SECTION 4

PROJECTORS

SECTION 4

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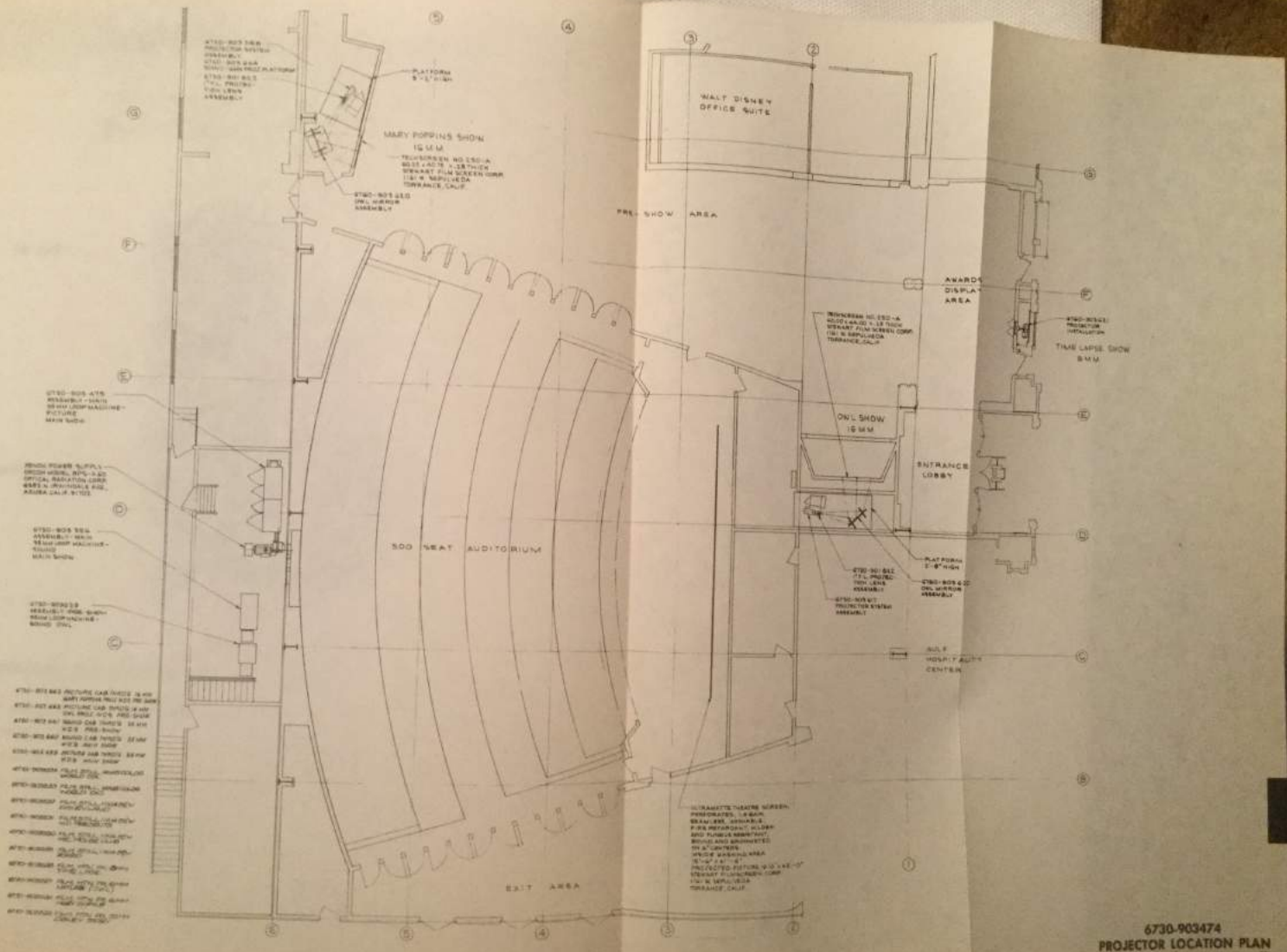


6730-903474
PROJECTOR LOCATION PLAN

SECTION 4.1

8mm PROJECTOR
Service Instructions

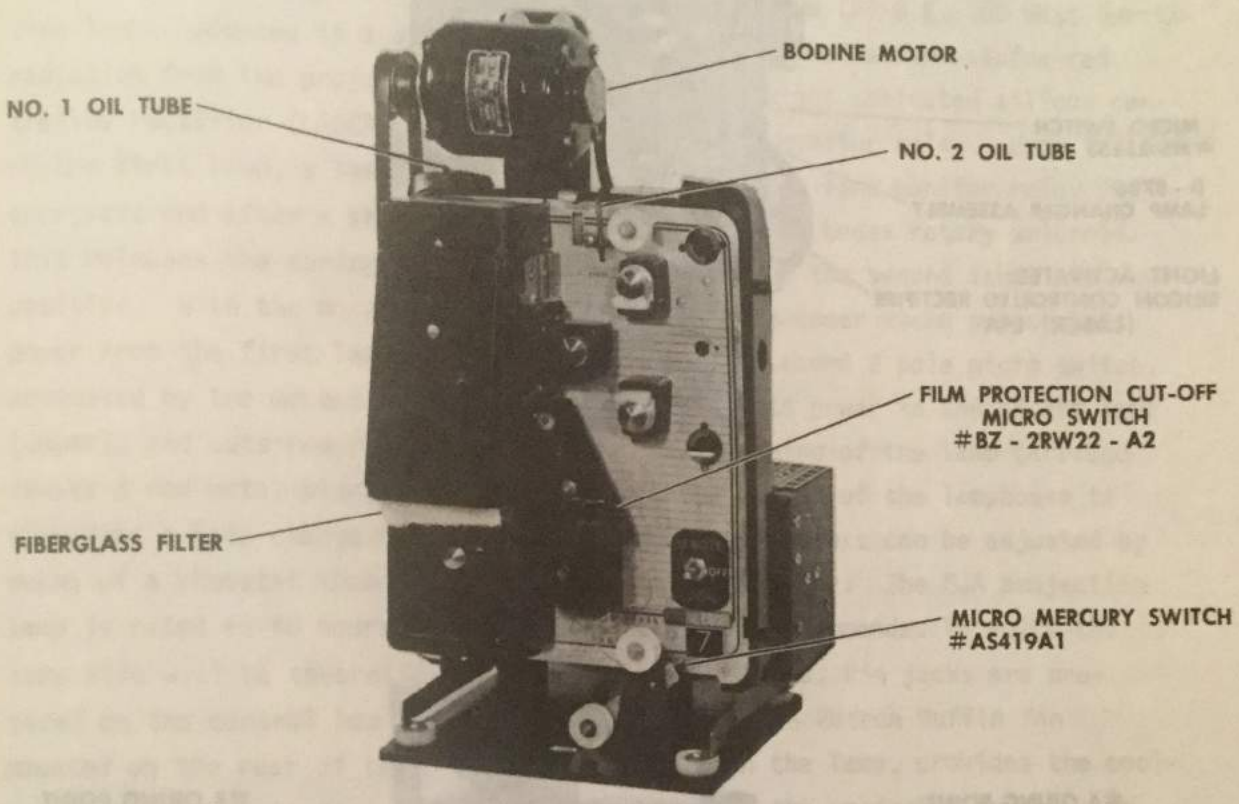


FIGURE 1

4.1.1 GENERAL DESCRIPTION

The Disney designed 8mm projection system used in the Walt Disney Story Show is an extremely reliable and a relatively maintenance free unit, providing that the daily routine maintenance and service is carried out per the Maintenance Schedule on Page 81 of this section. The projection system as a whole comprises of (4) basic units. These are:

1. Projector Head Assembly
2. Film Cabinet
3. Spotmaster Tape Machine
4. Tape Synchronizer and Motor Power Supply

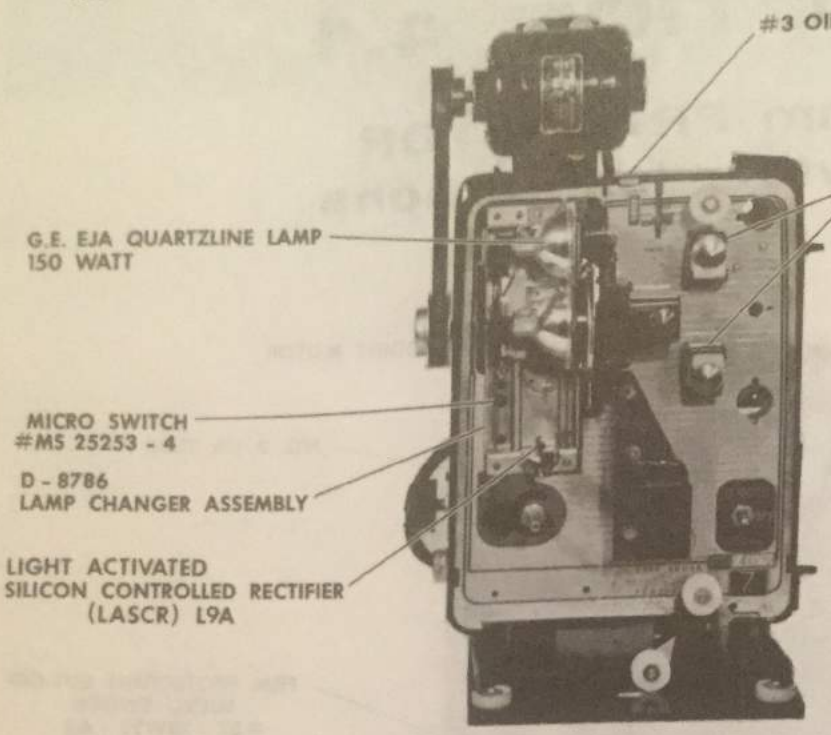


FIGURE 2

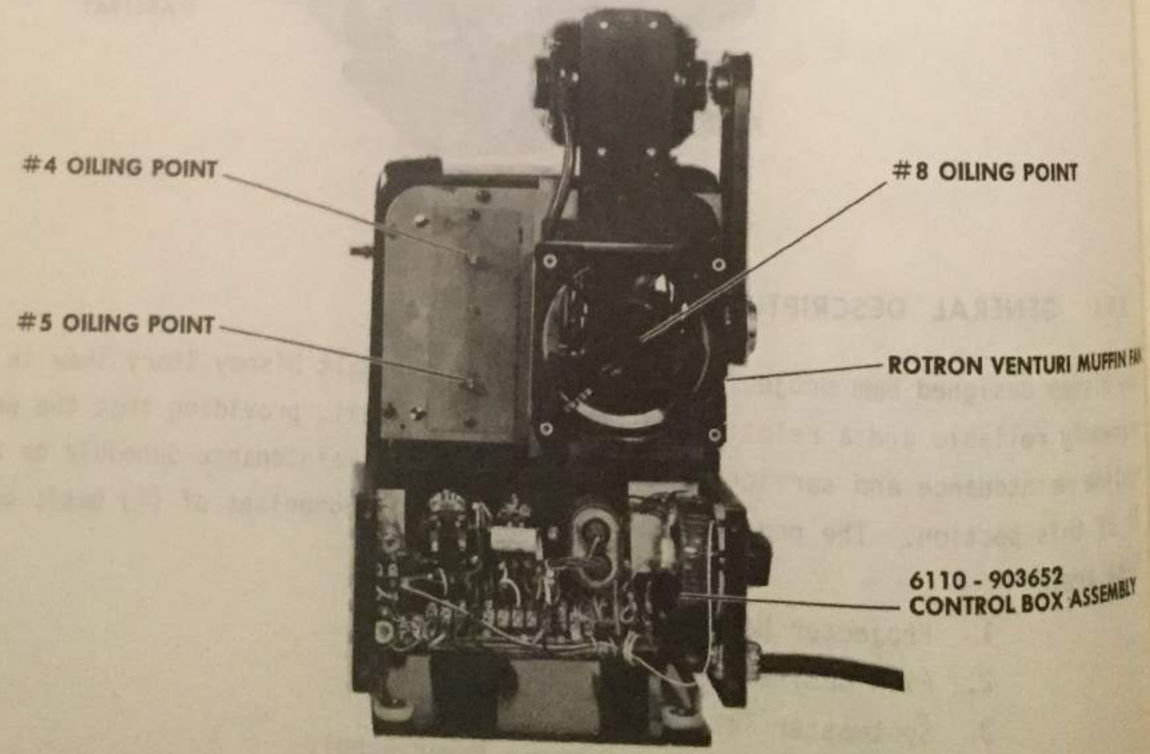


FIGURE 3

4.1.1 GENERAL DESCRIPTION (CONT.)

1. Projector head Assembly

The projector head is a Cine-Kodak Showtime 8 Projector which has undergone modification before being incorporated into the projector system. The reel to reel projector equipment has been removed, the projector drive motor replaced by a Bodine Synchronous motor, with pulleys and belt drive for the shutter, and the lamp and lamp holder have been replaced by two (2) G.E. 150 Watt Quartz-line lamps, mounted in a solenoid activated changing mechanism. Infra-red radiation from the projection lamp is sensed by a light activated silicon controlled rectifier (LASCR) which energizes the lamp monitor relay. Upon failure of the first lamp, a lamp change quickly occurs. The lamp monitor relay de-energizes and after a short time delay, energizes the Ledex rotary solenoid. This releases the spring loaded mechanism, and drops the second lamp into position. With the movement of the mechanism, the upper micro switch cuts power from the first lamp socket (lower), while a second 2 pole micro switch, activated by the mechanism position change, connects power to the second lamp (upper), and cuts power to the solenoid. The dropping of the lamp carriage causes a red metal plunger to protrude from the bottom of the lamphouse to show that a lamp change has taken place. Lamp brightness can be adjusted by means of a rheostat knob on the rear of the control box. The EJA projection lamp is rated at 40 hours life at 21 volts. At a recommended 18 volts the lamp life will be theoretically extended to 280 hours. Pin jacks are provided on the control box to measure lamp voltage. A Rotron Muffin fan mounted on the rear of the projector in line with the lamp, provides the cooling source. Lubrication tubes have been added to the projector as shown in Fig. 1, 2. Oil tubes #1 and #3 provide lubrication to the outboard shutter shaft bearings. (Front and Rear bearing caps respectively) and oil tube #3 to the claw cam follower. It is important that the service schedule be observed with respect to thses oiling points, to ensure good performance required of the projector.

Two (2) film protection cut-off switches have been installed on the projector. One, in the event of the projector losing its loop as the film passes through the projector aperture, a small roller under which the film passes, pulls up, trips a micro switch, and shuts off the projector drive motor to prevent film damage. A second switch, located by the remote/local switch also shuts off the drive motor should the film break after it has cleared the projector. This prevents the cabinet film after passing from the cabinet through the projector, piling up on the floor of the projection enclosure.

