PRO 35

INSTRUCTION MANUAL AND PARTS LIST

SPECIFICATIONS FOR BALLANTYE PRO-35 PROJECTOR

The Projector is designed so as to meet or exceed all Academy standards for film speed, picture jump, weave and film protection.

Basic design is so that the projector can be as simple as possible, yet readily adaptable to accept the most modern and sophisticated equipment, making it the most versatile and deluxe projector on the market.

1. SPROCKETS. Sprockets are standard 16 teeth. Both upper and lower sprockets are mounted to the drive shafts so that they are readily removable. All sprocket shafts are sealed ball bearing mounted.

2. PAD ROLLERS. Film is guided and held to upper sprockets by two pad rollers mounted on a detent arm. Pad roller arms are so designed that adjustment can be made horizontally and vertically.

3. FILM TRAP. The film trap is designed so it is easily removed from center frame. Film trap is slightly curved concave. Film trap shoe is hardened and gound steel mounted by means of screws. Trap is milled to accept snap-in type apertures for rigid positioning, yet are easily removed. Aperture has a finger or hand knob, non-metallic for heat insulation.

4. FILM GATE ASSEMBLY. Film gate assembly is a one-piece removable metal plate mounted on a single pivot.

5. LENS MOUNT. Lens mount is designed for instant change lens holder, to accept 4" diameter lens.

Lens mount is anchored to the Center frame by means of three screws and is designed for easy removal and replacement with a turret or horizontal lens mount. Lens mount is of rigid construction so as to accept the longest combination of lens and anamorphic attachment without deflection.

6. REAR SHUTTER. Cast aluminum rear shutter, angle mounted, double blade, revolves at 1440 RPM. Rear shutter is designed for maximum freedom from backlash. Shutter blade is easily accessible and adjustable for correct timing.

7. INTERMITTENT. Intermittent is heavy-duty and designed for easy adjustment in the field between star and cam. A heavy 4 point star is used and a 16 tooth sprocket.

Intermittent housing is designed so that it can be mounted on a flat face by three screws. Housing permits operation in an oil reservoir with oil drain and a visible oil gauge attached. All mechanical parts of intermittent are submerged in oil.

Intermittent housing has an outboard bearing, easily removable.

Intermittent sprocket is a standard hardened and ground steel sprocket as lightweight as good engineering standards will accept, mounted by a screw and nut.

Intermittent sprocket shaft is spiral cut on mechanism end to mate with framing device.

8. FRAMING DEVICE. The framing device consists of a nylon coupling with internal spirals and an external rack and gear for lateral movement. Gear is attached to a shaft running to the front of the projector with a hand knob mounted externally for adjustment. Shaft and knob are designed so as to accept automatic framing device.

9. LENS FOCUSING DEVICE. Lens focusing device is a part of the lens mount so that it can be removed if necessary for automatic focus device.

10. CENTER FRAME. Center frame of projector is made of aluminum, normalized for temperature stability. Placement of sprockets is such that necessary sensors for automation are readily mounted with adequate clearance.

11. MAIN DRIVE. Driving mechanism from motor to projector and motor to speed reducer is synchronous belt driven.

12. FRAMING LAMP. Framing lamp is mounted so that adequate illumination of entire aperture is obtained. Lamp is of low voltage and no means of switching is provided.

13. APERTURE COATING. Mechanism is designed for air or water cooling. Water circulating plate is a standard part of projector.

14. CHANGEOVERS. Low-voltage solenoid and dowser are built into rear shutter mechanism for light changeover and adequate space provided for automation.

Low-voltage transformer is built into mechanism for dowser solenoids as well as framing lamp.

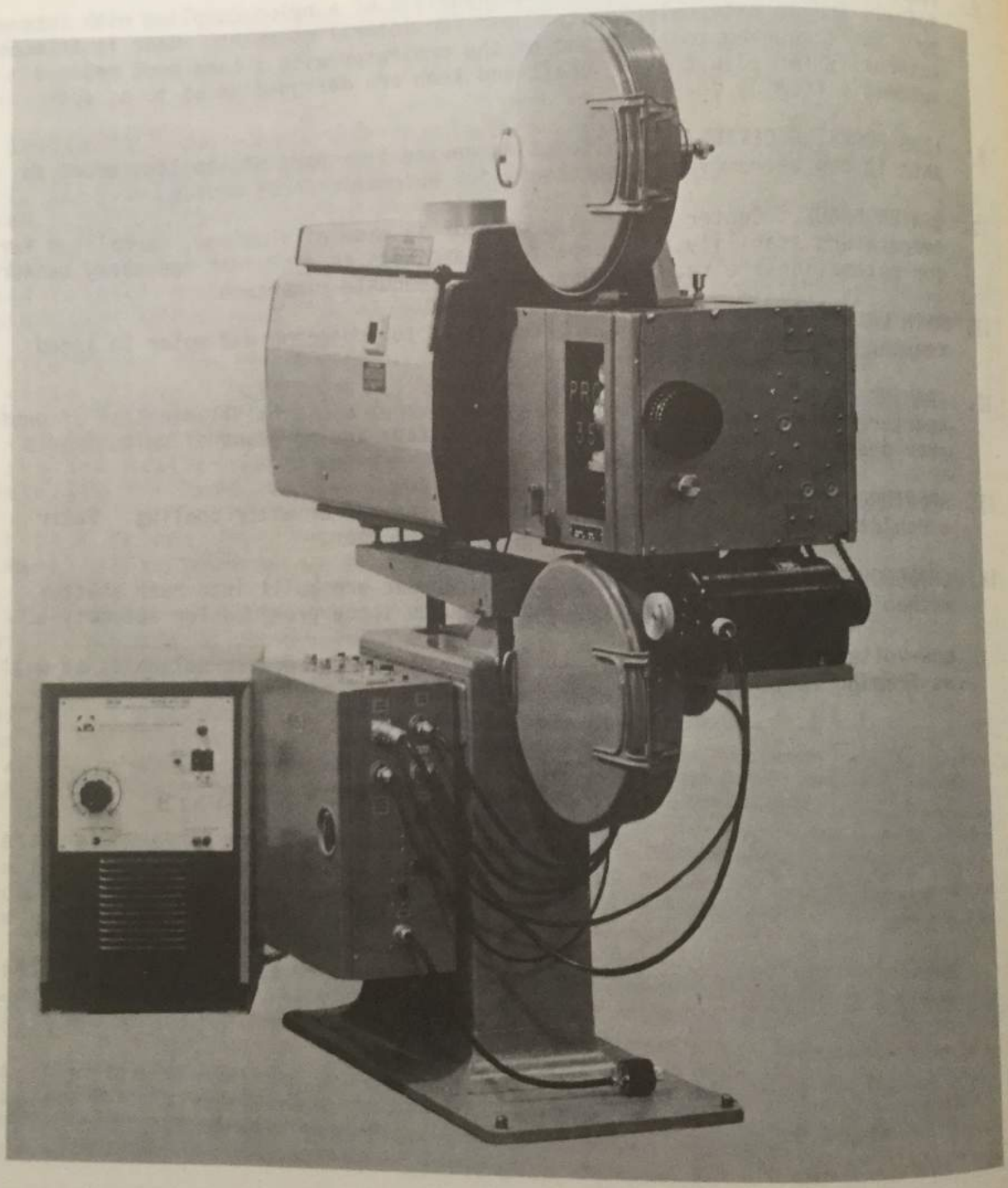


FIG. **1**

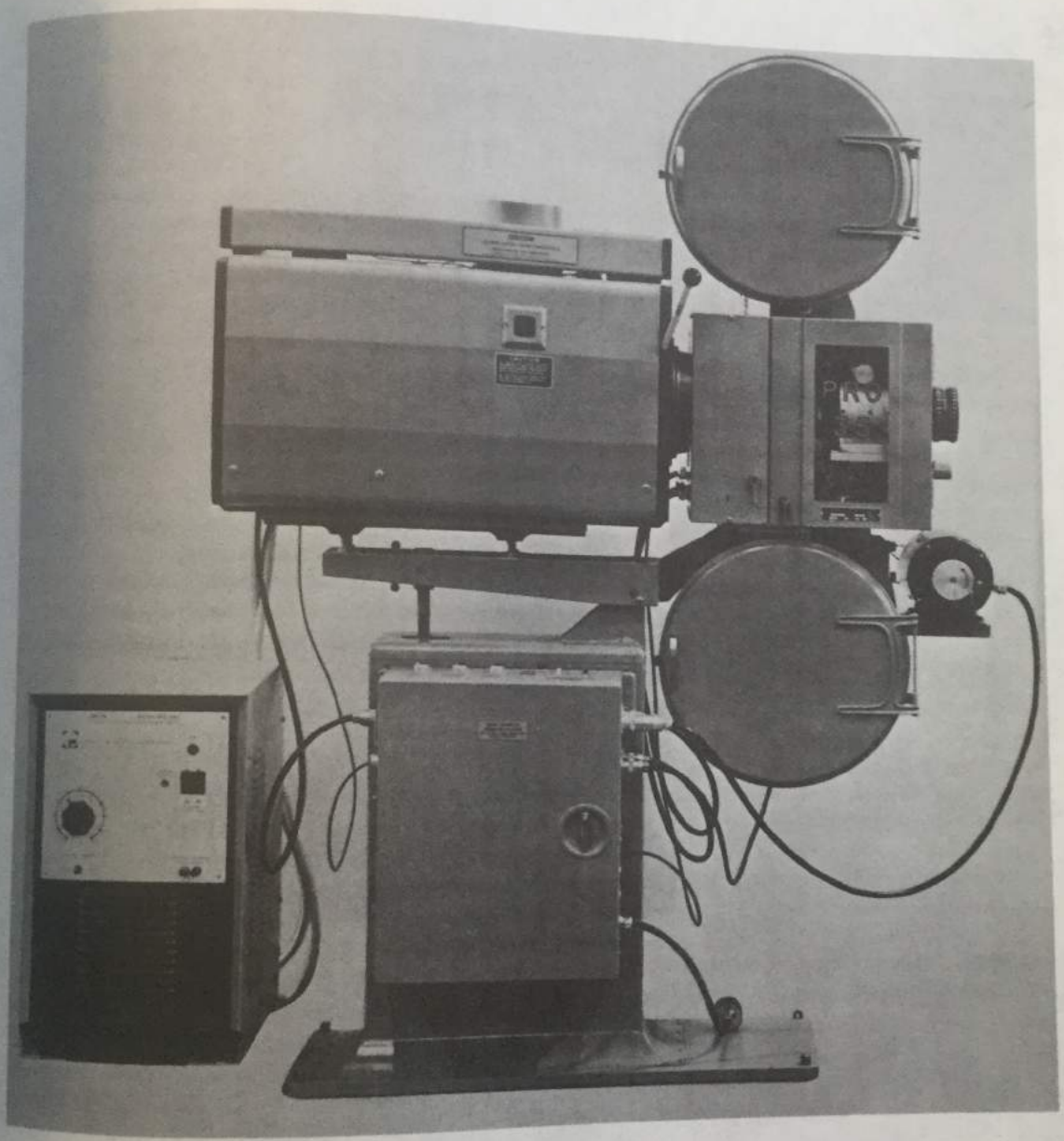


FIG. 2

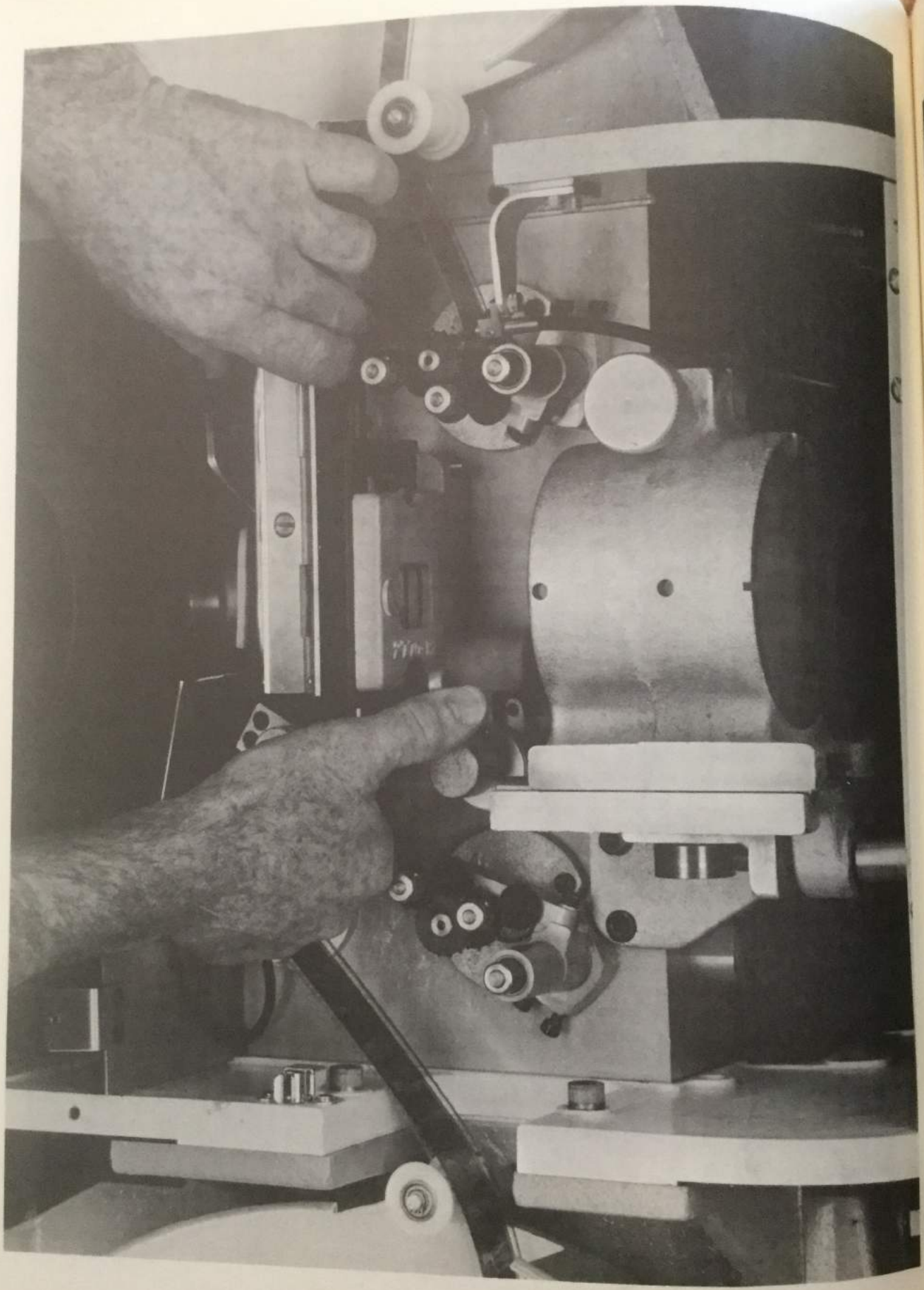


FIG. **3**

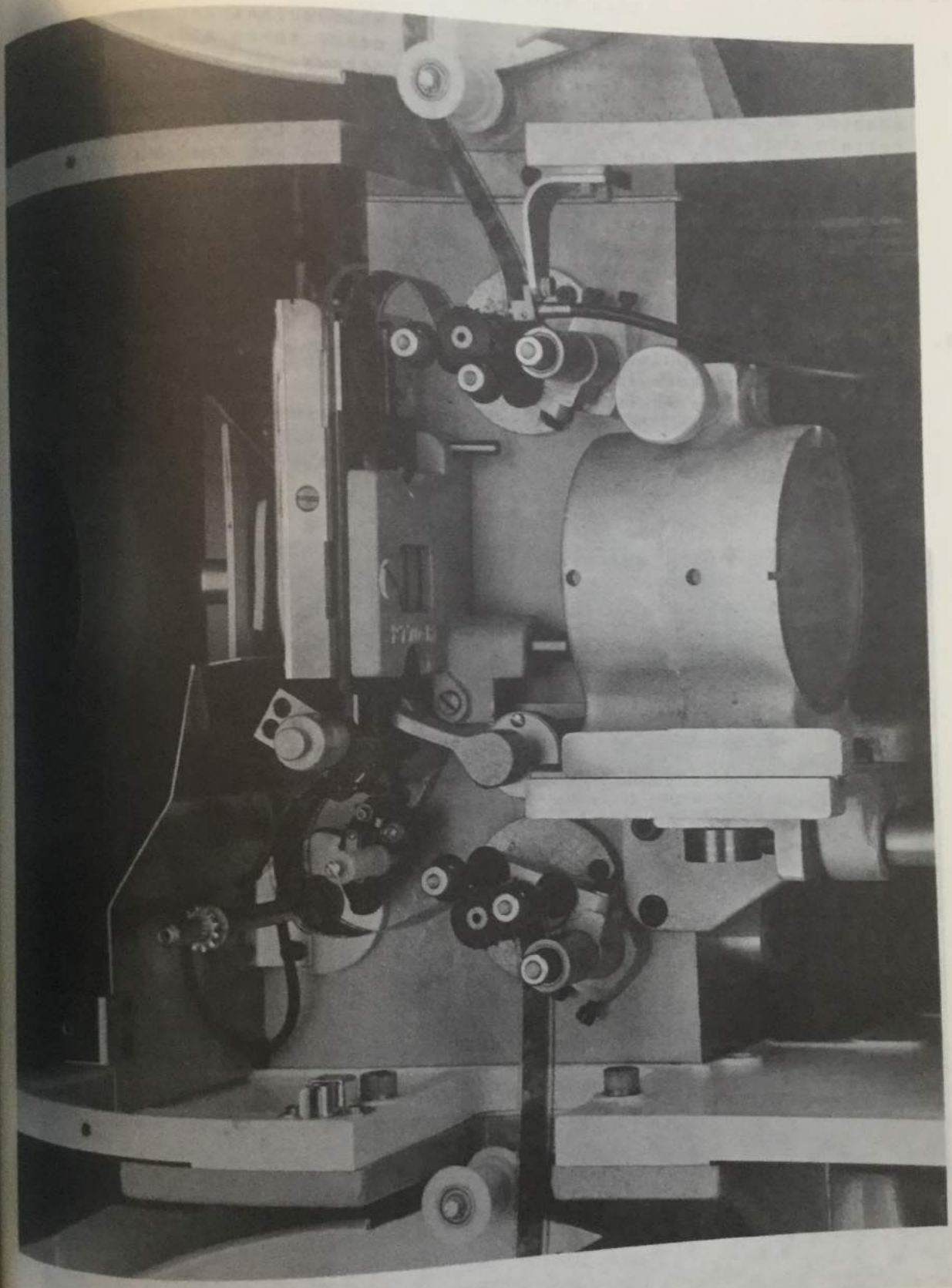


FIG. 4

TO INSTALL LENS

1. Each PRO-35 Projector is supplied with two lens adaptors (See Fig. 5). Insert lens adaptor in lens mount making certain that the pin on the lens adaptor fits into the guided slot in the lens mount. In this position, an Allen Set Screw will be in direct line with the hole in the lens mount so that lens can be anchored.

2. Focus picture on screen and when using anamorphics, make certain that picture is horizontal as well as in focus. When picture is completely focused, tighten lens anchor screw with Allen wrench supplied.

3. Remove lens and tighten the other three Allen anchoring screws.

4. Repeat this procedure for Wide Screen lens making certain that you do not disturb lens focus knob.

5. From this point on, going from Wide Screen to Cinemascope or reverse, is a simple matter inasmuch as either lens will be in focus as soon as the pin in the lens adaptor fits into the slot of the lens mount.

6. The lens mount should be in a center position when first installing lens.

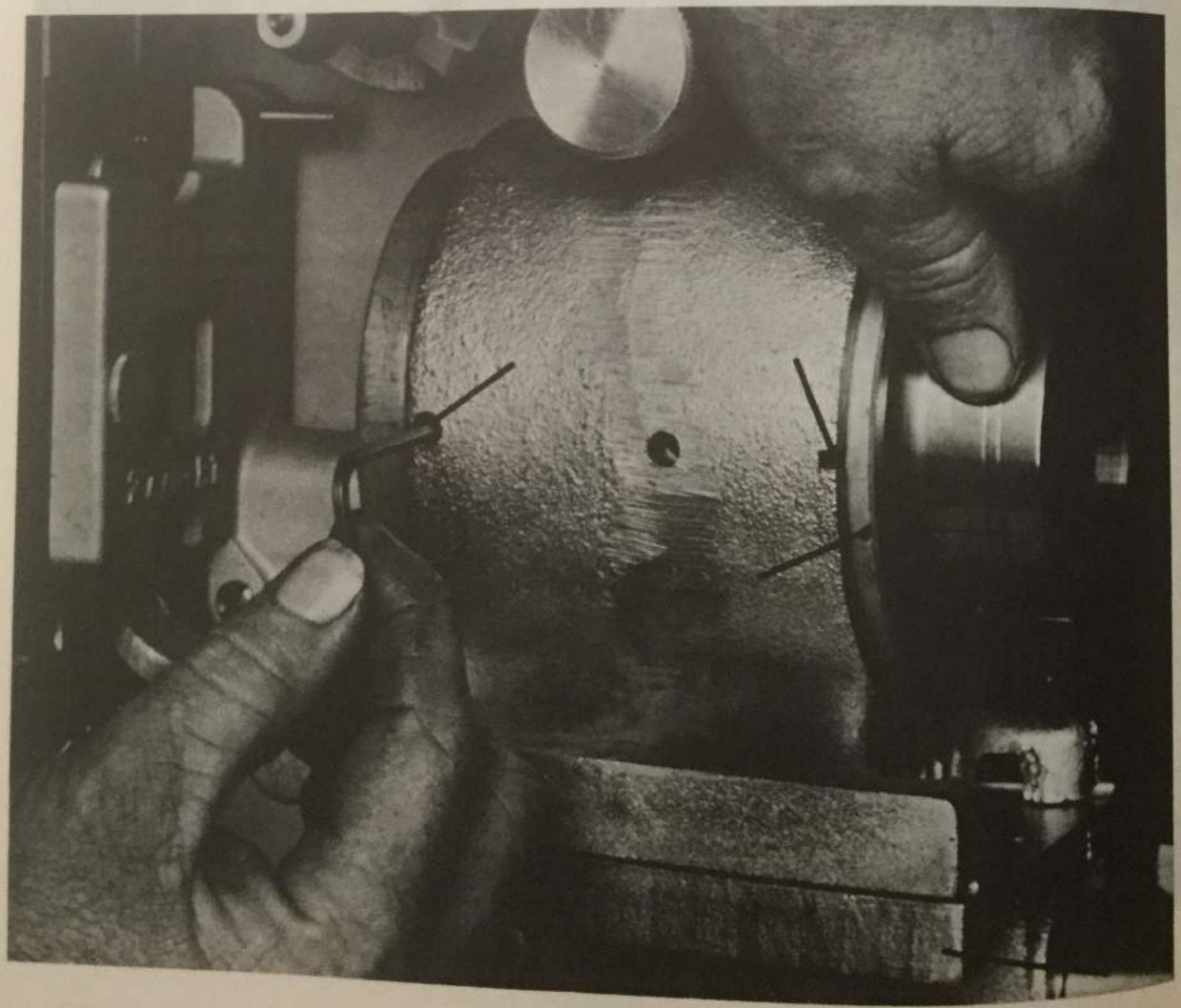


FIG. 5

FILM TRAP AND FILM GATE

Film trap and gate are easily removable inasmuch as the gate is an integral part of the trap. It should be removed occasionally and cleaned thoroughly. Easy access makes it possible to clean the trap and gate with a toothbrush at regular intervals. To remove trap and gate, simply loosen Screw No. 2780, Fig. ❻ and pull forward.

Film gate is easily removed with trap anchored or free. To remove gate without removing trap, loosen Knurled Screw No. 2837, Fig. ❼, and slide gate out. Gate is located in a milled slot of the gate mounting assembly No. 2770, Fig. ❼. To replace gate, place on gate carrying bracket, insert into milled slot and re-tighten Set Screw No. 2837, Fig. ❼.

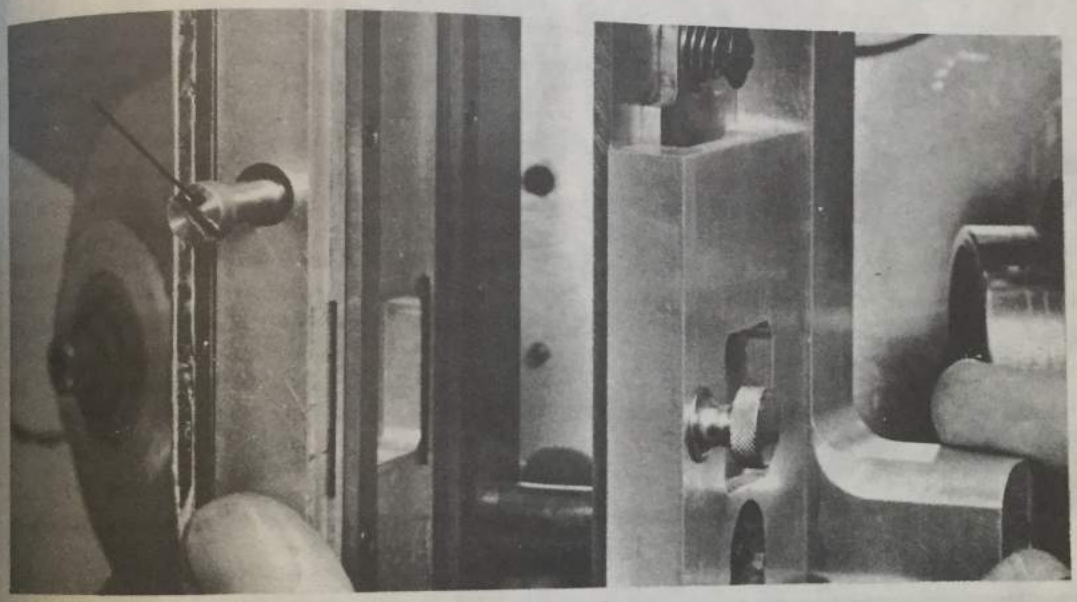


FIG. 6

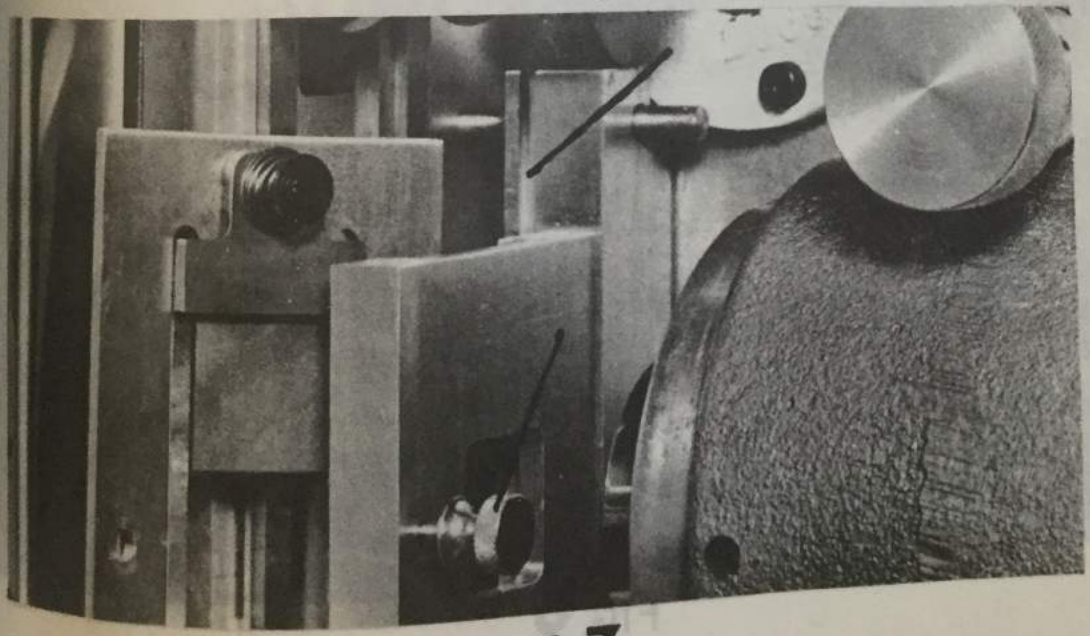


FIG. 7

The shutter blade and framing lamp are accessible through the left door on the film side of the projector. In order to afford maximum protection of anyone accidentally touching a shutter blade, case is designed so that the framing handle must be removed with an Allen Wrench before access can be gained to the shutter compartment. (See Fig. 8). In order to keep shutter blade at a minimum noise level, shutter blade is mounted on an isolation coupling No. 2713, Fig. 9. Ample room has been left in the shutter compartment for ease in servicing.

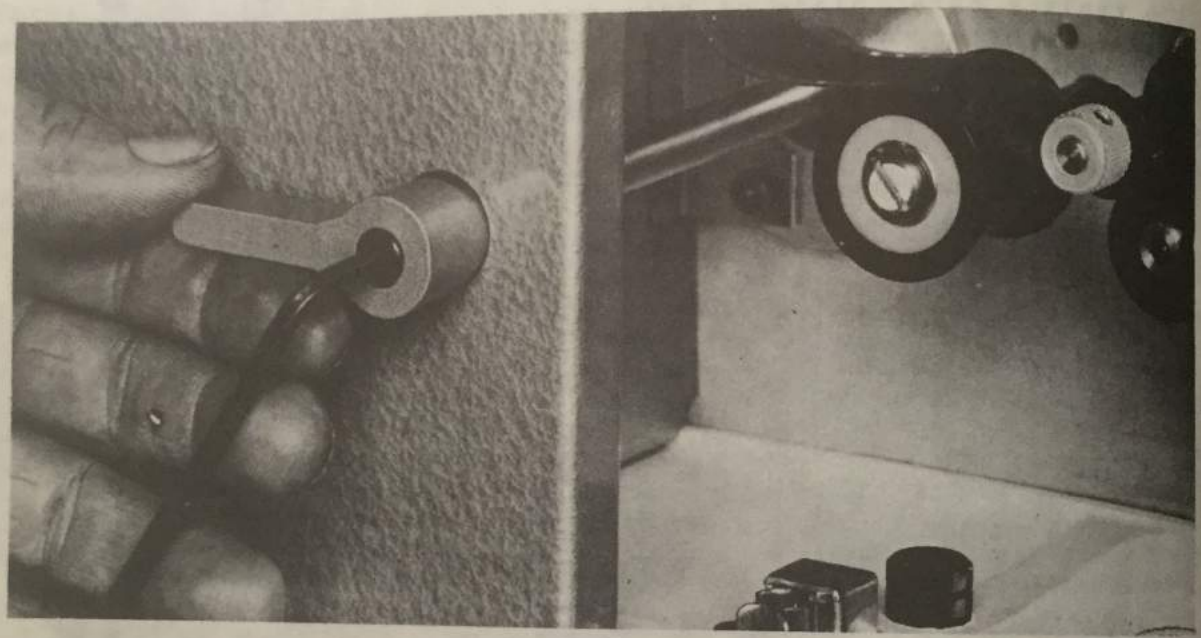


FIG. 8

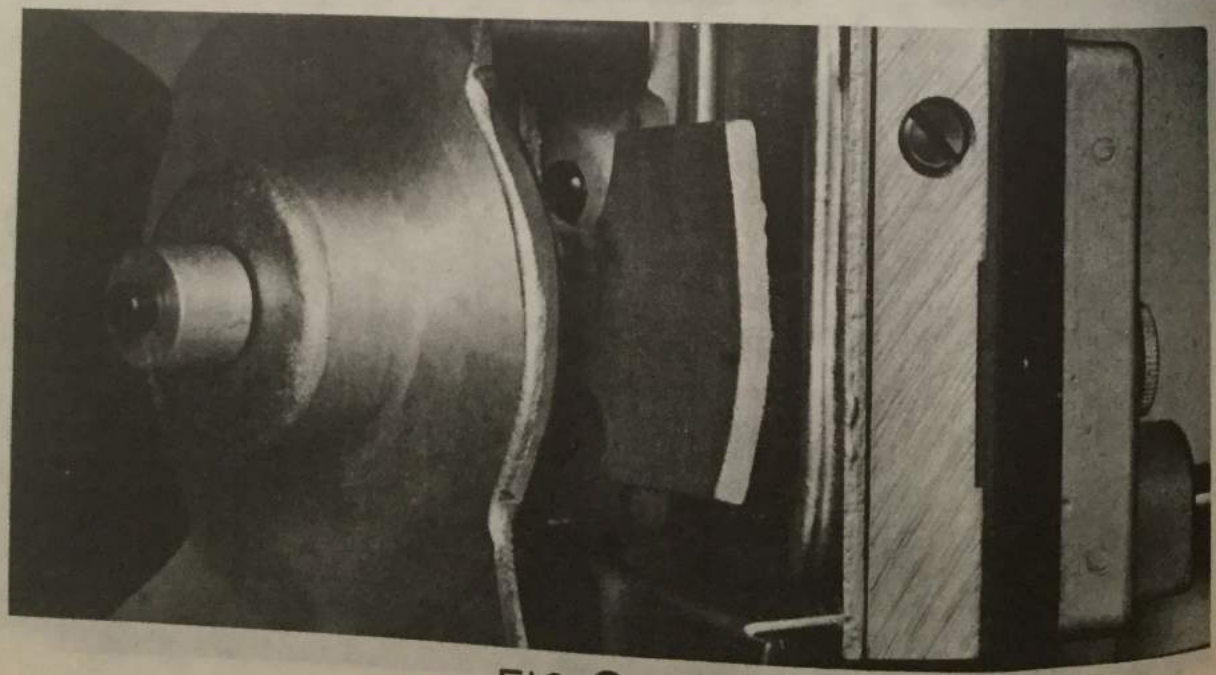
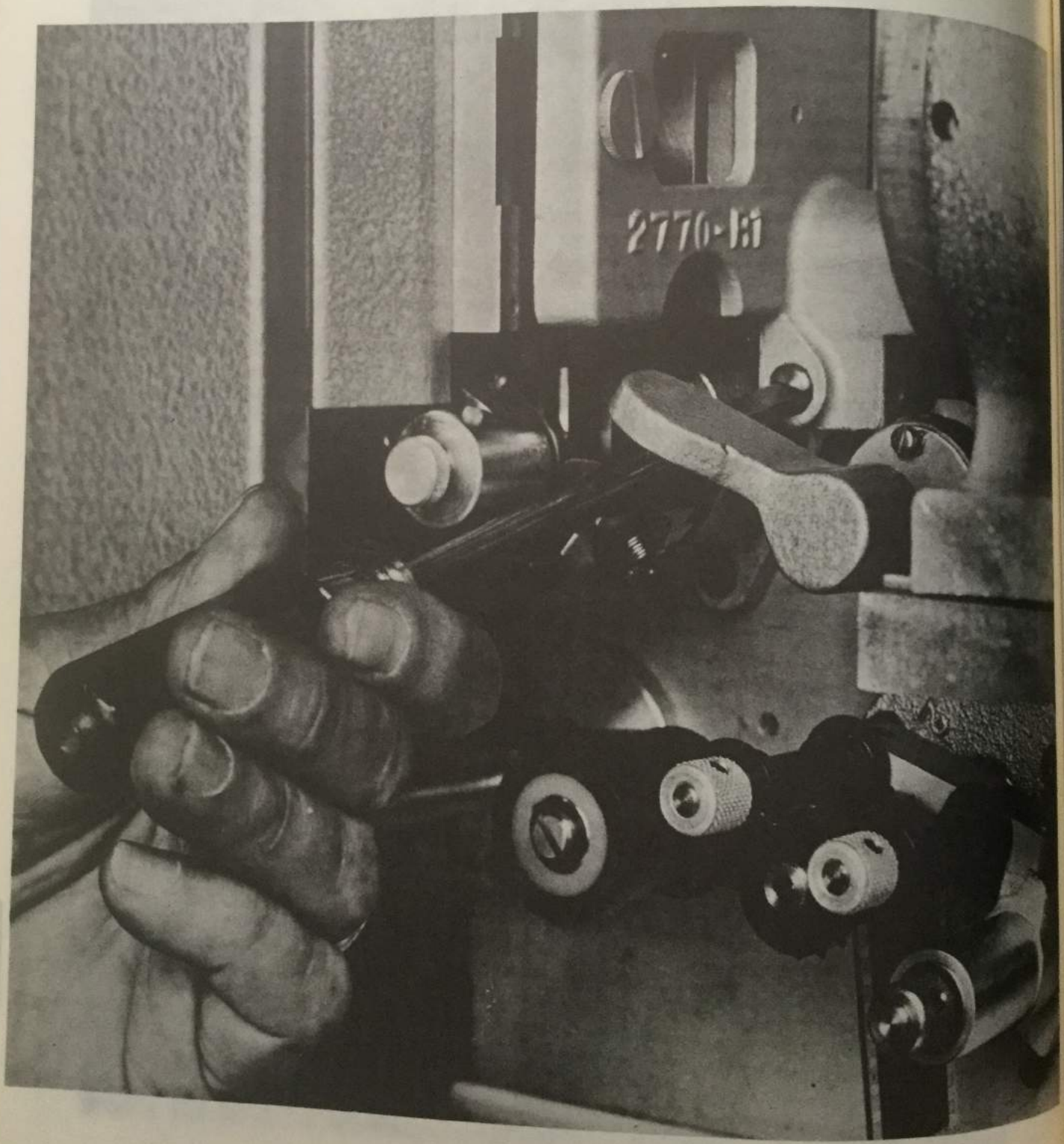


FIG. 9

FIG. 10

ECCENTRIC SHAFT ADJUSTMENT

Eccentric shaft will need adjustment when differences in film thickness changes the pressure on pressure pads. Turn eccentric shaft, slotted end, clockwise or counter clockwise for adjusting. This adjustment is done as machine is running.



