-	878A	Split Lockwasher, 3/8"
-	385	Screw, 10-24 x 1/2" Fil.Hd.
-	885	#10 Lockwasher, Shakeproof
-	875	Split Lockwasher, 3/16"
12	71938	Bulb Focus Control Cable Assy.
-	46138	Snap Ring, 1/4"
-	714	Set Screw, 8-32 x 1/8", Soc.Hd. Cup Pt.
13	71213	Focus Shaft
-	76157	Snap Ring, 3/8"
14	39179	Arc Stabilizing Magnet
-	81137	Retaining Block, Magnet

Item	Part No.	Description
-	781	Set Screw, 8-32 x 1/4", Soc.Hd., Cup Pt.
-	1710	Screw, 8-32 x 1/4", Hex Hd.
-	81413	Mounting Bracket, Magnet
-	1304	Screw, 8-32 x 5/16" Pan Hd.
-	891A	#8 Lockwasher, Shakeproof
15	80168	Door Interlock Switches (S1, S3, S5)
16	71937	Vertical Bulb Adjust Control Cable Assy.
-	46138	Snap Ring, 1/4"
-	714	Set Screw, 8-32 x 1/8", Soc.Hd., Cup Pt.
17	71938	Horizontal Bulb Adjust Control Cable Assy.
-	46138	Snap Ring, 1/4"
-	714	Set Screw, 8-32 x 1/8, Soc.Hd. Cup Pt.
18	72375	Barrier Strip, 4 Terminal
-	1473	Screw, 6-32 x 1/2" Pan Hd.
-	884	#6 Lockwasher
19	71938	Flexible Shaft Assy., Horizontal Bulb Adjust (With Item 17)
20*	81315	Stud, Reflector Frame
-	81318	Shoulder Screw, Hex Hd.
-	1573	Lock Nut, 1/4-20
21	71237	Cathode "V" Block, Insulated (as shown; 1-2.5KW)
-	81135	Cathode "V" Block, Insulated (3-4.2KW)
-	81336	Spacer, Cathode Block (3-4.2KW)
-	313	Screw, 10-24 x 7/16" Rd.Hd.
-	319	Screw, 10-24 x 3/4", Rd.Hd.
-	885	#10 Lockwasher, Shakeproof
-	71942	Support Casting, Cathode Block
-	81133	Adjustment Shaft, Horizontal
-	81134	Adjustment Shaft, Vertical
22	-	Cathode Adapter &Cable Assy. (See Bulb Adapter Chart)

20* Factory Aligned - Do not Adjust.

-	81440	Heat Shield (Not shown; Mounts to 81315)