2. Film Cabinet

This enclosure where the film is stored, requires very little maintenance, see Page 81 . After the system is switched on, the film travels from the cabinet, through the projector, and back into the cabinet in an endless loop. At the start of each show, the Spotmaster Tape Machine is started automatically each time the sync cue mark on the film is sensed by the fiber optic sensor mounted within the cabinet.

3. Spotmaster Tape Machine

The Spotmaster 1/4" Tape Sound Reproducer starts from an optically sensed white cue mark on the film via the P.E.C. Scanner. The Spotmaster Reproducer, modified by the addition of a motor switch on the front panel is controlled by a 60Hz resolver and a motor power supply amplifier.

4. Tape Synchronizer and Motor Power Supply

The 1/4" Tape Synchronizer and Motor Power Supply are used with the Spotmaster 1/4" Tape Sound Reproducer to synchronize the sound with the projected picture. The tape synchronizer and motor power supply furnishes power to the Spotmaster drive motor. The tape synchronizer compares a 60Hz tone recorded on the tape with the 60Hz line frequency. It will adjust the speed of the Spotmaster until the tape frequency matches the line frequency and will then maintain the synchronization. The projector, driven by a synchronous motor maintains a constant rate of speed.

MECHANICAL DRAWINGS

ELECTRICAL DRAWINGS

4.1.2 MAINTENANCE FREQUENCY CHART

LUBRICATION POINT	FREQUENCY	REFERENCE
* Oiling Tubes #1 & #3	2-3 drops minimum daily for 8 to 10 hours. An additional daily minimum of 2 drops is recommended for a 17 hour run.	See Figure 1&2
** Oiling Tube #2	As above.	See Figure 1
* Oiling Points #4 & #5	As above.	See Figure 3
Lubrication Points #6 &#7	See Note below	See Figure 2
*** Oiling Point #8 (Rotron Muffin Venturi Fan).	1 - 2 drops monthly.	See Figure 3
Film Lubrication	Once every other day.	Use Tuff Coat Special Formula #3-316-3X.

* Use Valvoline Oil SAE 20
** Use Mitchell Oil #A111
*** Use Rotron Oiler Kit

NOTE: Lubrication points #6 & #7 are bearings at the other ends of the film sprocket shafts to oiling points #4 & #5. They are lubricated only at overhaul using Plastilube No. 1 EK No. 8362.

4.1.3 CLEANING INSTRUCTIONS

CLEANING POINTS	FREQUENCY	REFERENCE
Aperture Plate Assembly	Daily	Projector
Projection Lens	Daily	Projector
Shutter	Daily	Projector
Sprockets	Monthly	Projector
Cabinet Film Rollers	Monthly	Film Cabinet
Mirror Assemblies	Monthly	Projection Enclosure
Lamphouse (remove cover)	Monthly	Projector
Film Splices (Also check for torn perforations).	Daily	Film Cabinet

4.1.3 CLEANING INSTRUCTIONS (cont.)

1. OPTICAL PARTS

Clean the front and rear elements of the projection lens. Do not attempt to take the lens apart for any further cleaning. Clean with any quality glass cleaner and lens cleaning tissue. If only a slight amount of dust has accumulated on the lens, use lens cleaning tissue to remove it. If, however, fingerprints, oil, grease or other accumulation of dirt is present, use a quality glass cleaner on the lens surface. Then clean thoroughly with lens cleaning tissue.

2. FILM CONTACT PARTS

Film contact parts include aperture plate, film sprockets, and cabinet film rollers over which the film must pass. All of these parts should be cleaned with a soft cloth. If any dirt has accumulated and hardened, dampen the soft cloth with Tuff Coat and rub the dirt off. Follow this by polishing with a dry soft cloth. Do not scratch the film contact surface. If any emulsion has collected, remove it with a toothpick or an orange stick cut to a knife edge. Dirt that may have accumulated between the teeth of film sprockets or around the aperture opening should be removed with a small soft brush or soft cloth. Minor scratches or burrs can be removed from parts which contact the film by polishing lightly with crocus cloth.

3. MECHANISM PARTS

Parts other than those already mentioned, which have been removed during a maintenance operation should be cleaned with alcohol or equivalent to remove old grease and lubricating oil. Dry thoroughly. Where possible, dry with compressed air. Where this method is not convenient, dry with a clean cloth and then allow parts to dry thoroughly in air. Re-lubricate per instructions.

4. MIRRORS

If only a slight amount of dust has accumulated on mirror surface, remove with a soft brush. If, however, fingerprints, oil, grease or other matter is present, use a quality glass cleaner, soft cloth and light pressure.

5. FILM CLEANING

This film must be cleaned every other day using Tuff Coat #3-316-3X film cleaner lubricant.

4.1.3 CLEANING INSTRUCTIONS (cont.)

6. FILM REPLACEMENT STRIP

Film replacement strips will be no less than 4" in length. This ensures that the first film splice has cleared the film gate before the second splice moves into the gate. One bad perforation can stop the projector by losing the film loop and actuating the cut-off switch.

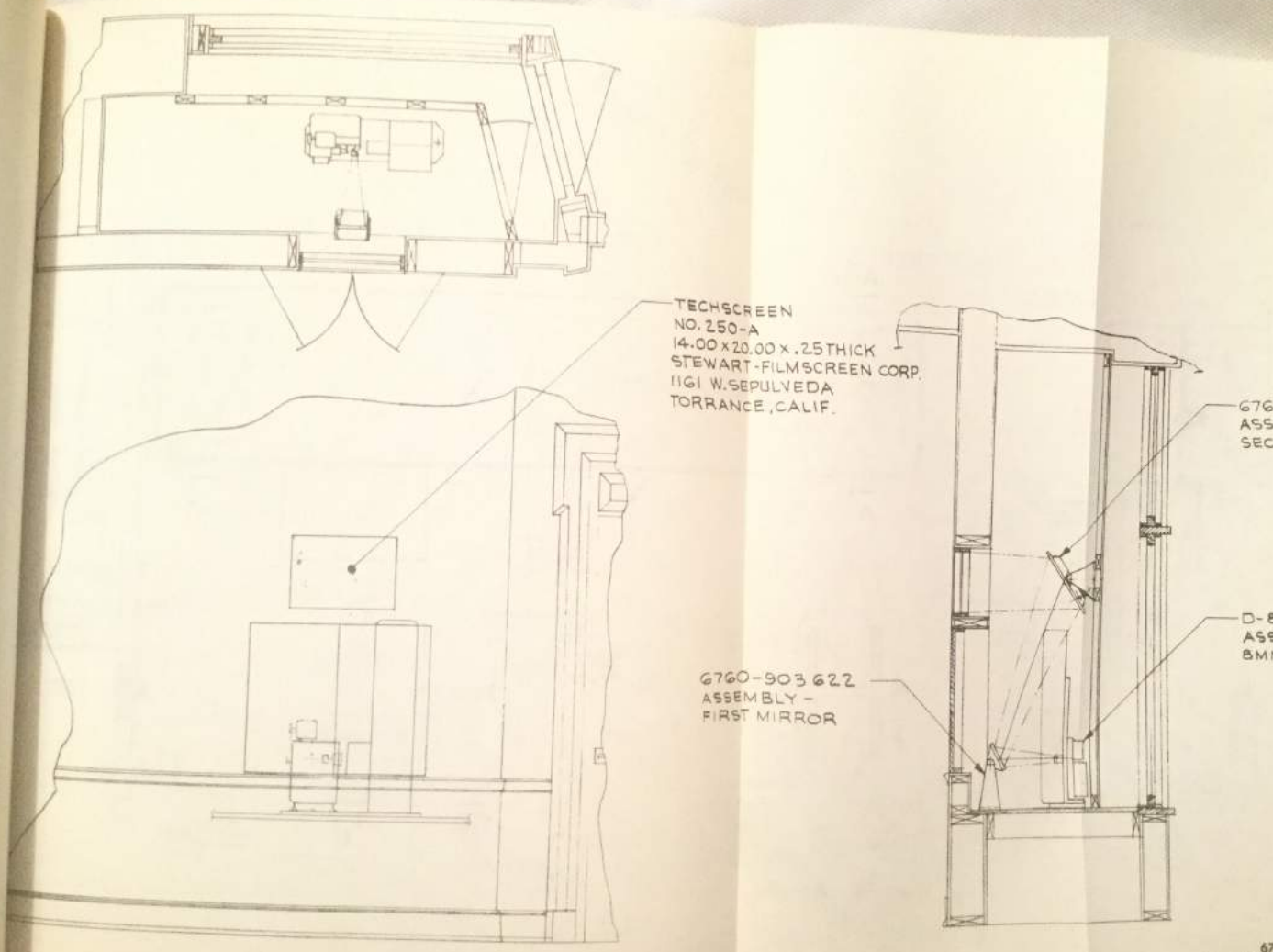
NOTE: Replacement strips will be exactly the same length as the removed portion of film in order to maintain sound synchronization.

4.1.4 RECOMMENDED SPARE PARTS

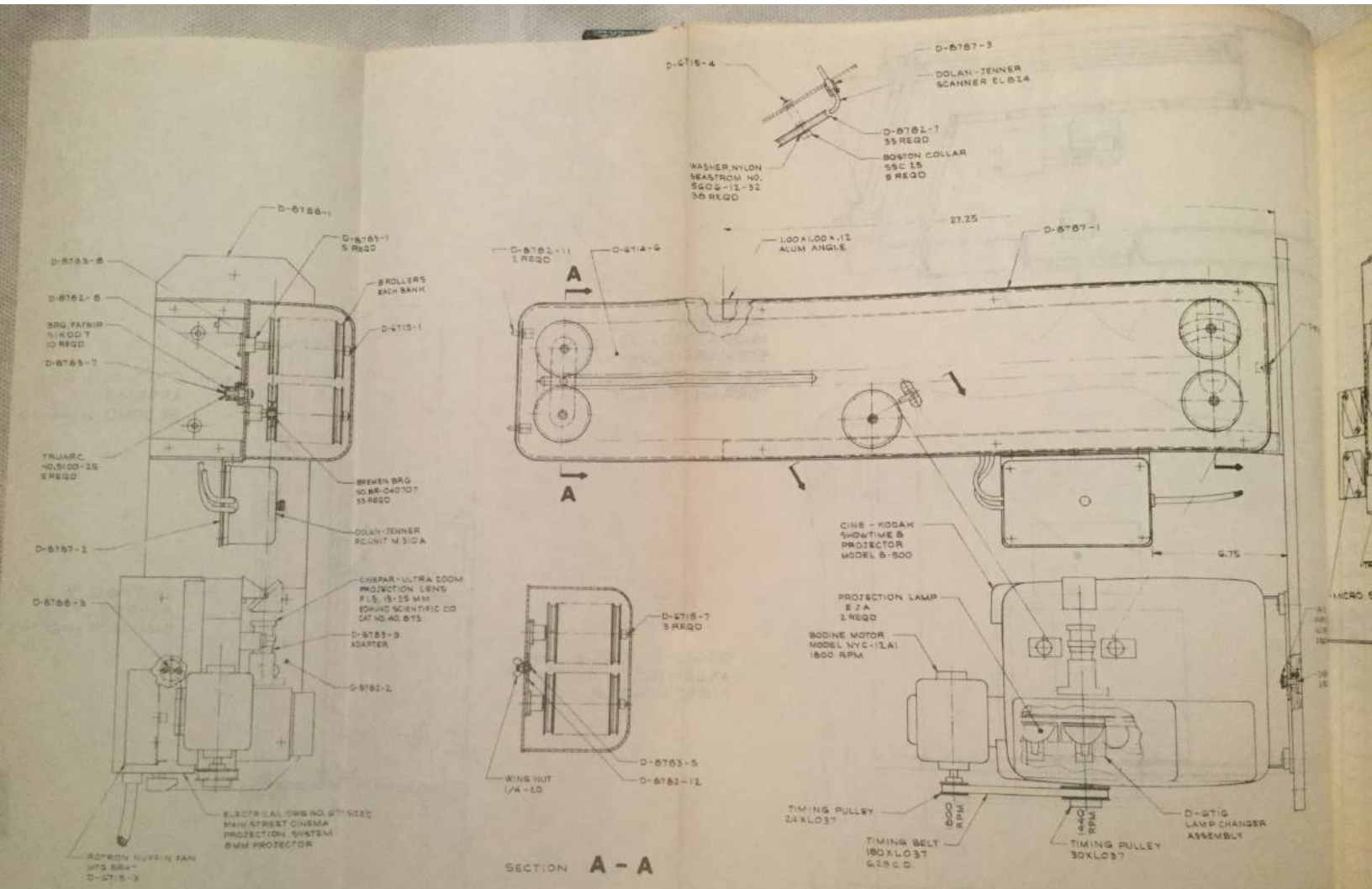
DESCRIPTION	SOURCE
G.E. EJA Quartzline Lamp 150 Watt 21 Volts	General Electric Co. Miniature Lamp Dept. MO-0 Nela Park Cleveland, Ohio 44112
Ledex Rotary Solenoid #810-367-330	Ledex Div. Ledex Inc. 123 Webster Street Dayton, Ohio 45402
Bodine Motor #NYC-12A1	Bodine Electric Co. Chicago, Ill.
Muffin Venturi Fan	Rotron Mfg. Co., Inc. Woodstock, N. Y.
Tuff Coat (Film Lubricant/Cleaner) #3-316-3X	Nicholson Products 3403 Cahuenga Blvd. Los Angeles, Calif. 90068
Projection Lens Cinepar-Ultra Zoom F1.5 13-25mm #40-873	Edmund Scientific Co. 300 Edscorp Building Barrington, N.J. 08007
Micro Switch #MS25253-4	Honeywell, Inc. 200 Bond Street Wabash, Indiana 46992
Micro Mercury Switch #AS419A1	Honeywell, Inc.
Micro Switch #BZ-2RW22-A2	Honeywell, Inc.
Mitchell Camera Oil #A111	Mitchell Camera Corp. 666 W. Harvard Glendale, Calif.
Plastilube No. 1 #EK No. #8362	Warren Refining & Chemical Co. Cleveland, Ohio