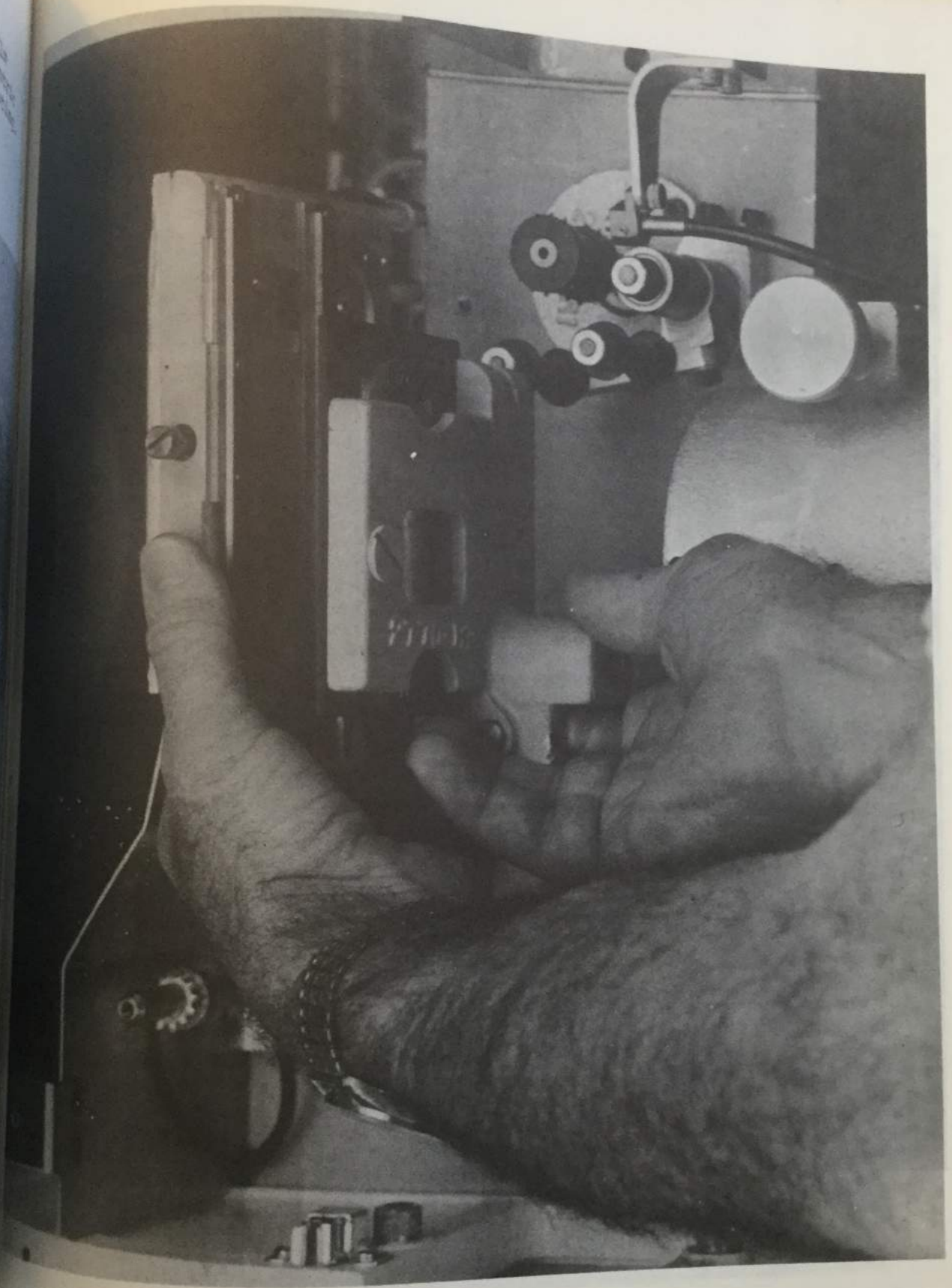


FIG. **11**

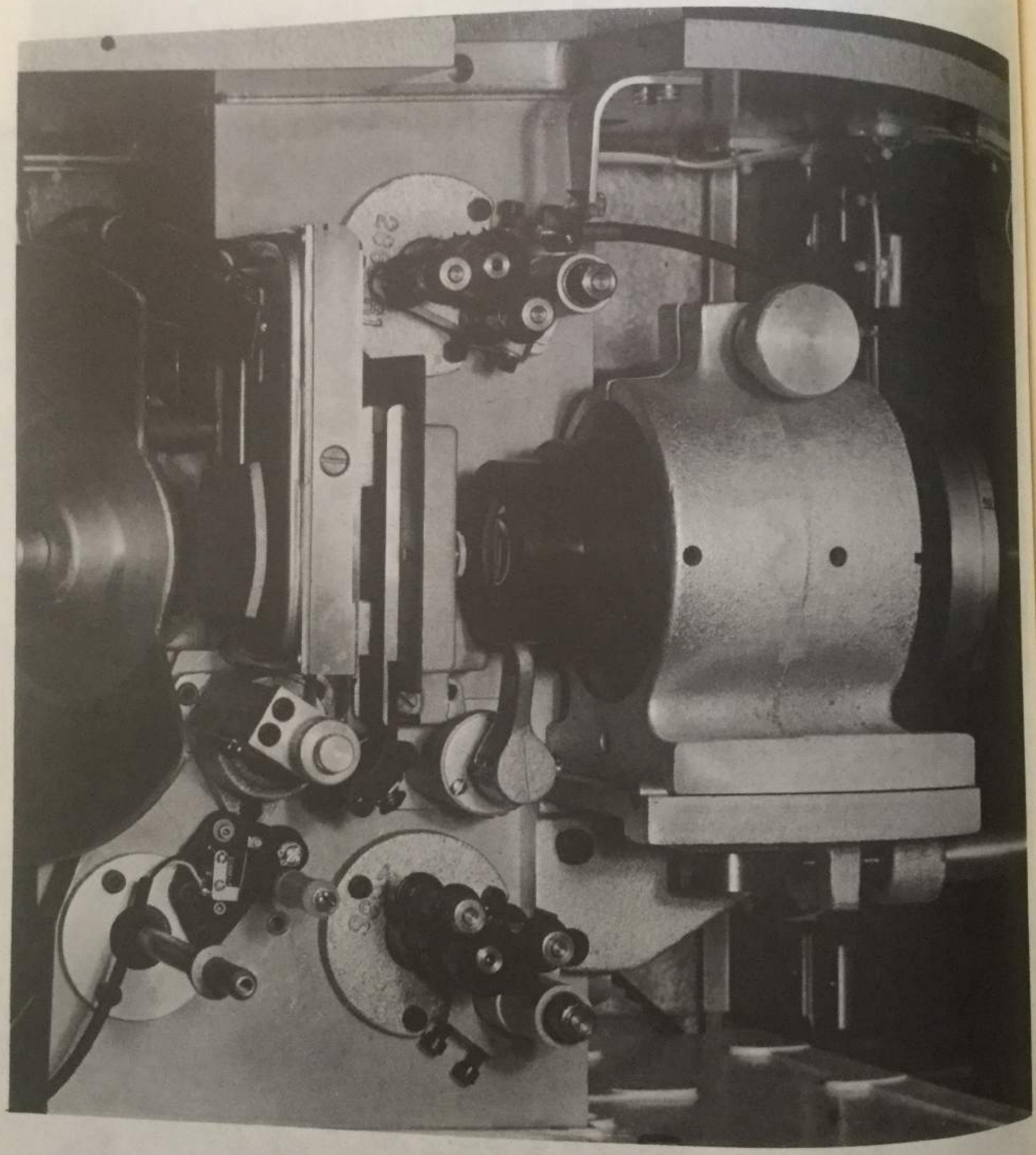


FIG. **12**

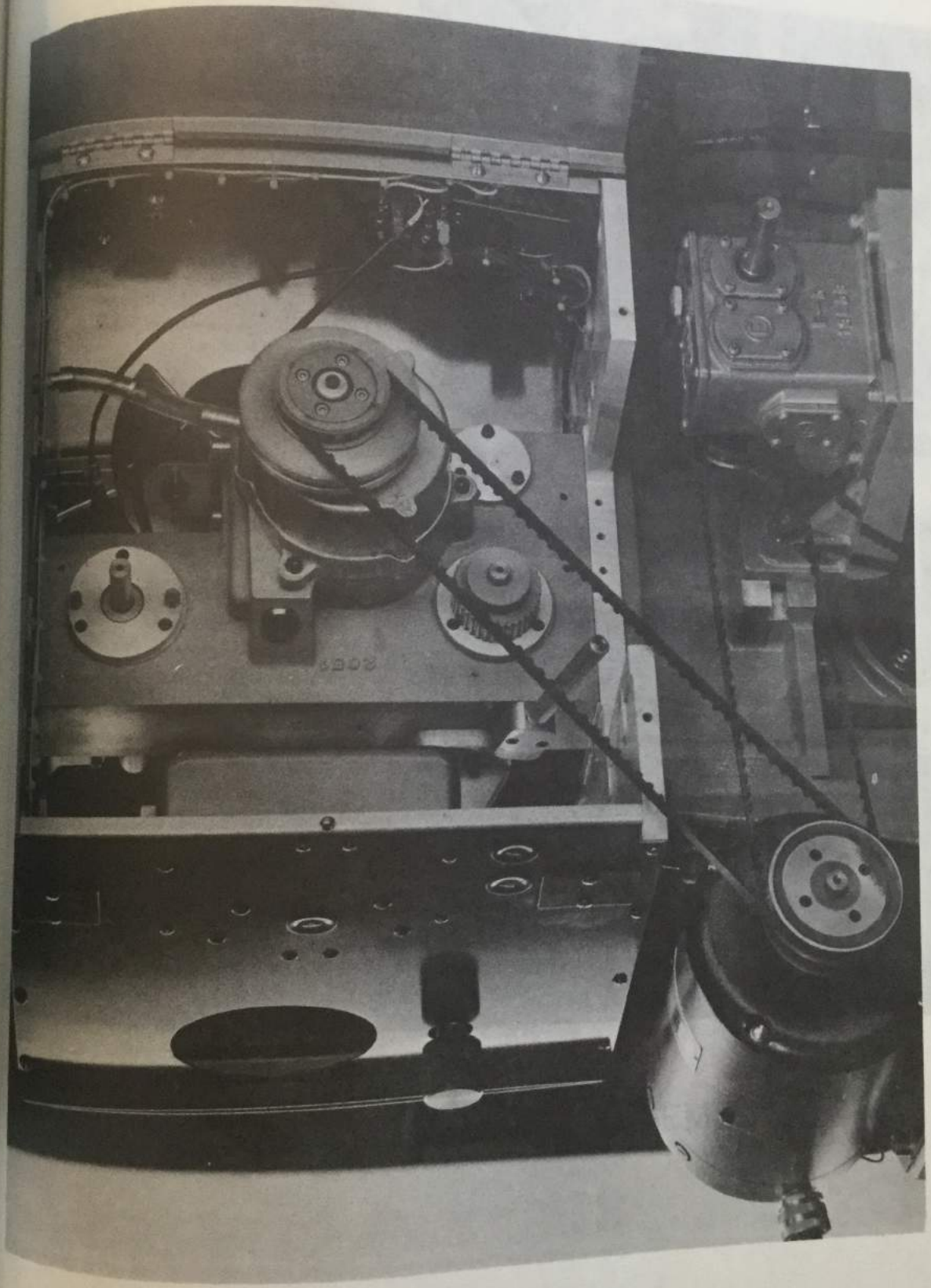


FIG. **13**

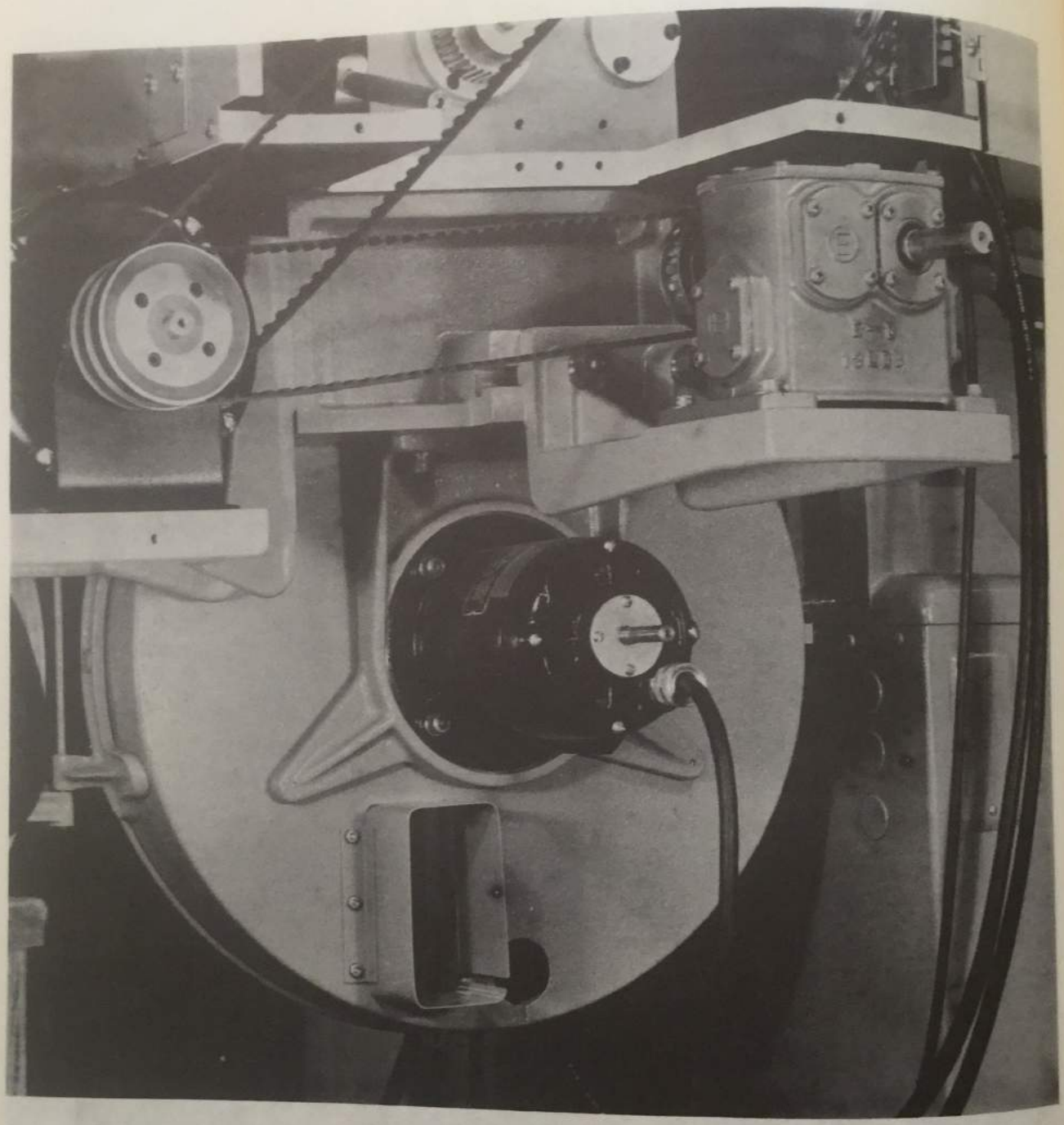
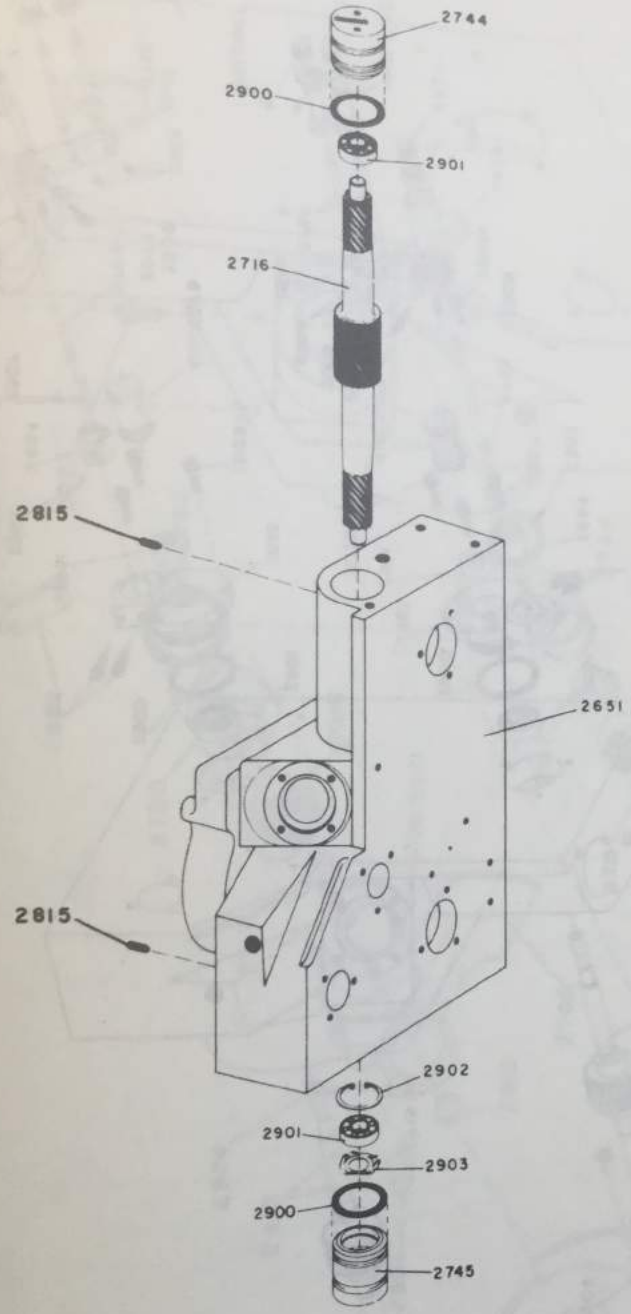
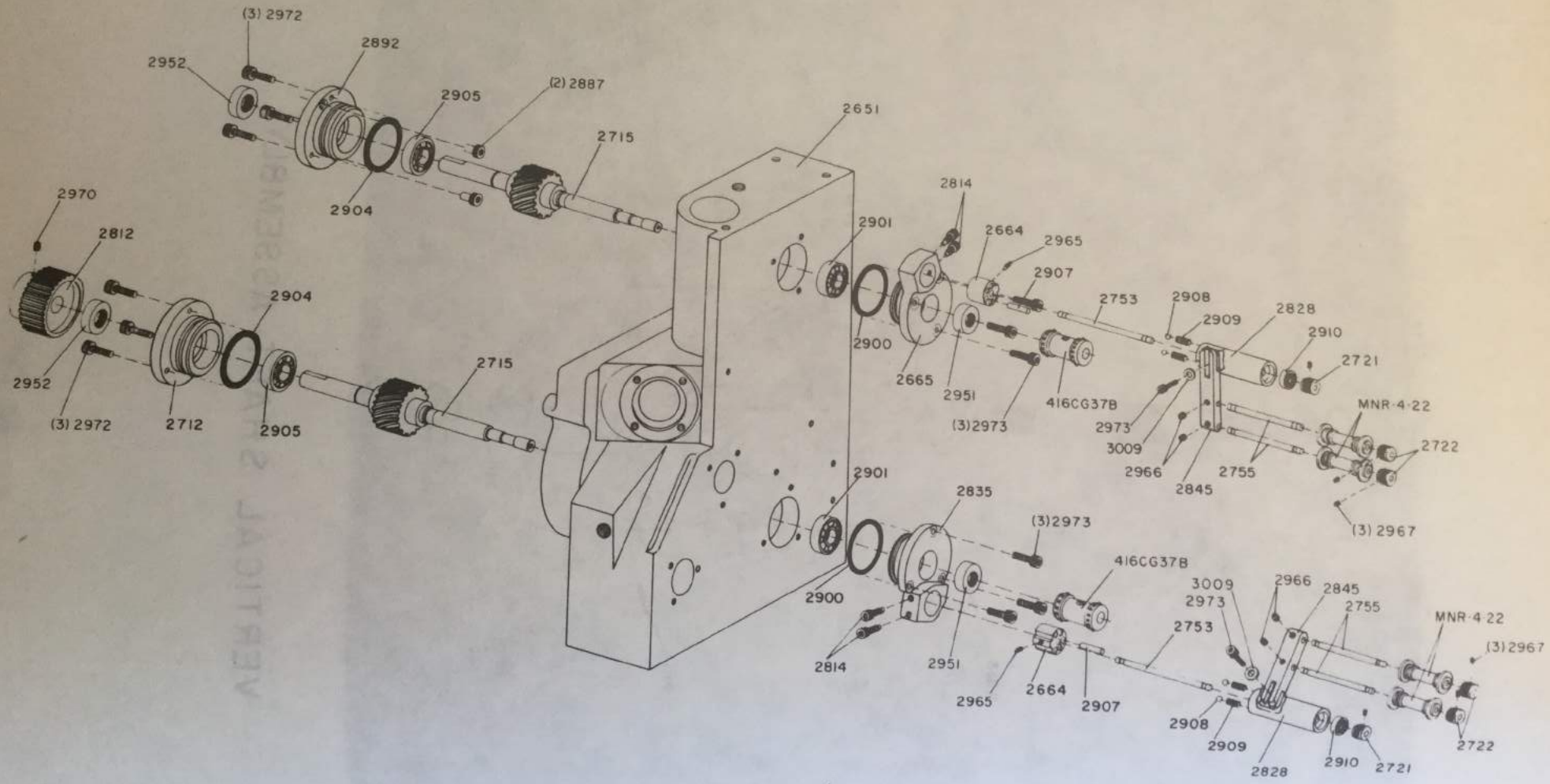