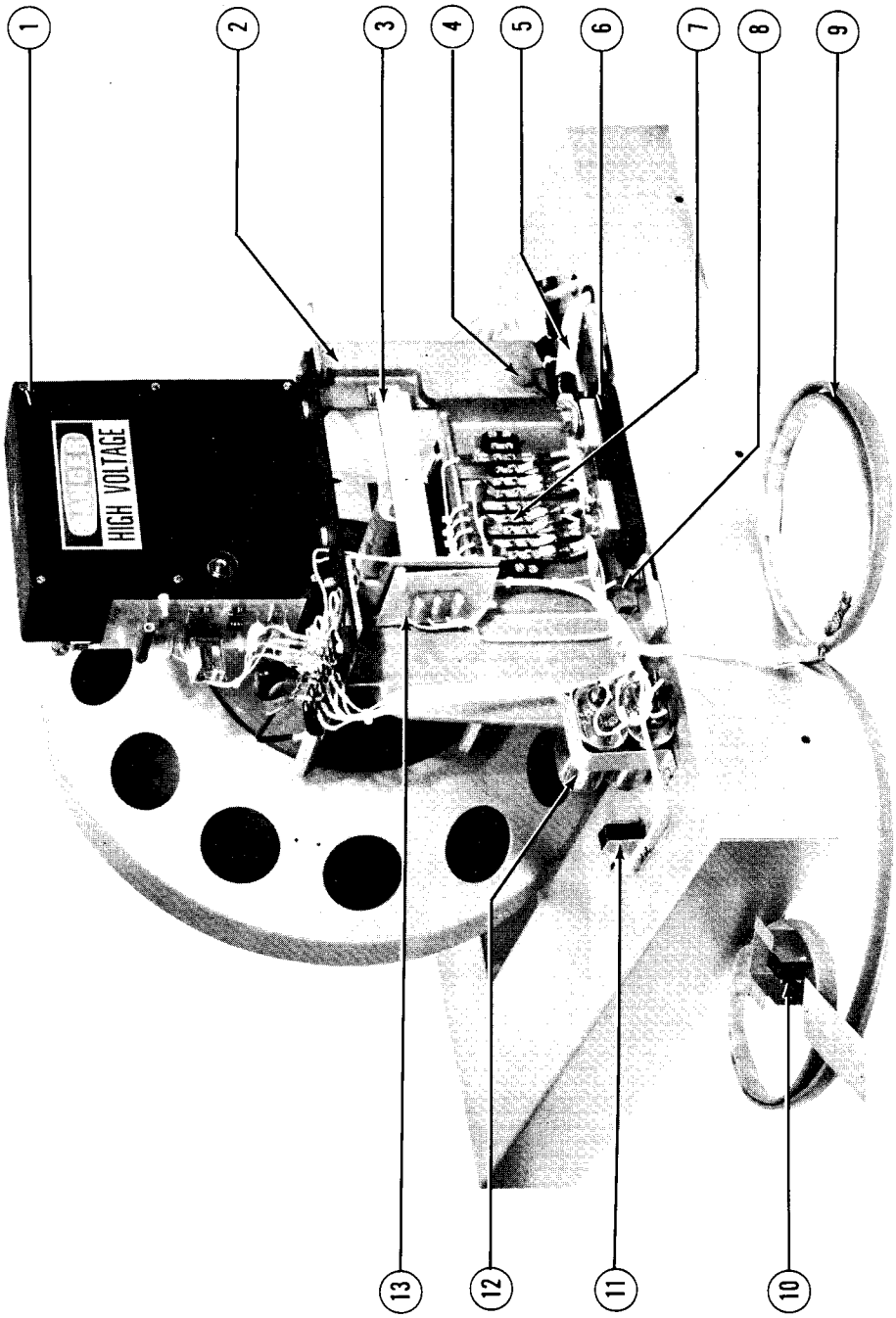


FIGURE 4

FIG. 4
PARTS LIST

Item	Part No.	Description
1	71953	Igniter & PC Board Assy. (1 & 2.2 KW)
1	71954	Igniter & PC Board Assy. (2.5KW)
1	71955	Igniter & PC Board Assy. (3&4.2KW)
-	1419	Screw, 5/16-18 x 3/4" Hex Hd.
-	877	5/16" Split Lockwasher
2	71251	Pedestal Reflector & Igniter
-	1419	Screw, 5/16 x 3/4" Hex Hd.
-	877	5/16" Split Lockwasher
3	71248	Alignment Bracket
-	1304	Screw, 8-32 x 5/16" Pan Hd.
-	891	#8 Lockwasher, Shakeproof
4	79127	Capacitor (C6)
5	81920	Feed-Through Connector & Cable Assy. (E1) (See Fig. 3, Item 11)
6	81247	Shunt (R1)
-	385	Screw, 10-24 x 1/2" Fil. Hd.
-	875	3/16" Split Lockwasher
7	71263	Barrier Strip, 10 Terminal
-	1593	Screw, 8-32 x 1/2" Fil. Hd.
-	886A	#8 Lockwasher, Shakeproof
8	81274	Ground Lug
-	689	Screw, 1/4-20 x 5/8" Hex Hd.
-	876	1/4" Split Lockwasher
-	835	1/4" Flatwasher
9	-	Control Circuit Interconnect Leads
-	71944	Wire Harness Assy.
10	75187	Air Vane Switch, Exhaust Stack (S7)
-	81914	Air Vane
-	81304	Switch Cover
-	1618	Screw, #6 x 1/4, Self Tapping, Bd. Hd.
-	1343	#4 Lockwasher, Shakeproof
-	1565	Screw, 4-40 x 3/4", Rd. Hd.
-	1620	4-40 Hexnut
-	48316	Nylon Grommet
11	75187	Air Flow Switch, Bulb Seal Blower
-	71918	Air Vane
-	81333	Bracket
-	1305	Screw, 6-32 x 1/4" Pan Hd.
-	892	#6 Lockwasher, Shakeproof
-	1343	#4 Lockwasher, Shakeproof
-	1565	Screw, 4-40 x 3/4", Rd. Hd.