MECHANICAL DRAWINGS

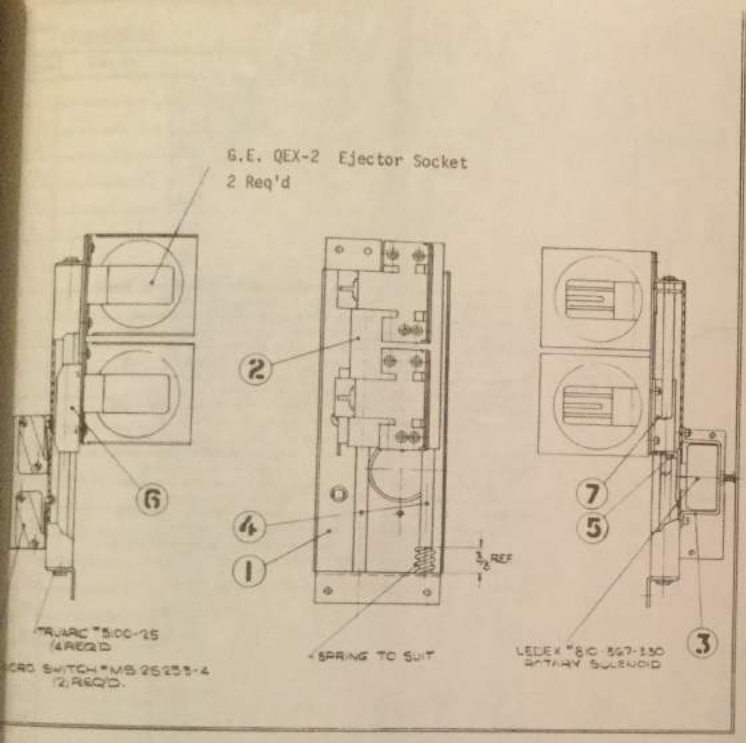
FOR ADDITIONAL DETAILED MECHANICAL INFORMATION ON DOCUMENTS OR EQUIPMENT APPEARING IN THE PROJECTOR SECTION OF THIS MANUAL CONTACT: DEPARTMENT HEAD - MACHINE SHOP - WALT DISNEY PRODUCTIONS

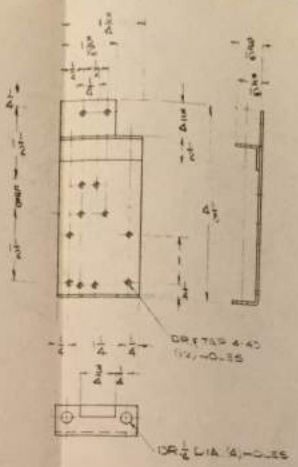


6760-903621
8mm PROJECTOR INSTALLATION
87

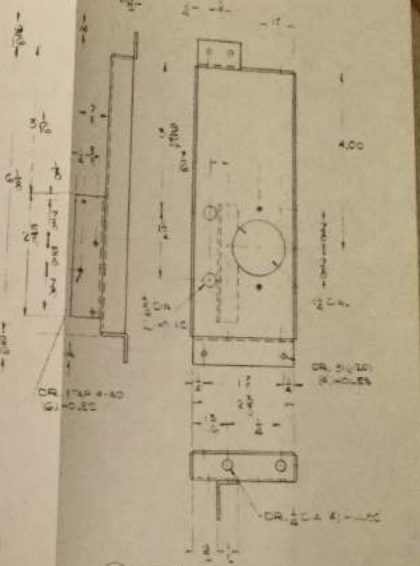


D8786
8mm FILM CABINET
III





(2) 1 REQ'D - 16 GA. C.R.S.



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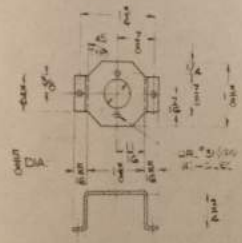
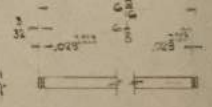
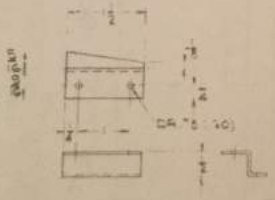


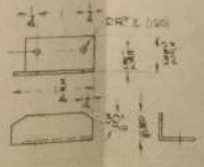
(3) 1 REQ'D - 16 GA. C.R.S.



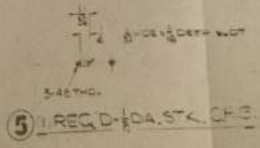
(4) 4 REQ'D - 1/8 DIA. STK. C.R.S.



(7) 1 REQ'D - 16 GA. C.R.S.



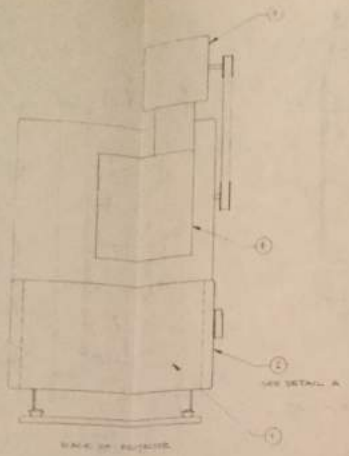
(6) 1 REQ'D - 16 GA. C.R.S.

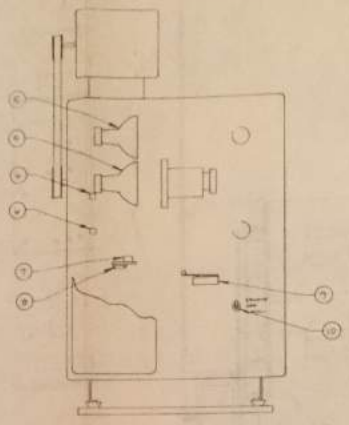


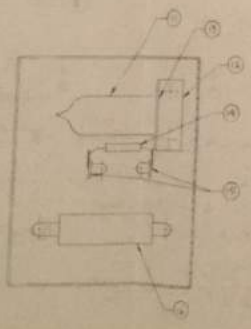
(5) 1 REQ'D - 1/8 DIA. STK. C.R.S.

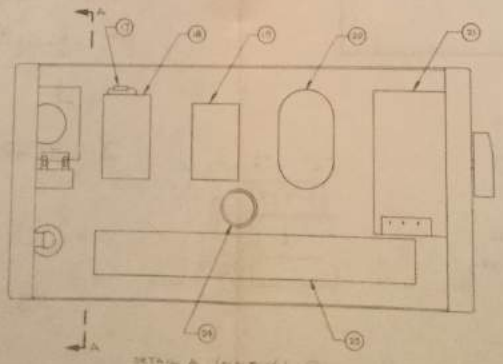
*TRIARC "5100-25
1 REQ'D
CRO SWITCH "MS 25253-4
2 REQ'D.

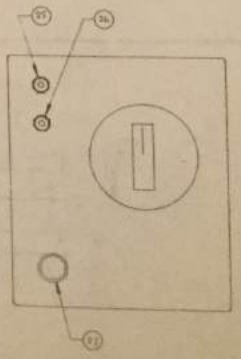
D-6716
8MM PROJECTOR LAMP CHANGER ASSEMBLY









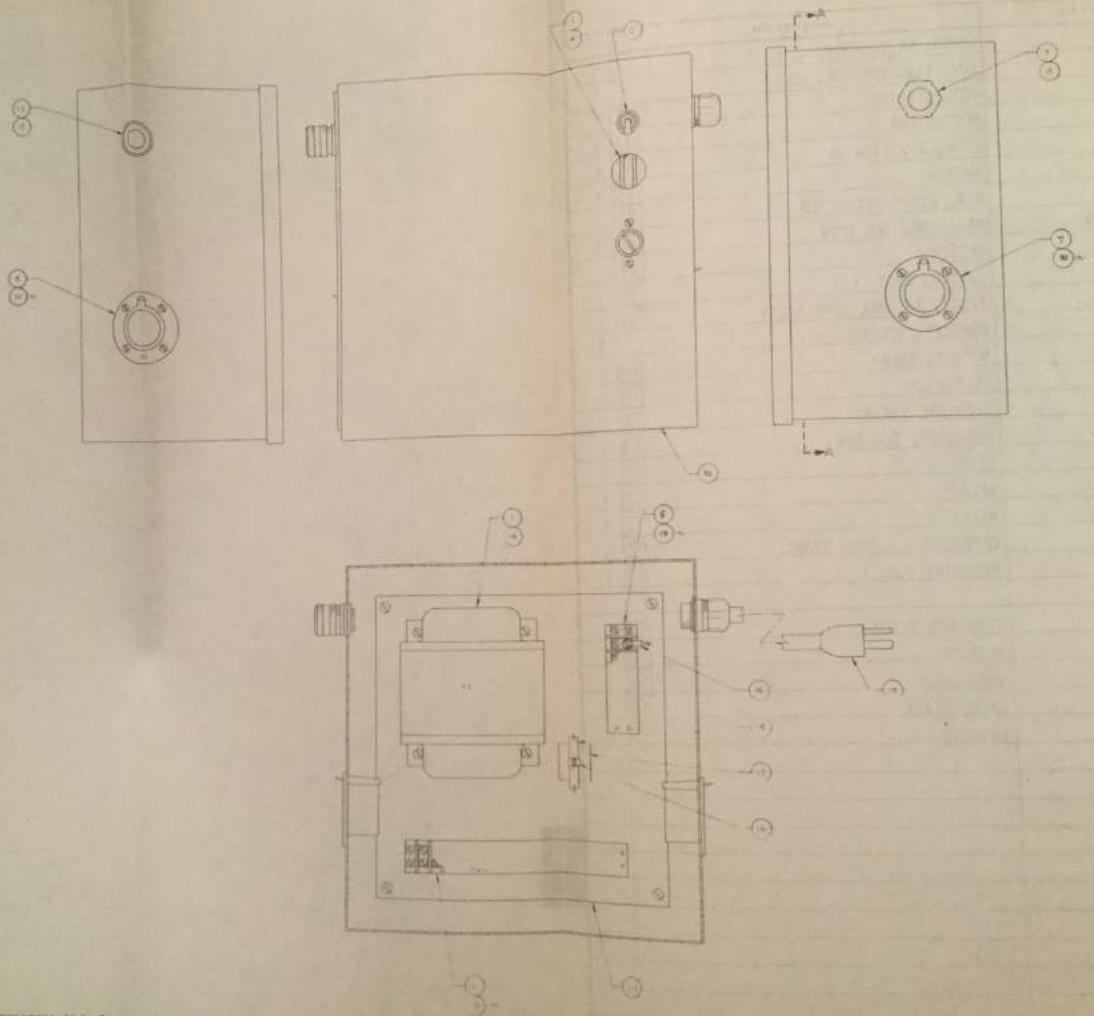


6110-903652
8MM PROJECTOR CONTROL BOX ASSEMBLY
90

DWG. 6110-903652

ASSEMBLY, CONTROL BOX

ITEM	WDP NO.	PART NO.	DESCRIPTION	QTY.
1.		5975-903654	COVER, ELEC CONTROL, NO. 1	1
2.		5975-903653	BOX, ELEC CONTROL, NO. 1	1
3.		NYC-12A1	MOTOR, DRIVE [2]	1
4.		V9133	MOTOR, FAN [3]	1
5.		EJA	LAMP, 21V 150W 7A [4]	2
6.		4565	SWITCH [5]	2
7.		L9A	SCR, LIGHT ACTIVATED [6]	1
8.		RC0520GF563JS	RESISTOR, 56K 1/2W [7]	1
9.		BZ2-2RW22-A2	SWITCH [8]	1
10.		12TS15-1	SWITCH, 2PDT [8]	1
11.		24N03T	RELAY, THERMAL TIME DELAY [9]	1
12.			BRACKET, RELAY	1
13.		77M1D9	SOCKET, RELAY [10]	1
14.		18D84A	RECTIFIER [11]	1
15.		816	TERMINAL STRIP [12]	2
16.		0366	RESISTOR, 50Ω 25W [13]	1
17.		1N4817	DIODE [11]	1
18.		1205-2C-6D	RELAY [14]	1
19.		1200-3C-24A	RELAY [14]	1
20.		P149F265	CAPACITOR, 3.75ηF 330VAC [15]	1
21.		0441	RHEOSTAT 100W 1 [13]	1
22.				
23.		670A-16	TERMINAL BLOCK [16]	1
24.		SB-875-11	BUSHING [17]	1
25.		105-252-1	JACK, RED [18]	1
26.		105-253-1	JACK, BLACK [18]	1
27.		CG1838	BUSHING [19]	1



6110-903655
8MM PROJECTOR CONTROL BOX ASSEMBLY NO. 2
92

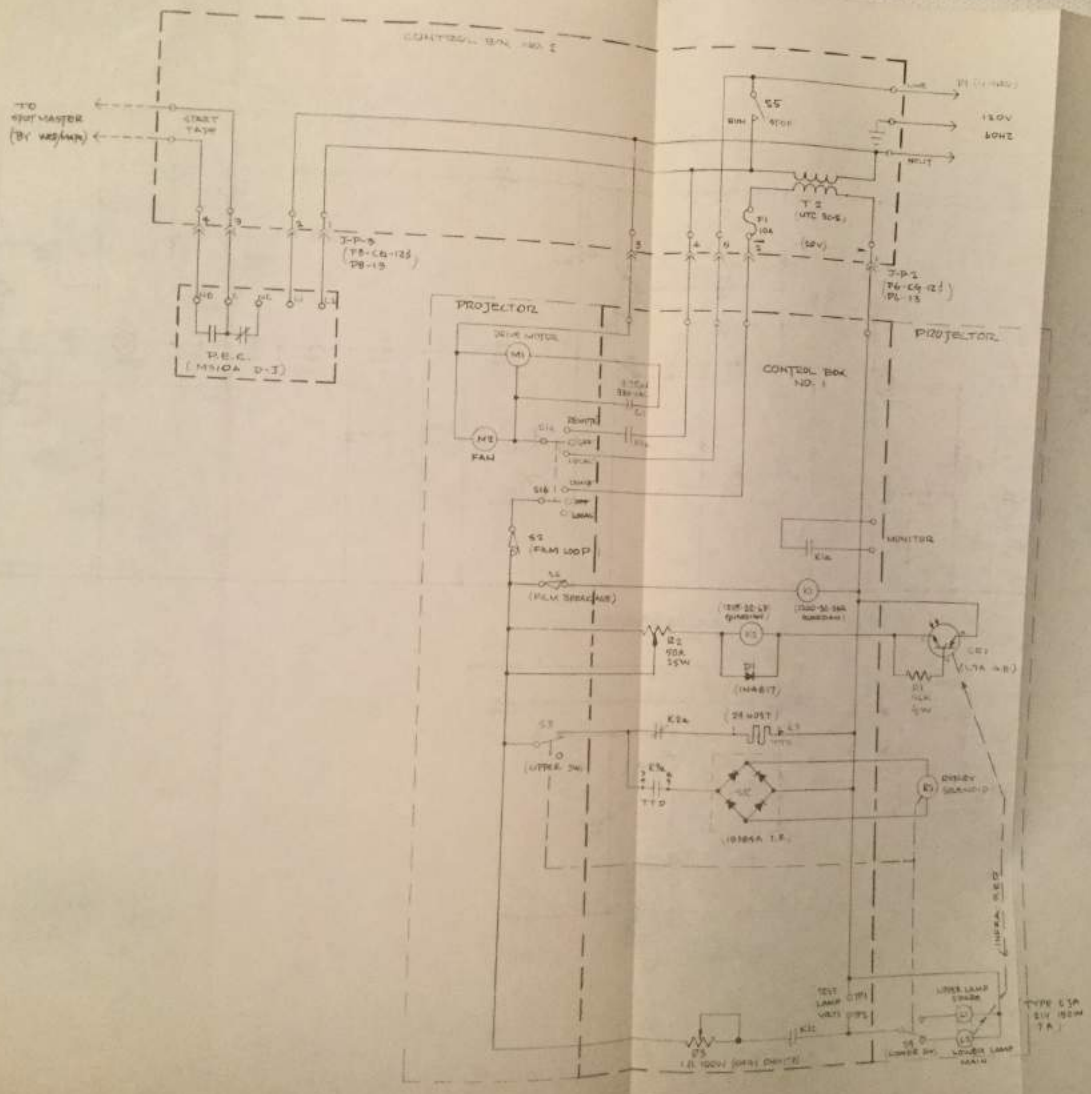
DWG. 6110-903655 8MM PROJECTOR CONTROL BOX ASSEMBLY NO. 2