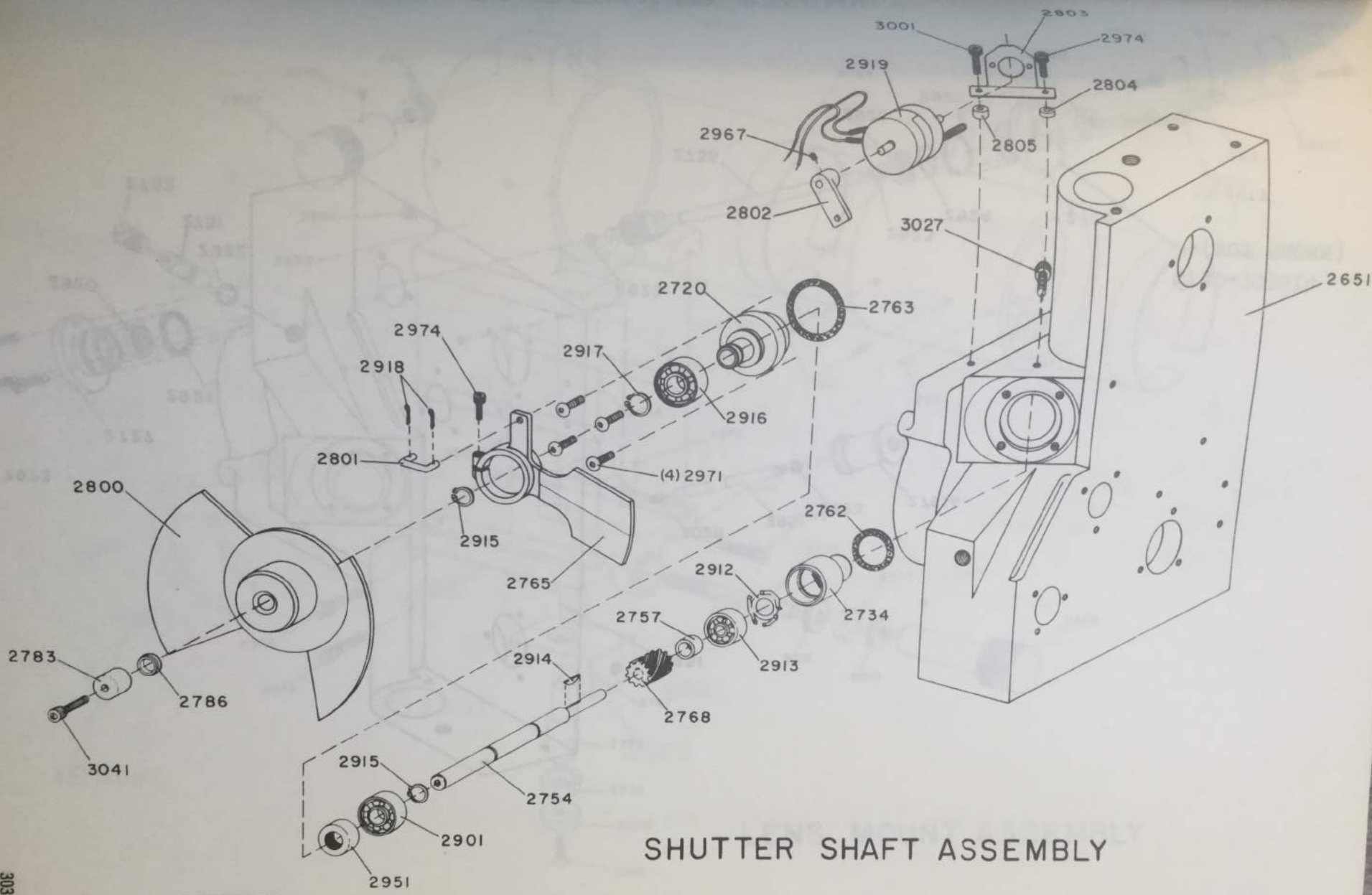
FIG. **14**



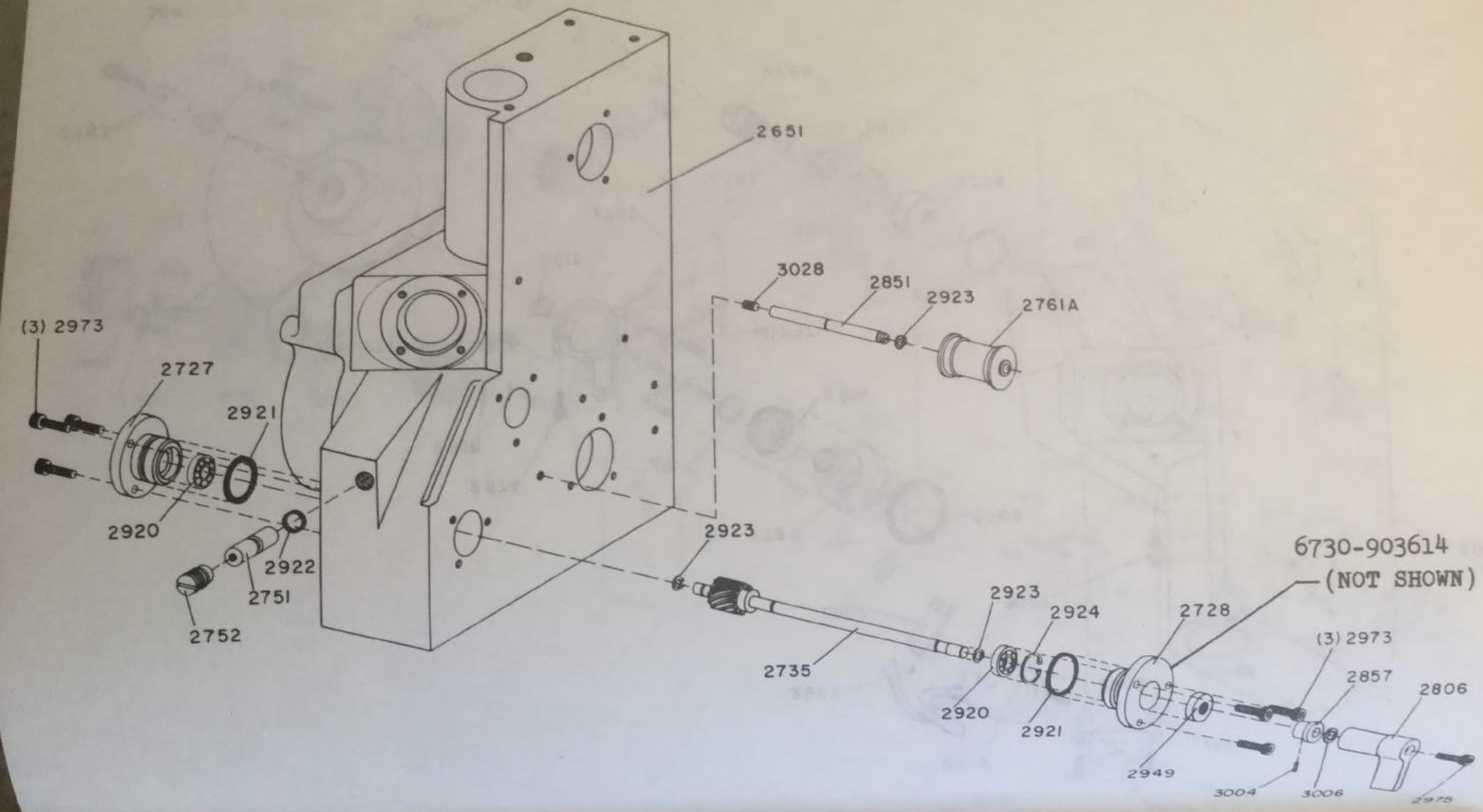
VERTICAL SHAFT ASSEMBLY



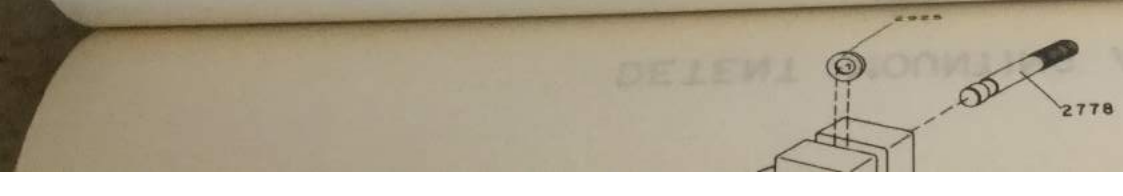
HORIZONTAL UPPER & LOWER SHAFT ASSEMBLY

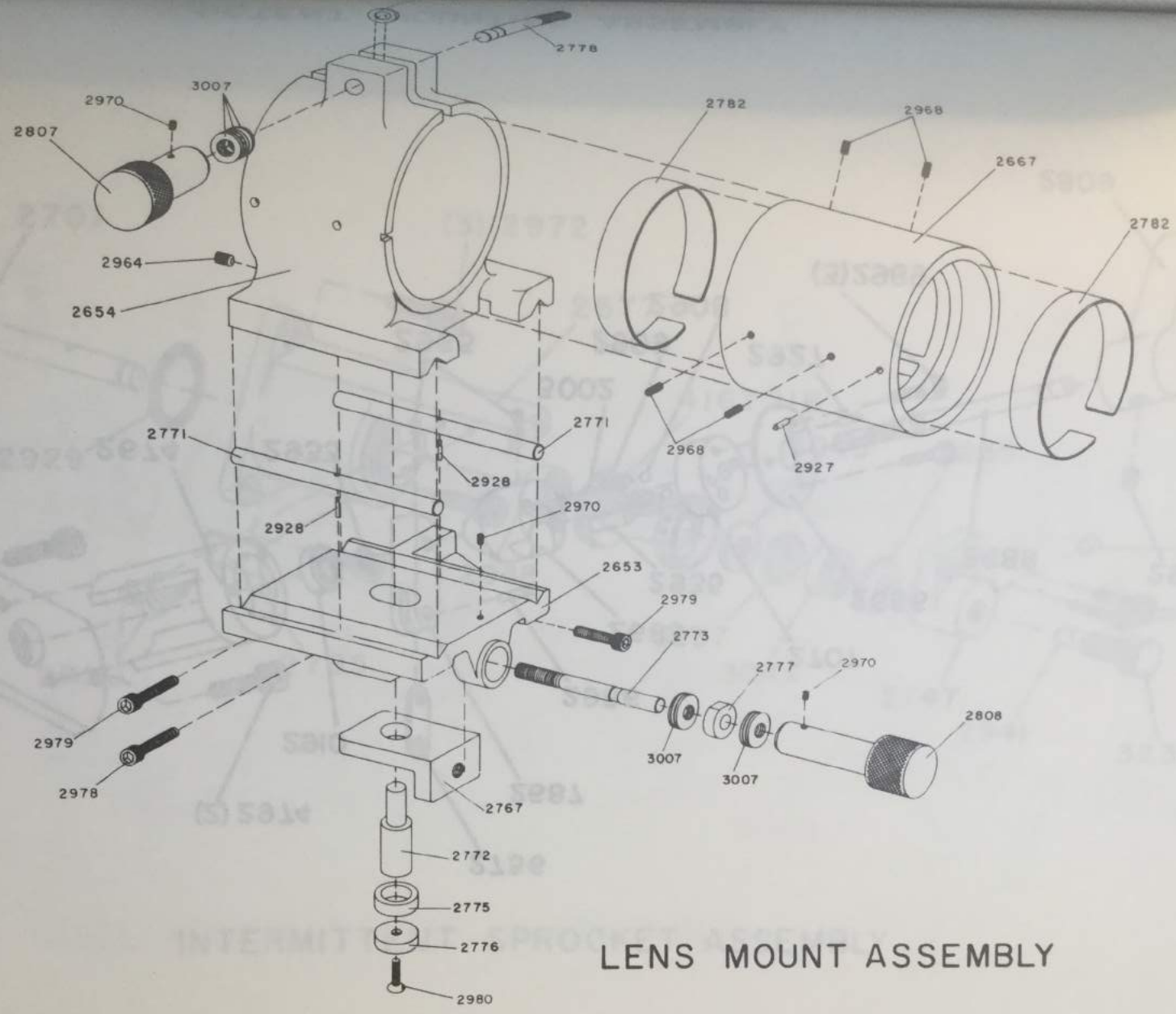


SHUTTER SHAFT ASSEMBLY

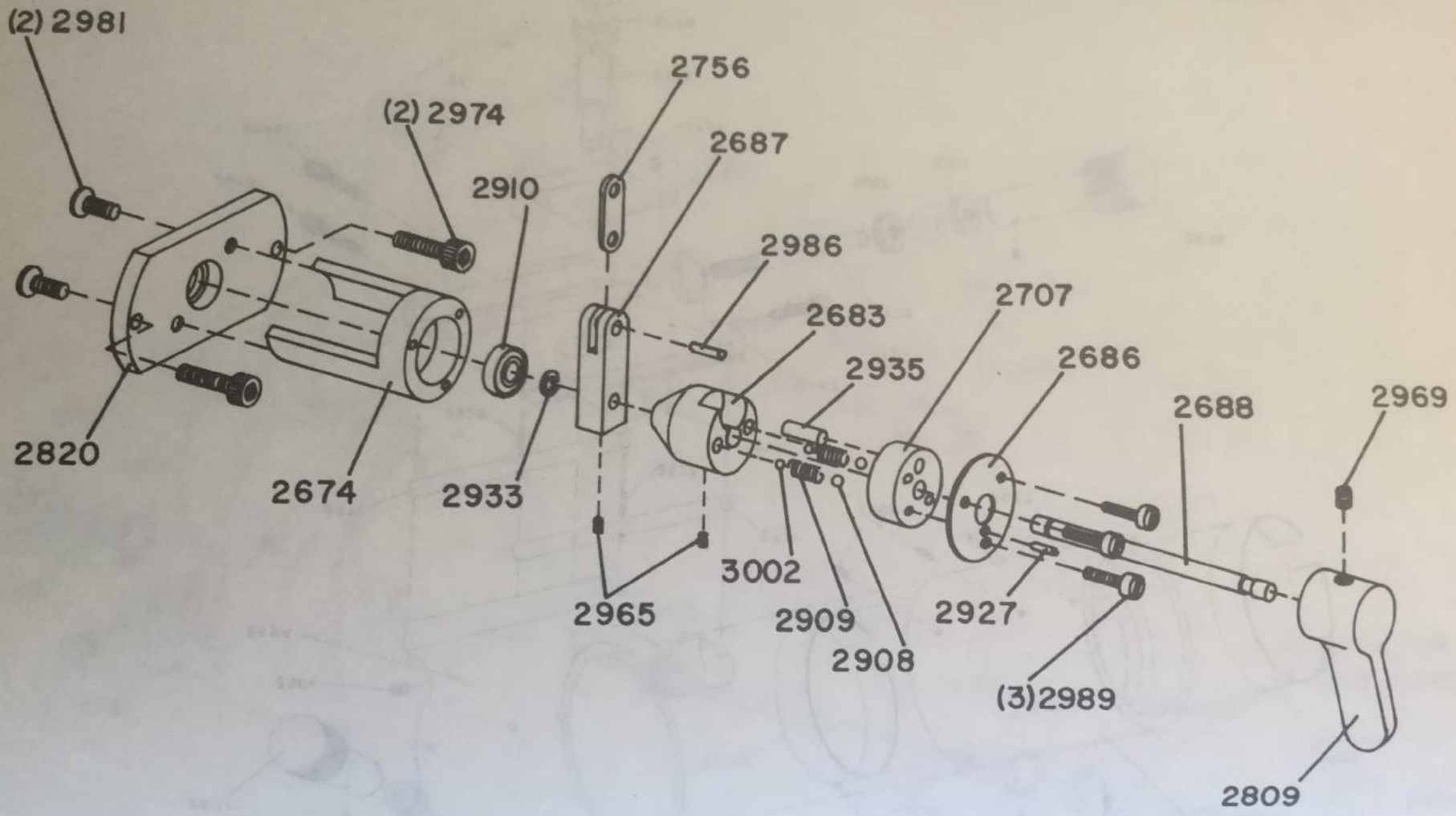


HORIZONTAL FRAMING ASSEMBLY

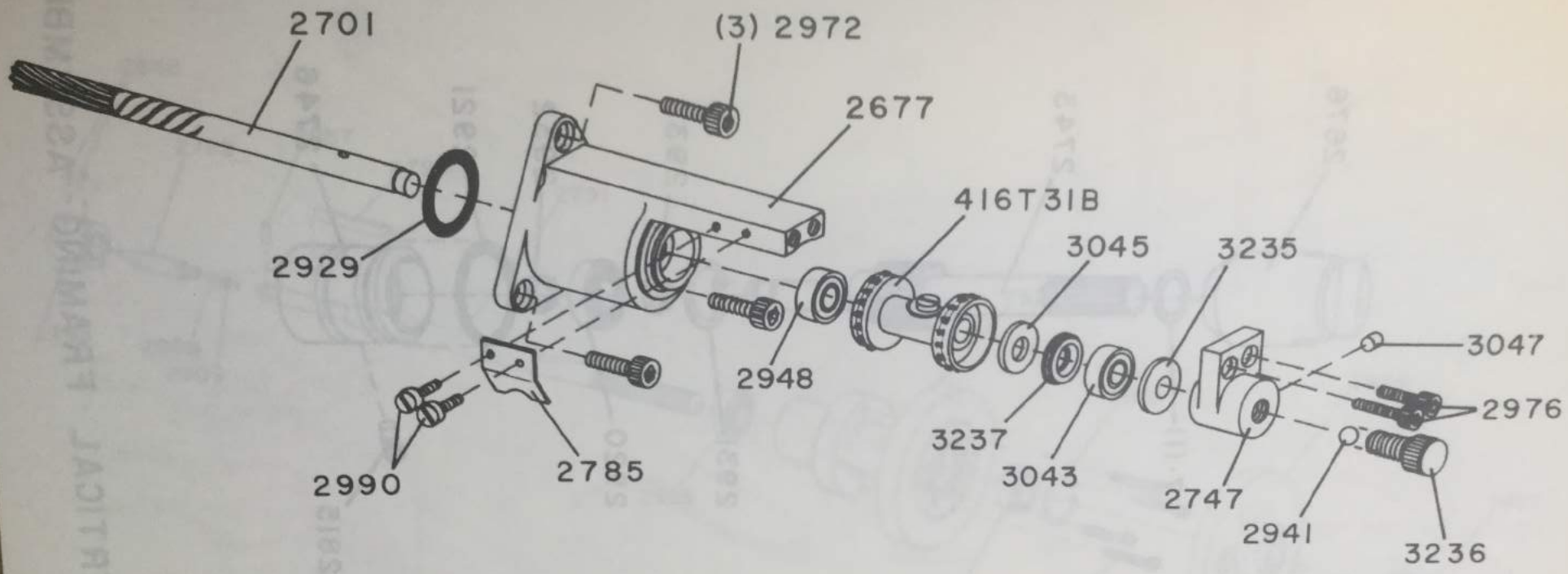




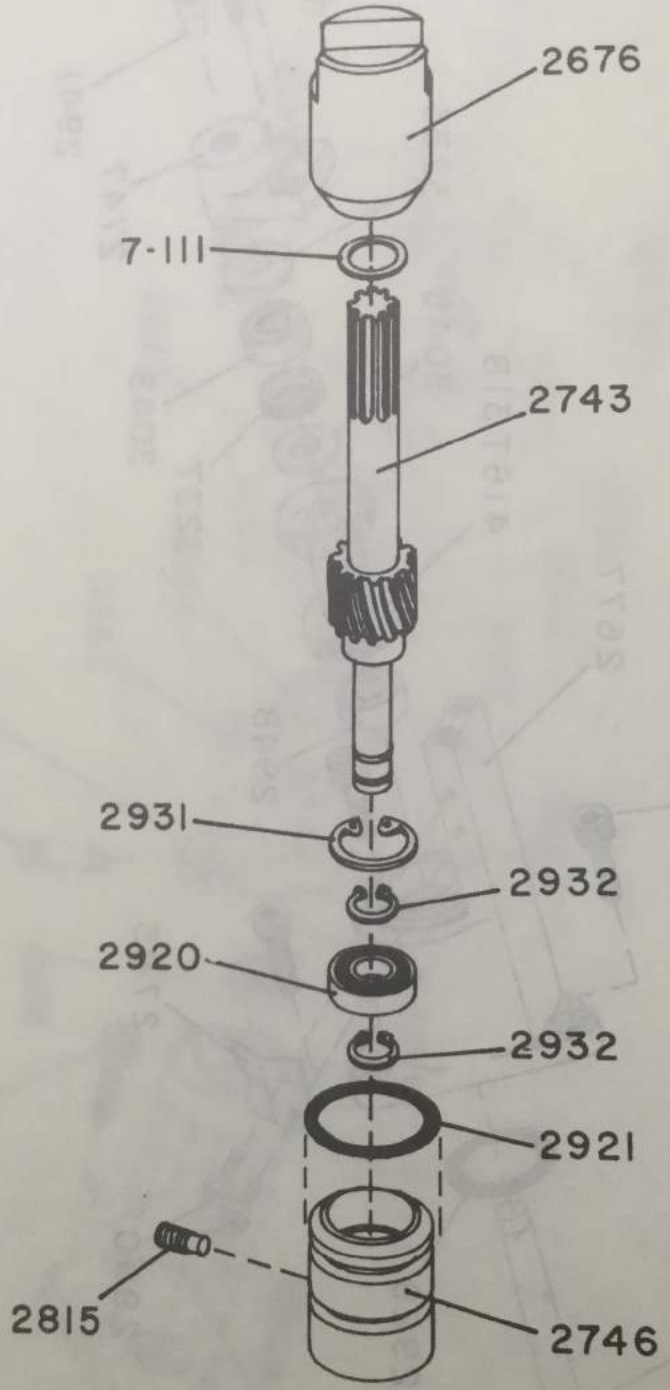
LENS MOUNT ASSEMBLY



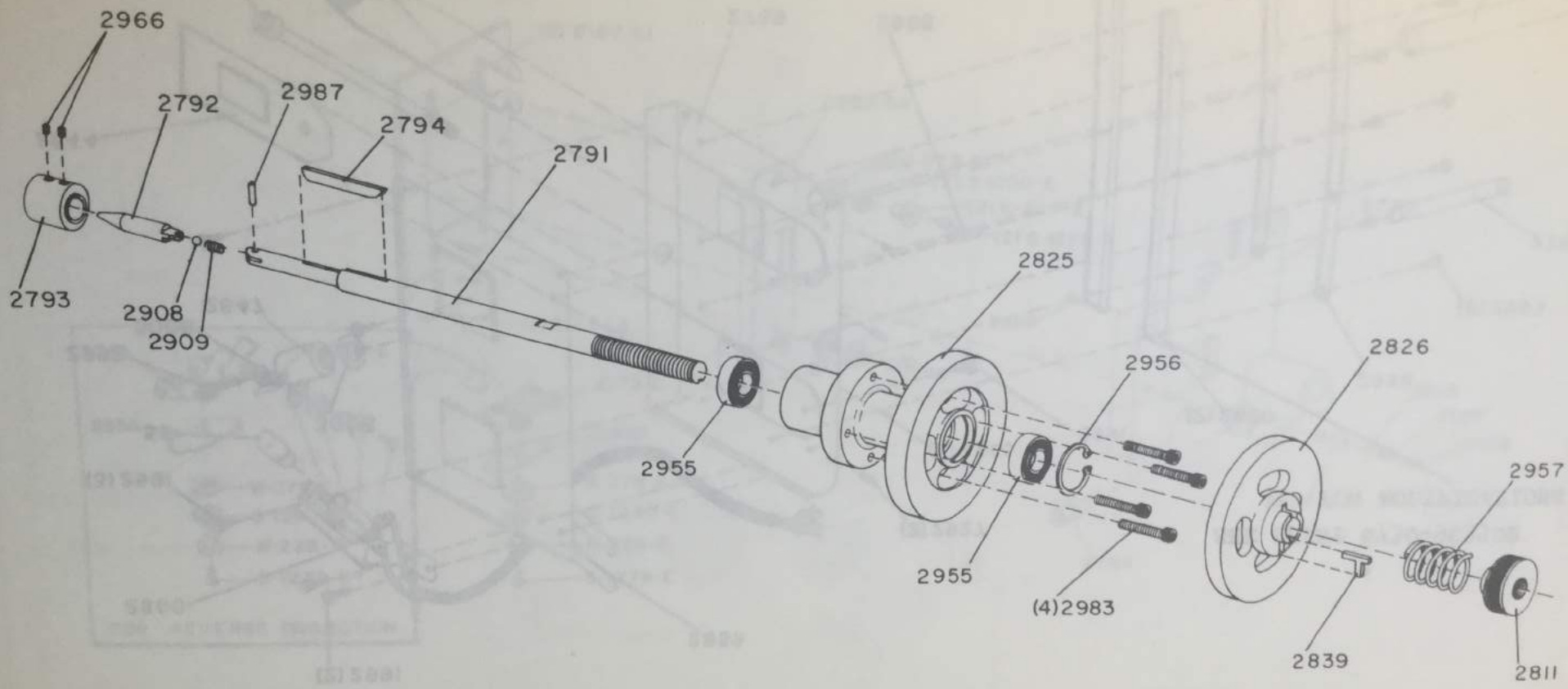
DETENT MOUNTING ASSEMBLY



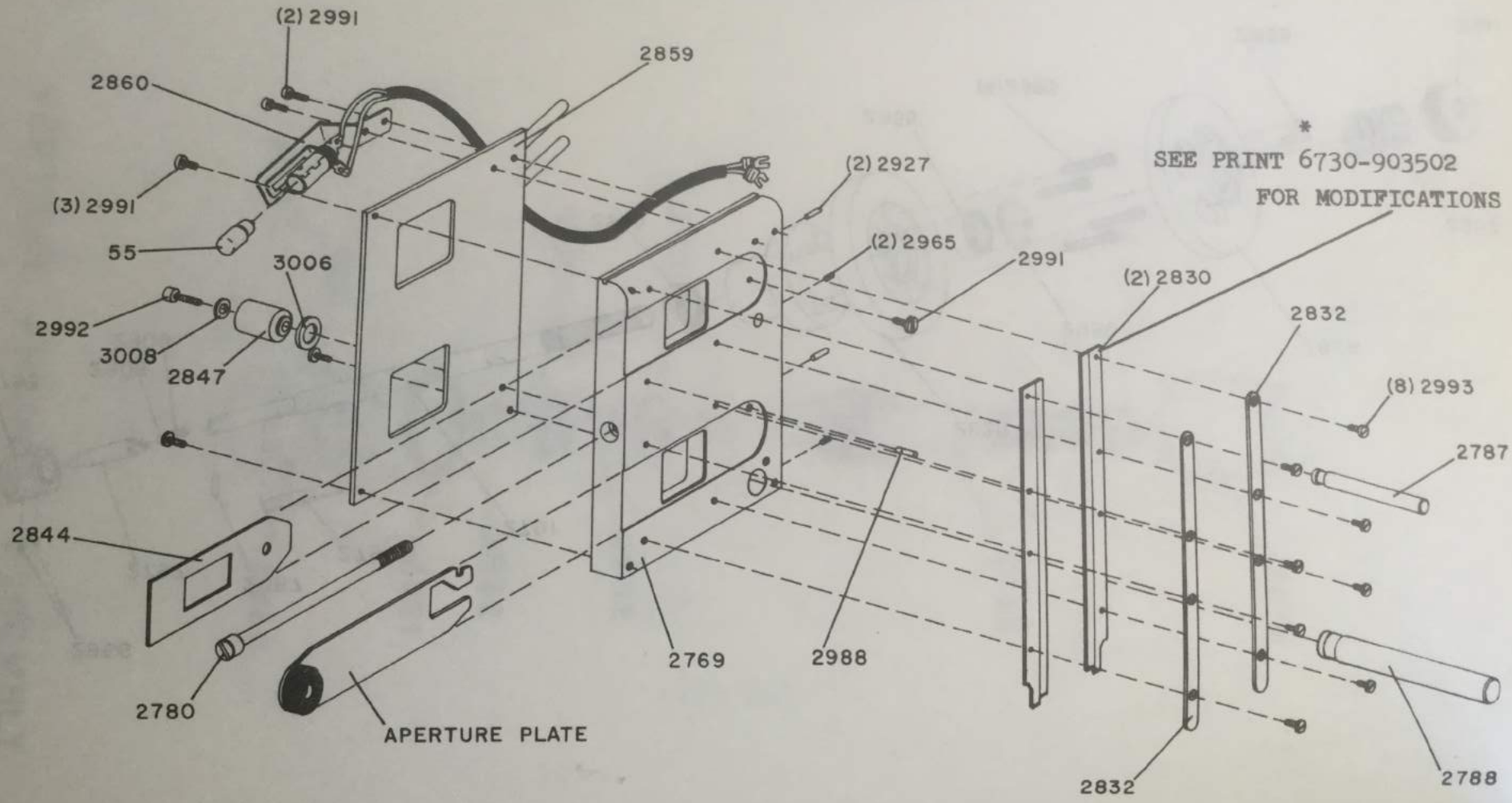
INTERMITTENT SPROCKET ASSEMBLY



VERTICAL FRAMING ASSEMBLY



REEL HOLD BACK CLUTCH ASSEMBLY

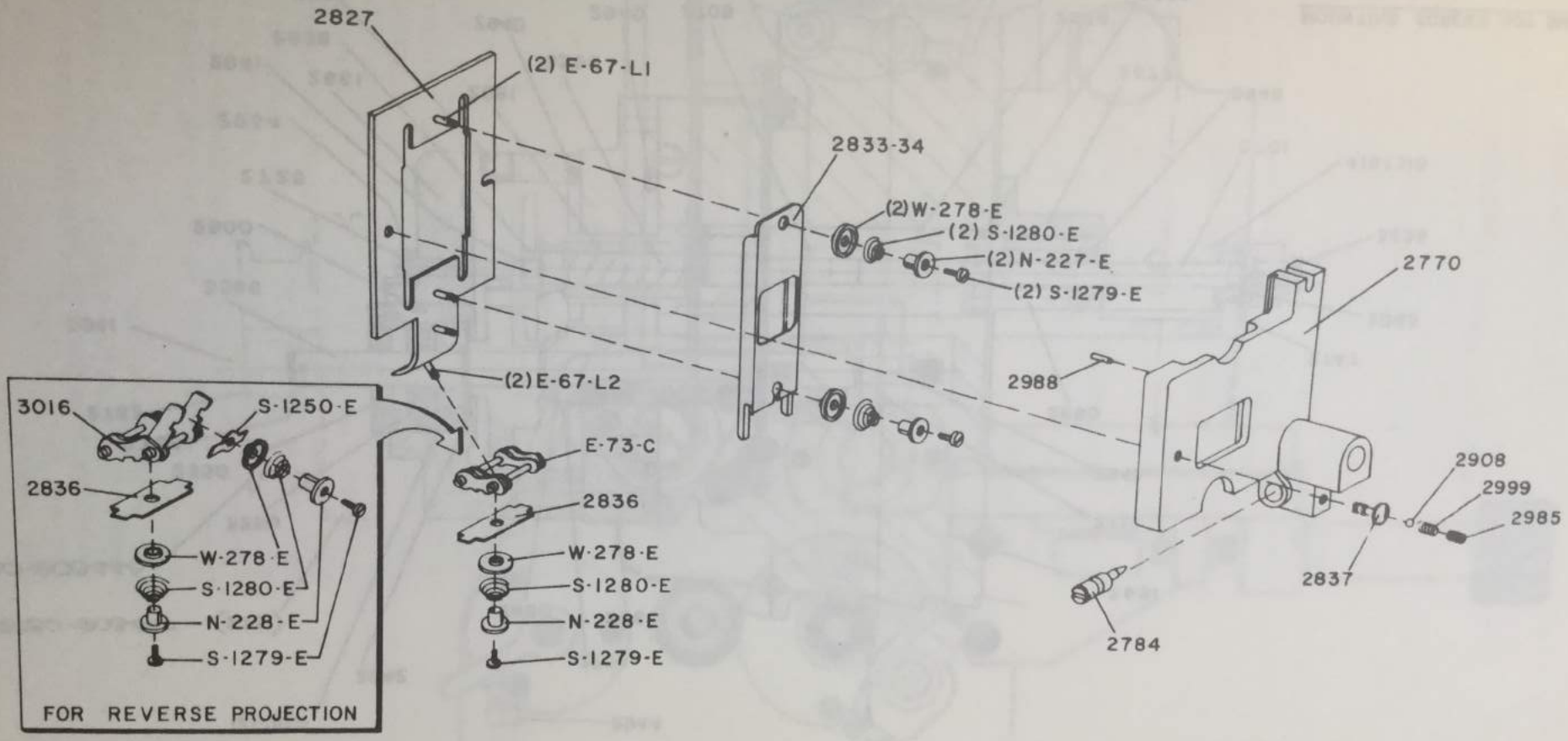


*
SEE PRINT 6730-903502
FOR MODIFICATIONS

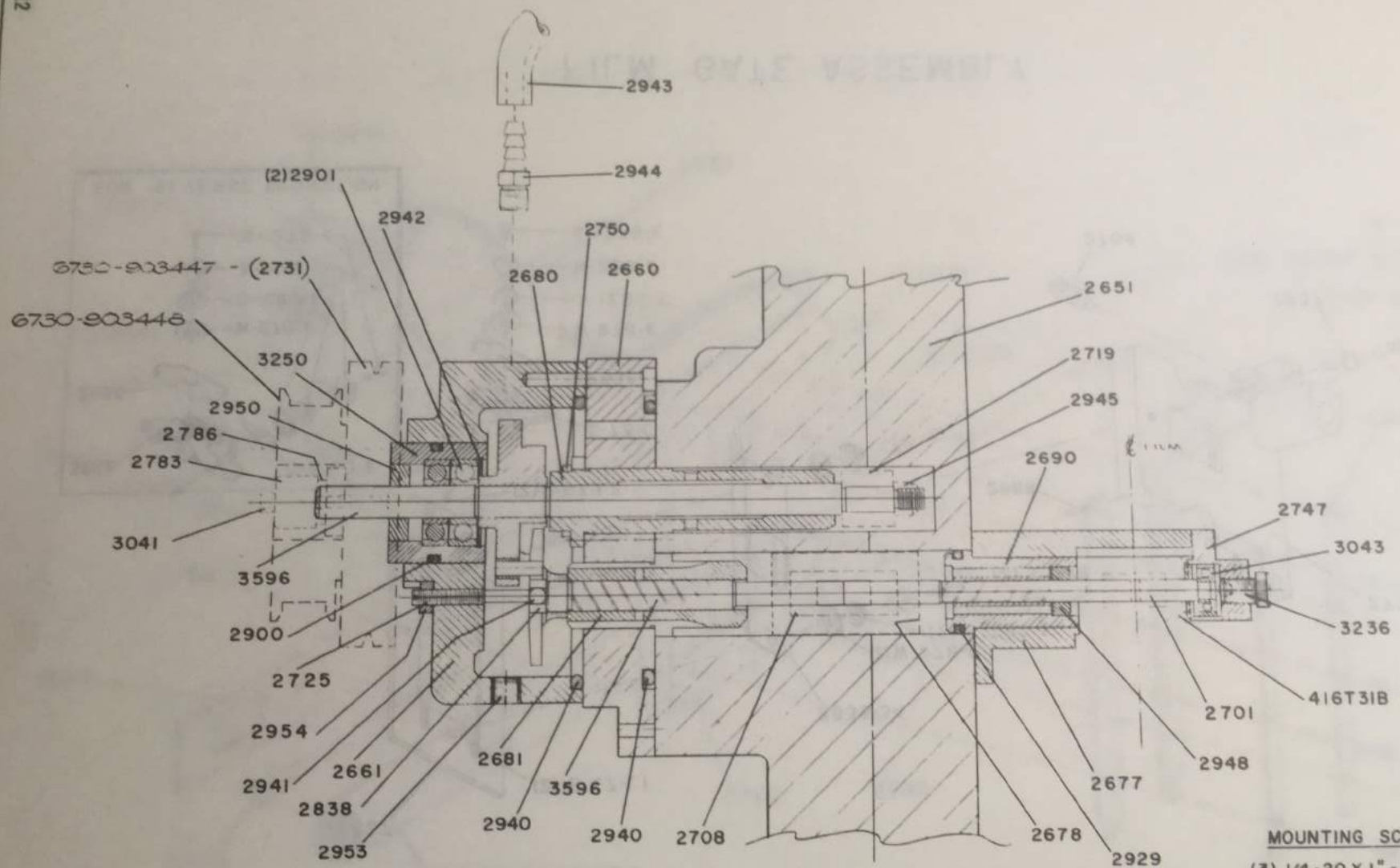
* *INCORPORATED IN MANUAL*

FILM TRAP ASSEMBLY

* INCORPORATED IN MANUAL



FILM GATE ASSEMBLY



MOUNTING SCREWS NOT SHOWN

(3) 1/4-20 X 1" - PARTS 2660 TO 2651

(3) 10-32 X 1 1/4" - PARTS 2661 TO 2660

(1) 10-32 X 1/2" - PARTS 2750 TO 2660

BALLANTYNE of OMAHA, INC.

1712 JACKSON STREET TELEPHONE 342-4444 OMAHA, NEBRASKA

INTERMITTENT ASSEMBLY

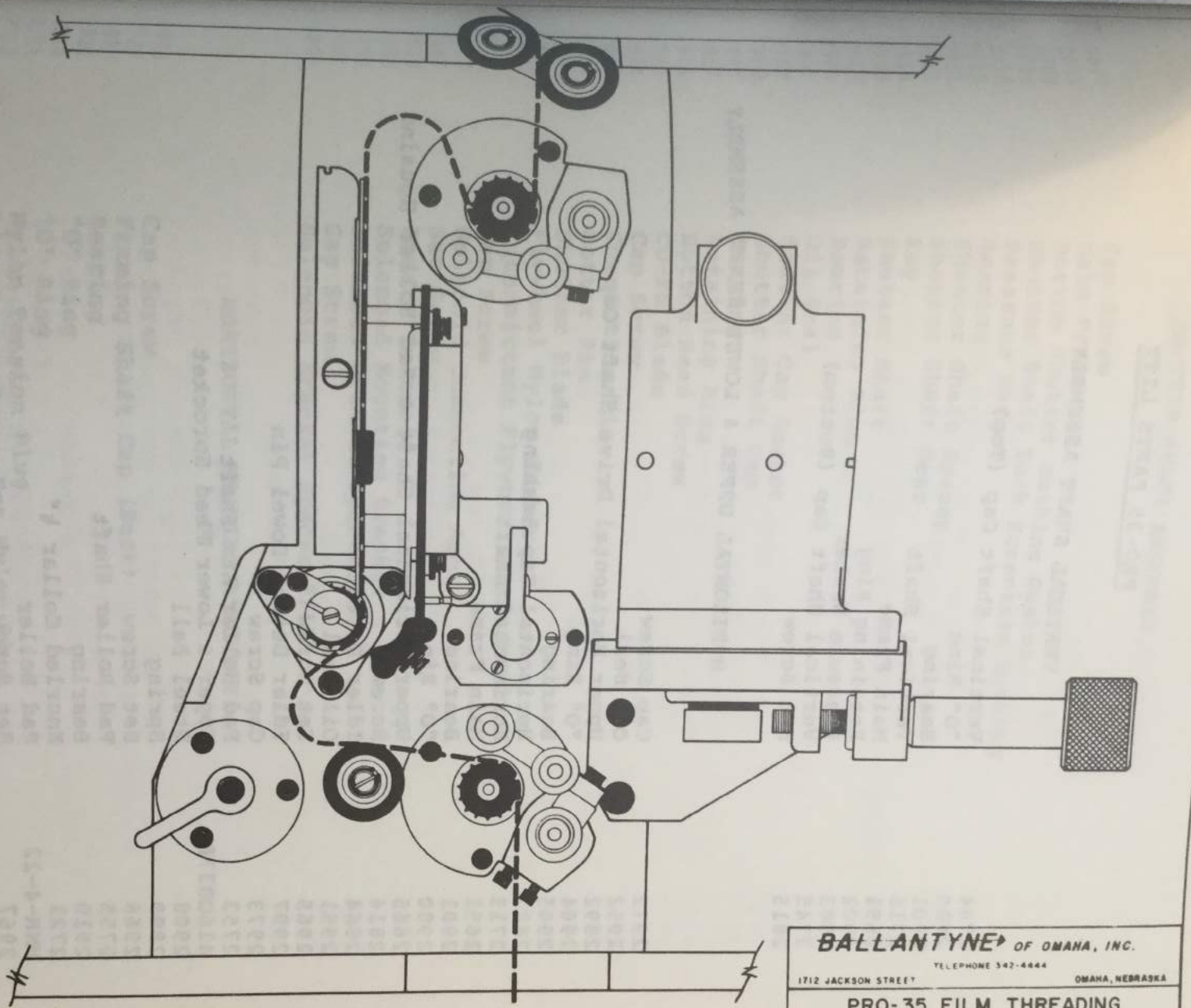
SCALE DRAWING NO. 2705

2678

2929

MOUNTING SCREWS NOT SHOWN
(3) 1/4-20 X 1"- PARTS 2660 TO 2651
(3) 10-32 X 1 1/4"- PARTS 2661 TO 2660
(1) 10-32 X 1/2"- PARTS 2130 TO 2660

BALLANTYNE OF OMAHA, INC.



BALLANTYNE OF OMAHA, INC.
TELEPHONE 342-4444
1712 JACKSON STREET OMAHA, NEBRASKA

PRO-35 FILM THREADING

SCALE
DRAWING NO 2913
DRAWN BY Bob Powers
DATE 9/14/71
REVISED

VERTICAL SHAFT ASSEMBLY

2744	Vertical Shaft Cap (Top)
2900	"O" Ring
2901	Bearing
2716	Vertical Shaft
2651	Main Frame
2902	Retaining Ring
2903	Pressure Washer
2745	Vertical Shaft Cap (Bottom)
2815	Set Screw

HORIZONTAL UPPER & LOWER SHAFT ASSEMBLY

2972	Cap Screw
2952	Oil Seal
2892	Upper Horizontal Drive Shaft Cap
2904	"O" Ring
2905	Bearing
2887	Horizontal Cap Bushing
2715	Horizontal Shaft
2651	Main Frame
2901	Bearing
2900	"O" Ring
2665	Upper Horizontal Shaft & Pad Roller Housing
2814	Screw
2664	Idler Detent
2951	Oil Seal
2965	Set Screw
2907	Idler Detent Dowel Pin
2973	Cap Screw
2753	Pad Roller Arm Shaft
416CG37B	Upper & Lower Feed Sprocket
2908	Steel Ball
2909	Spring
2966	Set Screw
2755	Pad Roller Shaft
2910	Bearing
2721	Knurled Collar ¼"
MNR-4-22	Pad Roller
2967	Set Screw
2722	Knurled Collar 7/32"
2828	Upper & Lower Pad Roller Arm
2845	Upper & Lower Pad Roller Arm Extension
3009	Washer
2973	Cap Screw
2835	Lower Horizontal Shaft & Pad Roller Housing
2712	Lower Horizontal Drive Shaft Cap
2812	Timing Belt Drive
2970	Set Screw

SHUTTER SHAFT ASSEMBLY

	Cap Screw
3027	Main Frame
2651	Bottom Shutter Bushing Gasket
2762	Shutter Shaft Back Eccentric Bushing
2734	Pressure Washer
2912	Bearing
2913	Shutter Shaft Spacer
2757	Shutter Shaft Gear
2768	Key
2914	Shutter Shaft
2754	Retaining Ring
2915	Bearing
2901	Oil Seal
2951	Shutter Cap Gasket
2763	Shutter Shaft Cap
2720	Bearing
2916	Retaining Ring
2917	Button Head Screw
2971	CO-FS Blade
2765	Cap Screw
2974	Connecting Pin
2801	Cotter Pin
2918	Shutter Blade
2800	Flywheel Nylon Washer
2786	Intermittent Flywheel Shaft Cap
2783	Cap Screw
3041	Solenoid Connecting Arm
2802	Set Screw
2967	Rotary Solenoid
2919	Solenoid Mounting Bracket
2803	Solenoid Bracket Spacer ¼"
2804	Cap Screw
3001	Solenoid Bracket Spacer 7/16"
2805	

HORIZONTAL FRAMING ASSEMBLY

2973	Cap Screw
2727	Framing Shaft Cap (Back)
2920	Bearing
2921	"O" Ring
2922	"O" Ring
2751	Nylon Tension Plug
2752	Adjustment Screw For Nylon Plug
2651	Main Frame
2923	Retaining Ring
2735	Framing Shaft (Horizontal
2924	Retaining Ring
2728	Framing Shaft Cap (Front)
2949	Oil Seal
2857	Horizontal Shaft Flange

3004	Roll Pin
3006	Lock Washer
2806	Framing Knob
2975	Cap Screw
3028	Set Screw
2851	Intermittent Sprocket Roller Shaft
2923	Retaining Ring
3064	Bearing
6730-903614	Projector Shut Off Switch

LENS MOUNT ASSEMBLY

2807	Lens Holder Knob
2970	Set Screw
3007	Thrust Bearing
2925	Washer
2778	Lens Clamp Shaft
2654	Lens Holder
2964	Set Screw
2782	Lens Adapter Pressure Ring
2968	Set Screw
2667	Lens Adapter
2927	Roll Pin
2771	Lens Slide Rod
2928	Lens Slide Rod Pin
2653	Lens Mount Arm
2978	Cap Screw
2773	Lens Micro Focus Screw
2926	Bearing
2777	Focus Bearing Spacer
2808	Lens Mount Knob
2979	Cap Screw
2773	Lens Micro Focus Screw
2926	Bearing
2777	Focus Bearing Spacer
2808	Lens Mount Knob
2979	Cap Screw
2767	Focus Bracket
2772	Lens Mount Stud
2775	Lens Drag Washer
2776	Lens Mount Stud Washer
2980	Cap Screw

DETENT MOUNTING ASSEMBLY

	Screw
2981	Detent Mount Plate
2820	Screw
2974	Detent Mount
2674	Bearing
2910	Retaining Ring
2933	Film Trap Linkage Arm
2756	Detent Push-Pull Arm
2687	Roll Pin
2986	Idler Detent Mating Stud
2683	Set Screw
2965	Dowel Pin
2935	Steel Ball
3002	Spring
2909	Steel Ball
2908	Film Trap Detent Stud
2707	Idler Detent Mount End Washer
2686	Roll Pin
2927	Screw
2989	Detent Shaft
2688	Set Screw
2969	Detent Knob
2809	

INTERMITTENT SPROCKET ASSEMBLY

2701	Intermittent Sprocket Shaft
2929	"O" Ring
2990	Screw
2785	Intermittent Sprocke Stripper
2972	Screw
2677	Intermittent Sprocket Bearing Arm
2948	Oil Seal
416T31B	Sprocket
3043	Bearing
3045	Felt Washer
3237	Outboard Bearing Bushing
3235	Outboard Bearing Adjustment Washer
2747	Outboard Sprocket Shaft Bearing Bracket
2976	Screw
2965	Screw
2941	Steel Ball
3236	Outboard Bearing Adjustment Bolt
3047	Nylon Set Screw

VERTICAL FRAMING ASSEMBLY

	Framing Shaft Bushing
2676	Washer
7-111	Framing Shaft
2743	Retaining Ring
2931	Retaining Ring
2932	Bearing
2920	"O" Ring
2921	Set Screw
2815	Framing Shaft Cap
2746	

REEL HOLD BACK CLUTCH ASSEMBLY

2793	Reel Shaft Collar
2966	Set Screw
2792	Reel Lock
2908	Steel Ball
2909	Spring
2963	Steel Ball
2987	Roll Pin
2794	Takeup Shaft Key
2791	Takeup Shaft
2955	Bearing
2825	Upper Reel Hold Back Clutch
2956	Retaining Ring
2983	Cap Screw
2826	Upper Friction Disc.
2839	Upper Friction Disc. Key
2957	Spring
2811	Takeup Tension Knob
3017	Key

FILM TRAP ASSEMBLY

2991	Screw
2860	Framing Light Mount
55	Bulb
2992	Screw
3008	Lock Washer
2847	Teflon Stop Pin
3006	Lock Washer
2859	Gate Cooling Plate
2844	Framing Aperture Plate
2780	Film Trap Plate Mounting Bolt
2769	Film Trap Plate
2927	Roll Pin
2965	Set Screw
2988	Dowel Pin
2830	Right Film Rail
2831	Left Film Rail
2832	Film Guide
3993	Screw
2787	Upper Film Trap Plate Shaft
2788	Lower Film Trap Plate Shaft
6730-903502	Film Trap Plate

FILM GATE COVER ASSEMBLY

2827	Film Pressure Plate
E-67-L1	Pin
E-67-L2	Pin
E-73-C	Intermittent Sprocket Tension Shoe
2836	Shoe Plate
W-278-E	Spring Pressure Cup Washer
S-1280-E	Conical Compression Spring
N-228-E	Sprocket Shoe Spring Adjusting Nut
S-1279-E	Door Pad Guide Stud Screw
2833-34	Pressure Pad
N-227-E	Pad Spring Adjusting Nut
2988	Dowel Pin
2770	Film Trap Cover
2784	Eccentric Shaft
2837	Captive Trusshead Screw
2908	Steel Ball
2999	Spring
2985	Set Screw
3016	Intermittent Sprocket Tension Shoe
S-1250-E	Sprocket Shoe Spring Support

INTERMITTENT ASSEMBLY

2660	Intermittent Base Plate
2750	Bottom Plate
2680	Intermittent Cam Shaft Bushing
2944	Barb
2943	Nylon Tube
2942	Retaining Ring
2901	Bearing
2731	Intermittent V-Belt Flywheel
3250	Cam Shaft Bushing
2950	Oil Seal
2786	Flywheel Nylon Washer
2783	Intermittent Flywheel Shaft Cap
3041	Screw
3596	Cam & Shaft Complete
2900	"O" Ring
2725	Stop Pin
2954	Nut
2941	Steel Ball
2661	Intermittent Cover
2838	Delron Star Bushing
2953	Pipe Plug
2681	Intermittent Star Shaft Bushing
2940	"O" Ring
3595	Star & Shaft Complete
2940	"O" Ring
2708	Delron Framing Coupler
2678	Framing Coupler Housing

INTERMITTENT ASSEMBLY (CON"T)

2929	"O" Ring
2677	Intermittent Sprocket Bearing Arm
2948	Oil Seal
2701	Intermittent Sprocket Shaft
416T31B	Sprocket
3236	Outboard Bearing Adjustment Bolt
3043	Bearing
2747	Outboard Sprocket Shaft Bearing Bracket
2690	Intermittent Sprocket Shaft Bushing
2945	Nut
2719	Gear
2651	Main Frame
2977	Bolt
2982	Screw
2972	Screw
6730-903448	**Pulley - Projector Driven**
6730-903447	**Flywheel - Intermittent V-Belt**

OPERATING INSTRUCTIONS

MODEL 6000

XENON LAMPHOUSE

AND POWER SUPPLY

Optical Radiation Corporation

6352 N. Irwindale Avenue, Azusa, California 91702 • (213) 969-3344

REVISED February 1972

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WARNING

THE XENON LAMP USED IN THE ORCON PROJECTION SYSTEM IS HIGHLY PRESSURIZED AND SUBJECT TO POSSIBLE EXPLOSION. DO NOT OPEN DOOR OF LAMPHOUSE UNTIL XENON LAMP HAS COOLED FOR AT LEAST 15 MINUTES.

WARNING

BEFORE OPENING LAMPHOUSE DOOR, PUT ON PROTECTIVE FACE MASK AND GLOVES. DO NOT HANDLE XENON LAMP WHEN OUT OF ITS PROTECTIVE CONTAINER WITHOUT PROTECTIVE CLOTHING. XENON LAMP SHOULD BE KEPT WITHIN PROTECTIVE CONTAINER UNTIL ABSOLUTELY NECESSARY TO REMOVE IT.

WARNING

THE XENON LAMP USED IN THE ORCON PROJECTION SYSTEM IS OF EXTREME INTENSITY. DO NOT LOOK DIRECTLY AT LAMP WHEN ON FOR PROLONGED PERIODS OF TIME OR SERIOUS EYE DAMAGE MAY RESULT.

SECTION I - INTRODUCTION

1-1 GENERAL

This technical manual provides installation, operation and maintenance instructions for the ORCON Xenon Lamphouse Model 6000 and Xenon Current Regulator RPS-X60 (Power Supply). The system is manufactured by Optical Radiation Corporation (ORC), Monrovia, California, and is compatible with any 35 or 70mm motion picture projection system. Do not attempt installation, operation or maintenance of equipment until the contents of this manual are thoroughly understood. Damage to equipment or injury to personnel may result if all instructions are not carefully followed.

1-2 RECEIVING-HANDLING

Remove all packing material from around the lamphouse and power supply and carefully inspect for damage that may have been caused by shipping. Any claims for loss or damage that may have occurred in transit must be filed by the buyer with the carrier. Copy of bill of lading and freight bill will be furnished on request if required.

When requesting information concerning the equipment, be sure to furnish STOCK, SERIAL and MODEL numbers.