Item	Part No.	Description
12	76323	Capacitor (C4, 5)
-	76208	Strap
-	1304	Screw, 8-32 x 5/16 Pan Hd.
-	886A	#8 Lockwasher, Shakeproof
13	71945	RF Suppression Assy.
-	39155	PCB Stand-Off, Nylon
-	76132	Capacitor (C1, 2)
-	76133	Capacitor (C3)
-	81141	Insulator

Not Shown

71220	Blower, Bulb Seal (B1) (50/60 Hz)
88253	Lead Cord & Cap (B1)
71307	Grill
1774	Screw, 6-32 x 5/8" Hex Soc. Hd.
1448	Screw, 6-32 x 3/4" Pan Hd.
892	#6 Lockwasher, Shakeproof

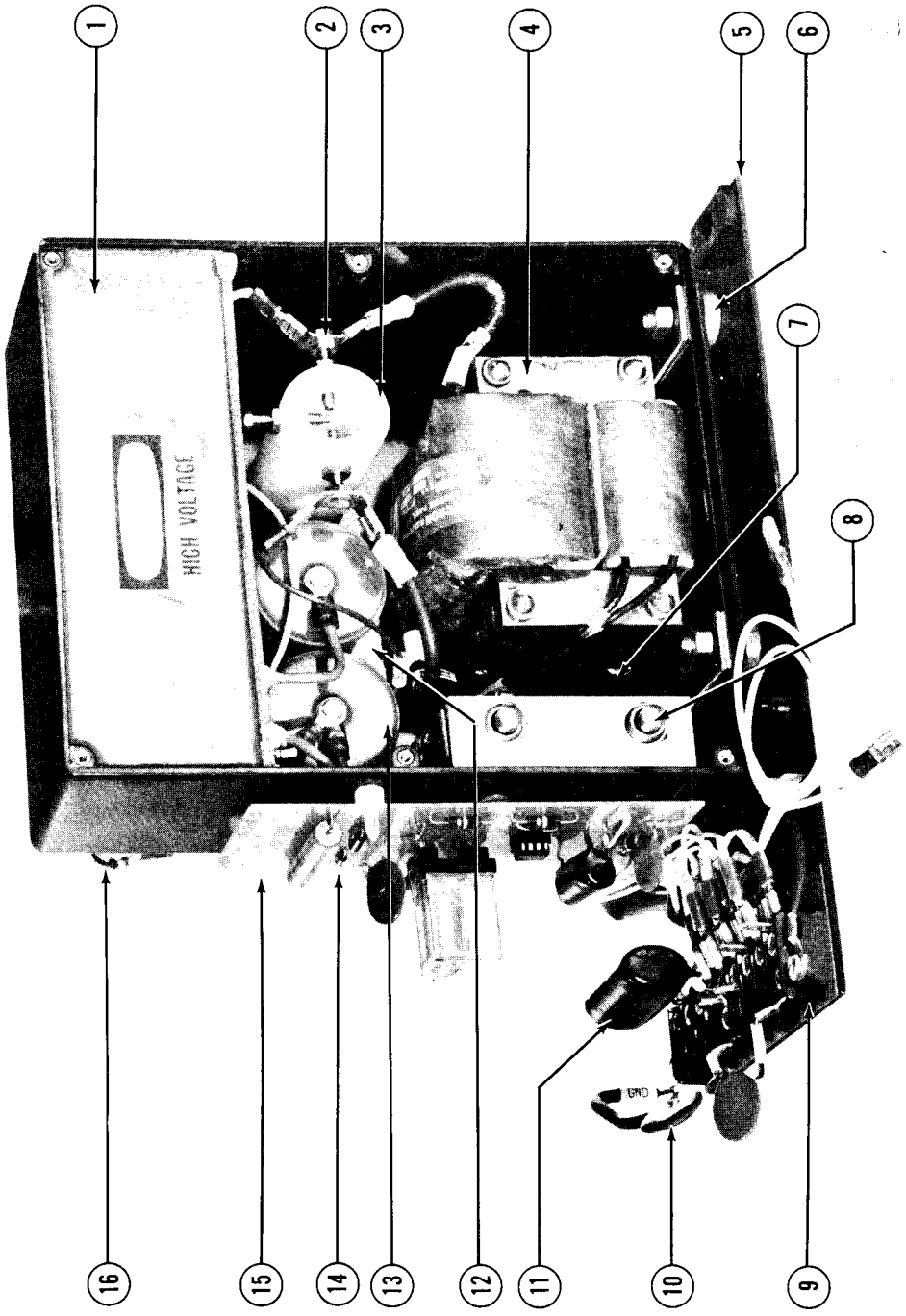


FIGURE 5

FIG. 5
PARTS LIST

Item	Part No.	Description
1	39998	Coil & Case Potted Assy.
2	39107 *	Tungsten Contact Screws
-	795	8-32 Hex Nut
-	831	#10 Flatwasher, Brass
-	39109	Terminal Tab
3	39201 *	Spark Gap Body
-	1567	Screw, 10-24 x 1/2" Pan Hd.
4	39937	High Voltage Transformer (T102)
-	795	8-32 Hex Nut
-	1582	#8 Flatwasher
5	71258	Base Plate Assy.
6	81417	Spacer
-	71957	Igniter Support Plate
-	81515	Igniter Support Bracket
-	695	Screw, 1/4-20 x 1" Hex Hd.
-	876	1/4" Split, Lockwasher
-	805-A	1/4-20 Hex Nut
7	39204	Transformer Spacer
8	80168	Switches, Interlock & Emergency Ignition (S101, S102)
-	39113	Switch Bracket
-	343	Screw, 10-32 x 1/4" Flat Hd.
-	49347	Wire Bushing
9	81415	Terminal Block
-	81416	Terminal Marker Strip