ITEM	WDP NO.	PART NO.	DESCRIPTION	QTY.
1.			TRANSFORMER, CONTROL, SC-5 T2	1
2.			SWITCH, SPDT, 11TS15-2 S5	1
3.			FUSE, 3AG, 10A, 32V, 313010 F1	1
4.			FUSE POST, IND., 344024	1
5.			TERMINAL BLOCK, 670A-6 TB1	1
6.			TERMINAL BLOCK, 670A-15 TB2	1
7.			RECEPTACLE, P6-13 J2	1
8.			RECEPTACLE, P8-13 J3	1
9.			CONNECTOR, RELIEF, 2531	1
10.			LOCKNUT, 142AL	1
11.			BUSHING, CG1838	1
12.			NUT, HEX, 140AL	2
13.			CORD, JACKETED REPLACEMENT, K-5151 P1	1
14.			TERMINAL, INSULATED, R4142	42
15.			WIRE, ELECTRONIC HOOKUP, #16, NB19294	A/R
16.			TIE, CABLE, STA-STRAP SSTIM	15
17.			MOUNT, CABLE TIE, ABMS-A	3
18.			SCREW, 8-32 X 1/4, RD HD	4
19.			SCREW, 6-32 X 1/2, RD HD	8
20.			SCREW, 4-48 X 1/4, RD HD	8
21.		5975-903656	BOX CONTROL NO. 2 A-10N104	1
22.		5975-903657	PANEL, CONTROL BOX NO. 2 A-10N10P	1

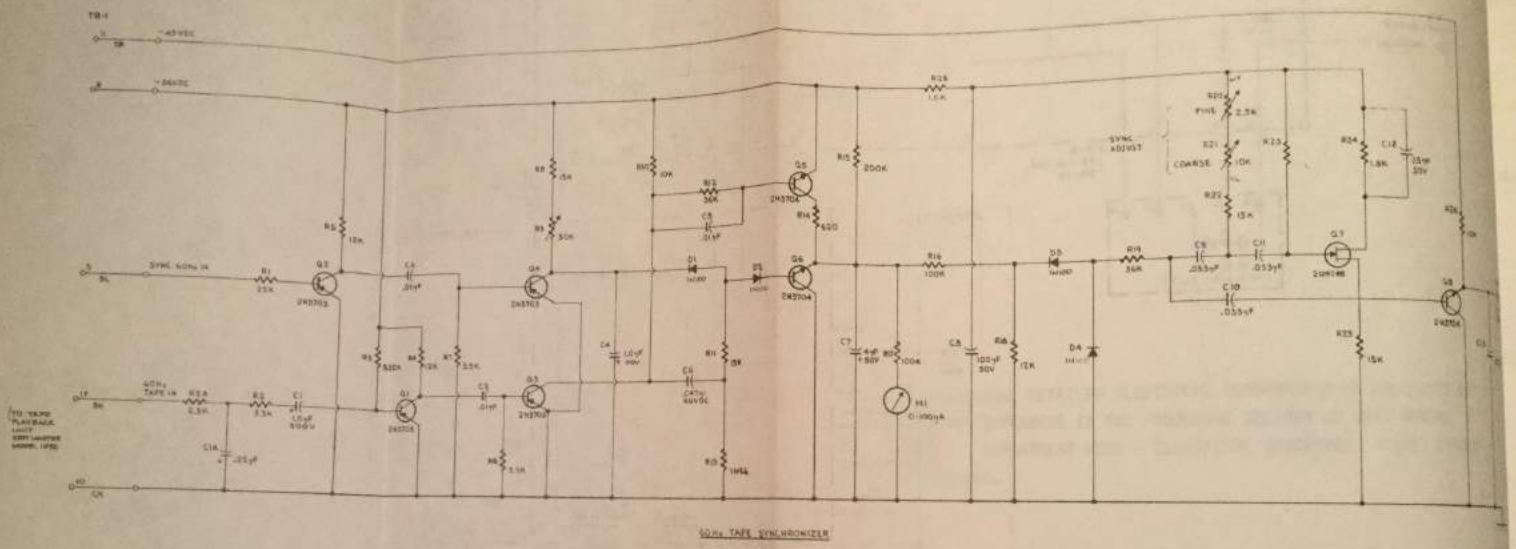
ELECTRICAL DRAWINGS

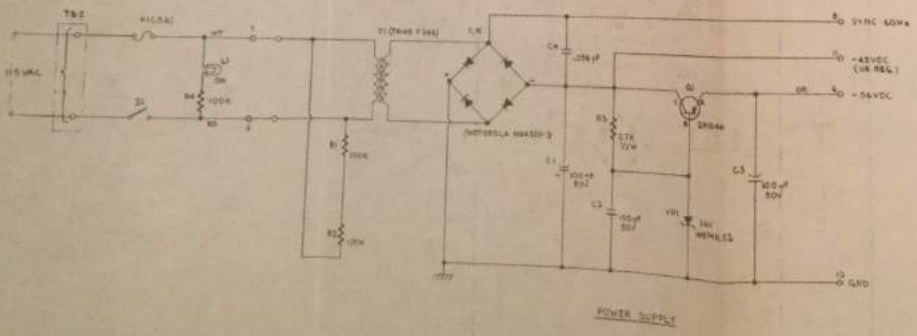
FOR ADDITIONAL DETAILED ELECTRICAL INFORMATION ON DOCUMENTS OR EQUIPMENT APPEARING IN THE PROJECTOR SECTION OF THIS MANUAL CONTACT: DEPARTMENT HEDA - ELECTRICAL DEPARTMENT - WALT DISNEY PRODUCTIONS.

ELECTRICAL
DRAWINGS



6730-906845
8MM PROJECTOR CONTROL BOX
SCHEMATIC DIAGRAM

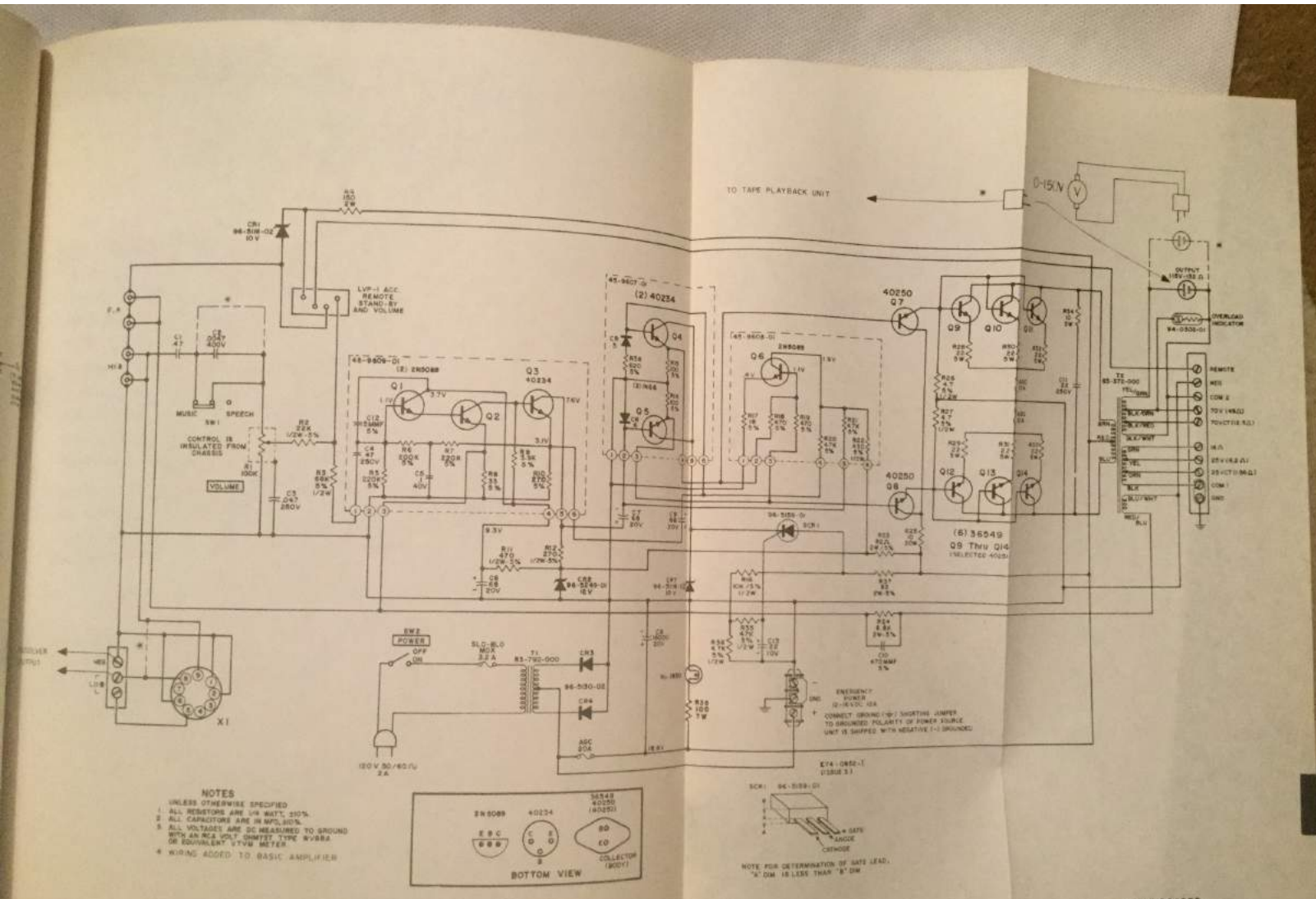




NOTES:

1. ALL RESISTORS ARE 1/4 W, 5%

5830-906849
TAPE RESOLVER SCHEMATIC DIAGRAM
STEPHENS MODEL 110



NOTES

UNLESS OTHERWISE SPECIFIED

1. ALL RESISTORS ARE 1/4 WATT, ±10%
2. ALL CAPACITORS ARE IN MFD, ±20%
3. ALL VOLTAGES ARE DC MEASURED TO GROUND WITH AN RCA VOLT OHMYST, TYPE WV98A OR EQUIVALENT VTVM METER
4. WIRING ADDED TO BASIC AMPLIFIER

5830-906850
MOTOR DRIVE AMPLIFIER SCHEMATIC DIAGRAM
BOGEN MODEL MT100

SECTION 4.2

16mm PROJECTOR Service Instructions

4.2.1 GENERAL DESCRIPTION

The Disney designed 16MM projection systems used in the Walt Disney Story Show are extremely reliable and relatively maintenance free units providing that the daily routine maintenance and service is carried out per the maintenance schedule on page 102 of this section.

Section 4.2 is comprised of maintenance functions that apply to both 16MM projectors (Owl and Mary Poppins) used in Walt Disney Story - Disneyland. A maintenance frequency chart, cleaning instructions, recommended spare parts, troubleshooting, mechanical adjustments and model 1000 Xenon lamphouse operating instructions are found in this section.

Section 4.3 and 4.4 give a more detailed description and operating instructions for the Owl and Mary Poppins Pre-show projection systems. These sections also include mechanical and electrical drawings that are particular to the above projectors.

4.2.2 MAINTENANCE FREQUENCY CHART

LUBRICATION POINT	FREQUENCY	REFERENCE
PROJECTOR LUBRICATION		
*Shutter Knob Oilite Bearing (intermittent cover need not be removed).	Every (3) days (1) drop. Use hypodermic.	See Figure 1
*Gits Oil Cup Reservoir (3)	2 to 3 drops daily.	See Figure 1
*Movement Oil Reservoir	2 to 3 drops daily.	See Figure 10
*Automatic Shuttle Oiler	Check Oiler Reservoir daily.	See Figure 13
*Rear Gearbox Cover Oilite Bearings (2)	Every (3) days (1) drop. Use hypodermic.	See Figure 2
Projector Silent Chain Drive	Check monthly - lubricate as needed.	50/50 mixture SAE 90 oil and S.T.P.
Motor Gearbox	Check monthly	Houghtons Cosmolube No. 1 grease or equivalent.
CABINET LUBRICATION		
Drive Chain in rear of film cabinet	Every 6 months or as required.	50/50 mixture SAE 90 oil and S.T.P.
Film Lubrication	Once a week	Use Tuff Coat Special Formula #3-316-3X. Nicholson Products 3403 Cahuenga Blvd. Los Angeles, Ca. 90028 (213) 851-4511

*USE VALVOLINE OIL SAE 20

4.2.3 CLEANING INSTRUCTIONS

CLEANING POINTS	FREQUENCY	REFERENCE
Aperture Plate Assembly	Daily	Projectors
Delrin Gate Assembly	Daily	Projectors
Projection Lens	Daily	Projectors
Sprockets and all Rollers	Monthly	Projectors and Film Cabinets
Cabinet Film Spools	Monthly	Film Cabinets
Mirror Assemblies	Monthly	Projector Location Plan 6730-903474

1. OPTICAL PARTS:

Clean the front and rear elements of the projection lens. Do not attempt to take the lenses apart for any further cleaning. Clean with any quality glass cleaner and lens cleaning tissue. If only a slight amount of dust has accumulated on the lenses, use lens cleaning tissue to remove it. If, however, fingerprints, oil, grease or other accumulation of dirt is present, use a quality glass cleaner on the lens surfaces. Then clean thoroughly with lens cleaning tissue.