Removal of Power Supply Container

a. Orient power supply so that proper side is up.

b. Remove lag bolts from bottom edge of power supply packing.

c. Lift upper packing container off.

d. Locate and remove forklift skid.

Removal of Lamphouse Container

a. Slit top side of container along taped seam.

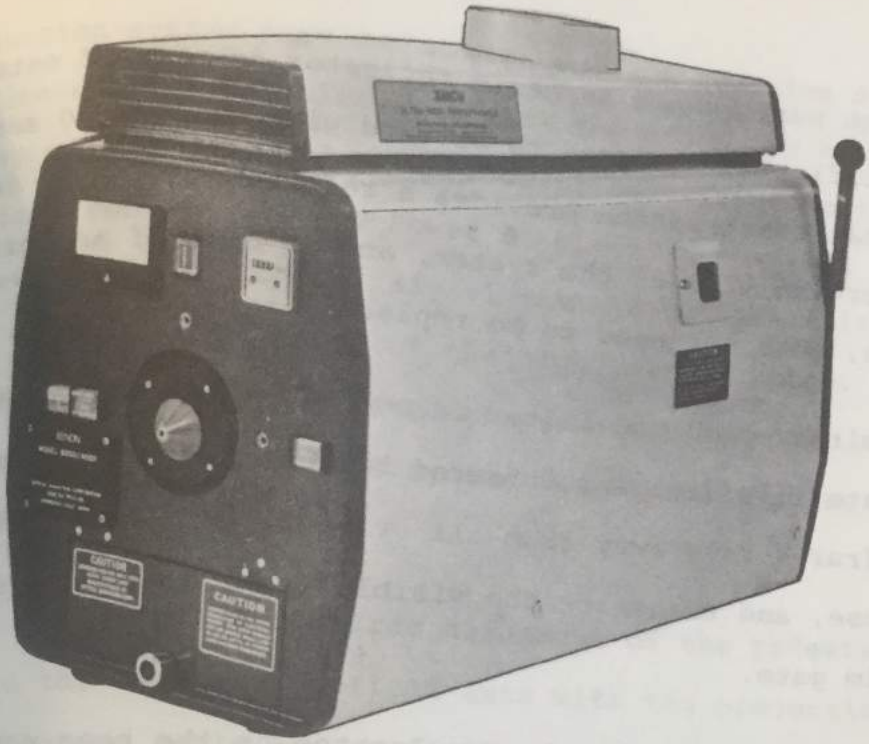
b. Remove side packing and lift lamphouse from container.

1-3 DESCRIPTION/SPECIFICATIONS

Model 6000 Xenon Lamphouse (See Figure 1-1)

The Model 6000 is recommended for screen sizes in excess of 50 feet and provides 55,000 lumens open shutter illumination, using an f1.7 projection lens, and operating at a nominal current of 150 amperes. Screen brightness distribution of not less than 75 per cent is assured when the system is properly aligned, providing the optimum film presentations.

The system has a standard nine-inch optical centerline and the base of the system adapts to the mounting plate of all projector pedestals. The xenon lamphouse is equipped with a high performance aspheric reflector, necessary control circuitry, system status displays, ignition system, safety interlocks, dichroic filter, manual light douser, three axis lamp adjustment, and self-contained cooling system. Table 1-1 is the general lamphouse specifications.



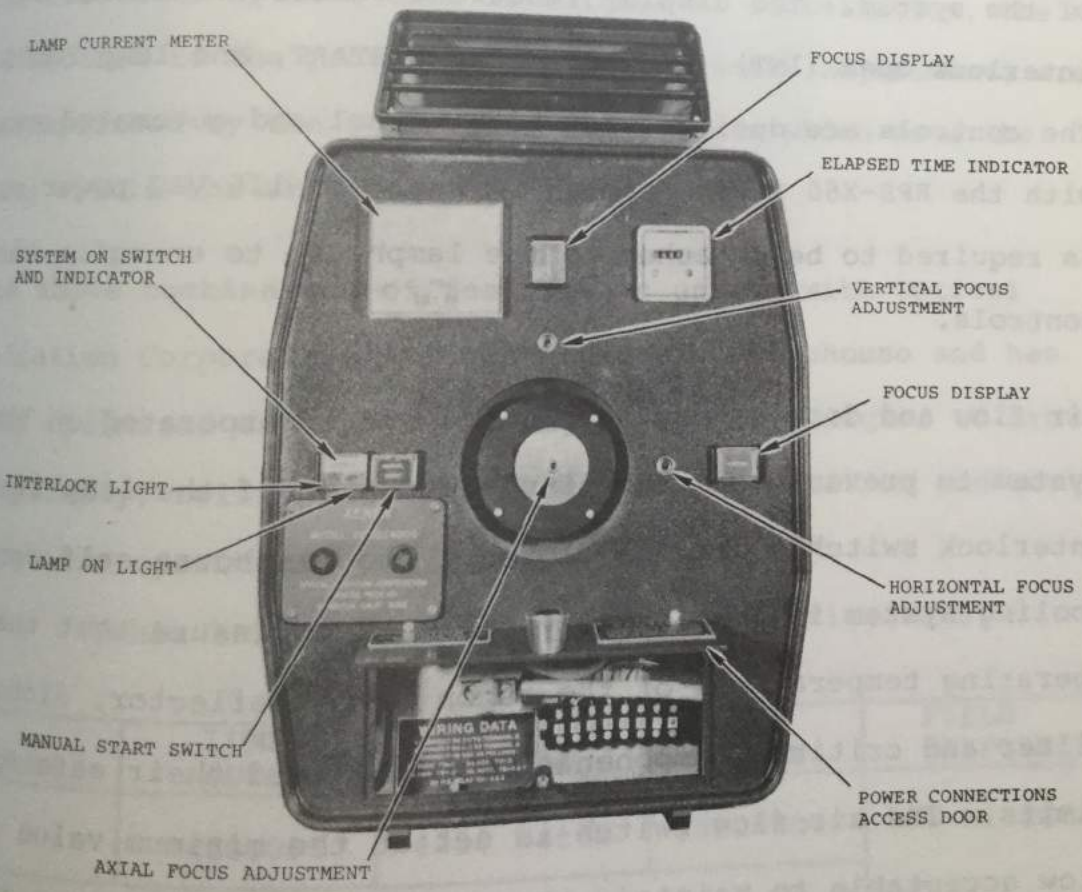


Figure 1-1. Model 6000 ORCON Lamphouse

The high performance aspheric reflector is made of metal and is specifically designed to be used with the X-6000 xenon lamp. The metal construction provides a reflector which is essentially good for the life of the system, and in case of an abrupt lamp failure, does not need to be replaced.

A hot mirror dichroic filter is mounted in the front section to eliminate film damaging infrared radiation. The filter reflects the infrared rays away from all critical components within the lamphouse, and transmits the visible light in the direction of the film gate.

All the necessary controls are located on the rear panel for easy access, and have illuminated displays to signify the status of the system. The display functions consist of SYSTEM ON, interlock open (INT), LAMP ON, MANUAL START, and lamp FOCUS. The controls are designed for both manual and automated usage with the RPS-X60 Power Supply. A separate 115 VAC power cord is required to be attached to the lamphouse to energize these controls.

Air flow and door safety interlocks are incorporated on the system to prevent or discontinue operation of the lamp if the interlock switches are not closed. The lamphouse self-contained cooling system is specifically designed to insure that the operating temperatures of the xenon lamp, reflector, dichroic filter and critical components do not exceed their safe operating limits. The air flow switch is set at the minimum value of air flow acceptable to maintain the proper environmental conditions.

The ignition system provides a high voltage RF pulse of approximately 35,000 volts to ionize the xenon gas between the lamp electrodes, and enables sustained direct current lamp operation from the RPS-X60 Power Supply. The control circuit provides a 115 VAC control signal command to the ignition system which in turn produces the high voltage pulse. The high voltage areas are limited to prevent break-over, and are not accessable when the system is properly set up for operation.

Initial installation requires alignment of the pedestal base to align the reflector optical axis with the projection lens axis. Factory tools are available for this operation which is simplified due to the symmetry of the optical system. Once the reflector optical axis is aligned at installation, the base is secured to the pedestal; subsequent focus adjustments are accomplished by the three axis adjustments which move the lamp within the stationary reflector.

The above combination of features is unique with Optical Radiation Corporation's xenon projection lamphouse and has been optimized with advanced engineering techniques to provide simplicity, reliability and safety in installation and continued long term operation.

Table 1-1. Lamphouse, General Specifications

DC CURRENT	LUMEN* OUTPUT	POWER	LIFE	FIELD UNIFORMITY
150	50,000	4200 Watts	1000 Hour	75% Minimum
*Open aperture, f/1.9 Projection Lens				

X-6000 Xenon Lamp

The xenon lamp is constructed of special quality quartz which prevents transmission of the energy in wavelength bands which create ozone. The lamp is constructed using the latest sealing and electrode design techniques developed over the past decade for military and aerospace applications. The result is a lamp which is extremely rugged and of highest quality and reliability. In addition, the lamp is specifically designed for stable operation over a wide current range, and requires no external magnetic fields for stabilization.

Power Supply (See Figure 1-2)

The power supply is designed specifically for operating the X-6000 Xenon Lamp in the Model 6000 Xenon Lamphouse. Table 1-2 is the specifications for the power supply. The power source is current regulated to provide steady light output independent of incoming line voltage fluctuations and changing lamp characteristics caused by aging. This feature provides optimum projection quality.

This power source consists of a three phase power transformer, primary contactor, silicone diode rectifier, 1 per cent current ripple filter, remote or standard amperage control capability, reduced current standby mode, control and power overload protection, and cooling fan.

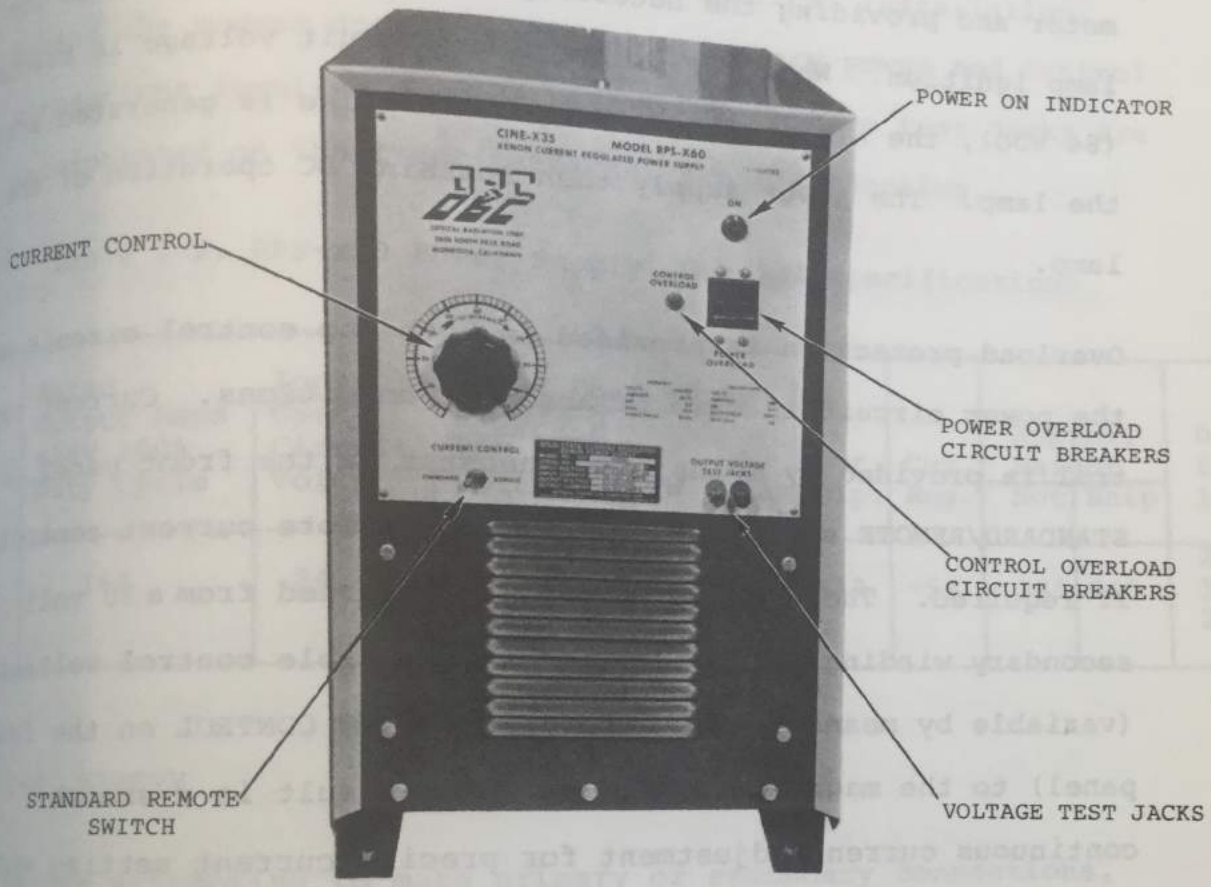


Figure 1-2. Model RPS-X60 Power Supply

The power supply operates by supplying a command signal from the lamphouse when the safety interlocks are closed. This signal energizes the primary contactor, thus starting the fan motor and providing the necessary DC open circuit voltage for lamp ignition. When the proper open circuit voltage is reached (84 VDC), the high voltage RF ignition pulse is generated across the lamp. The power supply then sustains DC operation of the lamp.

Overload protection is provided in both the control circuit and the power circuit in case of abnormal conditions. Current control is provided by means of a rheostat on the front panel. A STANDARD/REMOTE switch is provided for remote current control if required. The current control is obtained from a 30 volt secondary winding which supplies the variable control voltage (variable by means of the amperage CURRENT CONTROL on the front panel) to the magnetic amplifier. The result is a smooth continuous current adjustment for precise current setting which can be accomplished while the lamp is operating.

The system is equipped with the necessary inductive and capacitive elements to maintain a current ripple of less than 1%. The low ripple factor eliminates any flicker in the film presentation inherent in many systems which do not have adequate filtering. In the case of large screen projection, most shutters

are opened to increase light, and it is therefore important to have adequate filtering for a quality film presentation.

A hinged access door is located on the left side of the power supply for convenience and ease of electrical installation. Behind the access door are all the necessary power and control connections required for installation. Voltage test jacks are incorporated on the front panel for trouble shooting.

Table 1-2. RPS-X60 Power Supply, General Specifications

	Rated Output Amps @28V 100% Duty Cycle	Input at Rated Load 60 Hz Open Circuit Volts	Amps/3 Ø 208 Volt	230 Volt	KW	KVA	Cur. Rip.	Cur. Reg.	Approx. Weight Net	Ship	Dim. in Inches
-175	160	84	36	32	6.9	12.9	<1%	<5%	335	345	24"H 15"W 22-5/8"D

1-4 SAFETY

Before attempting to make primary or secondary connections, change parts or make repairs, be sure the power source is completely disconnected from the main power line.

Before attempting to change lamp or perform maintenance on the lamphouse, the lamphouse power should be disconnected.

Caution should be exercised in taking voltage measurements when troubleshooting the unit. Always avoid contact between any part of the human body and any current carrying part of the power source.

Whenever it is necessary to be exposed to or handle the xenon lamp, follow the necessary precautions outlined in the front of the manual.

When installing the power source, be sure that a ground cable is connected from the stud labeled GRD(on the primary connection board)to a suitable ground.

The following definitions apply to WARNINGS, CAUTIONS and NOTES found throughout this manual.

WARNING

INSTALLATION, OPERATING AND MAINTENANCE PROCEDURES, PRACTICES, ETC., WHICH WILL RESULT IN PERSONNEL INJURY OR LOSS OF LIFE IF NOT CAREFULLY FOLLOWED.

CAUTION

INSTALLATION, OPERATING AND MAINTENANCE PROCEDURES, PRACTICES, ETC., WHICH WILL RESULT TO DAMAGE TO EQUIPMENT IF NOT CAREFULLY FOLLOWED.

NOTE

INSTALLATION, OPERATING AND MAINTENANCE PROCEDURES, PRACTICES, ETC., WHICH ARE ESSENTIAL TO EMPHASIZE.

SECTION 2 - INSTALLATION

2-1 LOCATION

Lamphouse Location

The lamphouse is supplied with mounting rails which fit into the track of a standard 35/70mm projector base on the top of the pedestal. The lamphouse is fastened by means of 5/16-18 bolts installed through the slots in the projector base and engaged in the lamphouse rails. One bolt per side is adequate for restraining the lamphouse. The working distance from the aperture to the front bulkhead where the light cone mounts is 8 to 8.38 inches.

When used with various film transport systems and projectors which do not use the standard base, such as the Norelco, a working distance of 8 inches and an optical centerline of 9 inches should be observed. In these cases, a special adapter can be supplied by Optical Radiation Corporation.

Power Supply Location

A good installation is essential if the power source is to provide satisfactory and dependable service. Proper component operating temperatures are maintained by the air stream produced by the power source fan unit. Therefore, the power source should be located so that the air passing into the front and bottom of the power source is not restricted. The back of

the power source should be located at least 12 inches from the wall so that the air passage from the fan will not be blocked.

The power supply should be located in an area where a minimum amount of dirt or dust will be drawn into the air stream. Preventive maintenance will consist of periodically removing the cover and blowing out the dust accumulation inside the power supply. For this reason it is desirable to locate the unit so that the left side cover can be easily opened without obstructi

The distance between the power supply and lamphouse is not critical as long as adequate conductor size is used to prevent any noticeable voltage drop. Acceptable voltage drop is approximately 1 volt at 160 amps. If the distance between the lamphouse and power supply is significant, a remote current control can be installed.

The input AC control and DC power enters the back of the unit as shown in figure 2-1. The conduit trough for convenience can be located on the floor in the vicinity of the conduit connector knockouts.

2-2 POWER CONNECTIONS

Primary Power to Power Supply

The power supply is designed to operate on 208 or 230 volts 60 Hz, three phase AC power. Facilities for operation on other

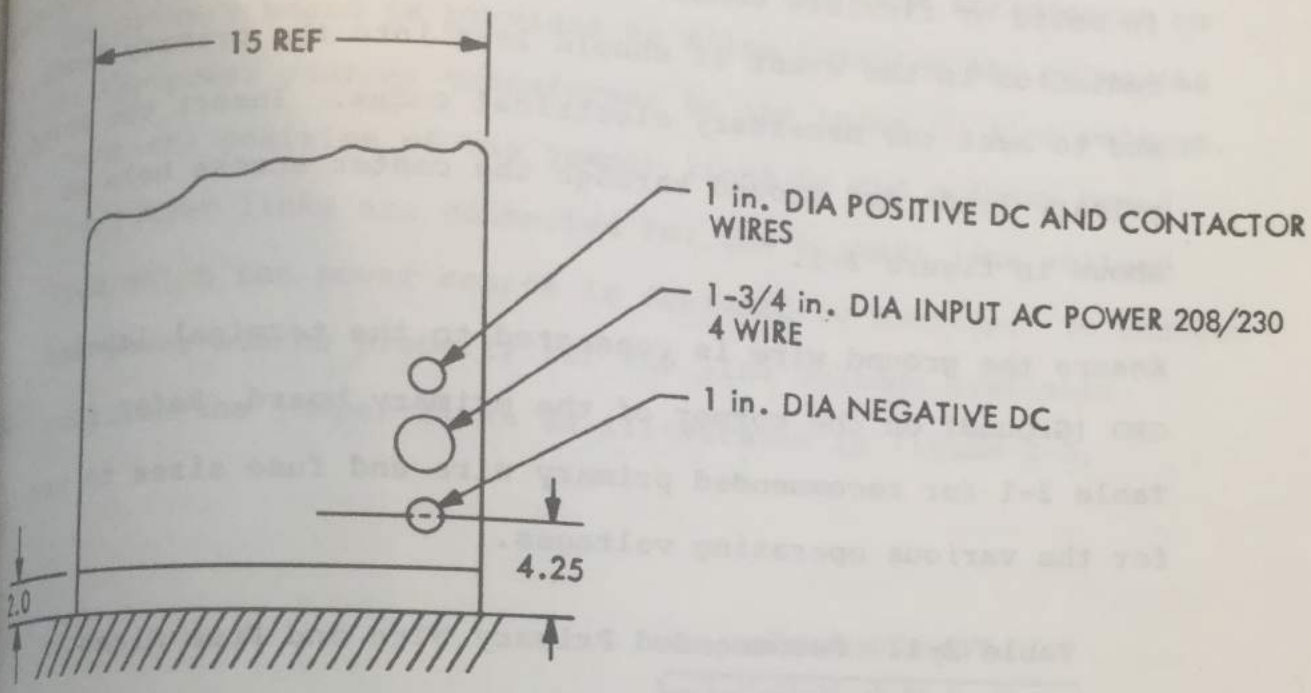


Figure 2-1. Cable Entrance Ports, RPS-X60 Power Supply

primary voltages, if ordered, are incorporated at the factory. These power sources should be operated from a separately fused or circuit breaker protected branch circuit.

Primary power connections are made directly to the three line terminals, L1, L2 and L3 on the bottom of the primary board. The primary board is located directly behind the access door on the side panel of the power source. A standard size conduit hole is provided on the back panel next to the access door to allow bringing the three primary power leads and ground wire

into the power source. The primary leads should be enclosed in solid or flexible conduit in order to decrease high frequency radiation in the event it should leak into the primary leads, and to meet the necessary electrical codes. Insert the three primary leads and ground through the center access hole as shown in figure 2-1.

Ensure the ground wire is connected to the terminal labeled GRD (Ground) on the corner of the primary board. Refer to Table 2-1 for recommended primary wire and fuse sizes to use for the various operating voltages.

Table 2-1. Recommended Primary Wire and Fuse Sizes

Primary Wire Size - AWG		Fuse Size in Amps	
208V	230V	208V	230V
No. 8	No. 8	60	60

WARNING

BE SURE THE GROUND WIRE IS CONNECTED TO THE GROUND TERMINAL IN THE LINE DISCONNECT SWITCH BOX. IF NOT, CONNECT IT TO A GROUNDING ROD, WATER PIPE OR USE WHATEVER GROUNDING PROCEDURE THAT IS ACCEPTABLE TO THE LOCAL ELECTRICAL CODE AND INSPECTION. THE STUD, LABELED GRD, IS CONNECTED TO THE POWER SOURCE CHASSIS. DO NOT CONNECT ANY OF THE LINE LEADS TO THIS TERMINAL AS THIS WILL RESULT IN A HOT CHASSIS.

since these power sources are usually designed to operate from more than one line voltage, a jumper link arrangement on the primary board is provided to allow matching the primaries of the power sources transformer to the incoming line voltage. Check the position of the jumper links on the primary board. The jumper links are connected for the highest line voltage from which the power source is designed to operate. To connect the power source properly for the line voltage available, position the jumper links as illustrated in figure 2-2.

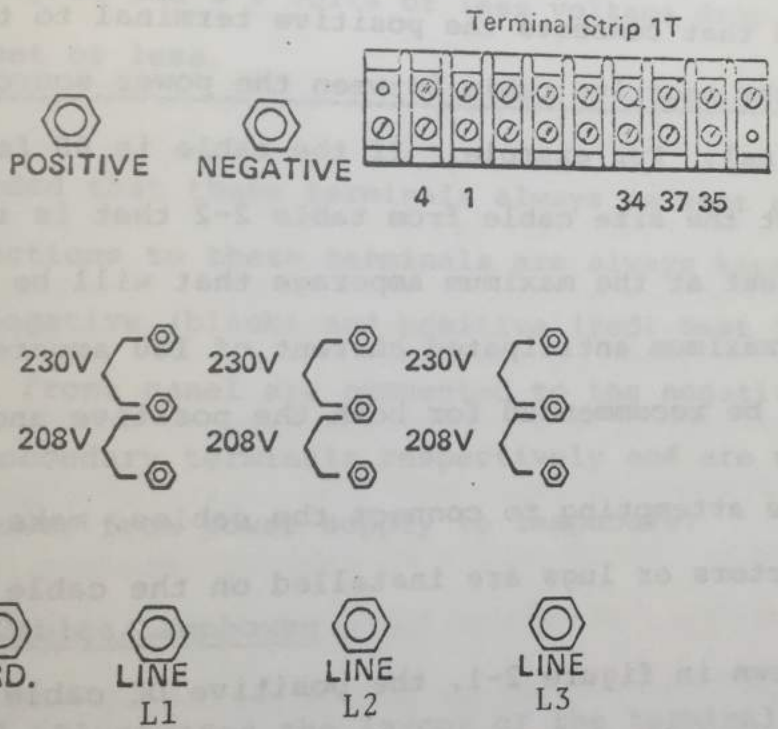


Figure 2-2. Current Regulator RPS-X60, Primary Board

Secondary DC & Control Cables to Power Supply and Lamphouse

DC Power Cables/Power Supply

If secondary cables were not ordered with the power source and you are supplying your own, the following instructions should be followed concerning the selection of cable:

a. Do not use damaged or frayed cables.

b. Consult table 2-2 as a guide for selecting the correct secondary cable size for the anticipated maximum current that will be used. Table 2-2 takes into account the total cable length for the current. This means the length of the positive cable that connects the positive terminal to the power source and the negative cable between the power source and the negative terminal. For example: If the cable is 60 feet long, you would select the size cable from table 2-2 that is recommended for 120 feet at the maximum amperage that will be used. In the case of a maximum anticipated current of 150 amperes, No. 3/0 cable would be recommended for both the positive and negative cables.

Before attempting to connect the cables, make sure that adequate connectors or lugs are installed on the cable ends.

As shown in figure 2-1, the positive DC cable goes through the upper conduit part and connects to the positive terminal, and the negative DC lead goes through the lower conduit part and connects to the black negative terminal. These connections are located immediately behind the access door. Along with the

positive DC lead, two #18 AWG control cables are incorporated for the contactor. These leads terminate in the lamphouse and will be described under contactor connections.

Table 2-2. Secondary Cable Sizes

Lamps Amperes	*Total Length of Cable (Positive & Negative)					
	**50	100	150	200	250	300
100	1/3	1/2	1/0	2/0	3/0	4/0
150	2/0	2/0	3/0	4/0	4/0	4/0

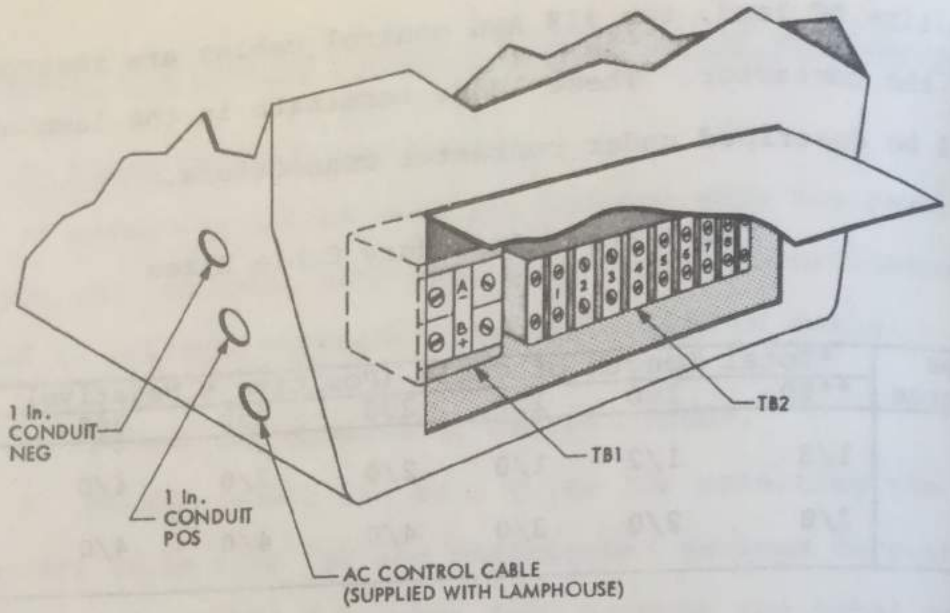
NOTE: * Cable size is based on direct current (DC) 100% duty cycle and a 2 volts or less voltage drop.

** 50 Feet or less.

It is recommended that these terminals always be kept clean, and that connections to these terminals are always kept secure. The negative (black) and positive (red) test jack located on the front panel are connected to the negative and positive secondary terminals respectively and are used for checking power from power supply to lamphouse.

DC Power Cables/Lamphouse

Figure 2-3 illustrates the layout of the terminal connections at the rear of the lamphouse behind the access door. The conduit parts and their function are shown to the left of the terminal when viewing from the rear. Access door can be opened by depressing the knob on the door and lifting up.



TERMINAL	DESCRIPTION
1	115 VAC, HIGH
2	115 VAC, LOW
3	GND
4	CONTRACTOR COIL POWER SUPPLY
5	
6	AUTOMATION
7	
8	SPARE

Figure 2-3, Lamphouse Power Cable Connections

The positive DC cable enters through the bottom port on the lamphouse and connects with the lower "B" (Red) terminal in the lamphouse. The negative DC cable enters the upper port and connects to the "A" (Black) negative terminal. The contactor wires from the power supply go in the same cable conduit as the positive DC lead.

CAUTION

BE SURE CORRECT POLARITY IS OBSERVED OR IGNITER WILL IMMEDIATELY DESTROY THE LAMP WHEN POWER IS APPLIED.

Before connecting the DC cables, strip the ends of each cable lead back approximately 3/8 inch. Strip terminal cleanly to eliminate all frayed cable and wire edges. Insert all of cable into respective terminations and tighten firmly. Check for strands of cable around termination and eliminate if existing since a possible short circuit could result.

Contactor Connection Power Supply/Lamphouse

In order for the lamphouse and power supply to work correctly as a system, the main power contactor in the power supply must receive a command signal from the lamphouse. This is accomplished when both the door and air flow interlock switches are closed.

It is recommended that #18 AWG wire be used for contactor connections. The termination in the power supply is at terminals 4 and 1 of TB-1T (See figure 2-2). The wires are then routed through the conduit containing the positive DC lead and terminated at terminals 4 and 5 of TB2 in the lamphouse termination area behind the access door (See figure 2-3). Since this is an AC coil connection, there is no need to be cautious of polarity.

Control AC Power Lamphouse

Connect 115 VAC B wire power to terminals 1 and 2 of TB2 on the lamphouse. Route the cable through the lower conduit at side of lamphouse before making electrical connections. The AC cord can be plugged into a standard 110 VAC outlet having a 10-amp circuit breaker.

Automation

To operate the system in an automation mode, it is necessary to parallel the contacts of the main switch module on the rear control panel of the lamphouse with a permanent contact closure such as an external latching relay.

Terminals 6 and 7 are parallel with the main switch module, and for automation should be wired to the external set of switch contacts. The wires can be brought into the lamphouse through any one of the three access ports.

Remote Current connections

If remote amperage control is required, a remote regulator should be connected to terminals 34, 35 and 37 of terminal strip 1T in the power supply (see figure 2-2). The wire size for remote operation should be #14 AWG.

2-3 EXHAUST DUCT

Since the lamps are ozone free and the lamphouse has a self-contained cooling system, it is not necessary to vent the lamps directly outside. However, due to the heat generated by the light source and stray light, venting may be desirous.

CAUTION

IF LAMPS ARE VENTED, IT IS MANDATORY THAT A MINIMUM FLOW CAPABILITY OF 300 CFM BE PROVIDED AFTER COMPENSATION FOR HEAD PRESSURE LOSSES. A FLOW CAPABILITY LESS THAN THIS WILL PREVENT THE INTERLOCK SWITCH FROM CLOSING.

2-4 INSTALLATION OF DICHROIC FILTER

The dichroic filter should be installed after the electrical system has been hooked up, but before the lamp is installed. This is accomplished as follows:

a. Open side access door of lamphouse to latching position.

b. Remove filter retainer on side facing access door by removing two screws (see Drawing No. 1140746 for location).

CAUTION

WEAR WHITE COTTON OR LINEN GLOVES WHENEVER HANDLING FILTER GLASS. FINGER CONTACT WITH GLASS SURFACE WILL LEAVE BODY OIL MARKS WHICH WILL IMPAIR PERFORMANCE AND CAUSE FRACTURE OF THE GLASS AS A RESULT OF HEAT SPOTS CAUSED BY LOCAL ABSORPTION OF THE ENERGY FROM THE LIGHT SOURCE.

c. While holding filter glass at an angle in a bright light, observe for any unusual stains. If stains are noticed,

clean with a mild hand soap and water. Rinse well with cold water and dry with Kleenex or equivalent.

d. Install lower filter segment by slipping bottom edge beneath far side filter retainer. The retaining may have to be loosened slightly for installation.

NOTE

Filter segment should be installed with coated side facing light source, Either an arrow on the edge of one of the sides of the filter points to the coated edge, or a black mark is painted on the uncoated side.

e. Install upper filter segment in the same manner as lower segment.

f. Secure filter retainer on both sides.

2-5 INSTALLING OR REPLACING LAMP (SEE FIGURE 2-4)

The installation of the lamp is accomplished in the following manner:

WARNING

DISCONNECT AC CONTROL POWER CORD TO LAMPHOUSE BEFORE LAMP INSTALLATION.

a. Open side access door of lamphouse to latching position.

b. Loosen set screws at both cathode and anode mounting receptacle.

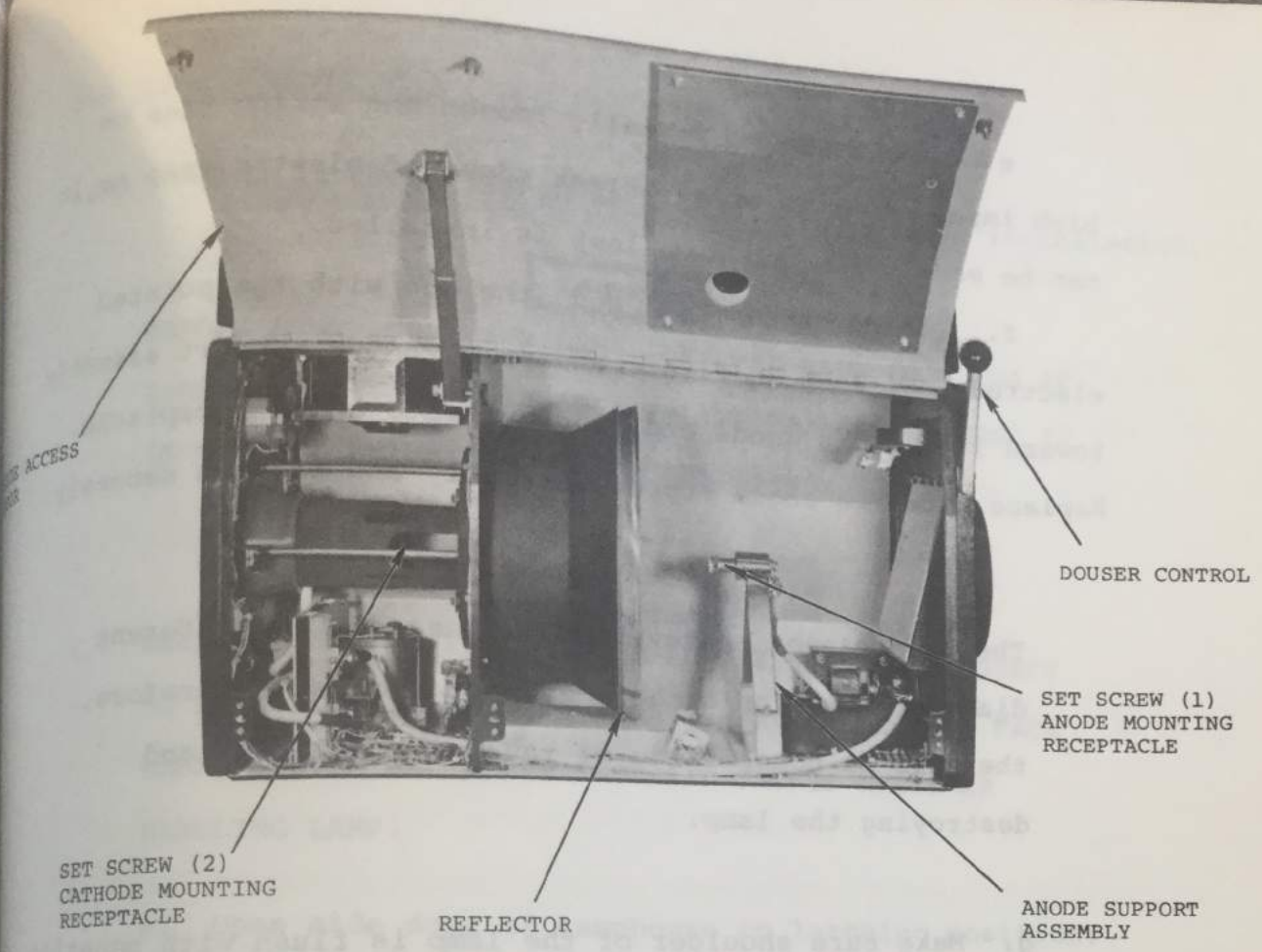


Figure 2-4. Inside Model 6000 Lamphouse

c. Remove one screw from anode support assembly and swing away from mirror.

WARNING

LAMP IS UNDER EXTREME INTERNAL PRESSURE AND SUBJECT TO POSSIBLE EXPLOSION. ALWAYS WEAR PROTECTIVE FACE MASK, GLOVES AND HEAVY MATERIAL JACKET WHENEVER HANDLING LAMP.

d. Remove lamp from shipping package, leaving protective cover on.

e. When ready to install, loosen end string ties on high impact plastic wrap. Break edges of plastic wrap so it can be easily removed once lamp is installed.

f. Insert cathode (-) end (the one with the pointed electrode) of lamp in first, and swing anode support assembly toward lamp. Slip anode end stud (+) into anode receptacle. Replace screw in anode support assembly and tighten securely.