-	1312	Screw, 8-32 x 1/4" Pan Hd.
-	891-A	#8 Shakeproof Lockwasher
10	81858	Capacitor Assy. (C101, 102)
11	81853	Capacitor Assy. (C103)
12	39112	Capacitor Mounting Bracket
-	39186	Spacer
-	1752	Screw, 1/4-20 x 1" Hex Hd. (Nylon)
-	1754	1/4-20 Hex Nut (Nylon)
-	889	1/4" Shakeproof Lockwasher
13	39110	High Voltage Capacitor (C107, 108)
-	1742	Screw, 8-32 x 1/4" Pan Hd.
-	254	Screw, 8-32 x 1/4" Fil. Hd.
-	891-A	#8 Shakeproof Lockwasher
14	71951	Printed Circuit Board Assy. (1000-2.2KW)
14	71952	Printed Circuit Board Assy. (2500W.)
14	81861A	Printed Circuit Board Assy. (3-4.2KW)
15	39155	PCB Stand-Off

Item	Part No.	Description
16	1346	Screw, 5/16-18 x 1/2" Hd. Hd.
-	877	5/16" Split Lockwasher
-	178	Screw, 6-32 x 3/16" Fil. Hd.
-	884	#6 Split Lockwasher
*	39923	Spark Gap Ass'y. (Items 2 & 3, assembled and gapped)

Parts Not Listed Above

39101	Igniter Box Cover
1305	Screw, 6-32 x 1/4" Pan Hd.
65353	Danger Label

XENON BULB RECORD

LAMPHOUSE TYPE ______________________________ MACHINE NO. __________

WATTAGE __________ NOM. CURRENT ______ AMPS. MAX. CURRENT _____ AMPS.

BULB		DATE LAMPHOUSE HOURS		
MFGR.	SERIAL NO.	INSTALLED	ROTATED*	REPLACED

STRONG ELECTRIC CORPORATION
87 City Park Avenue
Toledo, Ohio 43697

*IF REQ'D BY BULB MFGR.