2. FILM CONTACT PARTS:

Film contact parts include aperture plate, delrin gate, film sprockets, rollers and cabinet film spools, over which the film must pass. All of these parts should be cleaned with a soft cloth. If any dirt has accumulated and hardened, dampen the soft cloth with Tuff Coat and rub the dirt off. Follow this by polishing with a dry soft cloth. Do not scratch the film contact surface. If any emulsion has collected, remove it with a toothpick or an orange stick cut to a knife edge. Dirt that may have accumulated between the teeth of film sprockets or around aperture openings should be removed with a small soft brush or soft cloth. Minor scratches or burrs can be removed from parts which contact the film by polishing lightly with crocus cloth.

3. MECHANISM PARTS:

Parts other than those already mentioned, which have been removed during a maintenance operation should be cleaned with alcohol or equivalent to remove old grease and lubricating oil. Dry thoroughly. Where possible, dry with compressed air. Where this method is not convenient, dry with a clean cloth and then allow parts to dry thoroughly in air. Re-lubricate per instructions.

NOTE: SHUTTLE MECHANISM ASSEMBLY: Shuttle assembly parts (Drawing 061193 Kit Assembly, Shuttle Cams & Pivot) as shown on assembly Drawing 6730-901396 are supplied as a kit. If any one of these parts become damaged or excessively worn, the complete kit will be replaced.

4. MIRRORS:

If only a slight amount of dust has accumulated on mirror surface, remove with soft brush. If, however, fingerprints, oil, grease or other matter is present, use a quality glass cleaner, soft cloth and light pressure.

5. FILM CLEANING:

The film must be cleaned weekly using Tuff Coat #3-316-3X Film Cleaner Lubricant in lubricator assembly.

FILM REPLACEMENT STRIP:

Film replacement strips will be no less than 6" in length. This ensures that the first film splice has cleared the film gate before the second splice moves into the gate. One bad perforation can stop the projector by losing the film loop and actuating the cut-off switch.

NOTE: Replacement strips will be exactly the same length as the removed portion of film in order to maintain sound synchronization.

4.2.4 RECOMMENDED SPARE PARTS

PRINT OR PART NUMBER	DESCRIPTION
6730-301219	Plate - Base
901220	Shaft - Eccentric
901221	Knob - Eccentric
901222	Roller
901223	Shaft - Roller
901224	Bracket Roller
901322	Roller - S.C. Take-Up
901323	Bearing - Shutter Shaft
901324	Bearing - Front Cam Shaft
901325	Bearing - Rear Cam Shaft
901330	Shaft - Idler Gear
901334	Gear - S.C. Shaft
901339	Shaft - Rear Cam
901343	Gear - Shutter Shaft
901346	Sprocket - S.C. Drive
901347	Sprocket Driven Chain
901366	Pad - Top Pressure
901367	Pad - Center Pressure
901368	Pad - Bottom Pressure
901369	Rail - Top Pressure
901370	Rail - Center Pressure
901371	Rail - Inside Bottom Pressure
901372	Plate - Delrin Gate Support
6730-901373	Plate - Pressure

4.2.4 RECOMMENDED SPARE PARTS (cont.)

PRINT OR PART NUMBER	DESCRIPTION
6730-901492	*Shoe - Film
901500	Camshaft - Front
901501	Shaft - Framer
901502	Shaft - Shutter
901511	Plate - Aperture
901512	Pull - Aperture Plate
901514	Rail - Outside Bottom Pressure
901515	Spring - Rail Pressure
901643	Screw - Eccentric Shaft
901644	Spring - Sprocket Guide
6730-901829	Roller - 16mm Guide

4.2.4 RECOMMENDED SPARE PARTS (cont.)

PRINT OR PART NUMBER	DESCRIPTION
1-72 X 1/8	Round Head Machine Screw (SST)
1-72 X 1/4	Round Head Machine Screw (SST)
2-56 X 1/8	Fillister Head Machine Screw (SST)
4-40 X 1/8	Socket Head Set Screw (SST)
.062 Dia X 1/2	Dowel Pin (Steel)
.093 Dia X 5/16	Dowel Pin (Steel)
#C250A-0406	Compo Bearing
#CF252D-0500	Compo Bearing
#CF376C-0500	Compo Bearing
#CF376D-0750	Compo Bearing
#CF376Z-0500	Compo Bearing
#F4DD	Fafnir Bearing
#S1KDD7	Fafnir Bearing
#33KDD3	Fafnir Bearing
#MDW4K2	Fafnir Bearing
#Z99R4	New Departure Bearing
#AC100-128	Helical Coupling
#1106-1212	Helical Coupling
#5606-16-32	Seastrom Washer, Nylon
#5606-28-32	Seastrom Washer, Nylon
#5610-68-32	Seastrom Washer, Nylon
#5710-36-32	Seastrom Washer (SST)
#5100-12	Truarc (Cad Plated & Iridite)
#5100-25	Truarc (Cad Plated & Iridite)
#5100-43	Truarc (Cad Plated & Iridite)
#AS419A1	Micro - Mercury Switch
	G.E. 6S6 DC-215 Volt 6 Watt Lamp
#SC0305	Morse 3/16" Silent Chain (Complete with Spring Link)
	Dolan-Jenner Light Source LP-10 Photo Cell Receiver
#EL809	Dolan-Jenner Scanner

4.2.4 RECOMMENDED SPARE PARTS JAN PARTS

BELL and HOWELL NUMBER	DESCRIPTION
98757	Screw, Special Binder Head
061040	Bracket Assembly - Aperture Plate Mounting
061042	Gear Assembly - Front Cam
061150	Rail, Sub Assembly Film
061151	Rail, Sub Assembly Film Floating
061193	Kit Assembly, Shuttle Cams & Pivot
063112	Bar Assembly - Framer Pivot
067399	Plate Assembly, Shuttle Cover Mounting
067402	Cover Assembly, Shuttle
600293	Washer Lock
600789	Washer Lock
611251	Washer - Framer Bar Friction
611285	Washer, Rear Cam Retaining
611302	Ring - Front Cam Gear Lock
611314	Spring Shuttle
611380	Screw - Framer Bar Mounting
611383	Washer, Framer Bar Spring
611453	Nut, Elastic Stop #5-40
611482	Spring, Side Tension Bracket
611483	Washer, Side Tension Bracket
611484	Screw, Side Tension Bracket
611499	Screw, Film Guide
611866	Collar, Framer Shaft Lock
611973	Counterweight, Front Cam
611974	Disc, Front Cam Lube
611975	Nut, Special
613210	Screw, Aperture Mounting Bracket
615925	Nut, Cam Lock
620933	Gasket, Shuttle Cover
620937	Bracket, Framer Shaft

4.2.5 TROUBLESHOOTING CHART

TROUBLE	PROBABLE CAUSE	REMEDY
1. Picture Unsteady	Film not seated in gate properly.	Reseat film, make sure pressure pad is not being tilted by side guide buttons of Aperture Plate. See Figure 12.
	Loss of tension of Pressure Pad.	With claw retracted, check pressure of pad by gently pulling film thru the closed gate. Tension should be light. Tension can be increased or decreased by adjustable pressure nut. See Figure 3.
	Worn Shuttle Assembly	Remove movement cover. Turn Shutter Knob until claw protrudes it's maximum. Remove Aperture Plate and with finger tips check claw pins for up and down play. Claw normally should have no movement at this position. A slight shake should not affect steadiness.
	Excessive play caused by: wear between Heart Cam and Shuttle.	If a .002 Feeler Gauge can be inserted between cam and slide, replace assembly.
	The Helical Gear on the back end of the Heart Cam Shaft may be loose.	There should be no rotation between Shaft and Helical Gear. Replace or repair.
	Anti-back lash gear not properly loaded.	See Figure 8.
	Loose Mirror Assembly.	Check retaining screws. (Mirror vibration can cause unsteadiness).
	Loose Lens Mount Assembly.	Check screws retaining lens holder side rail and flat spring retaining plate on Lens Mount.

4.2.5 TROUBLESHOOTING CHART (cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
2. Loss of Loop	Film not seated in gate properly.	Run film thru gate by hand, making sure pressure pads are seated and aligned correctly.
	Damaged perforations.	Examine perforations closely for tears, notching, or bad splicing. See Page 104 Film Replacement Strip.
	Gate tension too light.	Open gate, back off pressure adjusting nut a fraction of a turn at a time. See Figure
3. Projector stops during run. Check initially for electrical power failure.	Lost loop tripping automatic cutoff roller. See Figure 1.	Examine film for damaged perforations. Replace damaged film section. Replacement film strip to be not less than 6" in length. This ensures that first splice has cleared film gate before second splice moves into film gate. One bad perforation can stop the Projector by losing the loop and actuating cutoff switch. NOTE: Replacement strip to be exactly same length as removed portion to maintain sound synchronization. See Paragraph 5.
	Mercury Switch on cutoff Roller Arm set too close or loose. See Figure 2.	Remove rear cover of Projector Head, actuate cutoff roller by hand and check action of Mercury Switch.

4.2.5 TROUBLESHOOTING CHART (cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
13. (Cont'd.) Projector stops during run. Check initially for electrical power failure.	Frozen Bearings in Projector Head.	Unthread Projector leaving film loose, disconnect drive between Projector Head and film cabinet, turn shutter knob to determine whether the seizure is in Projector Head. If so, proceed as follows: Inspect flex coupling between motor drive and Projector for breakage or loose set screws. Loosen set screw on projector end of drive coupling and turn motor thru the coupling to check possible gear box failure. See Figure 4. Check outboard Oilite Bearing behind shutter knob supporting the shutter shaft. The bearing must be kept lubricated. See Figure 1. Check Sprocket Drive Chain at rear of Projector. Should have slack. See Figure 2. Remove Sprocket Drive Chain and spin sprockets to check Oilite Bearings. Remove Shuttle Assembly Cover, check cams and shuttle for seizure due to lack of lubrication. See Figure 6. Remove Gearbox Cover, see Figure 8, and inspect for dry bearings, broken gear teeth, loose set screws, lack of shaft end play. NOTE: The most likely trouble area is in the Heart Cam Shaft and it's front and rear Oilite Bearings since it's bearing fit and shaft end play are of necessity held to a minimum tolerance.

4.2.5 TROUBLESHOOTING CHART (cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
3. (Cont'd.) Projector stops during run. Check initially for electrical power failure.		Continued. As far as shoulder protrusions and shaft fits are concerned, it is important that replacement bushings & bearings be identical with damaged parts.
4. Projector stops during run.	Aluminum Roller at bottom loop in film cabinet contacts power cutoff switch.	Check to see if aluminum Roller has jumped free of its' individual separator in which it revolves at lower film loop.
	Failure in Film Cabinet Drive Assembly.	Film cabinet sprocket assemblies and angle gear must turn freely. Check these items as well as Phenolic Drive Gear in Projector Head for stoppage or excessive drag. See Figure 4.
		Remove covers of Sprocket Drive Assembly (rear of cabinet), and check for broken or jammed chain, frozen bearings in sprocket hubs, loose studs, nuts, set screws, chain links, etc.
		Check inner cabinet. Inspect the action of individual keeper roller positions as they apply to their respective film sprockets. Keeper rollers must "straddle" their respecitve sprockets.
		Check action of the power trip rods in the cabinet base. These rods should be in the "UP" position. Any restriction holding a rod in the "DOWN" position would cut electrical power by activating the mercury switch assembly which is attached to the rod.

4.2.5 TROUBLESHOOTING CHART (cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
4. (Cont'd.) Projector stops during run.		Continued Check the positions of the mercury switches in their mounts. The switch mounts on a swivel bracket that is locked down in the operating position. A loose switch bracket could be a trouble source.
	Photo Electric Control (PEC) or the fiber optic sensor is set too fine.	Remove PEC cover (Projector Base Assembly). Place a piece of white paper in front of sensor. Turn slotted shaft clockwise all the way. Push "Power On" and "Motor Run" buttons. Turn slotted screw anti-clockwise until unit clicks. Replace cover, and remove paper from sensor.
5. Motor runs, mechanism does not.	Silent chain sprocket loose on shaft.	Tighten silent chain sprocket to shaft. See Figure 2.
6. Picture not framed.	Framer shaft not adjusted properly.	Turn framer shaft until picture is in frame. See Figure 10.
7. Fuzz projecting in picture area.	Dirt in aperture opening.	Clean aperture using brush. CAUTION: Projector must be stopped.
8. Picture not sharp on screen. One side or entire picture.	Improperly focused.	Focus lens. See Figure 1.
	Projection lens dirty, oily or fingerspotted.	Clean lens.
	Pressure plate and/or aperture plate worn.	Replace defective plates.

4.2.5 TROUBLESHOOTING CHART (cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
8. (Cont'd.) Picture not sharp on screen. One side or entire picture.	Pressure plate not seated firmly against film in aperture channel.	Check pressure plate seating.
	Defective projection lens.	Replace lens.
	Insufficient pressure plate tension.	Adjust pressure plate tension. See Figure 3.
9. Picture indistinct, illumination low.	Lamp old, black and ready to burn out.	Replace lamp.
	Dirty projection lens.	Clean optical elements.
	Adjustment of lamphouse reflector position incorrect.	Adjust lamphouse reflector. (See Lamphouse Operating Instructions & Optical Radiation Section).
10. Picture travel ghost. Vertical lines observed on screen above and/or below white objects.	Defective Projection Lamp.	Replace lamp.
	Projection Lamp out of adjustment.	Adjust lamp to maximum brilliance. (See Lamphouse Operating Instructions & Optical Radiation Section).
	Shutter out of time with intermittent mechanism.	Adjust shutter to synchronize with intermittent mechanism. See Figure 7.
11. Picture unsteady; jump or weave.	Improper slitting of film.	Check with film known to be in good condition.
	Improper threading.	Rethread Projector correctly.
	Pressure plate not seated firmly against film in picture channel.	Check pressure plate seating.