NOTE

The lamp cannot be reversed because of the different diameter studs on cathode and anode ends. Therefore, there is no possibility of reversing polarity and destroying the lamp.

g. Make sure shoulder of the lamp is flush with mounting receptacle at cathode end, and then firmly tighten the two set screws.

h. Securely tighten the set screw on the anode end.

i. Remove protective wrap.

j. Close main side door and secure with the three 1/4 turn fasteners.

k. System is now ready for operation.

2-6 LAMP REMOVAL

Lamp removal is accomplished in a similar manner as installation.

CAUTION

BEFORE REMOVING XENON LAMP, LET THE LAMP COOL FOR AT LEAST 10 MINUTES. IF ABRUPT LAMP FAILURE OCCURS, IT IS SAFE TO ENTER LAMPHOUSE IMMEDIATELY.

WARNING

LAMP IS UNDER EXTREME INTERNAL PRESSURE AND SUBJECT TO POSSIBLE EXPLOSION. ALWAYS WEAR PROTECTIVE FACE MASK, GLOVES AND HEAVY MATERIAL JACKET WHENEVER HANDLING LAMP.

a. Open side door of lamphouse to latching position.
b. Install plastic wrap material around lamp.
c. Loosen set screws on both cathode and anode end.
d. Remove screw on anode support assembly and swing away.
e. Remove lamp and store in packing container.

CAUTION

IF ABRUPT LAMP FAILURE HAS OCCURRED, REMOVE QUARTZ FRAGMENTS WITH VACUUM BEFORE INSTALLING NEW LAMP.

SECTION 3 - OPERATION

3-1 GENERAL

Once installation is complete, the system is ready for operation and alignment. The following is a general description of the controls and displays on both the lamphouse and power supply.

3-2 LAMPHOUSE (See Figure 1-1)

System Start Switch Module

When operated with the RPS-X60 Power Supply, depressing the SYSTEM ON switch will do the following:

a. Start blower motor in lamphouse.

b. Upon interlock closure, contactor in power supply will close.

c. Lamp ignition will occur after the proper open circuit voltage has been reached (approximately 3 seconds).

Lighting display on switch module is as follows:

SYSTEM ON switch (white) -	Indicates power is on.
INT light (red) -	Indicates interlocks are open.
LAMP light (green) -	Indicates lamp has ignited and is illuminated.

Automation Controls (External)

Provides same function as "System Start Switch Module".

Manual Start Switch Module

Used as an emergency switch in case the automatic ignition circuit fails to ignite the lamp. To operate switch the spring loaded protective guard must be raised and the MANUAL START switch depressed.

CAUTION

DO NOT USE THE MANUAL START SWITCH UNLESS NECESSARY. WHEN USING THE SWITCH, DEPRESS FOR APPROXIMATELY 1 SECOND. PROLONGED CLOSURE DECREASES THE LIFE OF THE ELECTRODES WITHIN THE XENON LAMP.

Focus Display

Lighted display which indicates the direction that image on screen will move when respective focus adjustment is made.

Lamp Current Meter

Meter which indicates DC current to xenon lamp.

Elapsed Time Indicator

Indicator which indicates total number of hours of system operation. Primary function is to monitor the number of hours on the lamp in the system. Lamp warranty card should be used in conjunction with elapsed time indicator. Refer to Section 6 for detailed instruction.

Vertical Focus Adjustment

Actuation of this adjustment moves the beam image up or down in the vertical direction on the screen. This is necessary for achieving even light distribution on the top and bottom of the screen.

Horizontal Focus Adjustment

Actuation of this adjustment moves the beam image horizontally on the screen. This is necessary for achieving even light distribution on the sides of the screen.

Axial Focus Adjustment

Actuation of this adjustment moves the lamp about the optical axis. This adjustment controls the size of the light image on the screen. When the lamp is properly located on this axis, the light beam will fill the screen.

3-3 POWER SUPPLY (See Figure 1-2)

Power Overload Circuit Breakers

The POWER OVERLOAD circuit breaker provides protection against overloading of the power source's main components. In the event of a continued overload or abnormal primary current draw, two current transformers (located in two of the secondary windings of the main transformer) detect this overload condition and cause the circuit breaker to open. The internal contacts of the circuit breaker are connected in series with the primary contactor coil of the power source and the interlocks in the

lamphouse. Thus, if the current transformers detect an overload condition, the opening or tripping of the circuit breaker causes the primary contactor to open, suspending lamp current output. The circuit breakers must be ON before the primary contactor of the power source can be energized. If it should open or trip, it must be manually reset.

Control Overload Circuit Breaker

The CONTROL OVERLOAD circuit breaker is a push button 10 ampere circuit breaker (located on the front control panel) which provides protection against overload in the 30 volt secondary control circuit. This breaker must be manually reset in the event of an overload.

Current Control Rheostat

The CURRENT CONTROL rheostat is located on the front panel of the power supply. A graduated dial from 0 to 100 per cent is provided for accurately setting the current output of the lamp.

The CURRENT CONTROL controls the lamp current output from the minimum to maximum (80-175 amperes) of the operating range. The operator can dial in the exact current required for his application by using this one control. Because this type current control is a continuous contact type, it may be adjusted while the lamp is operating without danger of damage to the lamphouse or power supply.

The volt-ampere curves (figure 3-1) show the output voltage available at any given output current within the limits of the minimum and maximum of the CURRENT CONTROL setting. The volt-ampere curves of the X6000 xenon lamps are superimposed on the volt-ampere control characteristics of the power supply. With the use of the volt-ampere curves, it is possible to determine the amperage required for a particular load voltage. The curves show the maximum and minimum settings of the current control only. Curves for other settings will fall between the maximum and minimum curves shown.

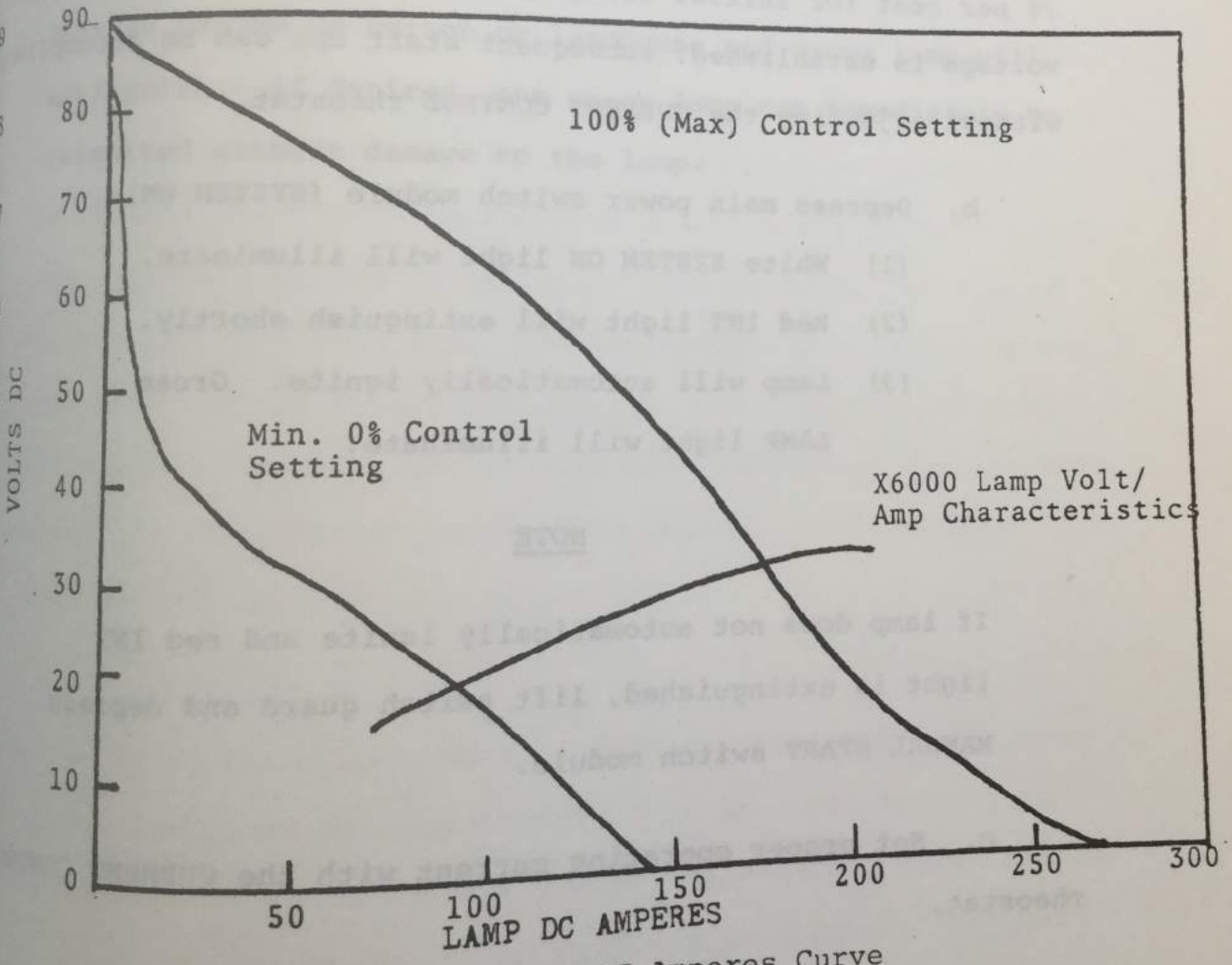


Figure 3-1. Lamp DC Amperes Curve

3-4 SYSTEM START UP

After installation is complete the system is ready for start up operations as follows:

CAUTION

IF THE XENON LAMPHOUSE IS CONNECTED TO AN EXTERNAL EXHAUST SYSTEM, MAKE SURE THE EXHAUST SYSTEM IS ON BEFORE LAMP IGNITION.

a. Set CURRENT CONTROL on power supply to approximately 70 per cent for initial start up. Once proper current control voltage is established, subsequent start ups can be accomplished without adjusting the CURRENT CONTROL rheostat.

b. Depress main power switch module (SYSTEM ON):

(1) White SYSTEM ON light will illuminate.

(2) Red INT light will extinguish shortly.

(3) Lamp will automatically ignite. Green LAMP light will illuminate.

NOTE

If lamp does not automatically ignite and red INT light is extinguished, lift switch guard and depress MANUAL START switch module.

c. Set proper operating current with the CURRENT CONTROL rheostat.

CAUTION

FOR INITIAL OPTICAL ALIGNMENT, THE CURRENT SHOULD BE SET AT 125 AMPERES UNTIL SATISFACTORY ALIGNMENT IS ACHIEVED. THE CURRENT CAN THEN BE ADJUSTED UPWARDS. INITIAL OPERATING CURRENT SHOULD NOT EXCEED 150 AMPERES. AS THE LAMP AGES, IT CAN BE ADJUSTED UPWARD TO A MAXIMUM OF 160 AMPERES.

3-5 SHUT DOWN

Depress SYSTEM ON switch on lamphouse and xenon lamp will extinguish. If desired, the xenon lamp can immediately be reignited without damage to the lamp.

SECTION 4 - OPTICAL ALIGNMENT

4-1 GENERAL

The optical alignment of the system can be easily accomplished once the lamphouse is set up properly with respect to the optical axis of the projection lens.

4-2 DESCRIPTION OF LAMP FOCUS ADJUSTMENTS

Three focus screws are provided at the rear of the lamphouse for locating the xenon plasma arc on the optical axis. The focusing screws move the lamp in three directions. The center adjustment moves the lamp in and out along the optical axis, the top adjustment moves the lamp up and down perpendicular to the optical axis, and the right hand adjustment moves the lamp sideways also perpendicular to the optical axis. This is illustrated in figure 4-1. The perpendicular movement of the lamp with respect to the optical axis was incorporated into the system to prevent any angular misalignment of the arc with respect to the optical axis. This feature allows optimum focus of the system.

4-3 INITIAL SET UP

Initially position lamphouse so that the projector film gate and the lamphouse are approximately on the same centerline within 1/16 of an inch, and the distance from the film gate to the front of the lamphouse is within approximately 8 inches.

FILM GATE
MIRROR
FIXED DISTANCE
FIXED MIRROR MOUNT
LATERAL MOVEMENT OF LAMP ⊥ TO OPTICAL AXIS
VERTICAL MOVEMENT OF LAMP ⊥ TO OPTICAL AXIS
AXIAL MOVEMENT OF LAMP PARALLEL TO OPTICAL AXIS

The approximate positioning of the lamphouse can be accomplished by means of simple measuring devices. Final positioning of the optical axis of the mirror and projector lens is described in section 4-4.

4-4 ALIGNMENT

Once the lamphouse is set up according to section 4-3, with the lamphouse optical axis partially aligned with the projection lens optical axis,the lamphouse and projector can be turned on.

Turn center focus screw counter-clockwise with the Allen wrench supplied until a bright spot is evident on the screen. If a well defined bright spot does not exist, then turn the top and right hand adjustments until a well defined symmetrical bright spot is evident. At this point it is not important whether the bright spot is in the center of the screen, but it must be symmetrical. This locates the lamp on the optical axis of the collector but not necesarily the projection lens. If the bright spot does not appear in the center of the screen, then the lamphouse should be moved (left, right, up, down, as required) until the bright spot is in the screen center. Once the bright spot is in the center, then the circle of symmetry should be centered on the screen as indicated in figure 4-2. If the bright spot and the circles are not symmetrical, the lamphouse is angularly misaligned. The lamphouse should be aligned so that both the bright spot and the circle of symmetry are symmetrical. At this point the lamphouse should be firmly secured and the center

Figure 4-2. Typical Bright Spot on Screen

focusing screw backed off clockwise until the screen is filled with uniform illumination. If one side is brighter than the other, turn the lateral adjustment until the brightness is equal on both sides. If it is brighter on the top or bottom, then turn the vertical adjustment until you have a balanced distribution. Once the unit is aligned, bolt the lamphouse firmly in place.

Obtaining a symmetrical bright spot is important for optimum alignment. When the focus adjustment is turned counter-clockwise, several different patterns, none of which resemble any defined hot spot, may appear as illustrated in figure 4-3. Also, if the adjustment is turned too far counter-clockwise, then a hole will be evident and the adjustment should be turned clockwise until the hole disappears and some form of a bright spot exists.

In figure 4-3, three types of out-of-focus patterns are illustrated. Patterns 1 and 2 require adjustment of the lateral and vertical adjustments to obtain a symmetrical bright spot. Pattern 3 requires an adjustment of a combination of both the lateral and vertical adjustments.

NOTE

Once the system is properly aligned, no adjustments will be necessary until a new lamp is installed. After installation of a new lamp, only the three lamp focus adjustments will be necessary to again achieve optimum alignment.

Figure 4-3. Typical Out of Adjustment Screen Patterns

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5-3
The
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WARNING

BE SURE THE BRANCH CIRCUIT OR MAIN DISCONNECT SWITCH IS OPEN OR PRIMARY INPUT CIRCUIT FUSES ARE REMOVED BEFORE ATTEMPTING TO MAKE ANY INSPECTION OR PERFORM ANY WORK INSIDE OF THE POWER SOURCE. PLACING THE POWER SWITCH IN THE OFF POSITION DOES NOT REMOVE VOLTAGE FROM THE POWER SWITCH TERMINALS INSIDE THE POWER SOURCE.

5-1 MAIN TRANSFORMER AND OTHER COMPONENTS

Clean the components inside of the power source with dry, compressed air. Keep all the doors open to make sure the dust and dirt blows out of the power source.

5-2 CIRCUIT BREAKER OVERLOAD PROTECTION

The circuit breakers will open or trip in the event of a continued overload on the power supply. If the circuit breakers should trip, manually reset them. If they should trip again with a small load in the circuit or when the power source is idling, check the power source's main circuitry.

5-3 FAN MOTOR

The power source is equipped with an exhaust fan and requires forced air for adequate cooling for high duty cycles and overload. The fan motor in the power source and lamphouse is manu-

factured with lifetime lubricated sealed ball bearing and no attention is required.

5-4 PRIMARY POWER AND SECONDARY LEADS

Periodically check primary and secondary leads for tightness. The cables should be inspected frequently and all breaks in the insulation repaired with electrical tape.

Periodically check the secondary terminal connections to determine whether or not the connections are heating. If heating is occurring, the connections should be taken apart and the metal cleaned. A chemical cleanser, such as Cameo or Brillo, should be used to clean the copper or aluminum connections. When chemicals are used to clean the copper or aluminum, they should be rinsed with hot water and covered with anti-oxidants, such as Mobilcote No. 203 or equivalent, to preserve the clean connections.

5-5 CLEANING OPTICS

It is recommended that at least twice annually the reflector and negative lens be cleaned to maintain high screen brightness. In cleaning the optics the following steps should be taken:

a. With a soft bristled brush, gently brush larger particles off the optics surface.

b. Dampen Kleenex tissue (or equivalent) with clean water and gently wipe the optical surface.

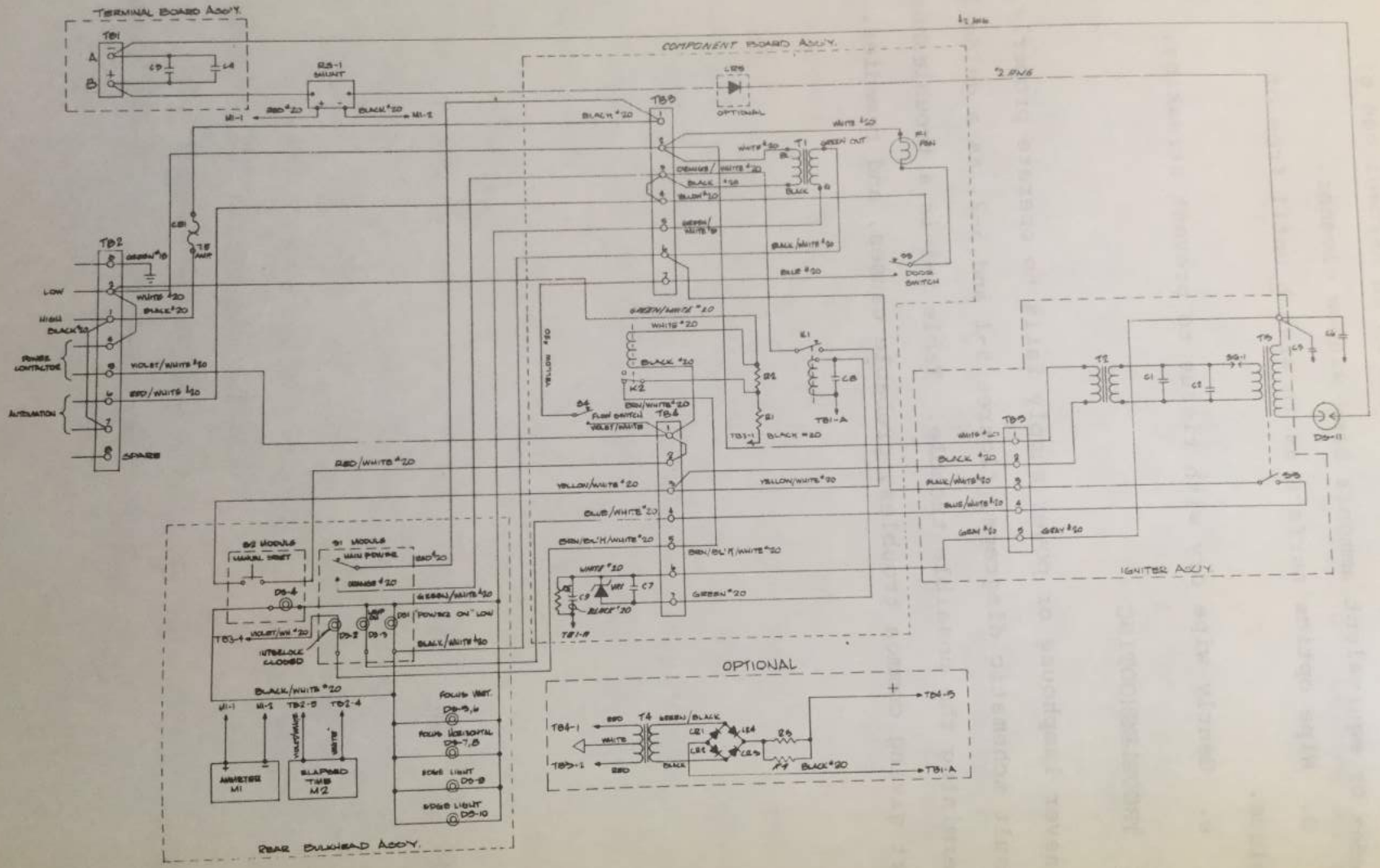
c. Spray optical surface with an an aerosol can of Windex or equivalent ammonia base window cleaner.

d. Wipe optics surface as in step b until free of residue.

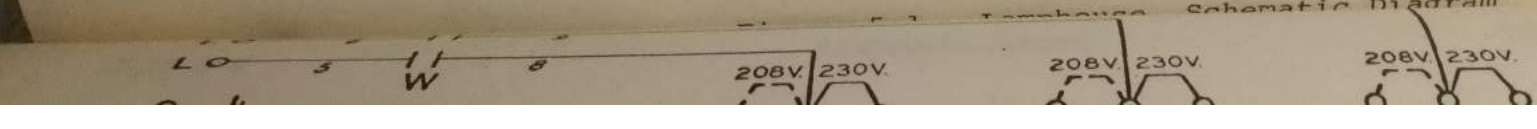
e. Gently wipe dry with tissue to prevent streaking.

5-6 TROUBLESHOOTING

Whenever lamphouse or power supply fails to operate properly, consult schematic diagrams, figures 5-1 and 5-2, as a guide in determining the possible trouble. Table 5-1 is a troubleshooting chart giving common troubles, probable causes, and remedies.



Lamphouse Schematic Diagram



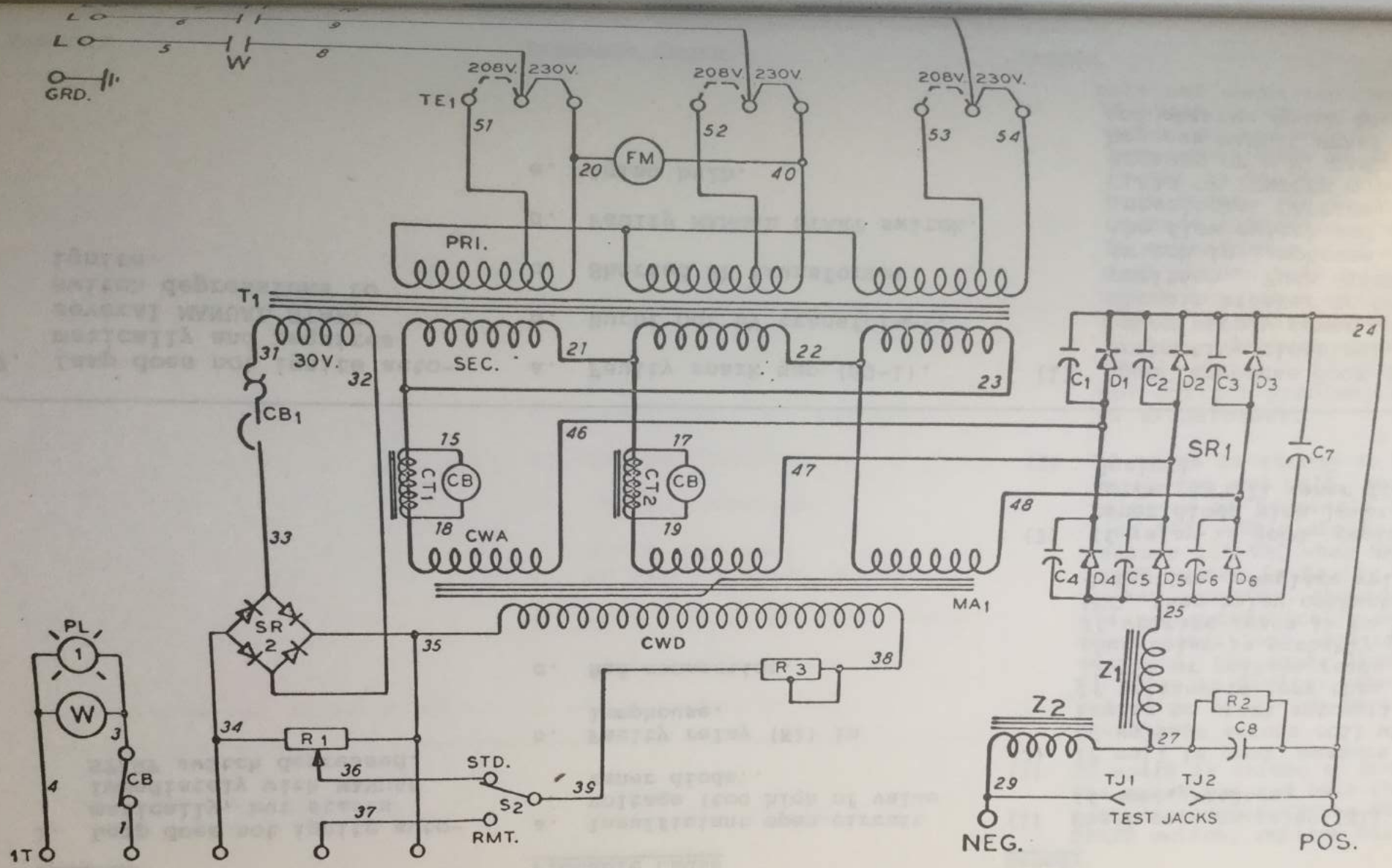


Figure 5-2. Power Supply, Schematic Diagram

Table 5-1, Trouble Shooting Chart

Symptom	Probable Cause	Remedy
1. Lamp does not ignite automatically, but starts immediately with MANUAL START switch depressed.	a. Insufficient open circuit voltage (too high of value zener diode).	(1) Check coil on relay (K1). If open, replace.
	b. Faulty relay (K1) in lamphouse.	(2) If coil is good, measure DC voltage across coil when trying to start automatically. If voltage is less than 12 VDC or voltage reads zero, then relay is probably good. If voltage reads 15 to 20 VDC, then relay contacts are defective. Replace relay.
	c. Bad connection.	(3) If relay is good, replace zener diode with lower value (order 1N5371 zener from dealer).
2. Lamp does not ignite automatically and requires several MANUAL START switch depressions to ignite.	a. Faulty spark gap (SG-1).	(1) Open lamphouse door (wear protective clothing). Turn power supply power overload circuit breaker to OFF position. Push SYSTEM ON switch in lamphouse. Close the flow switch and door interlocks. CAUTION: STAND CLEAR OF IGNITER OUTPUT BECAUSE OF H.V. DANGER. Depress MANUAL START switch and observe spark across the
	b. Burnt out HV transformer.	
	c. Shorted RF transformer.	
	d. Faulty MANUAL START switch.	
	e. Aging bulb.	

CLEAR OF IGNITER OUTPUT
BECAUSE OF H.V. DANGER.
Depress MANUAL START switch
and observe spark across the

Table 5-1, Trouble Shooting Chart (continued)

Symptom	Probable Cause	Remedy
		bulb and spark gap (SG-1). If spark is strong across spark gap and weak across lamp, then bulb or RF transformer is faulty. Replace bulb first. If it does not correct situation, replace RF transformer. If spark is weak across both bulb and spark gap, then either spark gap or HV transformer is faulty. Replace spark gap (SG-1) first. If it does not correct problem, replace HV transformer.
		(2) If spark is strong at both spark gap and bulb, measure voltages at terminals 1 and 2 on TB5. This should measure 115 VAC when MANUAL START switch is faulty. The system, however, should have started automatically under these conditions, and in addition, the zener diode or K1 relay is faulty. Check procedure of (1) to rectify situation.
		(3) If spark is strong at both the spark gap and bulb on each depression of the MANUAL START switch, replace bulb.

Table 5-1, Trouble Shooting Chart (continued)

Symptom	Probable Cause	Remedy
3. Bulb starts automatically but not manually.	a. Faulty MANUAL START switch.	(1) Replace switch.
4. Bulb does not start at all.	a. No interlock closure.	(1) If power supply fan comes on and red INT light does not go out, then one of the interlocks is not closed. Make sure lamphouse access door and main door are closed. If doors are closed, then more than likely the flow switch is not closing. Make sure flow switch paddle is not loose in the flow switch. If it is loose, then take off cover and re-engage paddle. Bulb should then start. If no restrictions are on the lamphouse exhaust, then rotate flow switch body slightly clockwise until closure occurs and bulb starts.
	b. Defective power contactor.	
	c. No 3 Ø power to power supply.	(2) Check 3 Ø power to power supply.
	d. No control power to lamphouse (115 VAC).	(3) If fan does not start in lamphouse, then there is no control power to lamphouse. Check voltage at TB2 terminals 1 & 5. If voltage exists, check circuit breaker in lamphouse.
	e. Loose connection.	
	f. Faulty igniter.	
	g. Fractured electrode in bulb.	

Symptom | Probable Cause | Remedy

(4) If power exists to both power supply and lamphouse

Table 5-1, Trouble Shooting Chart (continued)

Symptom	Probable Cause	Remedy
		(4) If power exists to both power supply and lamphouse, then check connection on lamphouse TB2 terminals 4 and 5 and TB1T - terminals 1 and 4 in power supply. If red interlock open light goes out and power supply red light comes on but fan does not start in power supply, first check circuit breakers in power supply to make sure they are engaged. If engaged, measure voltage at terminals 1 and 4 in power supply. It should read 115 VAC. If it does and power supply fan is not running and no DC open circuit voltage exists across DC output terminals (80 VDC), the circuit breaker is faulty.
		(5) If power supply fan is running and an open circuit voltage of approximately 80 VDC exists, then the igniter is probably faulty. Open lamphouse door and observe the transformer and RF transformer. If either appears to be charred, then

Table 5-1, Trouble Shooting Chart (continued)

Symptom	Probable Cause	Remedy
		the igniter should be replaced and zener diode VR1 checked and probably replaced. If the transformer is charred, then the igniter was probably on continuously, indicating that VR1 is shorted. If transformers appear to be good, then refer to remedy procedures of 2 in the area of faulty spark gap, shorted RF transformer and aging bulb.
5. Popping sound in lamphouse during ignition of bulb.	a. HV arc over.	(1) Check output terminal on RF transformer for signs of arcing to metal heat shield at left end of RF transformer. Bend heat shield away from HV end if arcing signs are apparent.
	b. Loose DC connection in power supply or lamphouse.	
	c. HV breakdown on connection to anode end.	(2) Check small hole in reflector for signs of arcing from bulb starting wire to hole in mirror edge. If signs exist, rotate bulb 180°.

Symptom Probable Cause Remedy

Table 5-1, Trouble Shooting Chart (continued)

Symptom	Probable Cause	Remedy
		(3) If HV breakdown occurs on cathode end around area of lamp support casting on center focus adjustment; check all DC power connections in lamphouse and power supply, including bulb end connection. Tighten securely. If problem still exists, take off power supply cover and check DC connection internal to power supply on chokes, capacitors and full wave bridge rectifiers. Loosen connections on rectifiers and retighten. Problem should go away.
6. Flickering light output.	a. Bad bulb.	(1) Replace bulb. If flicker does not go away with new bulb, then take cover off power supply and check each rectifier, being careful to disconnect one lead off each rectifier while checking. Replace faulty rectifier.
	b. Faulty rectifier in full wave bridge.	
7. Bulb goes out during operation.	a. Circuit breaker on rectifier and lamphouse.	(1) Check circuit breakers on rectifier and lamphouse.
	b. Fuse or breaker in wall.	(2) Check fuses or breakers on wall. Be careful - fuses can give signs of having continuity when they are really open.
	c. Thermal overload in power supply.	
	d. Faulty bulb.	

Table 5-1, Trouble Shooting Chart (continued)

Symptom	Probable Cause	Remedy
		(3) Check to see if fan operates in power supply. If fan does not operate, then thermal overload will shut system off.
		(4) Check bulb for leak. Bulb will be dark blue if leaking. Check for drooping anode or fractured cathode. Replace bulb.
8. DC current increases steadily.	a. Leaky seal on bulb.	(1) Replace bulb. Bulb will have turned dark blue or milky white. Electrodes, if visible, will be heavily oxidized and probably green in color.
9. Film too hot.	a. Improper adjustment	(1) Turn center focus screw clockwise until film temperature is reduced.
10. System does not shut off from lamphouse power on switch.	a. Faulty switch.	(1) Replace switch.
11. Indicator lamps out on lamphouse.	a. Burnt out indicator bulb.	(1) Replace with C/M 328 bulb.

SECTION 6 - LAMP WARRANTY

The lamp warranty on the xenon lamp will not be honored unless the necessary forms are completed.

Upon installation of a new lamp, the xenon lamp warranty card must be filled out and returned to Optical Radiation Corporation. It is mandatory that all information on the card be completed. Shown below is a sample card which was included with delivery.

This card must be filled out and returned within 30 days after installation of the lamp to validate the warranty of your new xenon lamp.

XENON LAMP WARRANTY CARD

USER'S NAME _____ DATE _____

COMPANY _____

STREET ADDRESS _____

CITY _____ STATE _____ ZIP _____

LAMP MODEL NO. _____ SERIAL NO. _____

INSTALLED IN _____ MODEL NO. _____

SERIAL NO. _____

RUNNING TIME METER READING AT TIME OF INSTALLATION _____ HRS.

PURCHASED FROM _____

CITY _____

READ ALL INSTRUCTIONS BEFORE INSTALLING LAMP

If the lamp has failed during the warranty period, the xenon lamp warranty claim form must be filled out and returned to Optical Radiation Corporation along with the defective lamp.

XENON LAMP
WARRANTY CLAIM FORM

To expedite warranty claims, please fill out the following as completely as possible and return with lamp to Optical Radiation Corporation:

1. Lamp Model No.....Serial No.....
   Purchase Date .....

2. Equipment

   a) Lamphouse Type - Model No.....
   Serial No.....

3. Operating Conditions

   Accumulated Running Hours on Lamp.....
   Average ON Time.....Average OFF Time.....
   Estimate Number of Ignitions.....
   Voltage at Failure.....Current at Failure.....

4. Conditions Causing Reject or Return.....
   .....
   .....

5. Additional Information.....
   .....
   .....

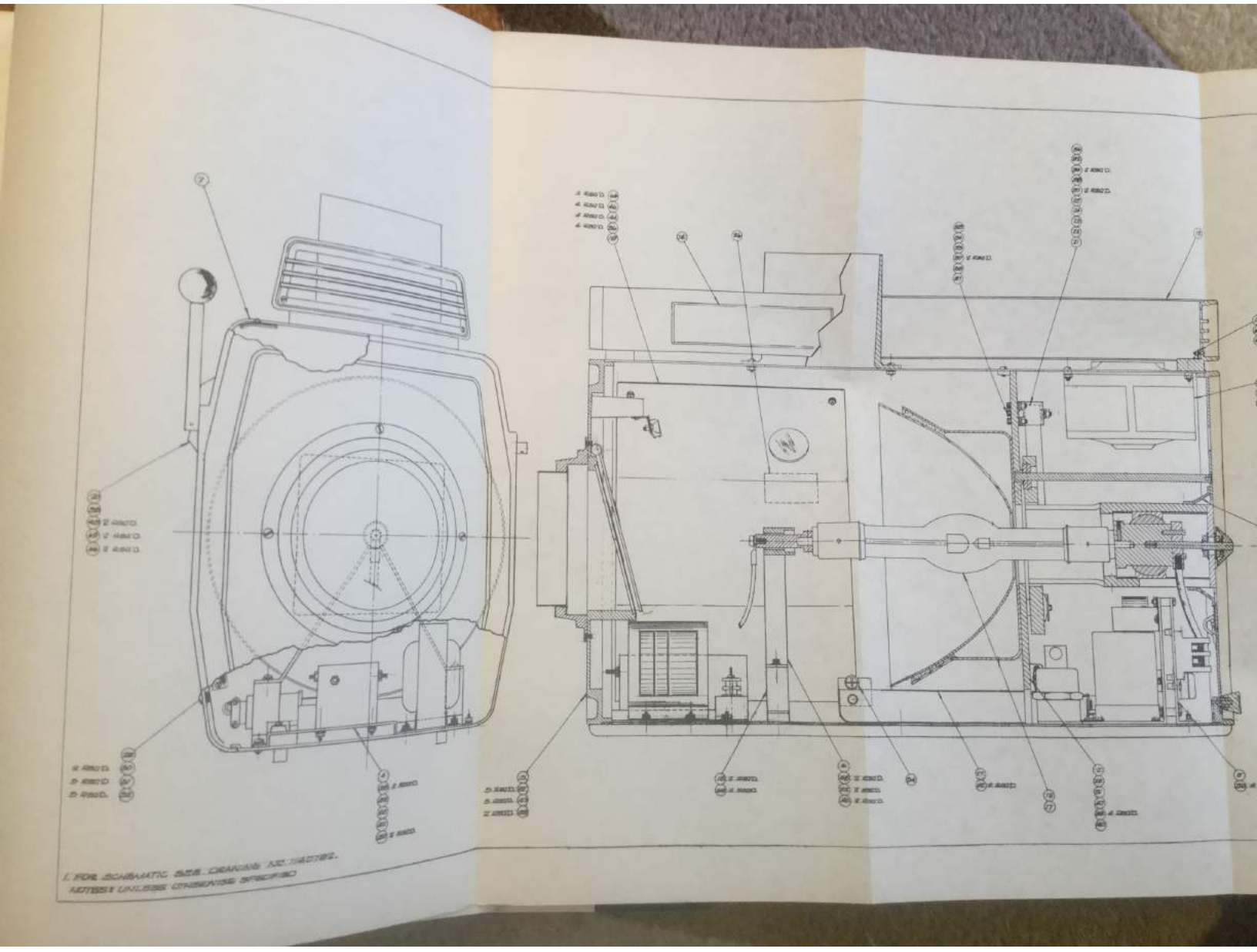
Form Completed By.....Title.....
Company.....
Address.....
Telephone No.....Date.....