4.2.5 TROUBLESHOOTING CHART (cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
11. (Cont'd.) Picture unsteady; Jump or weave.	Many consecutive film perforations damaged excessively.	Remove damaged section of film and splice. NOTE: Replacement strip to be exactly same length as removed portion to maintain sound synchronization. Minimum of 6".
	Poorly made splices.	Check film, remake splice(s). See NOTE above.
	Sprocket not turning properly.	Check screws holding sprockets. Tighten if necessary. Check sprocket gears for defects. See Figure 8.
	Worn parts in intermittent mechanism; broken shuttle tooth or last tooth slapping film.	Replace defective parts. See Figure 10.
	Center shuttle tooth not protruding far enough.	Adjust mechanism as directed Page 128, Figure 11.
	Insufficient pressure plate tension.	Check pressure plate seating.
	Worn sprocket teeth.	Replace defective sprocket.
	Excessive emulsion caked on aperture and/or pressure plate.	Remove caked emulsion with aperture brush; Tuff Coat, toothpick. See Section 4.1.4, Cleaning Instructions.
12. Film scratched.	Dirt or emulsion on aperture and/or pressure plate.	Clean, using aperture brush; Tuff Coat, toothpick. See Section 4.2.3, Cleaning Instructions.
	Dirt or emulsion on sprockets, film rollers.	Clean, using aperture brush; Tuff Coat, toothpick. See Section 4.2.3, Cleaning Instructions.
	Worn film contact parts; pressure plate, aperture plate, film sprockets, rollers.	Replace worn parts with new ones.

4.2.5 TROUBLESHOOTING CHART (cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
12. (Cont'd.) Film scratched.	Sticking or binding film rollers.	Remove rollers and clean shaft. If worn or if they still bind, replace with new ones.
	Nicks and scratches on contact surfaces of film path; film rails, rollers, pressure plate, sprockets.	Rub part with crocus cloth. If nick or scratch is deep, replace parts with new ones.
	Film may be loose and rubbing on metal cabinet.	Keep film tight at all times.
	Film lubricator may be scratching film.	Check cleaning pads in lubricator assembly.
	Film not running correctly between each individual separator in film cabinet.	Insufficient film lubrication.
13. Excessive film wear. Torn or damaged film splices. Damaged or torn perforations.	Worn or damaged shuttle teeth.	Examine shuttle teeth for undercut surfaces; if badly worn, replace with new shuttle assembly.
	Sprocket teeth badly worn.	Examine film sprocket teeth for undercut surfaces. Replace if badly worn.
14. Excessively noisy projector operation.	Film slap due to improper pressure plate tension.	Check pressure plate tension. See Figure 3.
	Inherent mechanical noise.	Examine intermittent mechanism for defective parts. Check gears and rotating parts for nicks or worn surfaces. Replace defective parts if needed.

SECTION 4.2.6

MECHANICAL ADJUSTMENTS

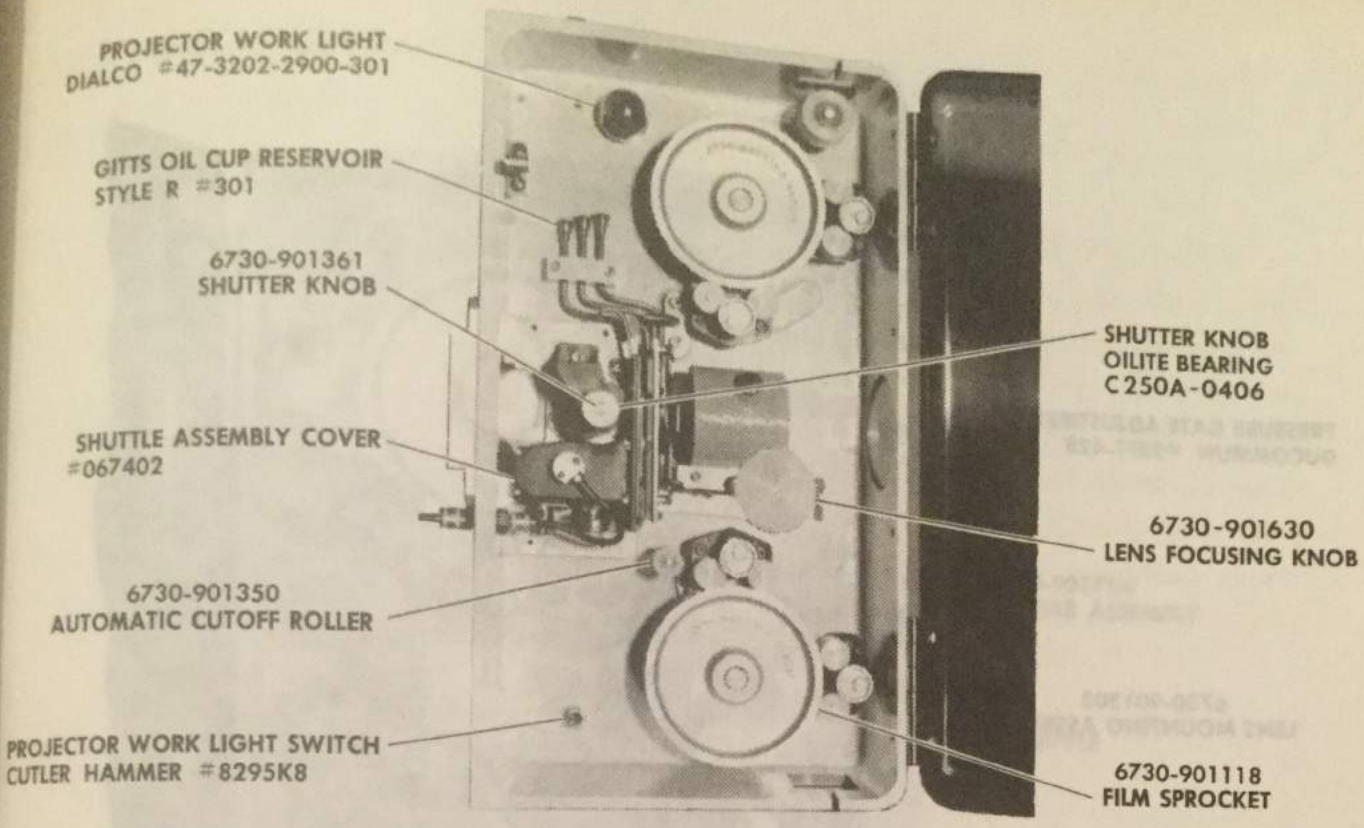


FIGURE 1

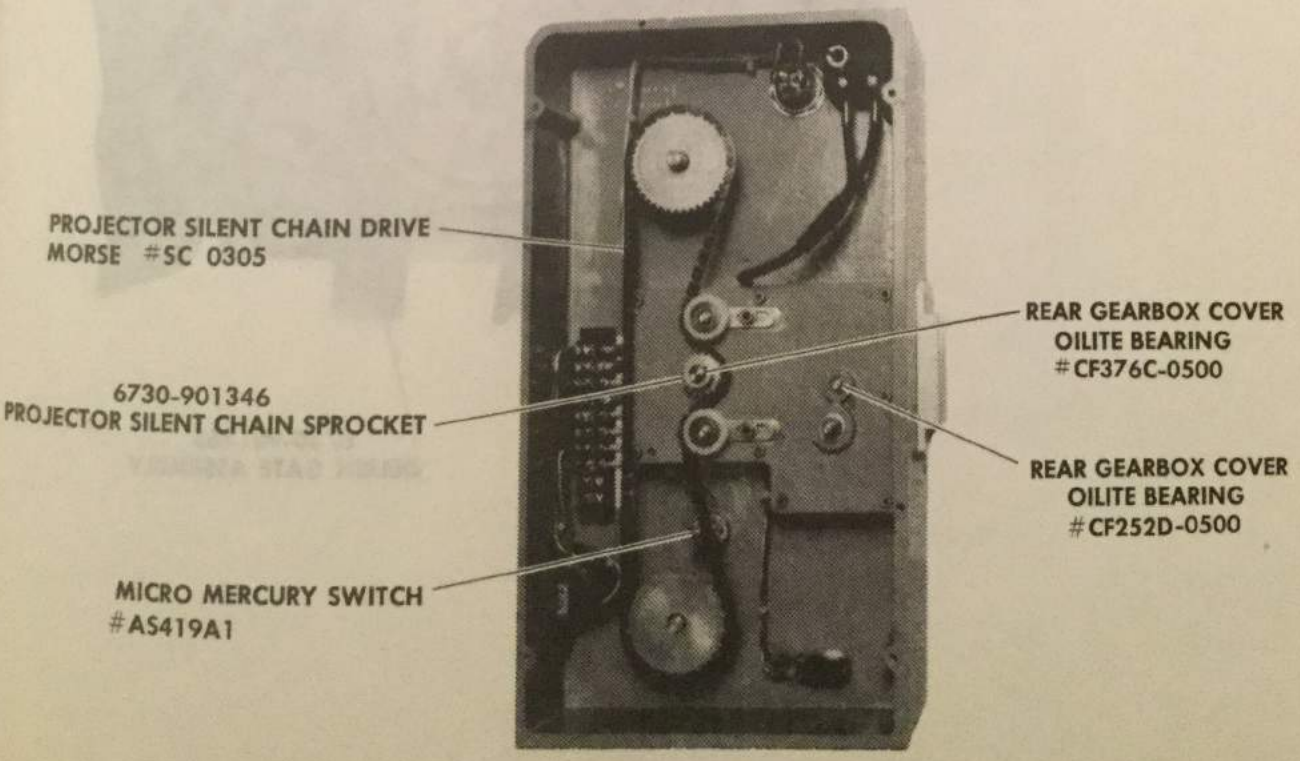


FIGURE 2

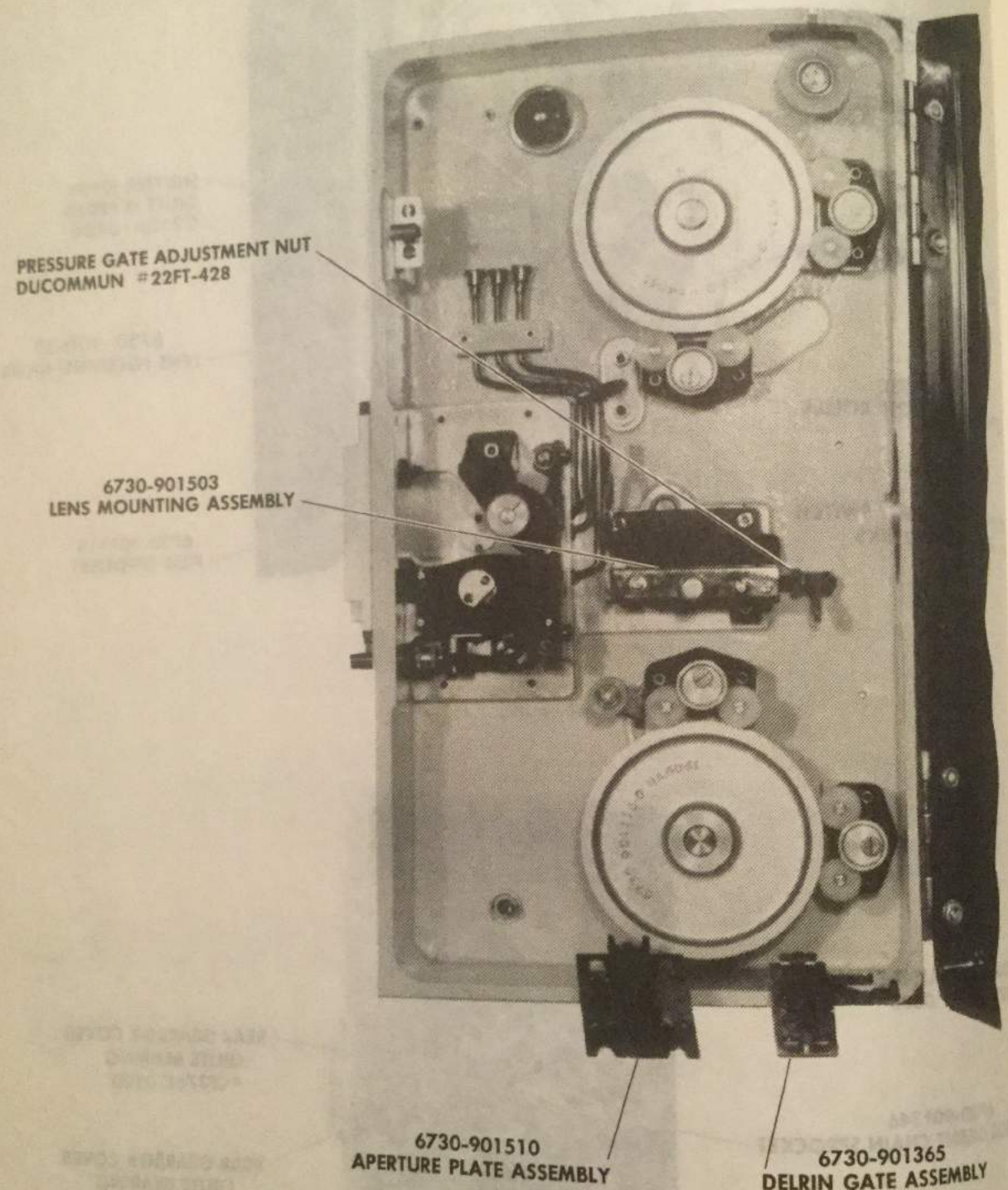

PRESSURE GATE ADJUSTMENT NUT
DUCOMMUN #22FT-428
6730-901503
LENS MOUNTING ASSEMBLY
6730-901510
APERTURE PLATE ASSEMBLY
6730-901365
DELRIN GATE ASSEMBLY

FIGURE 3

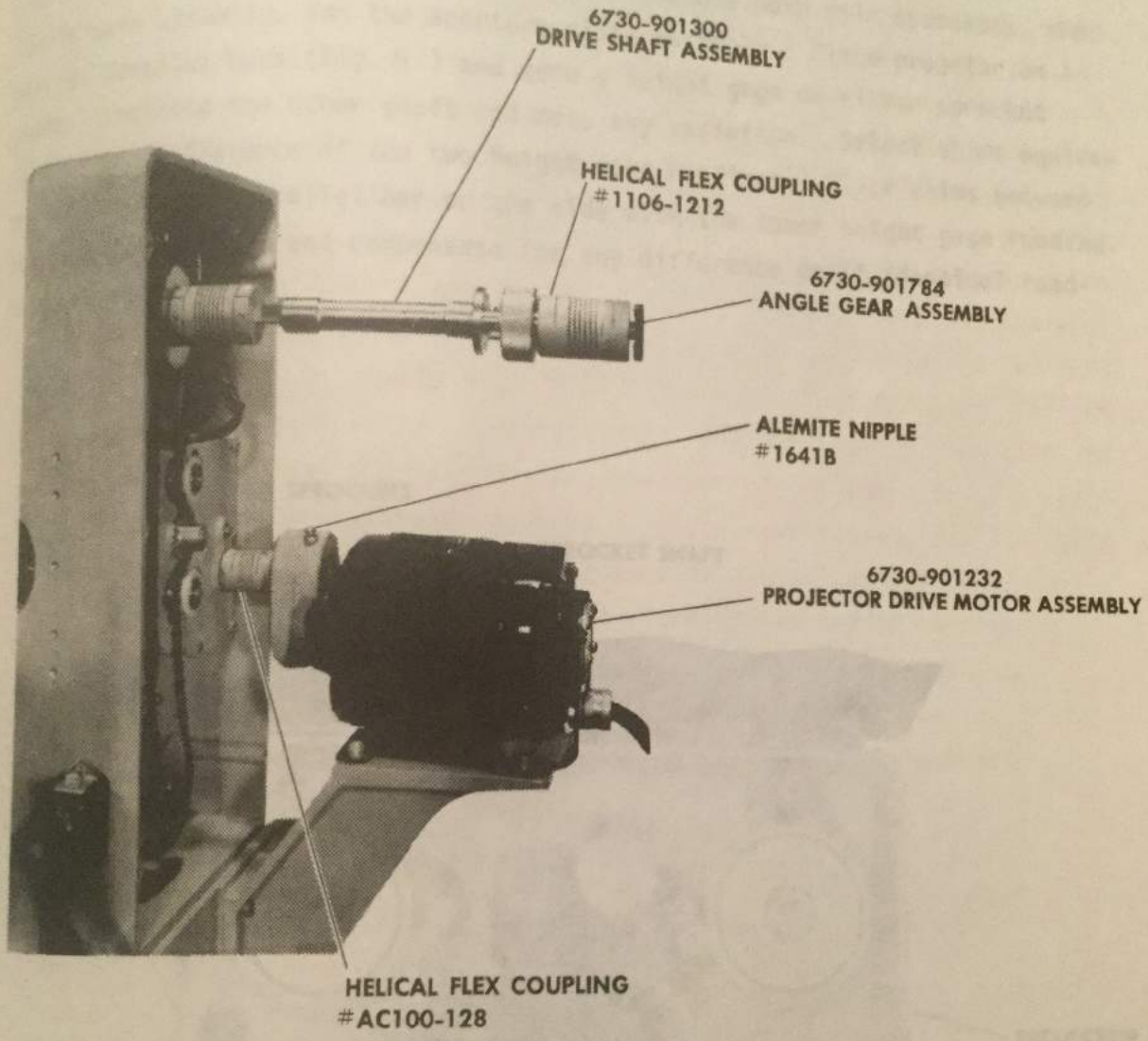

6730-901300
DRIVE SHAFT ASSEMBLY
HELICAL FLEX COUPLING
#1106-1212
6730-901784
ANGLE GEAR ASSEMBLY
ALEMITE NIPPLE
#1641B
6730-901232
PROJECTOR DRIVE MOTOR ASSEMBLY
HELICAL FLEX COUPLING
#AC100-128

FIGURE 4

4.2.6 MECHANICAL ADJUSTMENTS

SHUTTLE ALIGNMENT PROCEDURE

INITIAL SET-UP

The following procedure must be taken before the aperture plate alignment and framer bar setting checks are possible. Remove both film sprockets, the Delrin gate assembly, and the aperture plate assembly. Place projetor on a pair of parallel bars (Fig. 5) and zero a height gage on either sprocket shaft. Indicate the other shaft and note any variation. Select shims equivalent to the difference of the two height gage readings. Place shims between the projector and parallel bar on the side with the lower height gage reading. Indicate both shafts and compensate for any difference until identical readings are obtained.

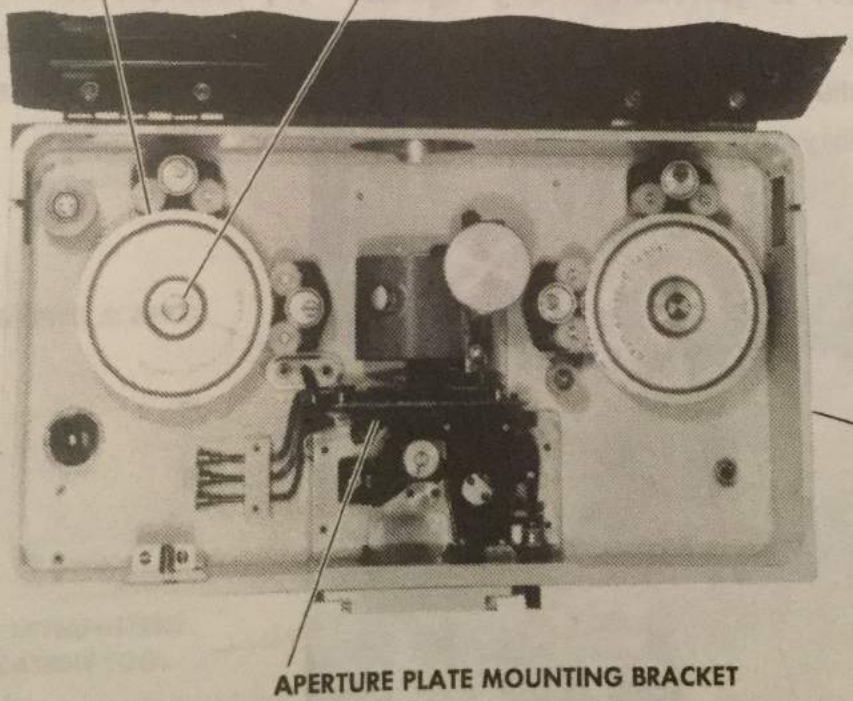


FIGURE 5

4.2.6 MECHANICAL ADJUSTMENTS

SHUTTER INTERMITTENT SYNCHRONIZATION

Remove the four shutter cover retaining screws and cover. In sequence, remove the elastic stopnut, shuttle pivot bushing washer, shuttle pivot outer spacer, nut cam lock, rear cam retaining washer, special nut, front cam counterweight, front cam lube disc, disengage shuttle spring from shuttle assembly, and remove shuttle assembly, shuttle pivot bushing, shuttle pivot inner spacer, rear horizontal motion cam, and front horizontal motion cam. Loosen the three shutter retaining screws to allow shutter to rotate manually. Rotate shutter knob until the registration pins are to the right of the shafts (Fig.6) and horizontal to each other. Install the shutter intermittent synchronization tool over the registration pins and lock in position by installing knurled nut (A) on front camshaft. Loosen knurled nut (B) and raise tool bar up against shutter blades in a horizontal position, by installing knurled nut (B). Re-tighten the three shutter retaining screws (Fig. 7). The shutter is now synchronized with the intermittent assembly.

NOTE: If the gearbox anti-backlash gear has been removed for any reason., leave the shutter intermittent synchronization tool in place and proceed to gearbox assembly Page 126. If, however, during this maintenance operation, the gearbox has remained untouched, remove the shutter intermittent synchronization tool and replace the shuttle assembly, etc., in the above reverse order.

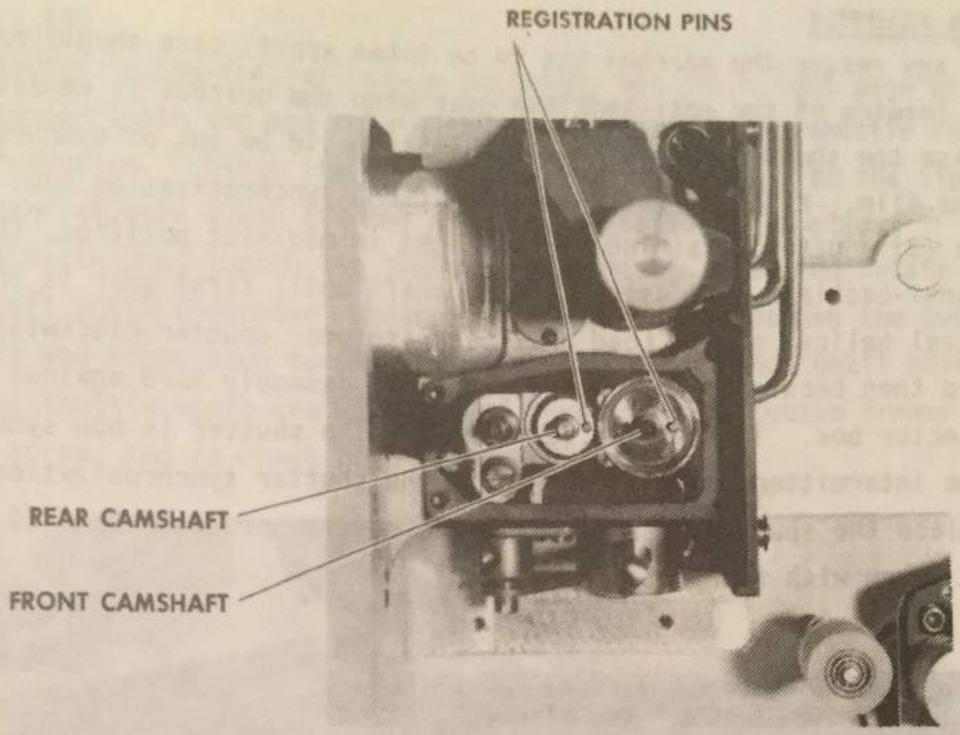


FIGURE 6

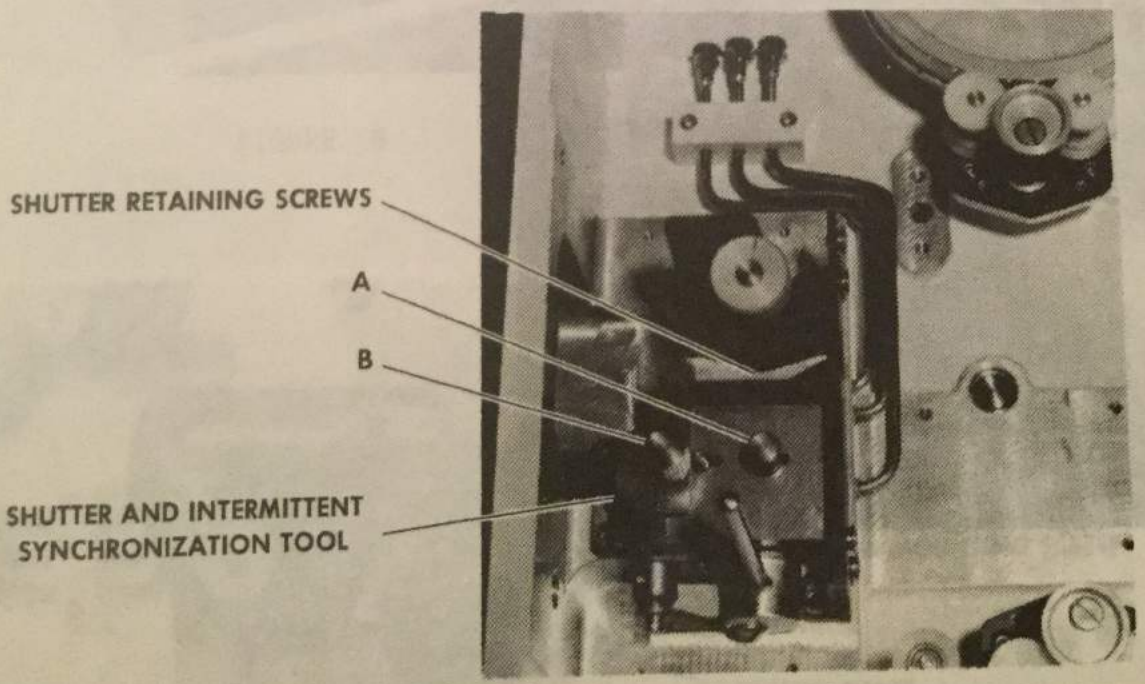


FIGURE 7

4.2.6 MECHANICAL ADJUSTMENTS

GEARBOX ASSEMBLY

If for any reason the gearbox has to be taken apart, care should be taken in the loading of the anti-backlash gear when the gearbox is re-assembled, otherwise the shuttle intermittent assembly would be out of synchronization with the film. With the shutter intermittent synchronization tool in place, and the (3) shutter retaining screws tight in mid-slot position, (Page 124) slide anti-backlash gear assembly onto shaft until first gear is in mesh with steel helical gear. Load anti-backlash gear counter-clockwise to maximum and then back off two teeth. Push gear assembly hard against bushing in projector box. Tighten two set screws. The shutter is now synchronized with the intermittent assembly. Remove the shutter synchronization tool, and replace the shuttle assembly, etc. in reverse order to Page 124. Secure shutter cover with four retaining screws.

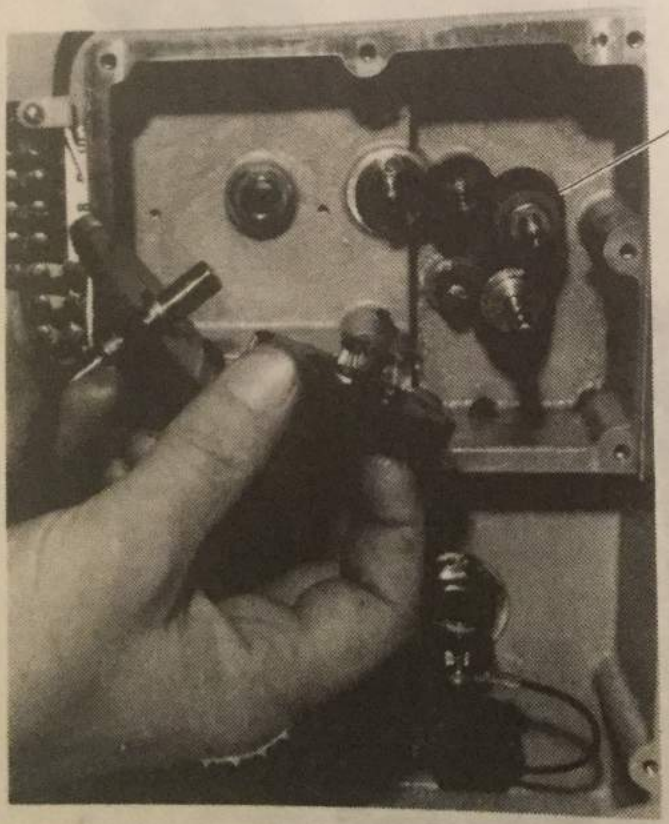


FIGURE 8

4.2.6 MECHANICAL ADJUSTMENTS

SETTING FRAMER BAR

With the projector in the initial set-up position, set the height gage on the shuttle center tooth tip and rotate shutter knob until the shuttle is at maximum protrusion. Change the position of the height gage to the tip of the left hand shuttle tooth tip and note any variation. To adjust for any noted variation, loosen the framer bar mounting screw and rotate the framer shaft until indicator reading is approximately between the two limits of left and right hand tooth readings. Repeat sequence until both left and right shuttle teeth are within .001 inch T.I.R. Tighten framer bar mounting screw, and re-check both readings.