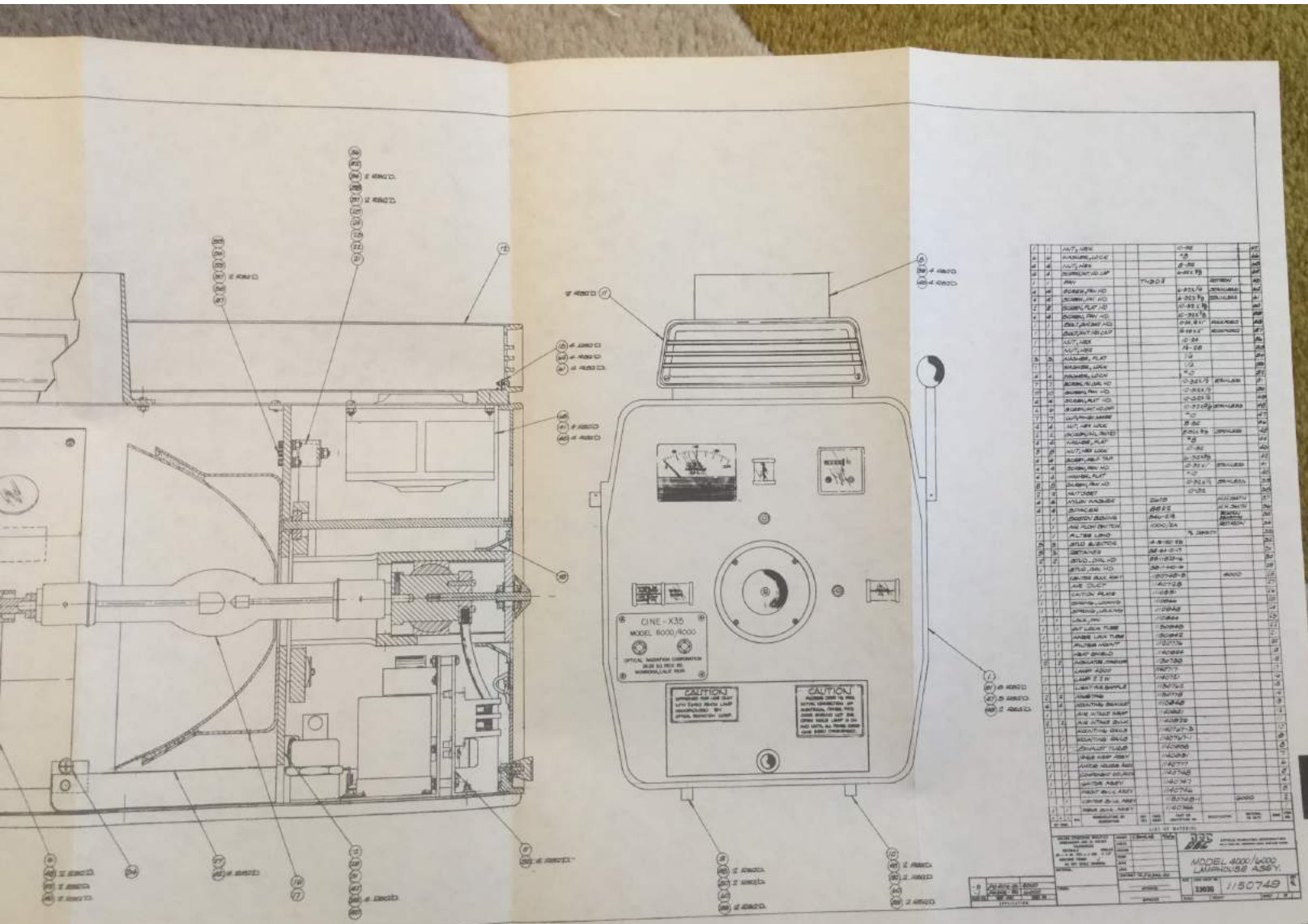
Return To:

ORC
OPTICAL RADIATION CORPORATION 2826 SOUTH PECK ROAD • MONROVIA, CALIFORNIA 91016 • (213) 446-6133

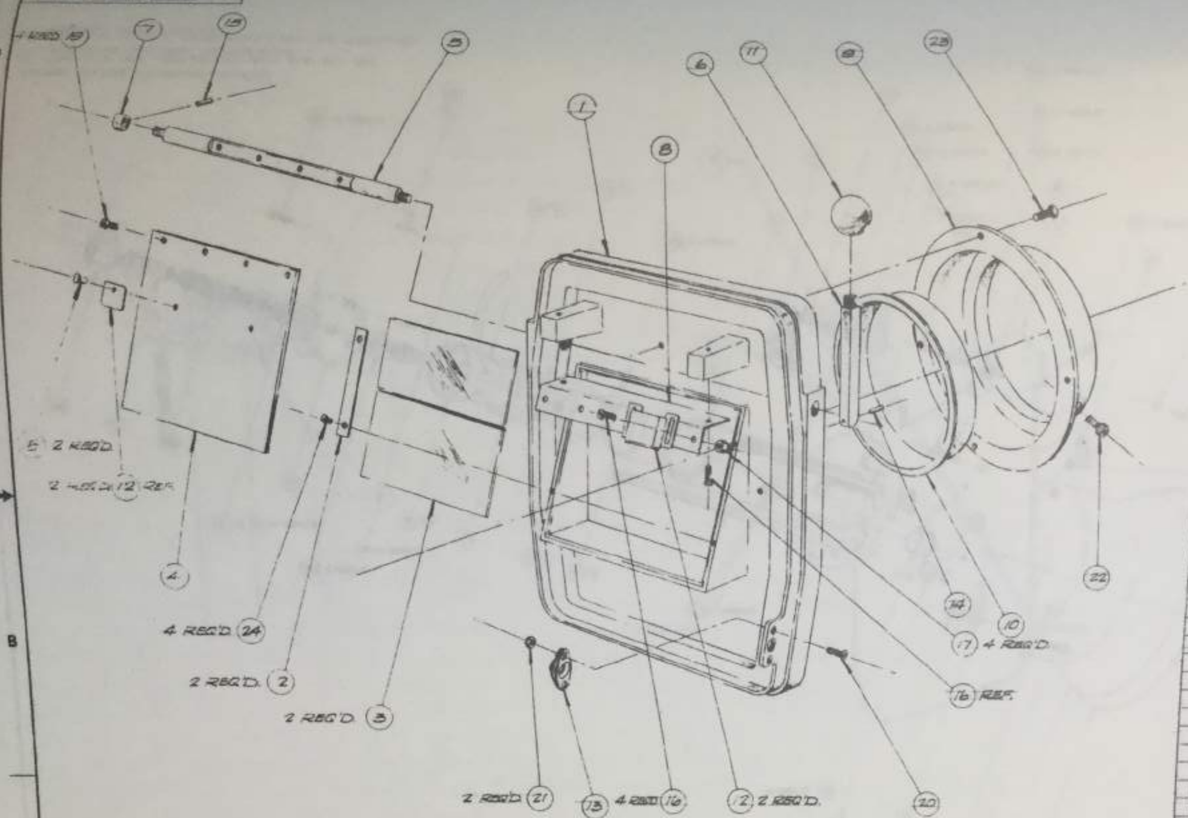
SECTION 7 - SPARE PARTS LIST

The following is the list of parts which comprise the Model 6000 ORCON Lamphouse. When ordering replacement parts, please specify complete part number and quantity required. Consult your local dealer or write Optical Radiation Corporation for prices.





MODEL 4000/4000
LAMPHOUSE ASSY.
1/50749



NOTES: UNLESS OTHERWISE SPECIFIED

QTY REQD	NOMENCLATURE OR DESCRIPTION	REF DES	CODE IDENT	PART OR IDENTIFYING NO.	SPECIFICATION	MATERIAL OR NOTE	ZONE	ITEM NO.
								26
								25
4	SCREW, PAN HD				4-40 x 1/4			24
4	SCREW, FIL. HD, FLT. HD				10-32 x .14	STAINLESS		23
1	SCREW, SKT HD. CAP				2-32 x 5/16			22
2	NUT, LOCK				4-40			21
2	SCREW, PH. FLAT HD				4-40 x 1/2			20
4	SCREW, SKT HD. CAP				8-32 x 3/8			19
2	RIVET, FLAT HD				3/32 x 9/64			18
4	NUT, LOCK				6-32			17
6	SCREW, PHIL. HD.				6-32 x 3/8			16
1	SPRING PIN				.09 DIA x 5/64			15
1	SPRING PIN				.09 DIA x 1/4			14
1	RECEPTACLE			86-36-285-15		SOUTHCO		13
2	LATCH, MAGNETIC			#78		AJAX		12
1	KNOB, HANDLE			40846100		AMERICAN		11
1	FRONT BEZEL EXT.			1130886				10
1	FRONT BEZEL			1140778				9
1	MAG. CATCH BRKT.			1120864				8
1	CAR. SHUTTER SHAFT			1120824				7
1	HANDLE SHAFT			1120725				6
1	SHUTTER PIVOT SHAFT			1120728				5
1	SHUTTER			1130727				4
2	I.R. FILTER			1130730				3
2	FILTER RETAINER			1120757				2
1	FRONT BULKHEAD			1150711				1

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES DECIMALS .XX = ± .03 .XXX = ± .010 ANGLES ± 1/2° MACHINE FINISH ✓ DO NOT SCALE DRAWING

MATERIAL:

FINISH:

DRAWN / CHECK B. Diehl / DESIGN / ENGR / APPR

CONTRACT NO. F04606-70

APPROVED

APPROVED

1140728	F04606-70	
DASH NO.	NEXT ASSY	USED ON

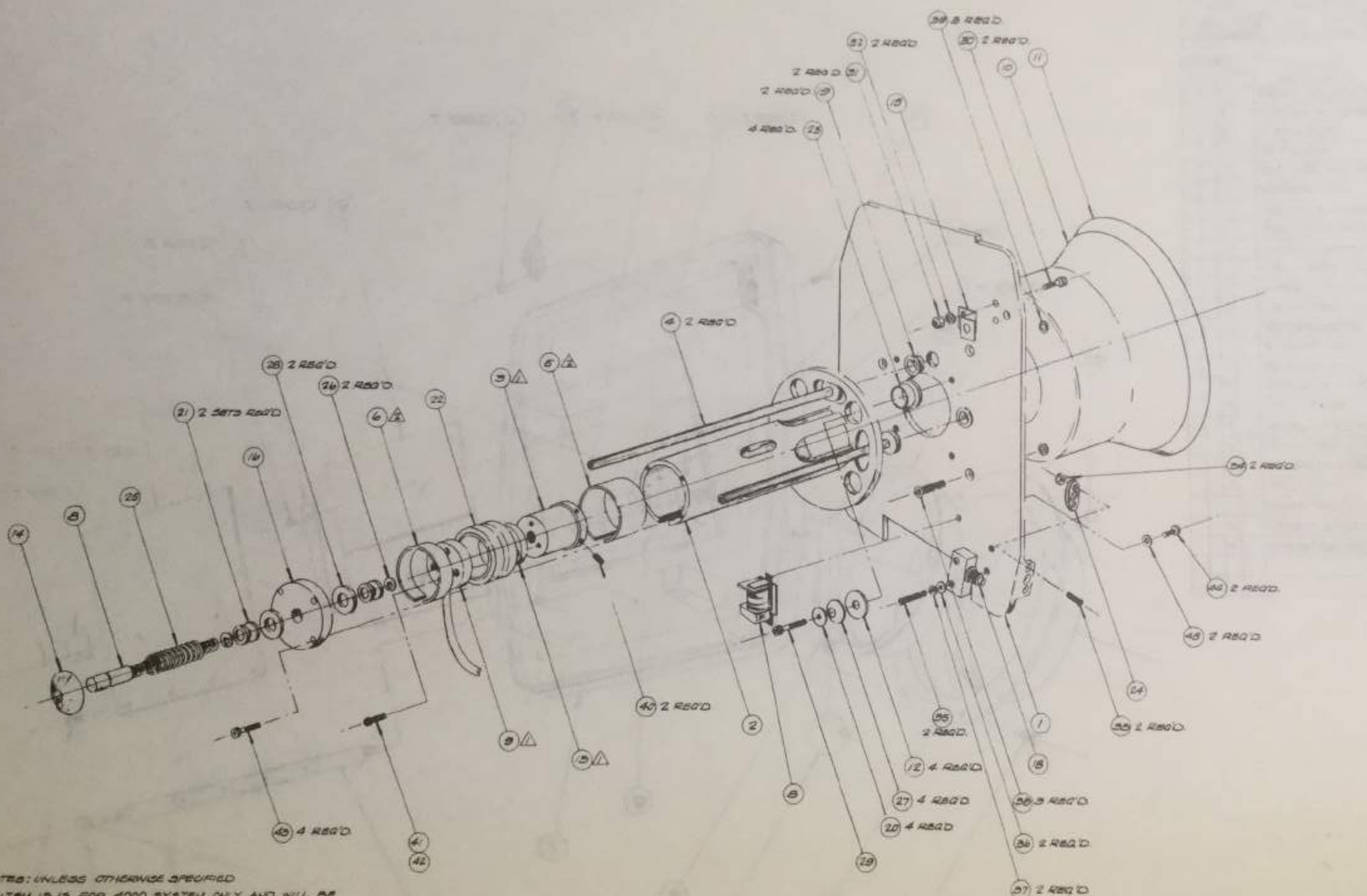
APPLICATION

ORC OPTICAL RADIATION CORPORATION

FRONT BULKHEAD ASSEMBLY

SIZE D · CODE IDENT NO. 33030 · 1140746 · REV N/C

SCALE ~ · WEIGHT · SHEET 1 OF 1



NOTES: UNLESS OTHERWISE SPECIFIED

⚠1 ITEM 13 IS FOR 4000 SYSTEM ONLY AND WILL BE ASSEMBLED BETWEEN ITEMS 3 AND 9.

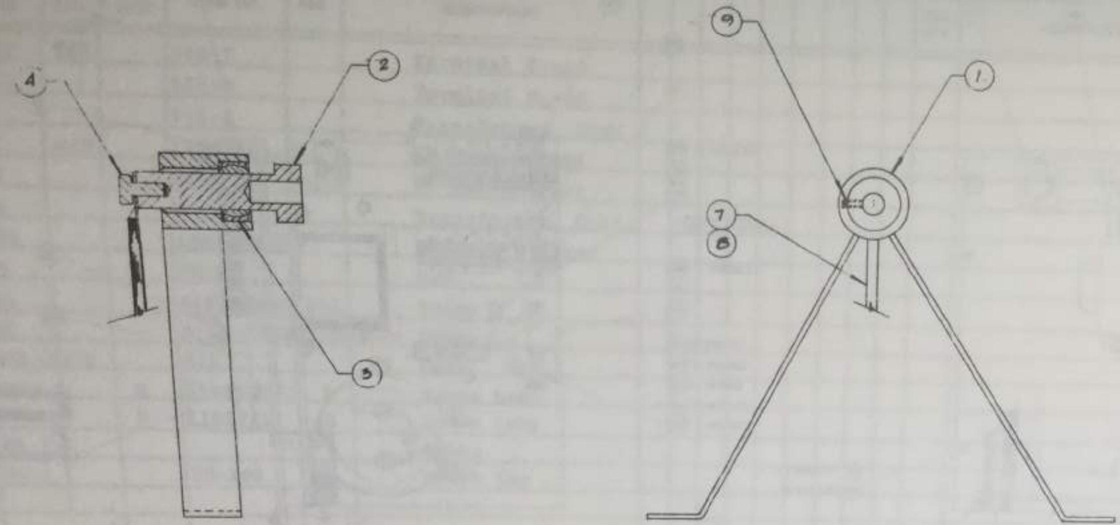
⚠2 FOR 4000 SYSTEM ITEMS 5 AND 6 WILL BE ASSEMBLED TOGETHER AFTER ITEM 22.

Note	Qty	Qty	Nomenclature or Description	Part or Identifying No.	Specification	Material / Vendor	Item No.
	2	2	WASHER, INTERLOCK		NO. 6		45
	2	2	SCREW, RD. HD.		6-32X¼		44
	4	4	SCREW, FIL. HD.		6-32X⅜		43
	5		SCREW, SKT. HD. CAP		8-32X⅜		42
		3	SCREW, SKT. HD. CAP		8-32X⅜		41
	2	2	SCREW, SKT. SKT. HD.		10-32X⅜		40
	3	3	RIVNUT		10-32		39
	3	3	SCREW, SKT. FLAT HD.		¼-20X1		38
	2	2	WASHER, LOCK		#6		37
	2	2	WASHER, FLAT		#6		36
	2	2	SCREW, PAN HD.		6-32X1		35
	2	2	NUT, LOCK		4-40		34
	2	2	SCREW, FLAT HD.		4-40X⅝		33
	2	2	WASHER, FLAT		#10		32
	2	2	NUT, LOCK		10-32		31
	2	2	SCREW, SKT. HD. CAP		10-32X⅝		30
	4	4	SCREW, SKT. HD. CAP		10-32X¼		29
	2	2	WASHER, BRONZE FLAT		#10-⅜ O.D.		28
	4	4	BELVILLE WASHER	5606-36-25			27
	2	2	SNAP RING	5144-25		TRU-ARC	26
	1		SPRING, COMP	1111084-3		4000	25
	1	1	RECEPTACLE	85-38-388-5			24
	4	4	BOSTON BEARING	FB%20-6		BOSTON BEARING	23
	1	1	TORRINGTON BEARING	20SF32		TORRINGTON	22
	2	2 set	SPHERICAL WASHER	ADB16160		AMERICAN	21
	4	4	THRUST WASHER	TB 225		BOSTON BEARING	20
	2	2	BUSHING	FB 68-3		BOSTON BEARING	19
	1	1	SWITCH	BA-2RG1		MICRO SWITCH	18
		1	SPRING, COMP	1111084-1		6000	17
	1	1	REAR COVER TUBE	1150685			16
	1	1	ZEE BRACKET	1110946			15
	1	1	SCREW SHAFT CAP	1110859			14
⚠1	1		4000 LAMP SPACER	1110985			13
	4	4	SPACER WASHER	1110961			12
	1	1	MIRROR	1140688			11
	1	1	REFLECTOR HOLDER	1140681			10
⚠1	1	1	ELECT CATHODE	1120689			9
	1	1	RELAY	AF5002S-5L	60%	SIGMA	8
		1	SCREW SHAFT	1120718-1			7
⚠2	1	1	SPACER	1150685-3			6
⚠2	1	1	SPACER	1150685-1			5
	2	2	CAM ASSEMBLY	1120644			4
⚠1	1	1	CATHODE HOLDER	1150684			3
	1	1	TUBE ASSEMBLY	1140687			2
	1	1	CENTER BULKHEAD	1150710			1

LIST OF MATERIAL

CENTER BULKHEAD ASSEMBLY

33630 1150745



QTY REQD	SYM	NOMENCLATURE OR DESCRIPTION	REF DES	CODE IDENT	PART OR IDENTIFYING NO.	SPECIFICATION	MATERIAL OR NOTE	ZONE	ITEM NO.
1		ALLEN SET SCREW				10-32 X 1/4			9
1		WIRE #2 AWG				10½" LG.			8
1		WIRE LUG			34107	T&B			7
									6
									5
1		BOLT, HEX HD, SS				1/4-20 x 1/2 LG			4
1		BEARING			6SF10	TORRINGTON			3
1		ANODE HOLDER			1120722-1				2
1		ANODE SUPPORT			1140723-1				1

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMALS .XX = ± .03 .XXX = ± .010 ANGLES ± 1/2°
MACHINE FINISH ✓
DO NOT SCALE DRAWING

MATERIAL

FINISH

QTY.	DASH NO.	NEXT ASSY	USED ON
I	-1	1150749	7006-20

APPLICATION

DRAWN: [signature]
CHECK: M. Nilsen
DESIGN
ENGR: [signature] 6/7/77
APPR: [signature]
APPR
CONTRACT NO. PD 806-20
APPROVED: [signature]
APPROVED

ORC OPTICAL RADIATION CORPORATION

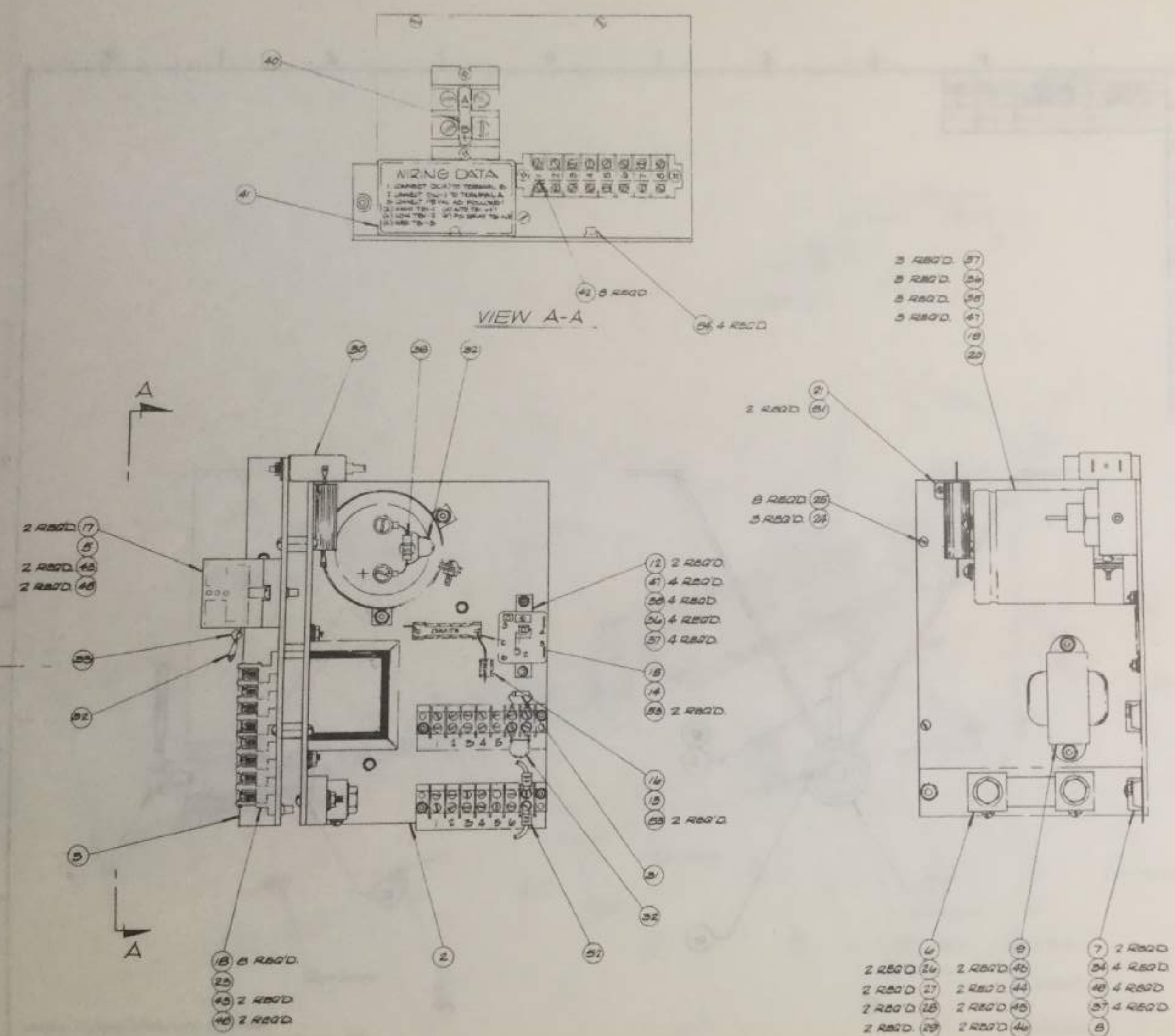
ANODE SUPPORT ASSY

SIZE D | CODE IDENT NO. 33030 | 1140777 | REV A

SCALE 1/1 | WEIGHT | SHEET 1 OF 1

REVISIONS: A

LTR	REVISIONS	DATE	APPROVED
A	ADDED ITEM NO. 64	[illegible]	
B	[illegible]		



QTY	NOMENCLATURE OR DESCRIPTION	PART OR IDENTIFYING NO.	SPECIFICATION	SUPPLIER	ITEM NO.
4	RIVNUT, FLAT HD.		10-32		[illegible]
4	RIVET, FLAT HD.		[illegible]		[illegible]
[illegible]	LUG, INSULATED		#6		[illegible]
2	SCREW, SELF TAP		4-40 X 3/8		61
					[illegible]
6	WASHER, STAR		#6		[illegible]
4	RIVNUT		8-32		[illegible]
7	SCREW, FLAT HD.		6-32 X 3/8		47
2	NUT, HEX		#8-32		[illegible]
2	WASHER, LOCK		#8		[illegible]
2	WASHER, FLAT		#8		[illegible]
4	SCREW, RD. HD.		8-32 X 3/8		[illegible]
8	WIRE MARKERS			BRADY	[illegible]
1	WIRING DATA PLATE	1130770			41
1	TRIM I.D. TAG	1120950			40
					39
1	RESISTOR		15K	SPRAGUE	[illegible]
7	NUT, HEX		#6-32		37
7	WASHER, LOCK		#6		[illegible]
7	WASHER, FLAT		#6		[illegible]
4	SCREW, FLAT HD.		6-32 X 3/8		[illegible]
1	CAPACITOR	2847	[illegible]	CDE	[illegible]
5	CAPACITOR		[illegible]		[illegible]
1	DIODE	1N5375A			31
1	CIRCUIT BREAKER	[illegible]	[illegible]	[illegible]	[illegible]
2	NUT, HEX		#10-32		[illegible]
2	WASHER, LOCK		#10		[illegible]
2	WASHER, FLAT		#10		27
2	SCREW, RD. HD.		10-32 X 1/2		[illegible]
6	SCREW, RD. HD.		10-32 X 5/8		[illegible]
8	STAND-OFF		[illegible]		[illegible]
1	T.B. END SECTION	990		[illegible]	[illegible]
					[illegible]
1	RESISTOR	RH-50	[illegible] 5%	DALE	[illegible]
1	CAPACITOR	7045		SPRAGUE	20
1	CAPACITOR CLAMP	[illegible]		SPRAGUE	19
8	TERMINAL BOARD	815		[illegible]	18
2	TERMINAL BOARD	824	[illegible]	BUCHANAN	17
1	RESISTOR	[illegible]	[illegible]	OHMITE	[illegible]
1	RESISTOR	[illegible]	[illegible]	OHMITE	[illegible]
1	RESISTOR CLIP	5908	OHMITE		14
1	RESISTOR CLIP	5904	OHMITE		13
1	RELAY	[illegible]	RBM		[illegible]
					11
					10
1	TRANSFORMER	[illegible]			9
2	TERMINAL STRIP	[illegible]		CINCH JONES	8
2	TERMINAL BOARD	140-7		CINCH JONES	7
1	SHUNT	[illegible]	[illegible]	[illegible]	6
1	T.B. END SECTION	890	[illegible]	BUCHANAN	5
					4
1	TERMINAL BRD. ASSY.	[illegible]			3
1	COMPONENT BRKT.	[illegible]			2
1	COMP. BRD. ASS'Y.	[illegible]			1

LIST OF MATERIAL

COMPONENT BOARD ASSEMBLY

[illegible]

MASTER PARTS LIST

PARTS LIST NO. 1120948

MASTER PARTS LIST

PARTS LIST NO. 1120948
PAGE 2 OF 3
JOB NO. PD 506-20

ITEM NO.	PL. CHG.	DWG. SIZE	DWG. NO.	REV.	DESCRIPTION	QTY. PER. ASSY.	NOTES	TOT. QTY.	MANUFACTURER	MFG. NO.	IN STK.	P.O. NO.	ORD.	FROM	DEL.	UNIT PRICE	TOT. PRICE
TB3 -	TB4		140-7		Terminal Board												
TB5			140-5		Terminal Board												
T1			F16-X		Transformer, Cont.					115V/6.3V							
T2	N/D		1140955		HV Transformer					115V/6000VRMS							
T3		D	1140927	N/C	RF Transformer					6000/30,000V							
T4			N-68X		Transformer, Cont.		(OPTIONAL)			115V/230V							
CB1			600-001-7		Circuit Breaker					7 amp, 115V							
F1			TN3D2		Fan					3000fu.3inH_2O							
K1			41F-5000S-SIL		Relay					SPDT, 5 amp							
K2			41FZ-5000,ACG-RSL		Relay					SPDT, 5 amp							
DS1-DS10			328		Lamp					6V							
DS11		D	1140717	B	Xenon Lamp					150 amp							
DS11		D	1140721	B	Xenon Lamp					100 amp							
RS-1					Shunt					50mv.200 amp							
SG-1			TG-109		Spark Gap					5000 VDC							

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED

REV.	DATE																			REV.	
BY	APP.																				

See Figure 5-1 for locations

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMALS .XX = ± .03 .XXX = ± .010 ANGLES ± 1/2°
MACHINE FINISH ✓
DO NOT SCALE DRAWING

MATERIAL:

FINISH:

DASH NO.	NEXT ASSY	USED ON

APPLICATION

DRAWN		
CHECK		
DESIGN		
ENGR		
APPR		
APPR		

CONTRACT NO.

APPROVED

APPROVED

OPTICAL RADIATION CORPORATION

P/L Wiring Diagram Model 6000

SIZE	CODE IDENT NO.		REV
B	33030	1120948	A

SCALE --- WEIGHT SHEET 2 OF 3

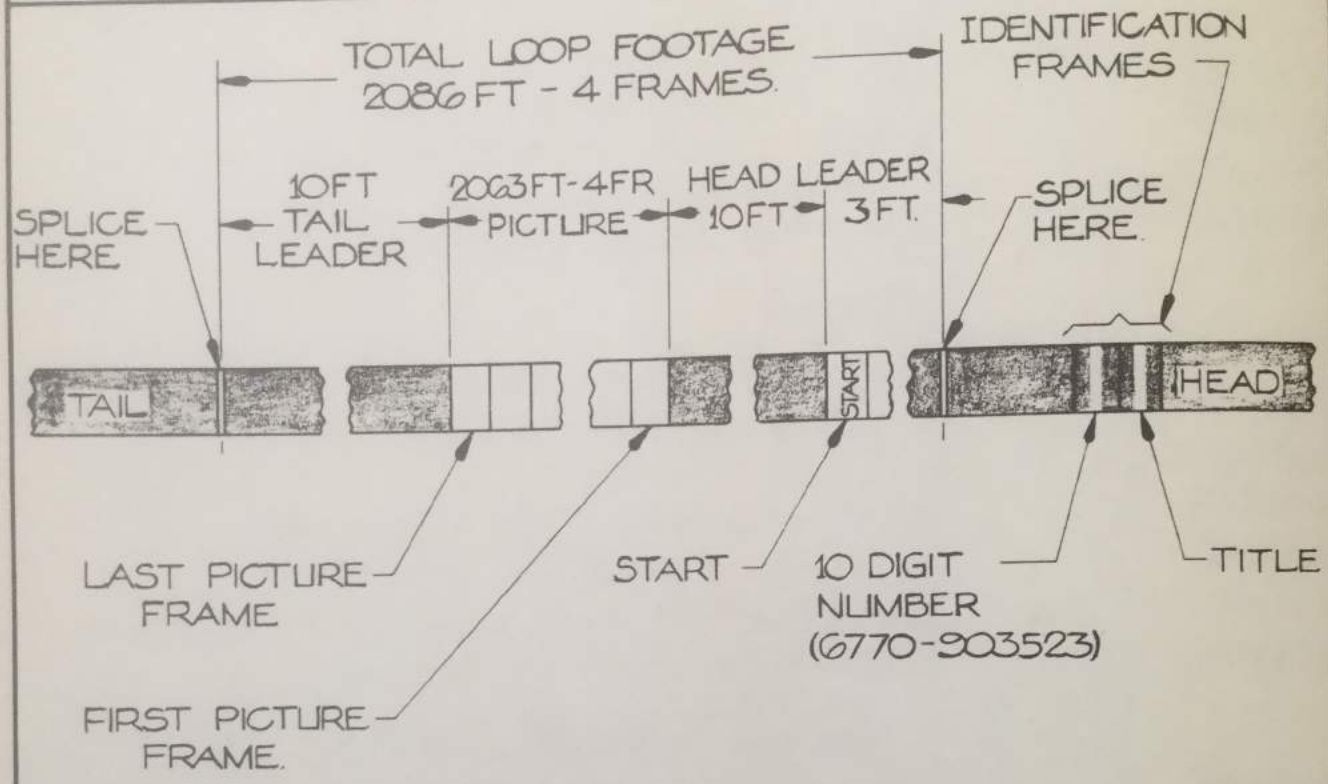
SECTION 4.6

PRE SHOW and MAIN SHOW FILM

DWG NUMBER	FILM TITLE
	MAIN SHOW
6770-903523	Film, Motion Picture 35MM, Disney Story
6730-903659	35MM Picture Cabinet Threading Diagram
6770-903610	Film Sound 35MM Disney Story
6730-903660	35MM Sound Cabinet Threading Diagram
	PRE-SHOW
6770-903527	Film, Motion Picture 16MM, Owl
6730-903662	16MM Picture Cabinet Threading Diagram Owl
6770-903613	Film, Sound 35MM Owl
6730-903661	35MM Sound Cabinet Threading Diagram Owl
6770-903526	Film, Motion Picture 16MM, Mary Poppins
6730-903663	16MM Picture Cabinet Threading Diagram Mary Poppins
6770-903528	Film, Motion Picture 8MM, Time Lapse
	PRE-SHOW BLACK AND WHITE STILL FILM
6770-903529	Film, Still, 11" X 14" B & W "Zorro"
6770-903530	Film, Still, 11" X 14" B & W "Mickey Mouse Club"
6770-903531	Film, Still, 11 1/2" X 18" B & W "Walt Disney Presents"
6770-903532	Film, Still 11" X 18" B & W "Disneyland"
	PRE-SHOW COLOR STILL FILM
6770-903533	Film, Still 14" X 18" Color "Wonderful World Of Disney"
6770-903534	Film, Still 14 3/8" X 18" Color Transparency "Wonderful World of Color"T.V. Title

MOTION PICTURE FILM

APPLICATION		REVISIONS				
NEXT ASSY	USED ON	LTR	E.O.	DESCRIPTION	DATE	APPROVED
6730-903385	DISNEY WORLD	B		REDRAWN. DRAWING REVERSED	PHIL 12-WISE '73.	12-12-73
6730-903474	DISNEYLAND					



NOTES:

1 FOOTAGES SHOWN ARE 35mm FOOTAGES

2 HEAD AND TAIL LEADERS TO BE BLACK

SOURCE: W.D.P. EDITORIAL DEPT.

WALT DISNEY STORY, W.D.W. & D.L.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES:
ANGLES ±
FRACTIONS ±
DECIMALS,
2 PLACES ±
3 PLACES ±

APPROVALS		
DRAWN	GRUNZE	3-73
CHECK	R. OTTO.	3-73
ENGRG	DON IWERKS	3-73

WALT DISNEY PRODUCTIONS

500 South Buena Vista, Burbank, California 91505 Phone 849-3411

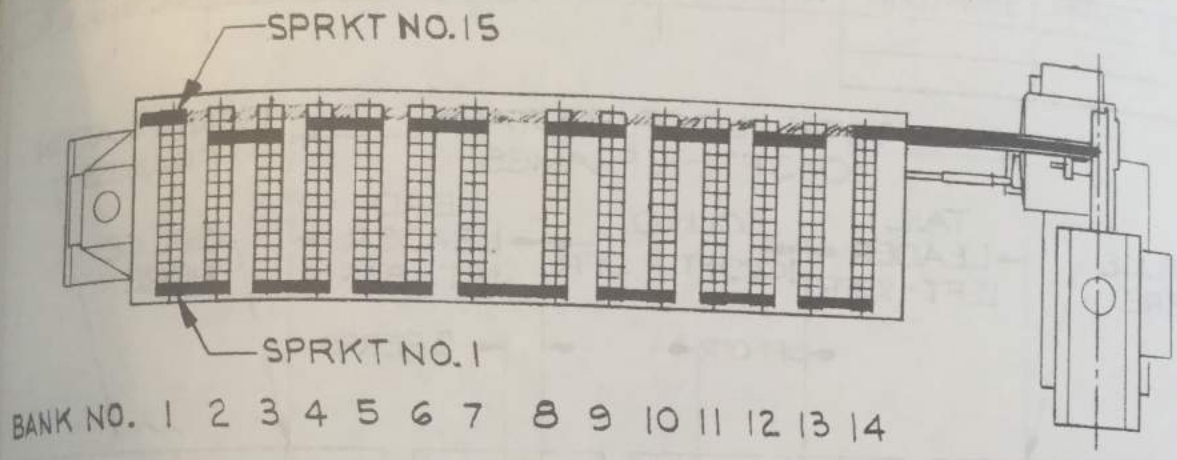
DWG. TITLE
FILM, MOTION PICTURE
35mm, DISNEY STORY

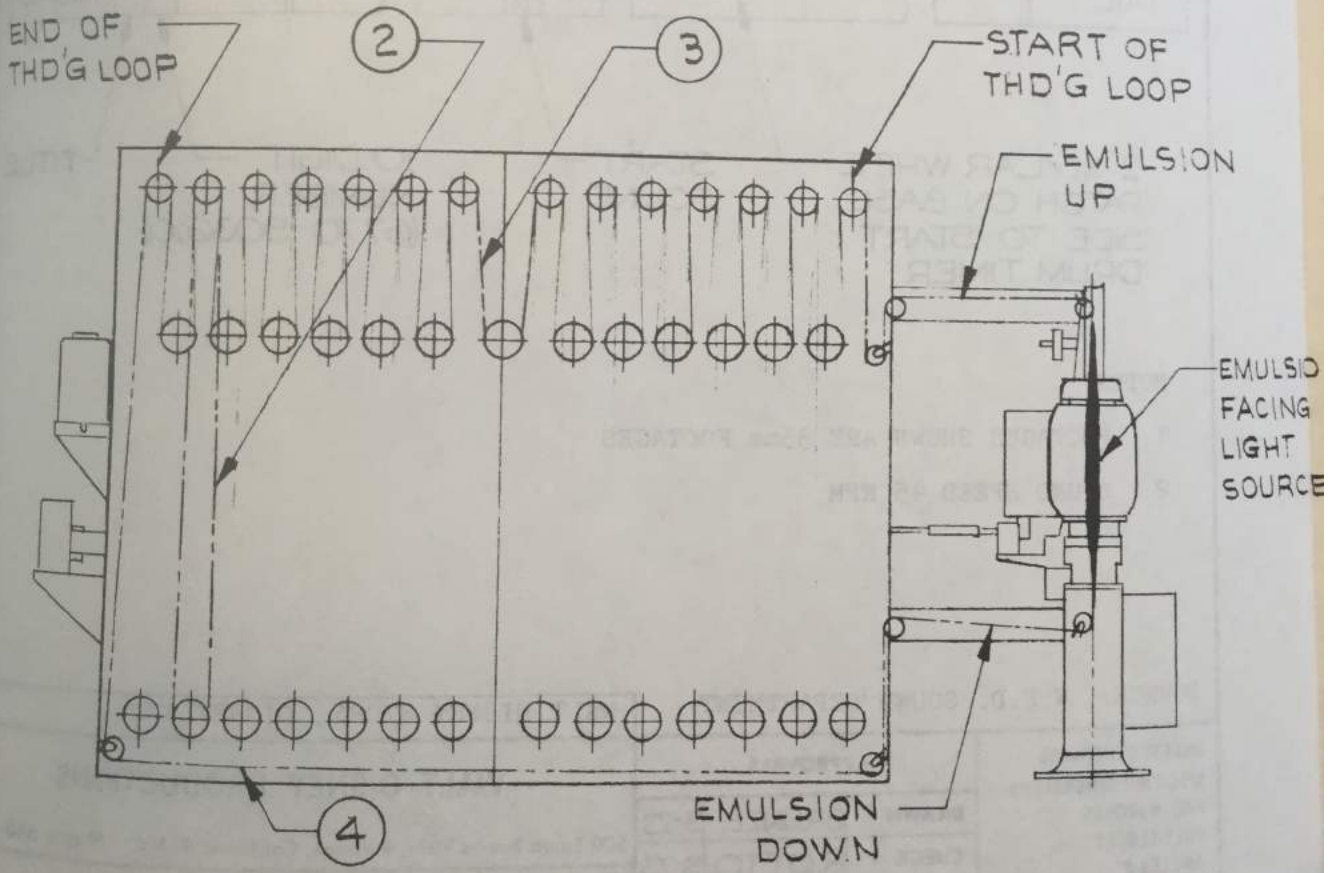
DWG. NO. 6770-903523

REV. B

SCALE

SHEET OF


SPRKT NO. 15
SPRKT NO. 1
BANK NO. 1 2 3 4 5 6 7 8 9 10 11 12 13 14


END OF THD'G LOOP
2
3
START OF THD'G LOOP
EMULSION UP
EMULSION FACING LIGHT SOURCE
4
EMULSION DOWN

NOTE :

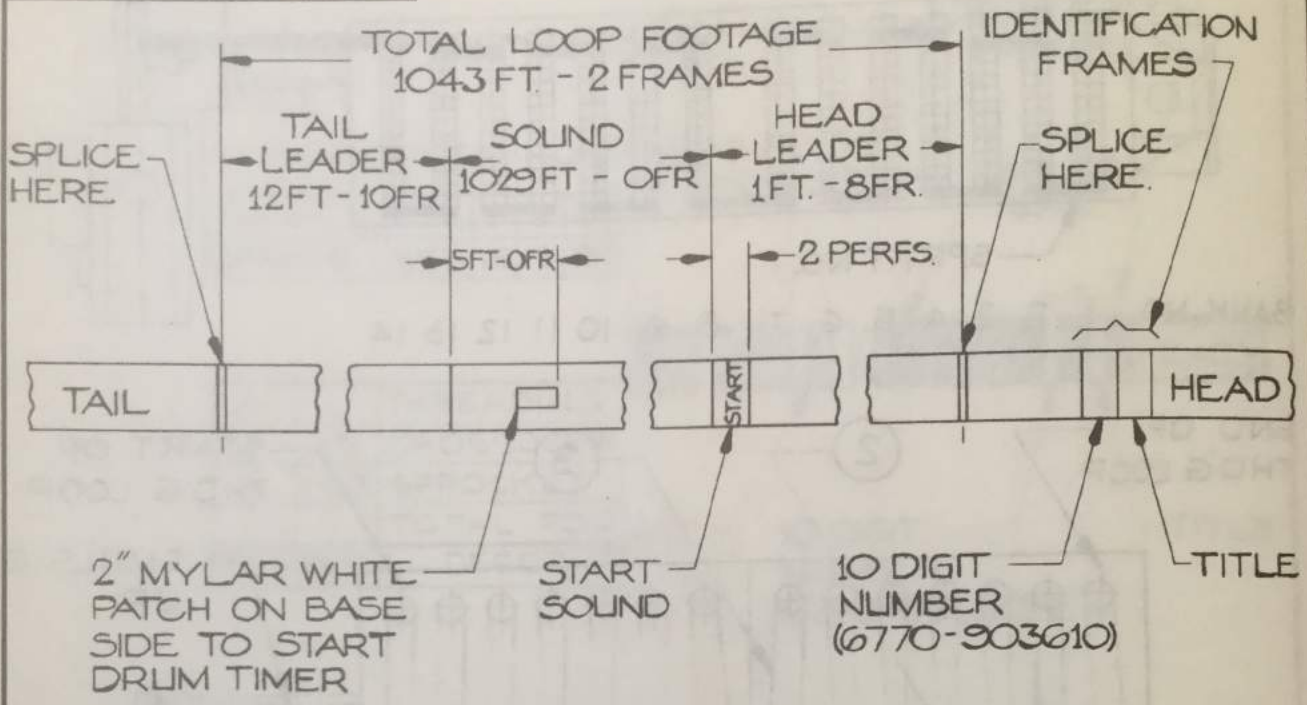
THREADING FROM LEFT TO RIGHT

BANK NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
SPRKTS USED	15	13	13	14	14	14	14	14	14	14	14	14	14	15

ITEM	REQD	DESCRIPTION	FEET	FRAMES
4	1	THREADING LOOP	30	15
3	13	CROSSOVER LOOP	4	3
2	182	SPROCKET LOOP	13	9
1	1	TOTAL FOOTAGE	2553	12

6730 - 903659
PICTURE CABINET THREADING DIAGRAM
MAIN SHOW

APPLICATION		REVISIONS				
NEXT ASSY	USED ON	LTR	E.O.	DESCRIPTION	DATE	APPROVED
6730-903474	DISNEYLAND	A		REDRAWN. DRAWING REVERSED.	PHIL 12. WISE. 73	R. OTTO 12-12-73



NOTES:

1. FOOTAGES SHOWN ARE 35mm FOOTAGES
2. SOUND SPEED 45 FPM

SOURCE: W.E.D. SOUND DEPARTMENT

WALT DISNEY STORY, DISNEYLAND

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES:
ANGLES ±
FRACTIONS ±
DECIMALS,
2 PLACES ±
3 PLACES ±

APPROVALS		
DRAWN	GRUNZE	3-73
CHECK	R.OTTO	5-73
ENGRG	DON IWERKS	5-73

WALT DISNEY PRODUCTIONS

500 South Buena Vista, Burbank, California 91505 Phone 849-3411

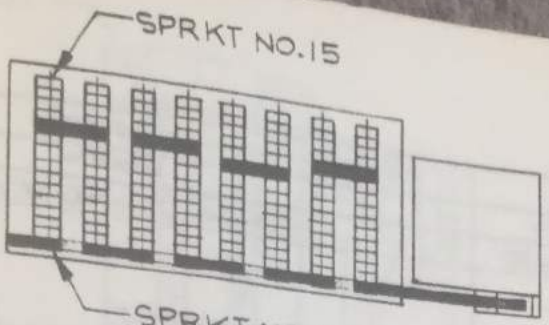
DWG. TITLE: FILM, SOUND 35mm DISNEY STORY

DWG. NO.: 6770-903610

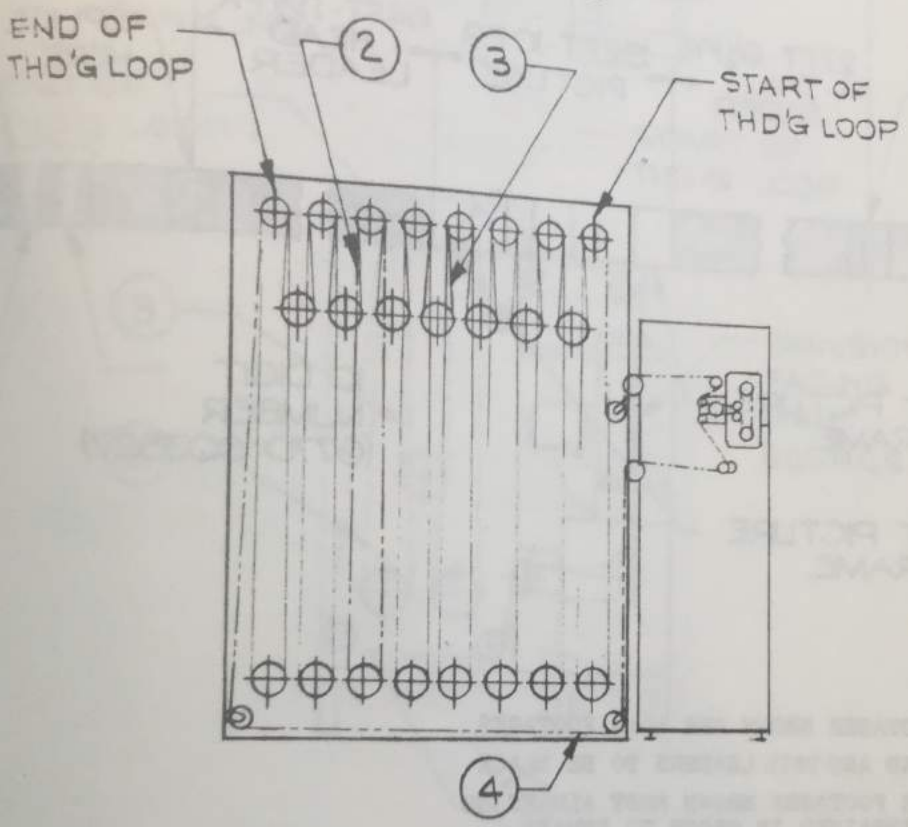
REV.: A

SCALE

SHEET OF



BANK NO. 1 2 3 4 5 6 7 8



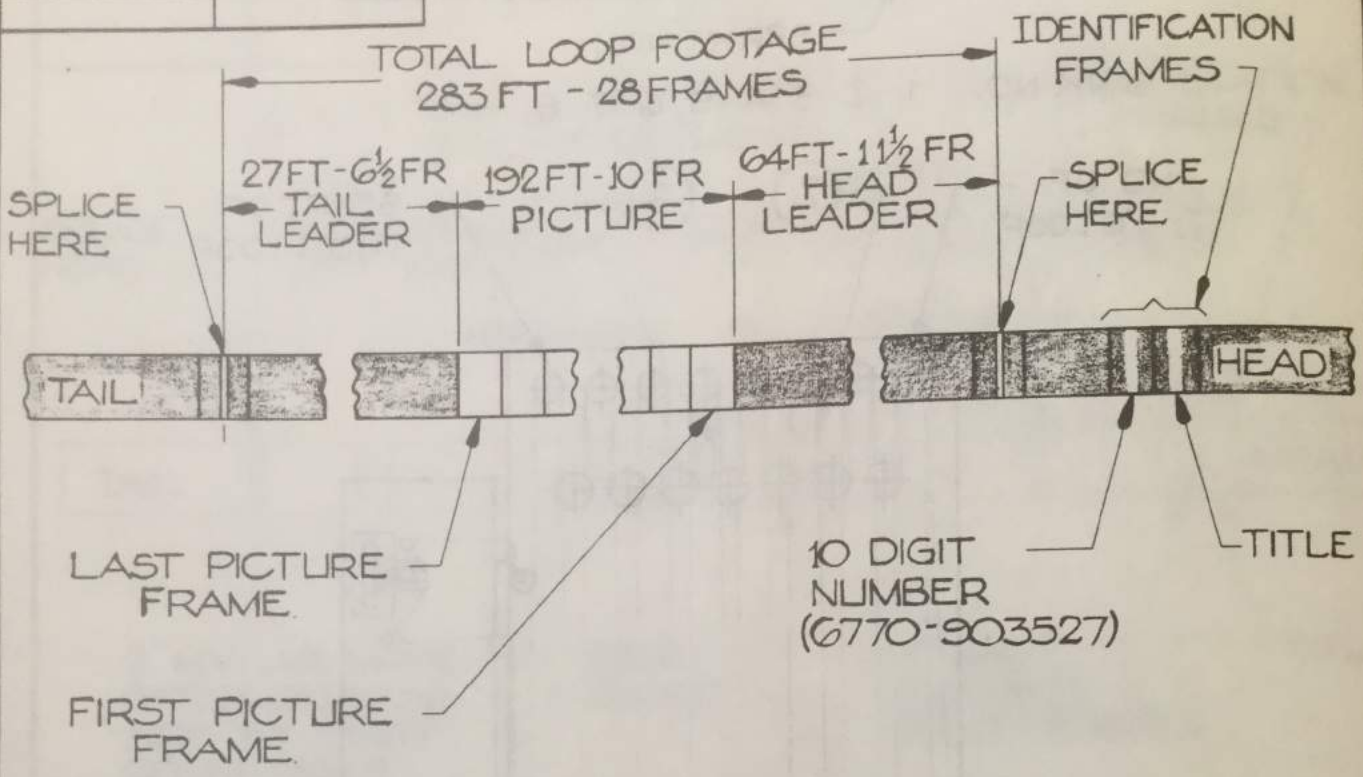
NOTE :
THREADING FROM LEFT TO RIGHT

BANK NO.	1	2	3	4	5	6	7	8
SPROCKETS USED	11	11	11	11	10	10	11	11

ITE'M	REQ'D	DESCRIPTION	FEET	FRAMES
4	1	THREADING LOOP	24	8
3	7	CROSSOVER LOOP	2	12
2	78	SPROCKET LOOP	12	13
1	1	TOTAL FOOTAGE	1043	2

6730-903660
SOUND CABINET THREADING DIAGRAM
35mm MAIN SHOW

APPLICATION		REVISIONS				
NEXT ASSY	USED ON	LTR	E.O.	DESCRIPTION	DATE	APPROVED
6730-903474	DISNEYLAND	B		REDRAWN. DRAWING REVERSED.	PHIL. WISE 12-73	RON 12-12-73



NOTES:

1 FOOTAGES SHOWN ARE 16mm FOOTAGES

2 HEAD AND TAIL LEADERS TO BE BLACK

3 THE FOOTAGES SHOWN MUST ALWAYS BE MAINTAINED IN ORDER TO REMAIN IN SYNC WITH THE SEPARATE 35mm SOUND TRACK

SOURCE: W.D.P. EDITORIAL DEPARTMENT

WALT DISNEY STORY, DISNEYLAND

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES:
ANGLES ±
FRACTIONS ±
DECIMALS,
2 PLACES ±
3 PLACES ±

APPROVALS		
DRAWN	GRUNZE	3-73
CHECK	R.OTTO.	3-73
ENGRG	DON IWERKS	3-73

WALT DISNEY PRODUCTIONS

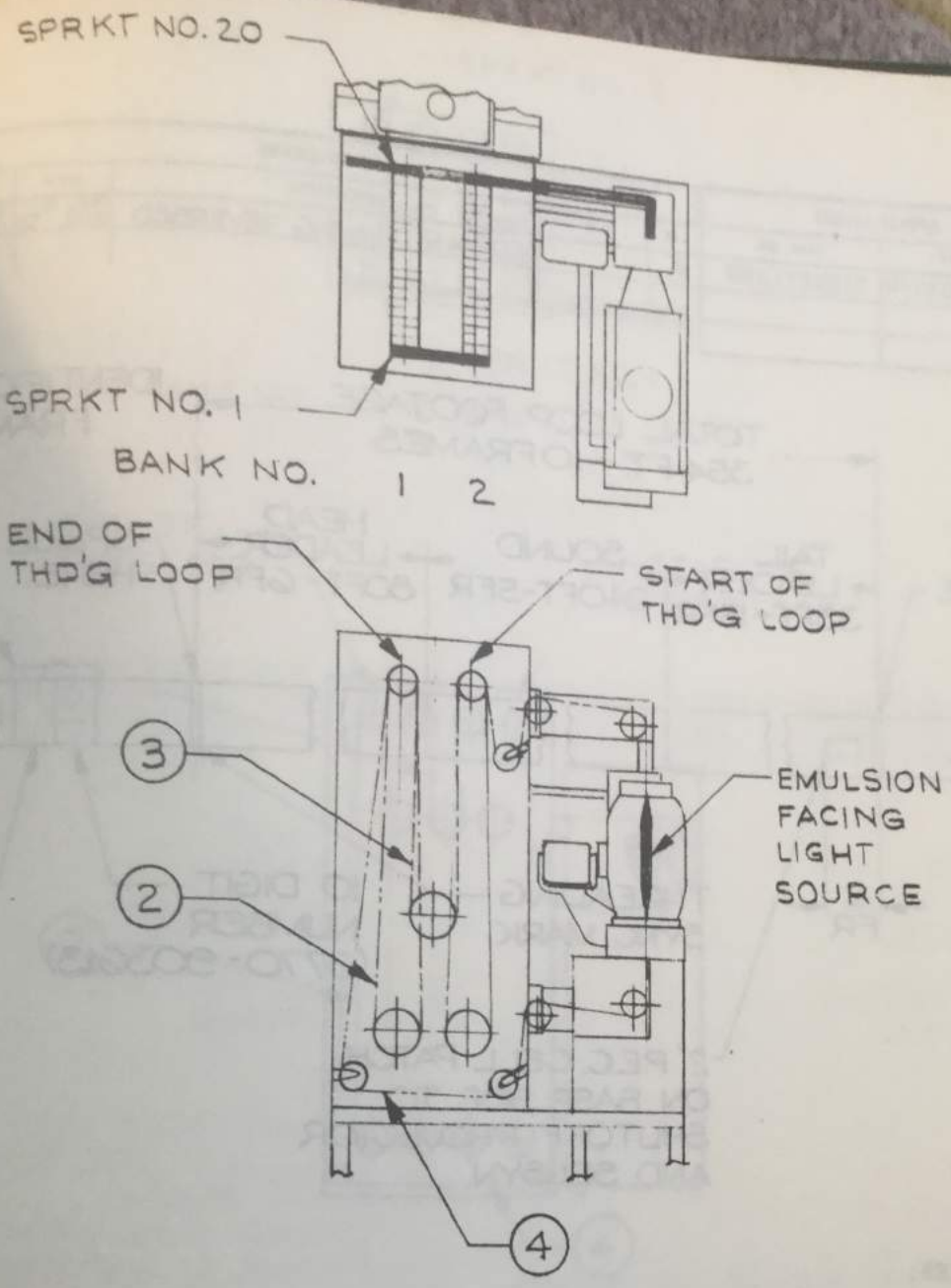
500 South Buena Vista, Burbank, California 91505 Phone 849-3411

DWG. TITLE
FILM, MOTION PICTURE
16mm. OWL

DWG. NO. 6770-903527

REV. B

SCALE | SHEET OF



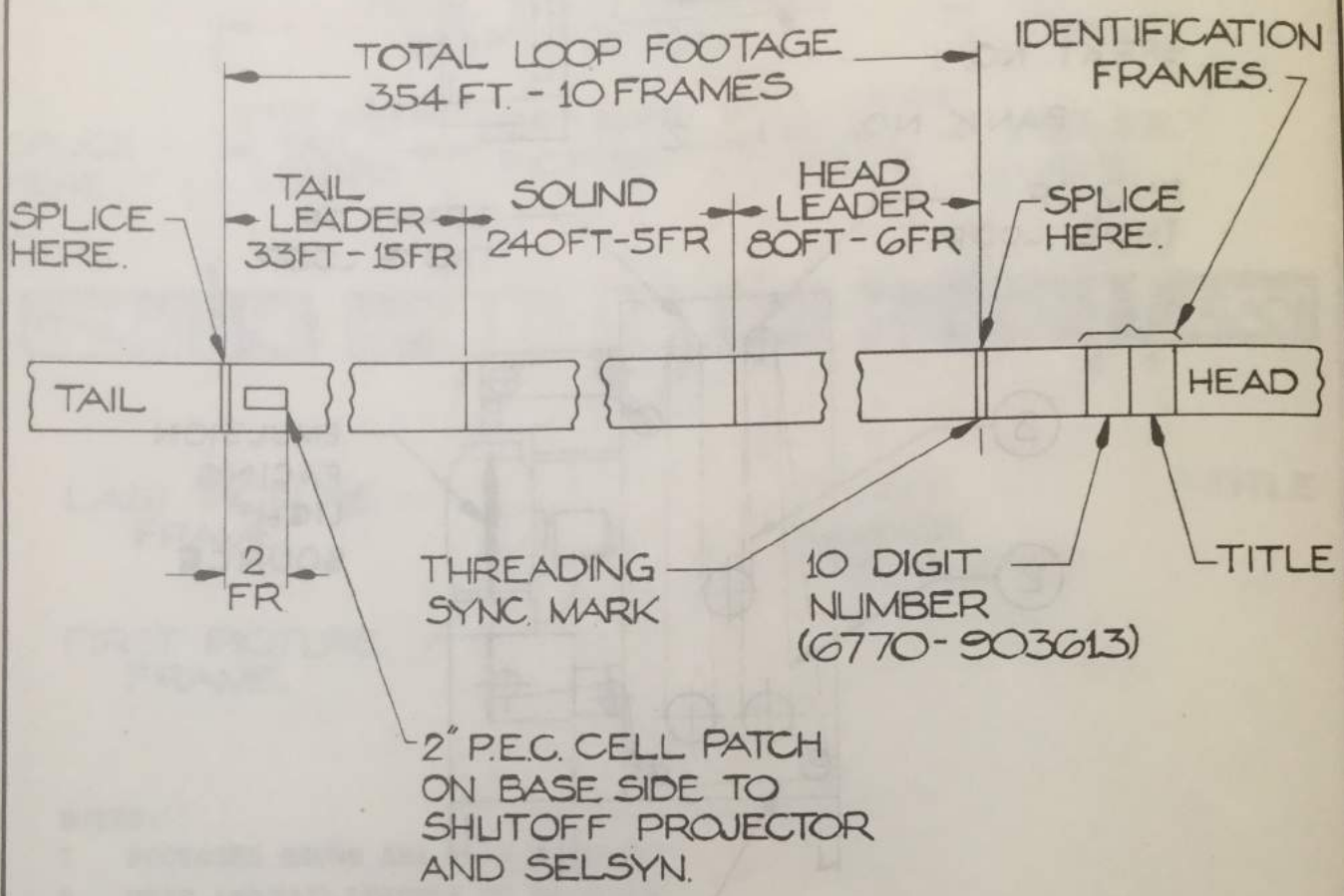
NOTE:
THREADING FROM LEFT TO RIGHT

BANK NO.	1	2
SPROCKETS USED	20	20

ITEM	REQ'D	DESCRIPTION	FEET	FRAMES
4	1	THREADING LOOP	12	23
3	1	CROSSOVER LOOP	5	5
2	38	SPROCKET LOOP	7	0
1	1	TOTAL FOOTAGE	283	28

6730 - 903662
16MM PICTURE CABINET THREADING DIAGRAM
OWL PRE-SHOW

APPLICATION		REVISIONS				
NEXT ASSY	USED ON	LTR	E.O.	DESCRIPTION	DATE	APPROVED
6730-903474	DISNEYLAND	A		REDRAWN. DRAWING REVERSED.	PHIL. 12-WISE. 73	E.O.#6 12-13-73



NOTES:

1. FOOTAGES SHOWN ARE 35mm FOOTAGES
2. SOUND SPEED 45 FPM

SOURCE: W.E.D. SOUND DEPT.

WALT DISNEY STORY. DISNEYLAND

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES:
ANGLES ±
FRACTIONS ±
DECIMALS,
2 PLACES ±
3 PLACES ±

APPROVALS		
DRAWN	GRUNZE.	3-73
CHECK	R.OTTO.	5-73
ENGRG	DON IWERKS	5-73

WALT DISNEY PRODUCTIONS

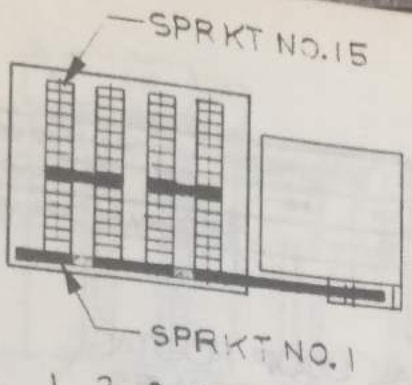
500 South Buena Vista, Burbank, California 91505 Phone 849-3411

DWG. TITLE: FILM, SOUND 35mm OWL

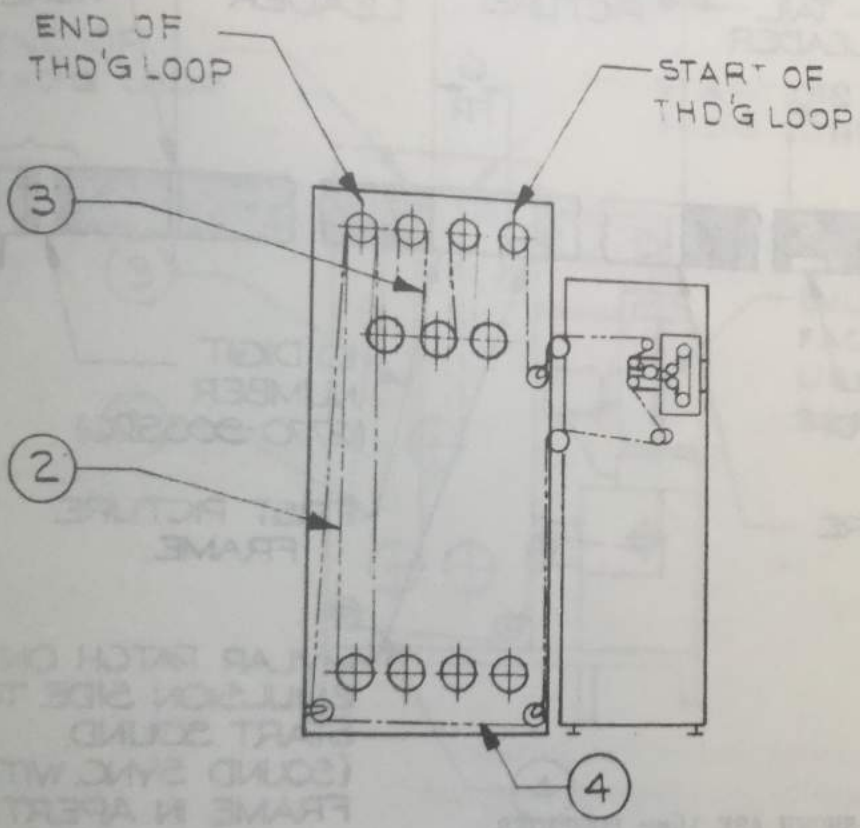
DWG. NO.: 6770-903613

REV.: A

SCALE | SHEET OF



BANK NO. 1 2 3 4



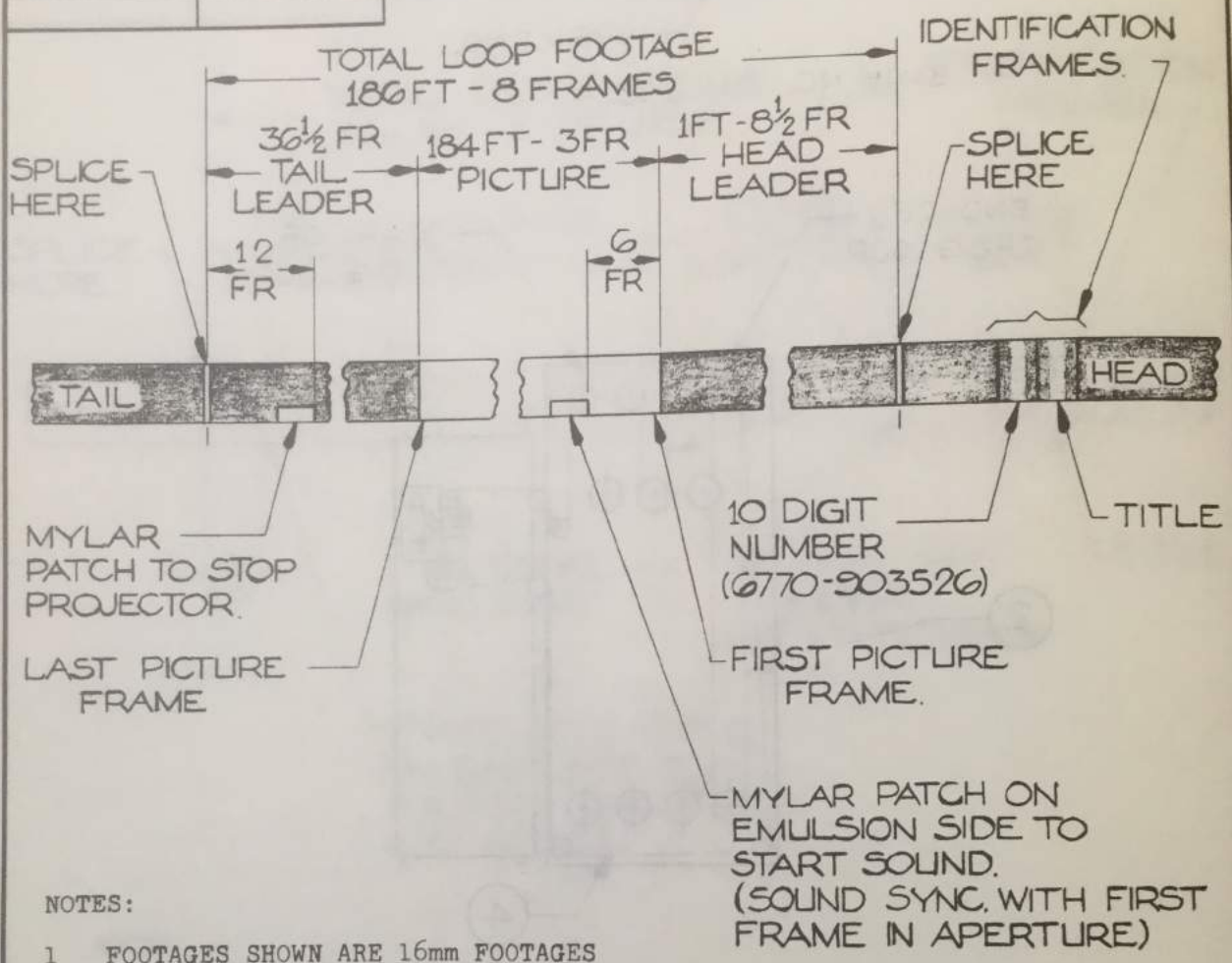
NOTE:
THREADING FROM LEFT TO RIGHT

BANK NO.	1	2	3	4
SPROCKETS USED	8	8	8	3

ITEM	REQ'D	DESCRIPTION	FEET	FRAMES
4	1	THREADING LOOP	21	0
3	3	CROSSOVER LOOP	2	13
2	28	SPROCKET LOOP	11	10
1	1	TOTAL FOOTAGE	354	10

6730 - 903661
35MM SOUND CABINET THREADING DIAGRAM
OWL PRE-SHOW

APPLICATION		REVISIONS				
NEXT ASSY	USED ON	LTR	E.O.	DESCRIPTION	DATE	APPROVED
6730-903474	Disneyland	B		REDRAWN. DRAWING REVERSED.	PHIL WISE 12-73	E.O. 778 12-12-73



NOTES:

1 FOOTAGES SHOWN ARE 16mm FOOTAGES

2 HEAD AND TAIL LEADERS TO BE BLACK

SOURCE: W.D.P. EDITORIAL DEPARTMENT

WALT DISNEY STORY, DISNEYLAND

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES:
ANGLES ±
FRACTIONS ±
DECIMALS,
2 PLACES ±
3 PLACES ±

APPROVALS		
DRAWN	GRUNZE	3-73
CHECK	R.OTTO	3-73
ENGRG	DON IWERKS	3-73

WALT DISNEY PRODUCTIONS

500 South Buena Vista, Burbank, California 91505 Phone 849-3411

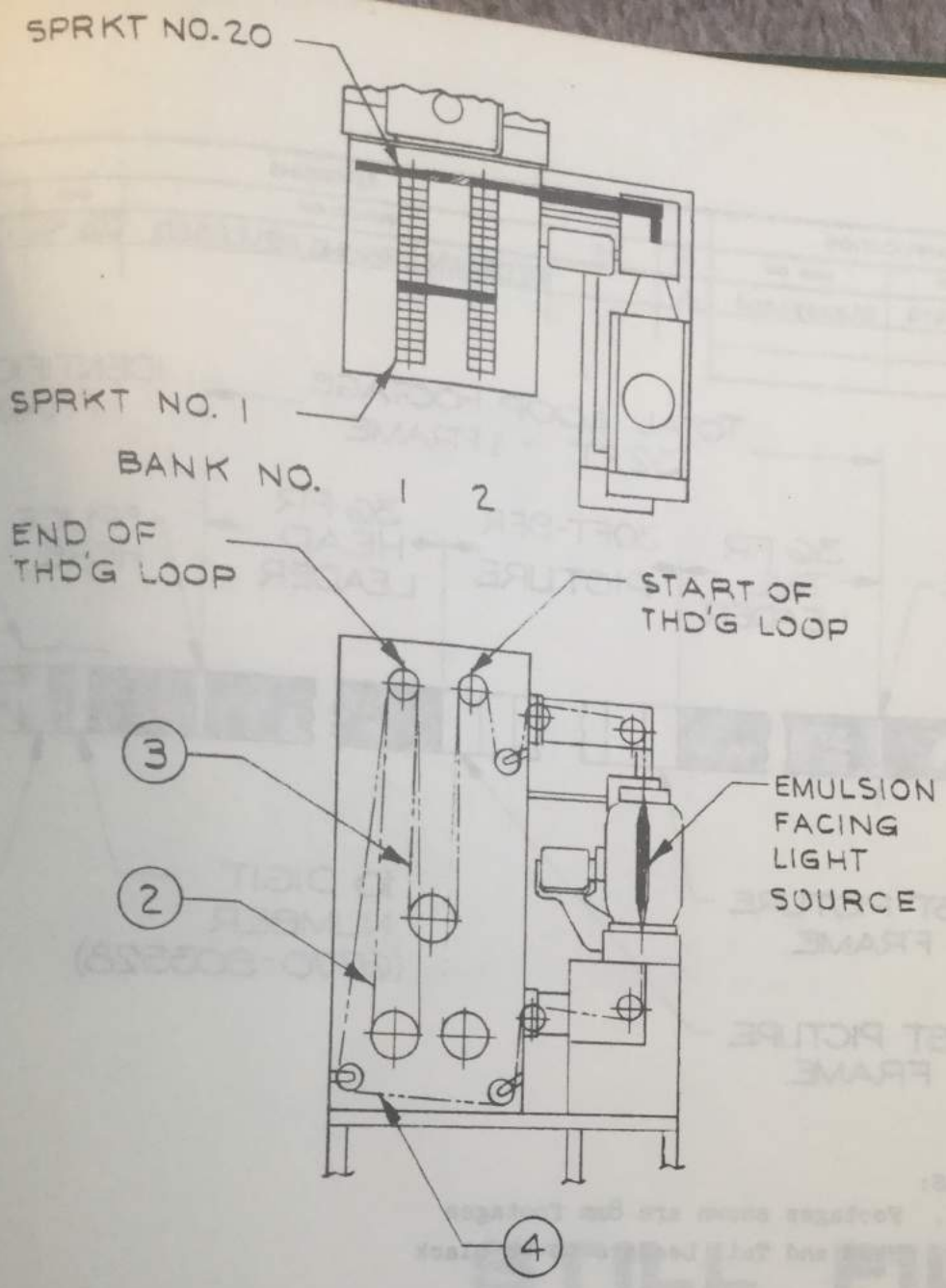
DWG. TITLE: FILM, MOTION PICTURE 16mm, MARY POPPINS

DWG. NO.: 6770-903526

REV.: B

SCALE

SHEET OF



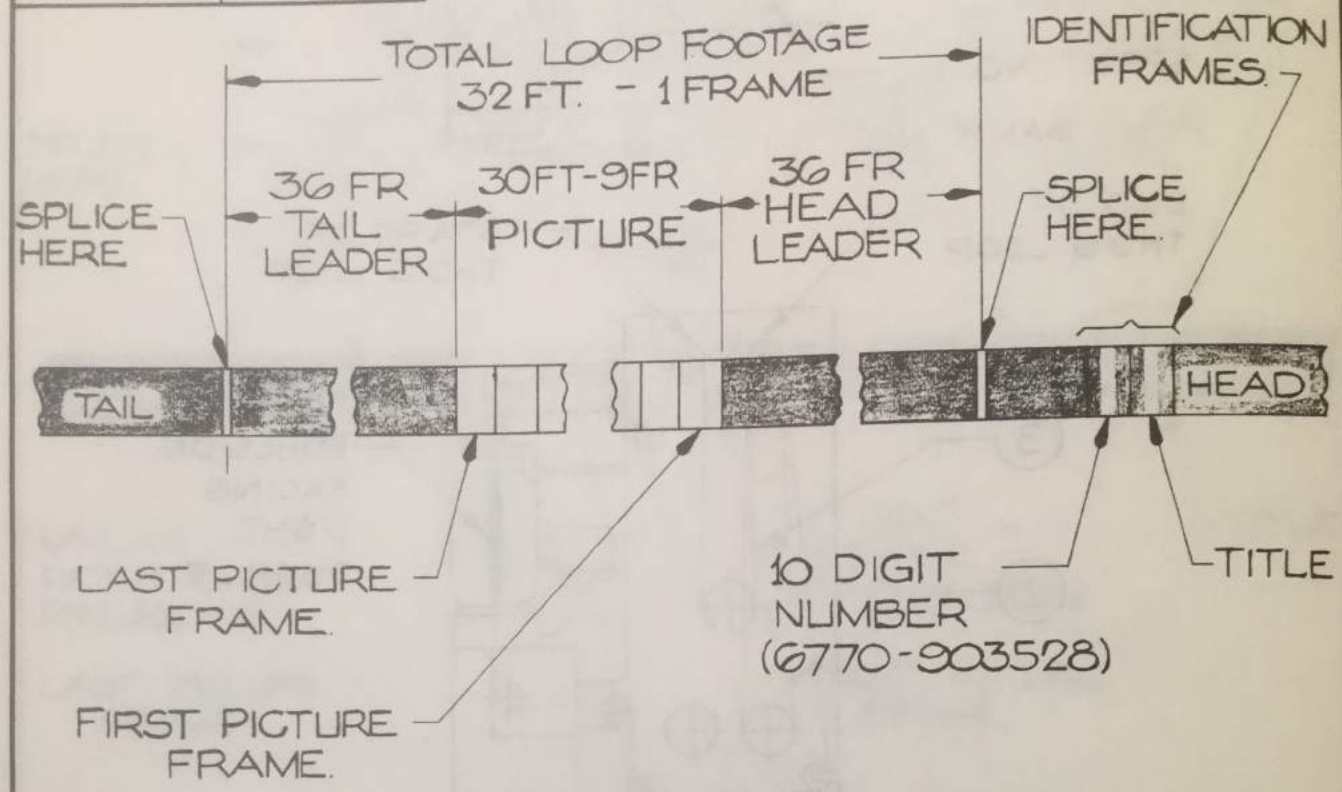
NOTE:
THREADING FROM LEFT TO RIGHT

BANK NO.	1	2
SPROCKETS USED	13	13

ITEM	REQ'D	DESCRIPTION	FEET	FRAMES
4	1	THREADING LOOP	12	24
3	1	CROSSOVER LOOP	5	12
2	24	SPROCKET LOOP	7	0
1	1	TOTAL FOOTAGE	185	36

6730 - 903663
16MM PICTURE CABINET THREADING DIAGRAM
MARY POPPINS PRESHOW

APPLICATION		REVISIONS				
NEXT ASSY	USED ON	LTR	E.O.	DESCRIPTION	DATE	APPROVED
6730-903474	Disneyland	A		REDRAWN. DRAWING REVERSED.	PHIL. 12-WISE. 73	12-12-73



NOTES:

1. Footages shown are 8mm footages
2. Head and Tail Leaders to be Black

SOURCE: W.D.P. EDITORIAL DEPARTMENT

WALT DISNEY STORY, DISNEYLAND

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES:
ANGLES ±
FRACTIONS ±
DECIMALS,
2 PLACES ±
3 PLACES ±

APPROVALS		
DRAWN	GRUNZE	3-73
CHECK	R.OTTO	3-73
ENGRG	DON IWERKS	3-73

WALT DISNEY PRODUCTIONS

500 South Buena Vista, Burbank, California 91505 Phone 849-3411

DWG. TITLE

FILM, MOTION PICTURE
8mm, TIME LAPSE

DWG. NO. 6770-903528

REV. A

SCALE

SHEET OF

STILL FILM

APPLICATION		LTR	E.O.	REVISIONS		
NEXT ASSY	USED ON			DESCRIPTION	DATE	APPROVED
6720-903385	DISNEY WORLD					
6720-903474	DISNEYLAND					

MATERIAL: ADLUX

SOURCE: W.D.P. STILL DEPARTMENT

WALT DISNEY STORY, W.D.W. & D/L

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES:
ANGLES ±
FRACTIONS ±
DECIMALS,
2 PLACES ±
3 PLACES ±

APPROVALS		
DRAWN	GRUNZE	3-73
CHECK	R. Otto	3-73
ENGRG	Don Iwerks	3-13

WALT DISNEY PRODUCTIONS

500 South Buena Vista, Burbank, California 91505 Phone 849-3411

DWG. TITLE: FILM, STILL, 11" x 14" B & W "ZORRO"

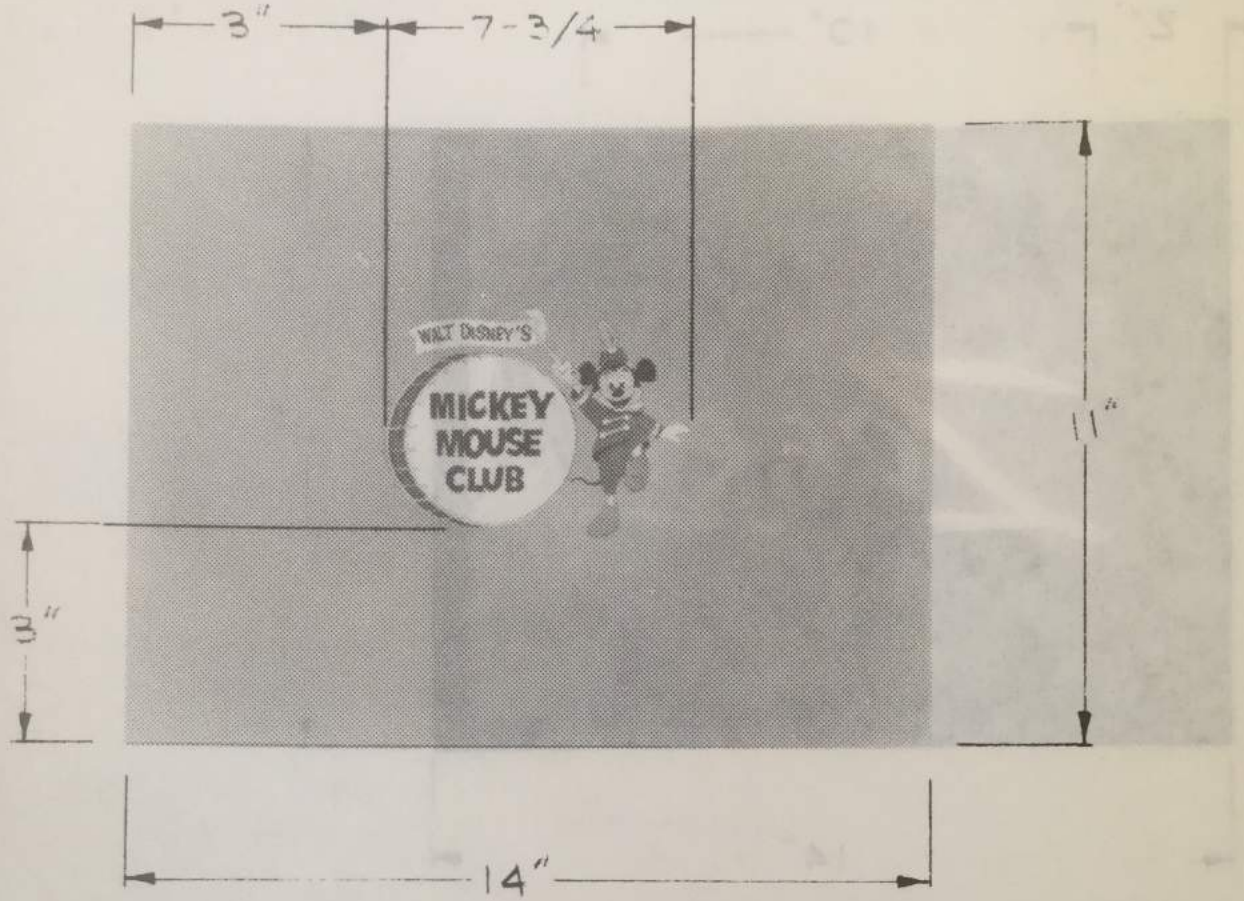
DWG. NO. 6770-903529

REV.

SCALE

SHEET OF

APPLICATION		REVISIONS				
NEXT ASSY	USED ON	LTR	E.O.	DESCRIPTION	DATE	APPROVED
6730-903385	DISNEY WORLD					
6730-903474	DISNEYLAND					



MATERIAL: ADLUX

SOURCE: W.D.P. STILL DEPARTMENT

WALT DISNEY STORY, W.D.W. & D.L.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES:
ANGLES ±
FRACTIONS ±
DECIMALS,
2 PLACES ±
3 PLACES ±

APPROVALS		
DRAWN	GRUNZE	3-73
CHECK	E OTTO	3-73
ENGRG	Dan Inotte	3-73

WALT DISNEY PRODUCTIONS

500 South Buena Vista, Burbank, California 91505 Phone 849-3411

DWG. TITLE

FILM, STILL, 11" x 14" B & W
"MICKEY MOUSE CLUB"

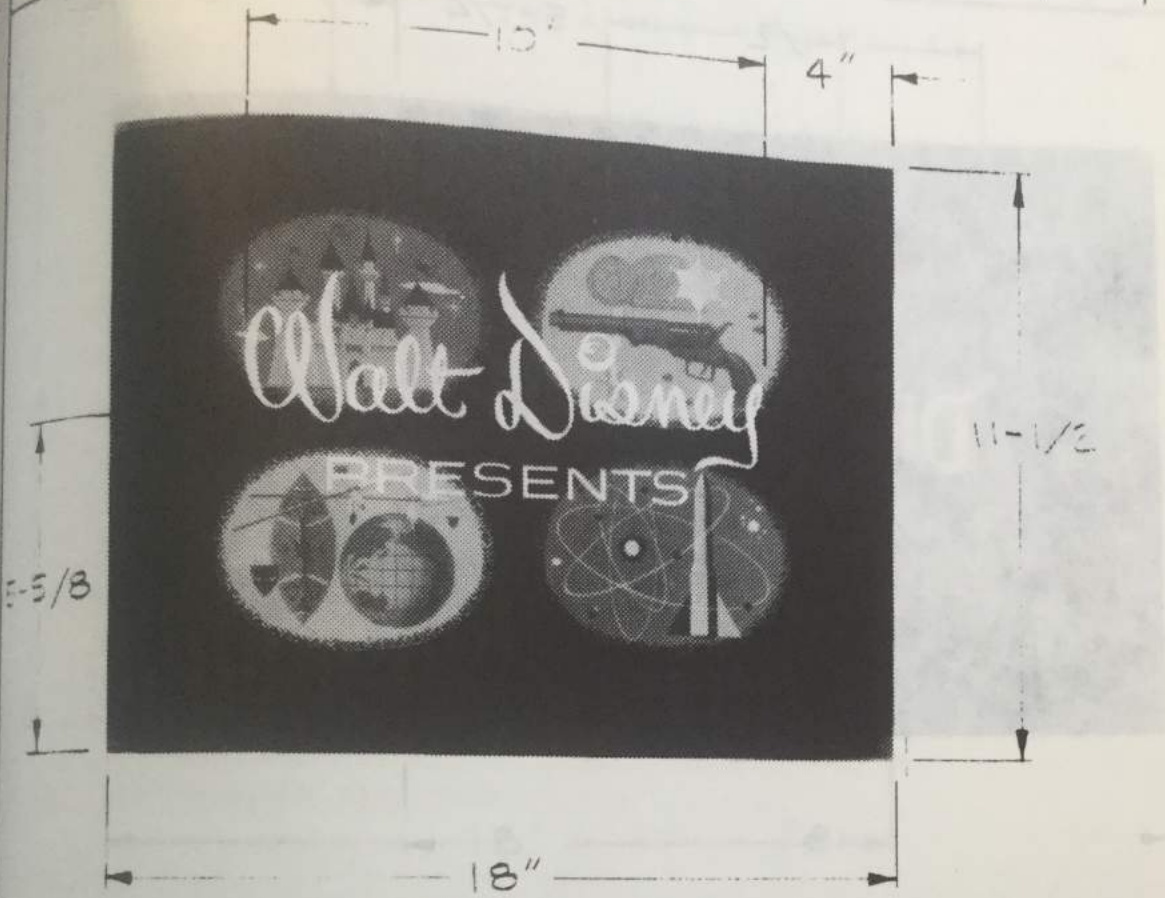
DWG. NO. 6770-903530

REV.

SCALE

SHEET OF

APPLICATION		REVISIONS				
NEXT ASSY	USED ON	LTR	E.O.	DESCRIPTION	DATE	APPROVED
6770903385	DISNEY WORLD					
6770903474	DISNEYLAND					



MATERIAL: ADLUX

SOURCE: W.D.P. STILL DEPARTMENT

WALT DISNEY STORY, W.D.W. & D.L.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES:
ANGLES ±
FRACTIONS ±
DECIMALS.
2 PLACES ±
3 PLACES ±

APPROVALS		
DRAWN	GRUNZE	3-73
CHECK	R Otto	3-73
ENGRG	Don Lucas	3-73

WALT DISNEY PRODUCTIONS

500 South Buena Vista, Burbank, California 91505 Phone 849-3411

DWG. TITLE: FILM, STILL. 11-1/2" x 18" B & W "WALT DISNEY PRESENTS"

DWG. NO. 6770-903531 REV.

SCALE SHEET OF

APPLICATION		REVISIONS				
NEXT ASSY	USED ON	LTR	E.O.	DESCRIPTION	DATE	APPROVED
6730-903385	DISNEY WORLD					
6730-903474	DISNEYLAND					

MATERIAL: ADLUX

SOURCE: W.D.P. STILL DEPARTMENT

WALT DISNEY STORY, W.D.W. & D.L.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES:
ANGLES ±
FRACTIONS ±
DECIMALS,
2 PLACES ±
3 PLACES ±

APPROVALS		
DRAWN	GRUNZE	3-73
CHECK	K OTT	3-73
ENGRG	[illegible]	3-73

WALT DISNEY PRODUCTIONS

500 South Buena Vista, Burbank, California 91505 Phone 849-3411

DWG. TITLE

FILM, STILL, 11" x 18" B & W
"DISNEYLAND"

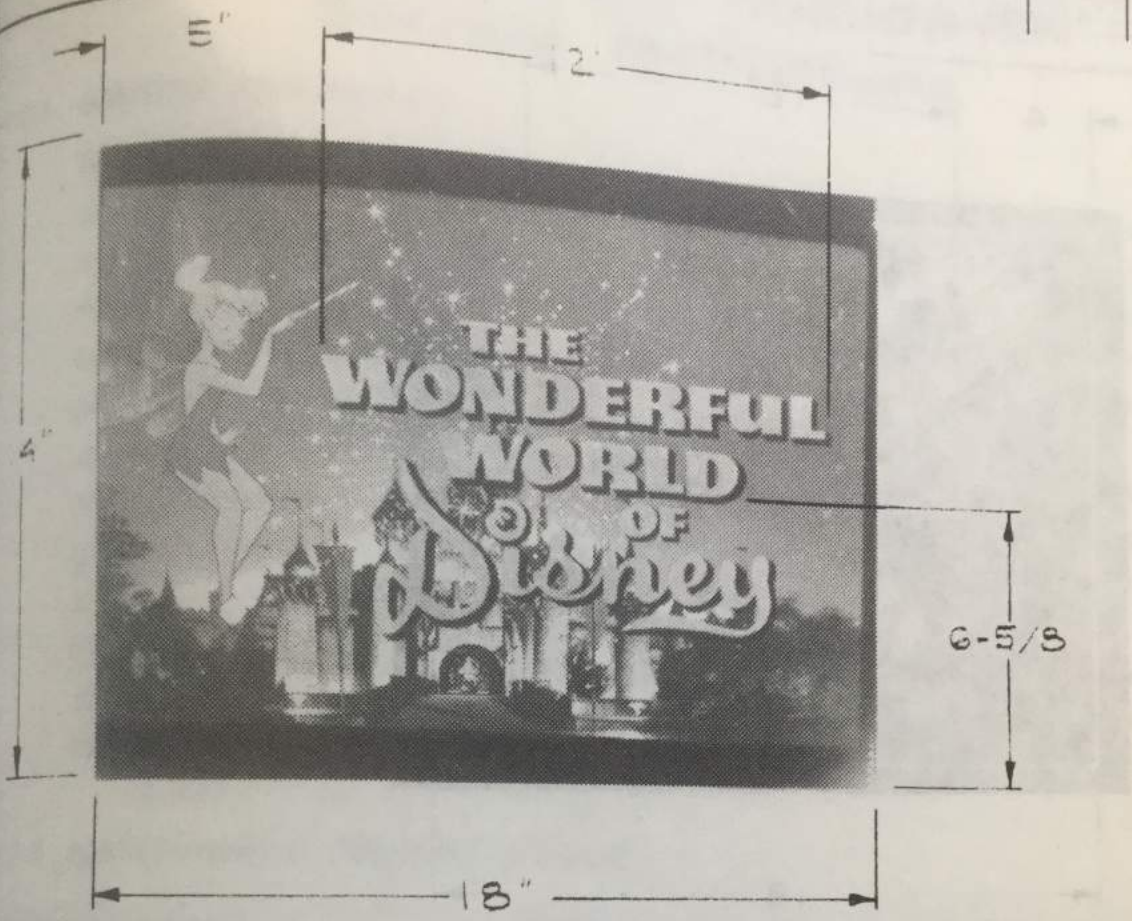
DWG. NO. 6770-903532

REV.

SCALE

SHEET OF

APPLICATION				REVISIONS		
NEXT ASSY	USED ON	LTR	E.O.	DESCRIPTION	DATE	APPROVED
6770-903385	DISNEY WORLD					
6770-903474	DISNEYLAND					



MATERIAL: EASTMAN EKTACOLOR PRINT FILM

SOURCE: W.D.P. STILL DEPARTMENT

WALT DISNEY STORY, W.D.W. & D.L.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES:
ANGLES ±
FRACTIONS ±
DECIMALS,
2 PLACES ±
3 PLACES ±

APPROVALS		
DRAWN	GRUNZE	3-73
CHECK	E. Otto	3-73
ENGRG	Don Iwerks	3-73

WALT DISNEY PRODUCTIONS

500 South Buena Vista, Burbank, California 91505 Phone 849-3411

DWG. TITLE: FILM, STILL, 14" x 18" COLOR "WONDERFUL WORLD OF DISNEY"

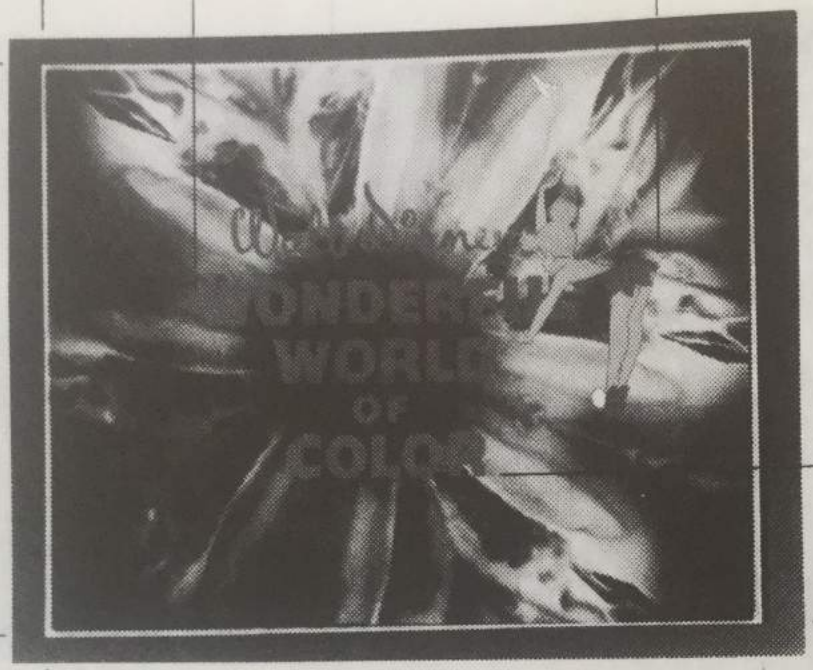
DWG. NO. 6770-903533

REV.

SCALE

SHEET OF

APPLICATION		REVISIONS				
NEXT ASSY	USED ON	LTR	E.O.	DESCRIPTION	DATE	APPROVED
6730-903385	DISNEY WORLD					
6730-903474	DISNEY LAND					



MATERIAL: EASTMAN EKTACOLOR PRINT FILM

SOURCE: W.D.P. STILL DEPARTMENT

WALT DISNEY STORY, W.D.W. & D.L.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES: ANGLES ± FRACTIONS ± DECIMALS, 2 PLACES ± 3 PLACES ±	APPROVALS		
	DRAWN	GRUNZE	3-73
	CHECK	E. Otto	3-73
	ENGRG	Don Lusk	3-73

WALT DISNEY PRODUCTIONS

500 South Buena Vista, Burbank, California 91505 Phone 849-3411

DWG. TITLE: FILM, STILL, 14-3/8" x 18" COLOR TRANSPARENCY "WONDERFUL WORLD OF COLOR" T.V. TITLE

DWG. NO.: 6770-903534

REV.:

SCALE | SHEET OF

SECTION 4.7

FILM CABINET HUMIDIFIER Service Instructions

4.7.1 GENERAL DESCRIPTION

The purpose of this unit is to maintain the relative humidity in the film cabinet when the ambient relative humidity is below 50%. In achieving and maintaining this condition, the film life is extended due to the constant relative humidity of 50% within the film cabinet. The humidifier unit is comprised of a Bodine Motor driving a spoked drum with a polyurethane foam pad evaporator around its circumference. Rotating in a reservoir of distilled water, moisture is picked up on the polyurethane foam pad and is evaporated into water vapor via a Universal Electric Blower unit housed in a return air plenum. The moist air is then discharged into the film cabinet via a supply air plenum box. The level of distilled water in the reservoir is maintained by a float assembly connected via a tube to a carboy mounted above the humidifier unit. Should the float inadvertently stick any time in the open position, the overflow outlet will discharge the excess water. (See Drawing 6730-902760).

4.7.2 MAINTENANCE FREQUENCY CHART

LUBRICATION POINT	FREQUENCY
Bodine Motor	2 to 3 drops monthly
(3) Oiling Points	(Each oiling point)

CLEANING POINTS	FREQUENCY
Evaporator Pad	Monthly
Blower Squirrel Cage	Monthly

4.7.3 FLOAT ADJUSTMENT

Float adjustment to be not less than 1 1/2" and not to exceed 2" from bottom of reservoir to center line of glass float in horizontal position. To achieve this condition, loosen slotted screw on float arm, hold rubber seat against needle valve with finger, set float at specified height, and tighten slotted screw. Re-check float height.

4.7.3 FLOAT ADJUSTMENT (cont.)

WARNING: Use ONLY distilled or de-ionized water in humidifier reservoir and carboy. If any other type of water is used, a white powder residue will form due to chlorides and solids. These will dry on the evaporator pad and eventually be carried into the film cabinet, causing film scratching and damage.

4.7.4 TROUBLESHOOTING CHART

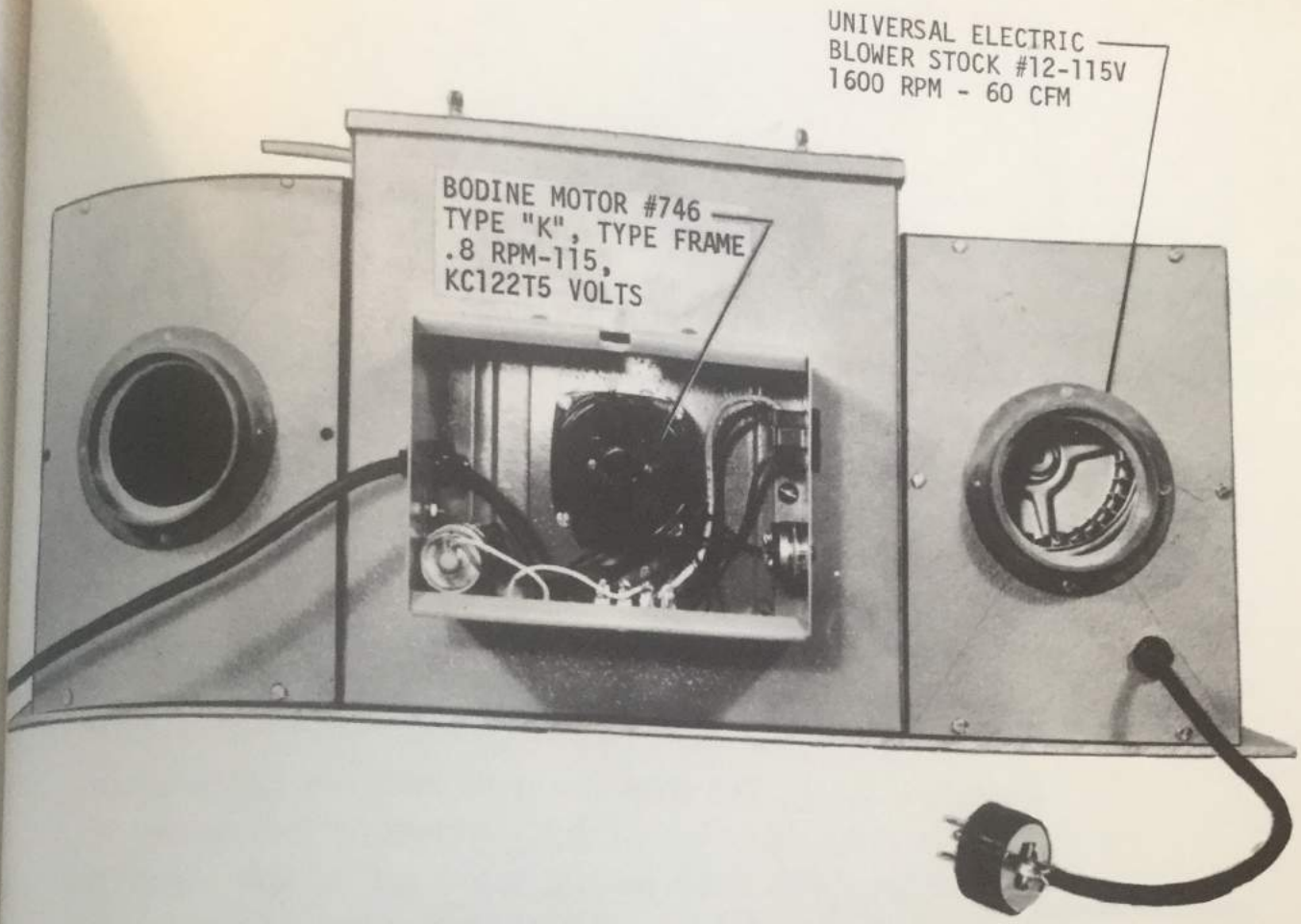
TROUBLE	PROBABLE CAUSE	REMEDY
1. Low humidity	Unit power off	Check fuse and breaker.
	Unit does not run (Power on)	Check humidistat for broken sensing element in film loop cabinet. Check all service cords, check capacitor.
	Water carboy empty	Refill with distilled water. See WARNING above.
	Sticking float	Manually check action of float. Adjust float, or replace as necessary.
	Obstruction in distilled water supply line.	Remove obstruction and clean out supply line.
	Water level too low.	Adjust float to maintain 1 1/2" minimum water level. See Float Adjustment.
	Humidistat set too low.	Adjust humidistat in film loop cabinet to 50%.
	Evaporator drum not turning.	Check coupling set screw on drive motor shaft.
	Obstruction in air supply or air return.	Remove obstructions.
	Plenum box hose damaged	Check hoses on both plenum boxes for cuts, holes or disconnects between unit and film loop cabinet.

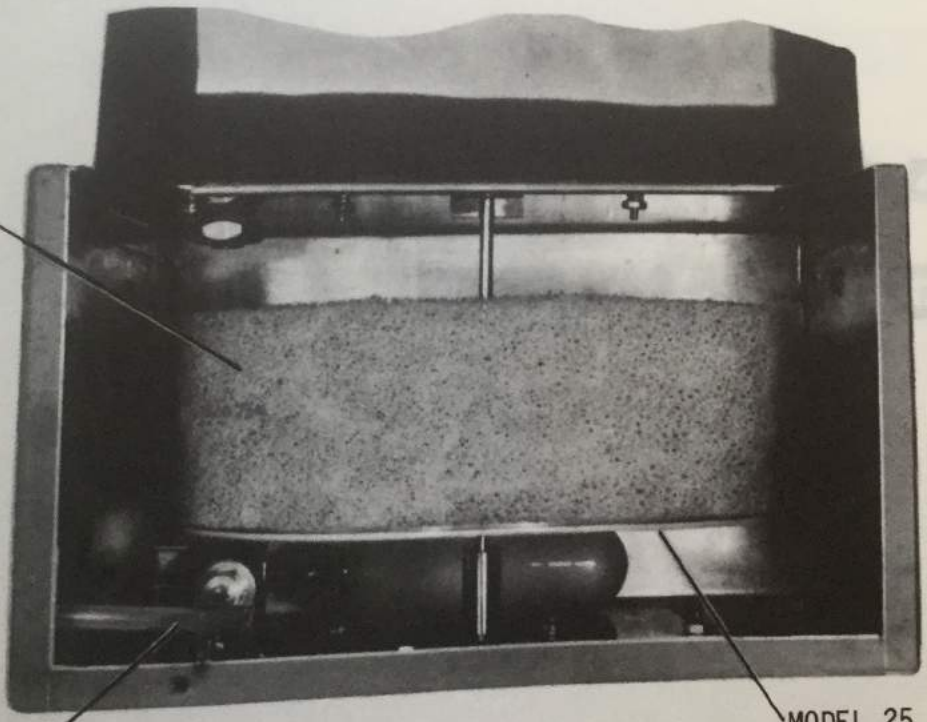
4.7.4 TROUBLESHOOTING CHART (cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
2. Reservoir overflows.	Sticking or broken float.	Adjust or replace float assembly.
	Float adjusted too high.	See Float Adjustment.
3. Dirt or white powder in reservoir.	Non distilled water used. See WARNING.	Remove humidifier unit. Drain completely. Remove all foreign particles and clean reservoir. Replace evaporator pad and refill with distilled water.
4. White powder and grit on film.	Non distilled water used. See WARNING.	Remove humidifier unit. Drain completely. Remove all foreign particles and clean reservoir. Replace evaporator pad and refill with distilled water.
5. Drive motor noisy.	Lack of lubrication.	Oil. See Maintenance Frequency Chart.
	Bearing(s) noisy.	Replace bearing(s).
	Loose coupling on drive motor shaft.	Tighten set screw.
6. Blower unit noisy (No lubrication point).	Blower vibration	Check for loose blower retaining screws (4).
		Check for loose set screw retaining squirrel cage blower on drive shaft.
		Spin squirrel cage blower by hand to check oilite bearing. Cage should spin freely with no vibration or binding.
	Bearings dry or noisy	Replace bearings.

4.7.5 RECOMMENDED SPARE PARTS

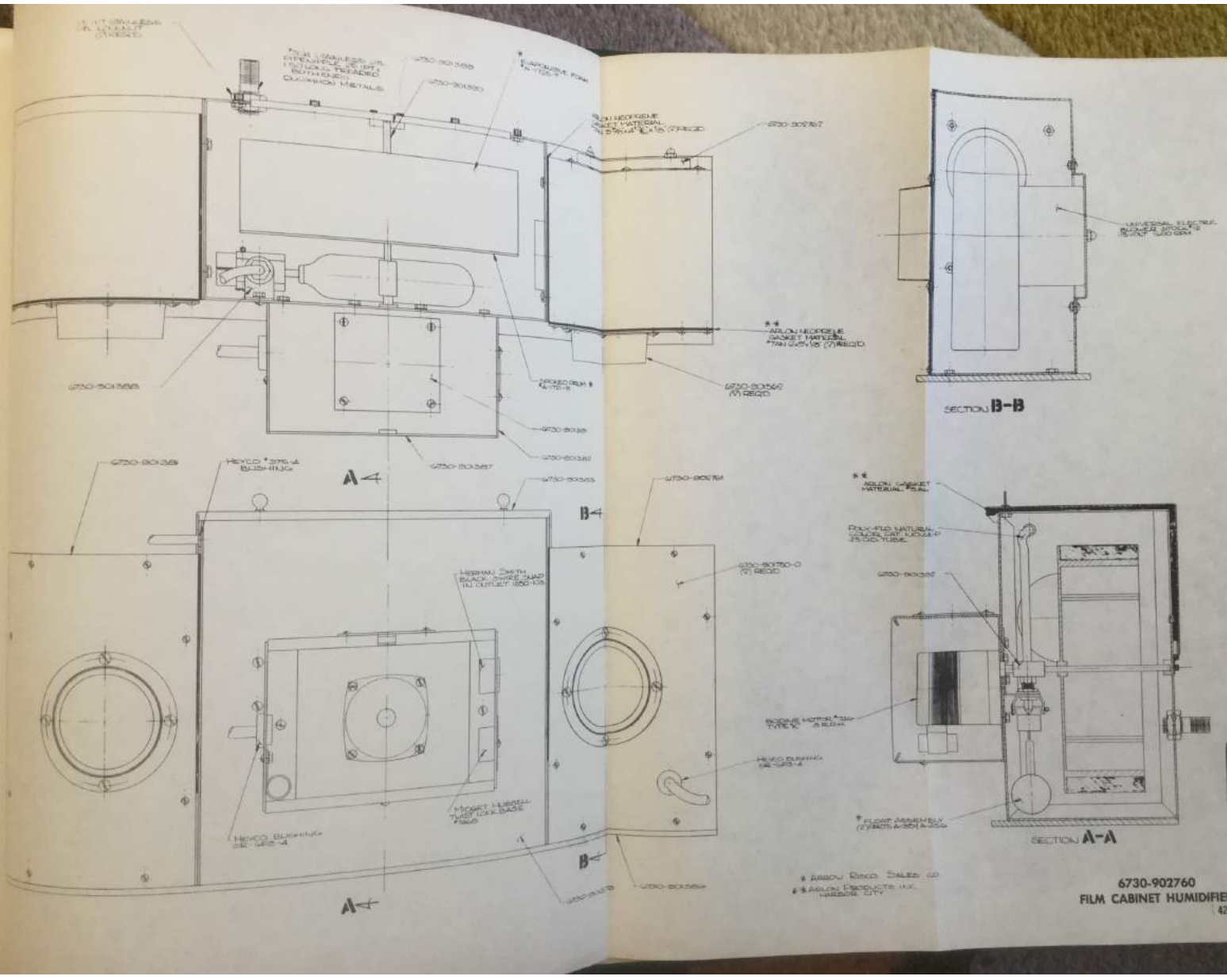
DESCRIPTION	SOURCE
Bodine Motor #746 Type "K" .8RPM Type Frame #KC122T5	Bodine Electric Co. Chicago, Illinois
Universal Electric Blower Stock #12 115V 1600RPM 60 CFM	Universal Electric Co. Owwosso, Michigan 48867
Float Assembly #A-39 & A-456	Arrow Risco Sales Co. 8210 Lankershim Blvd. No. Hollywood, Calif. 91605 (213) 768-5440
Polyurethane Foam Pad Evaporator #A1-1725-7	Arrow Risco Sales Co. 8210 Lankershim Blvd. No. Hollywood, Calif. 91605 (213) 768-5440
Poly-Flo Natural Color Tube #44-P 1/4" O.D.	Arrow Risco Sales Co. 8210 Lankershim Blvd. No. Hollywood, Calif. 91605 (213) 768-5440
Neoprene Gasket Material #7AN	Arlon Products, Inc. 23924 So. Vermont Ave. Harbor City, Calif. 90710 (213) 775-3507
Gasket Material #5AL	Arlon Products, Inc. 23924 So. Vermont Ave. Harbor City, Calif. 90710 (213) 775-3507





FILM CABINET HUMIDIFIER

MECHANICAL DRAWINGS



6730-902760
FILM CABINET HUMIDIFIER