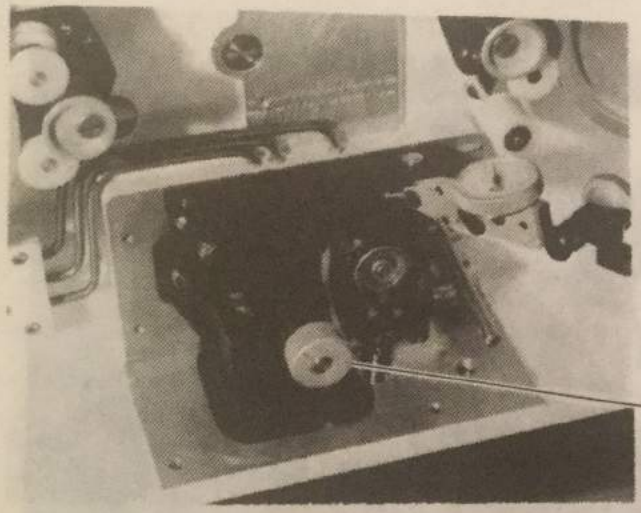


FIGURE 9

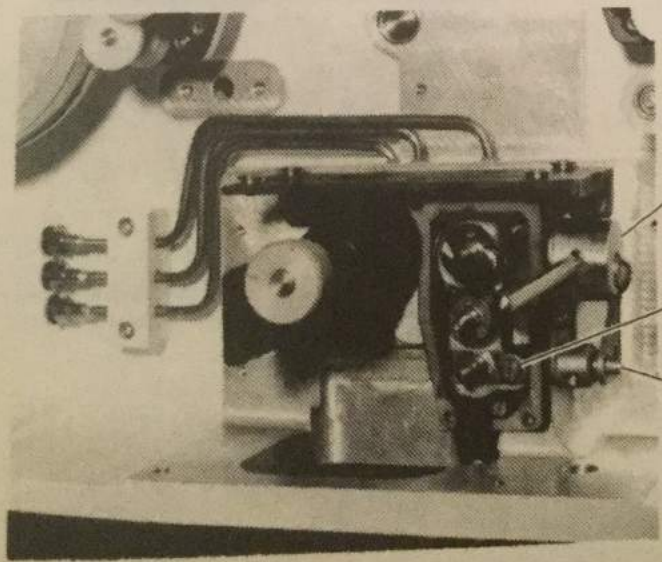


FIGURE 10

4.2.6 MECHANICAL ADJUSTMENTS

APERTURE PLATE ALIGNMENT AND SHUTTLE PROTRUSION:

With the projector in the initial setup position, replace the aperture plate assembly in the projector. Rotate the shutter knob until the shuttle is at maximum protrusion and place the height gage on the shuttle center tooth tip. Zero the indicator at this position. Using the height gage indicator, indicate the aperture plate surface end to end within 001" while the center shuttle tooth protrusion is 0340 ± .0005. To obtain this condition, loosen the two aperture plate mounting bracket screws, and move the mounting bracket in the appropriate direction. Re-tighten the screws, and repeat indicator checks to be sure calibration has not been disturbed.

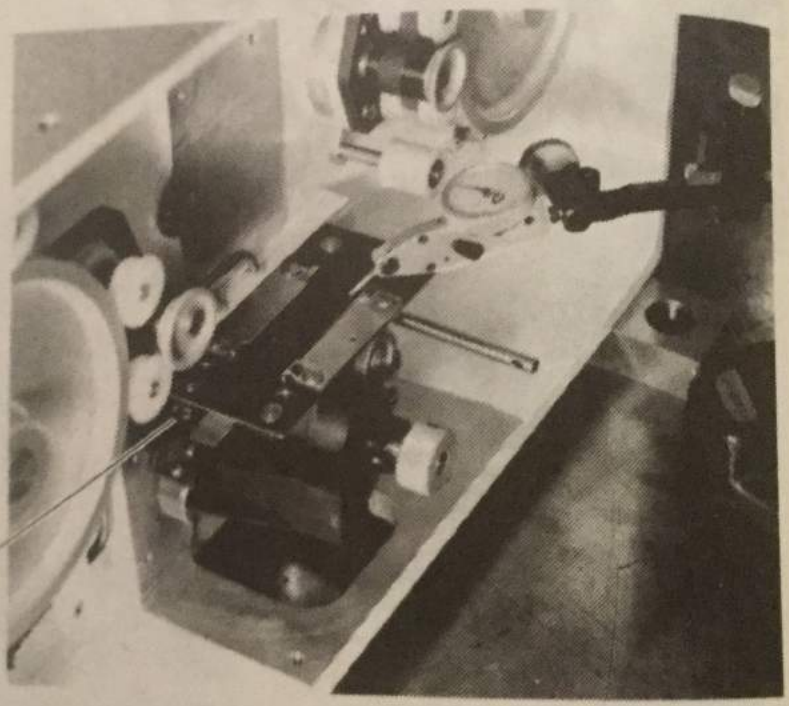


FIGURE 11

4.1.7 MECHANICAL ADJUSTMENTS

APERTURE PLATE FILM RAIL ADJUSTMENT

Secure fixed film rail to aperture plate with two screws, tightening screws enough to hold, with film rail free to slide. Place guide rail tool on aperture plate. Press down firmly on tool so that the two alignment pins on back of tool fit snugly into aperture plate mounting holes. Press tool upward (toward aperture plate pull) to lock the pins into mounting holes. Hold fixed film rail up flush against the tool and tighten two screws securely.

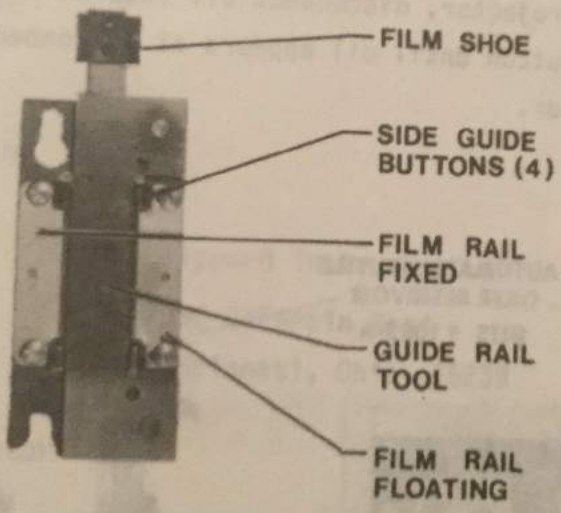


FIGURE 12

4.2.6 MECHANICAL ADJUSTMENTS

AUTOMATIC SHUTTLE OILER ASSEMBLY

This assembly (Drawing 6730-902687) contains several basic units. These are a solenid, timer, cam, manual control button, oil reservoir, ball check, and piston. The timer is a 24 hour unit modified to activate every six hours by four equally spaced notches on the cam. The solenoid moves the piston through a pre-determined travel which in turn forces oil along a tube into the shuttle mechanism of the projector. The amount of piston travel determines the amount of oil injected and can be adjusted by means of the piston travel adjusting screw. The further out the adjusting screw extends, the greater the amount of oil injection. The manual control button can be pressed to activate the solenoid, should the need arise for additional lubrication. The purpose of the ball check at the reservoir end of oiler is to ensure that the oil tube is constantly filled, thereby avoiding air bubbles in the oil tube. NOTE: To ensure that there are no air bubbles in oil tube from automatic oiler to projector, disconnect oil tube at projector, and activate manual control button until oil appears at disconnected end of tube. Re-connect to the projector.

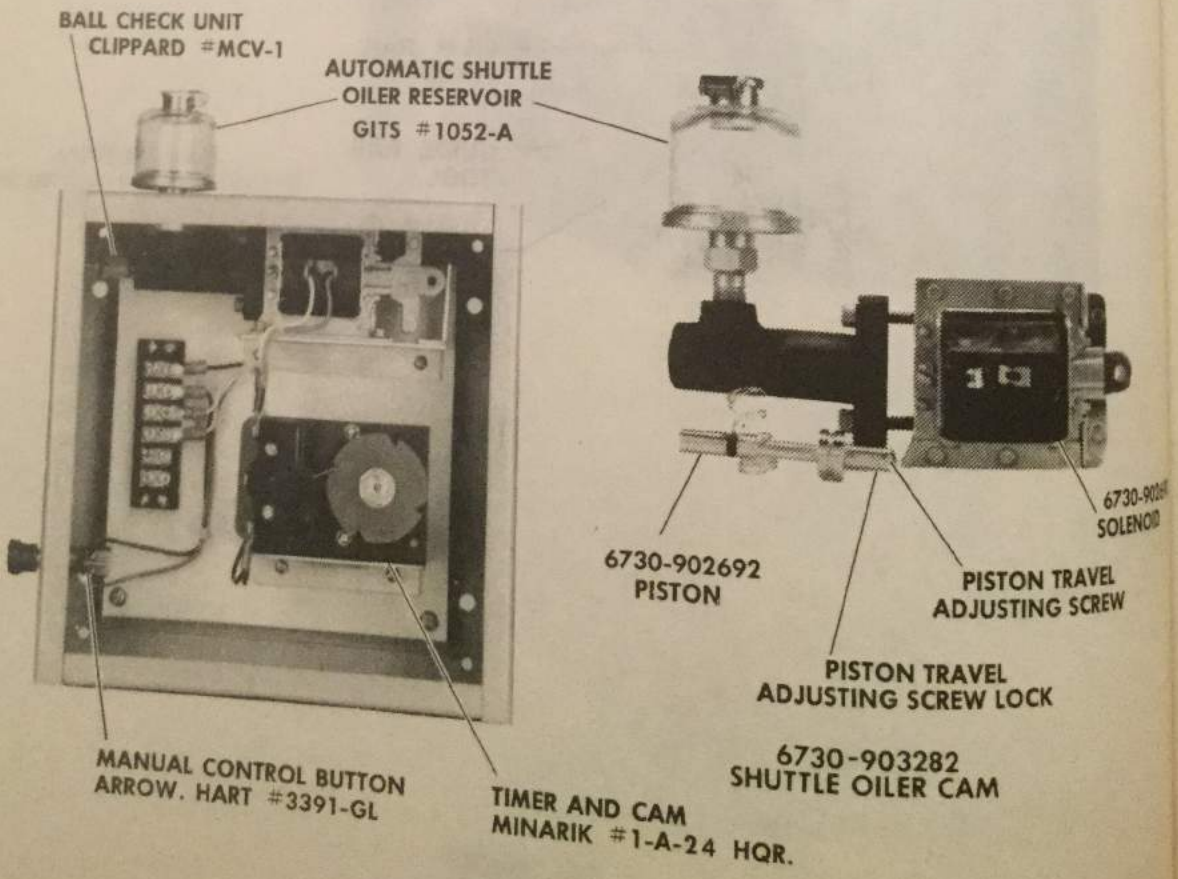
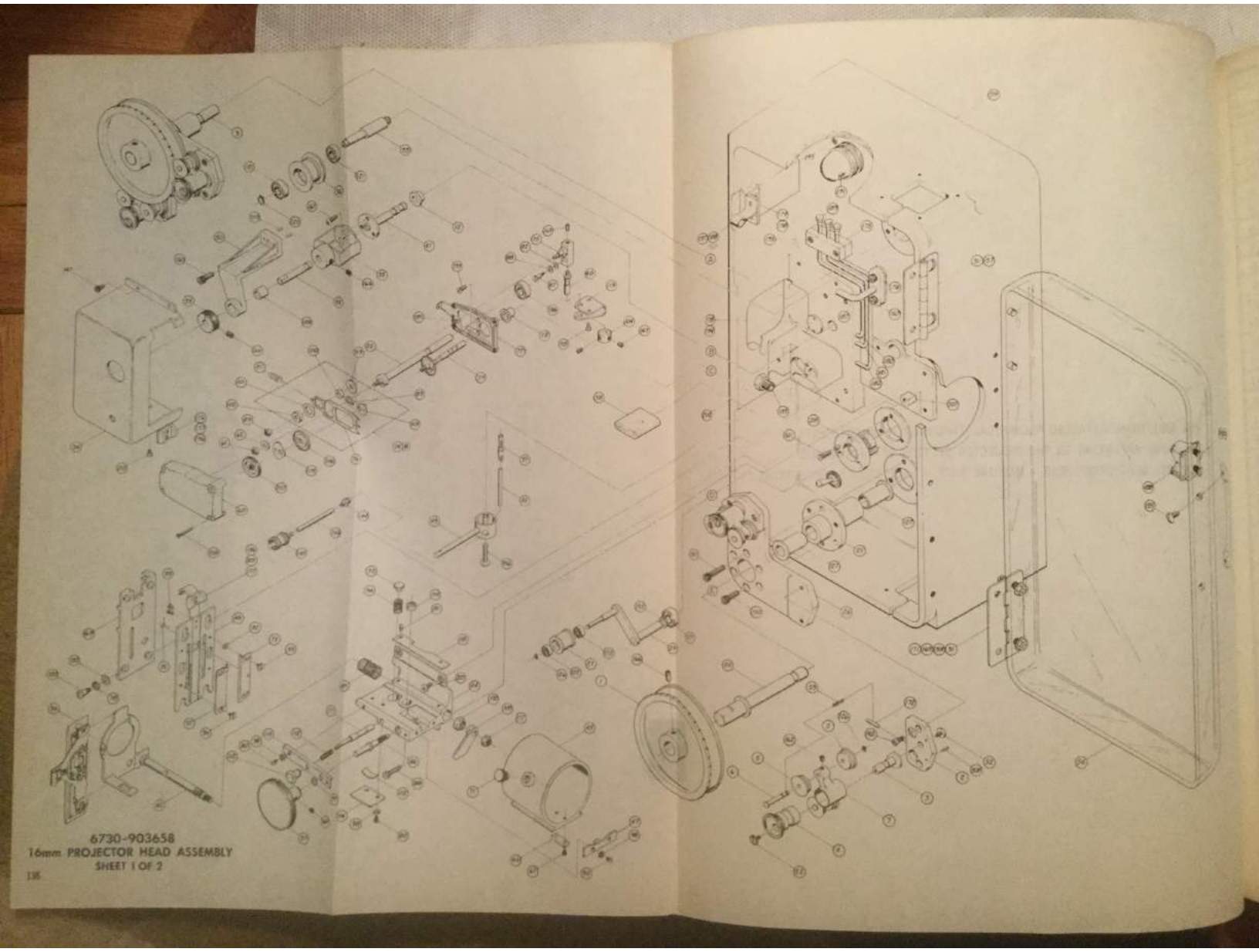


FIGURE 13

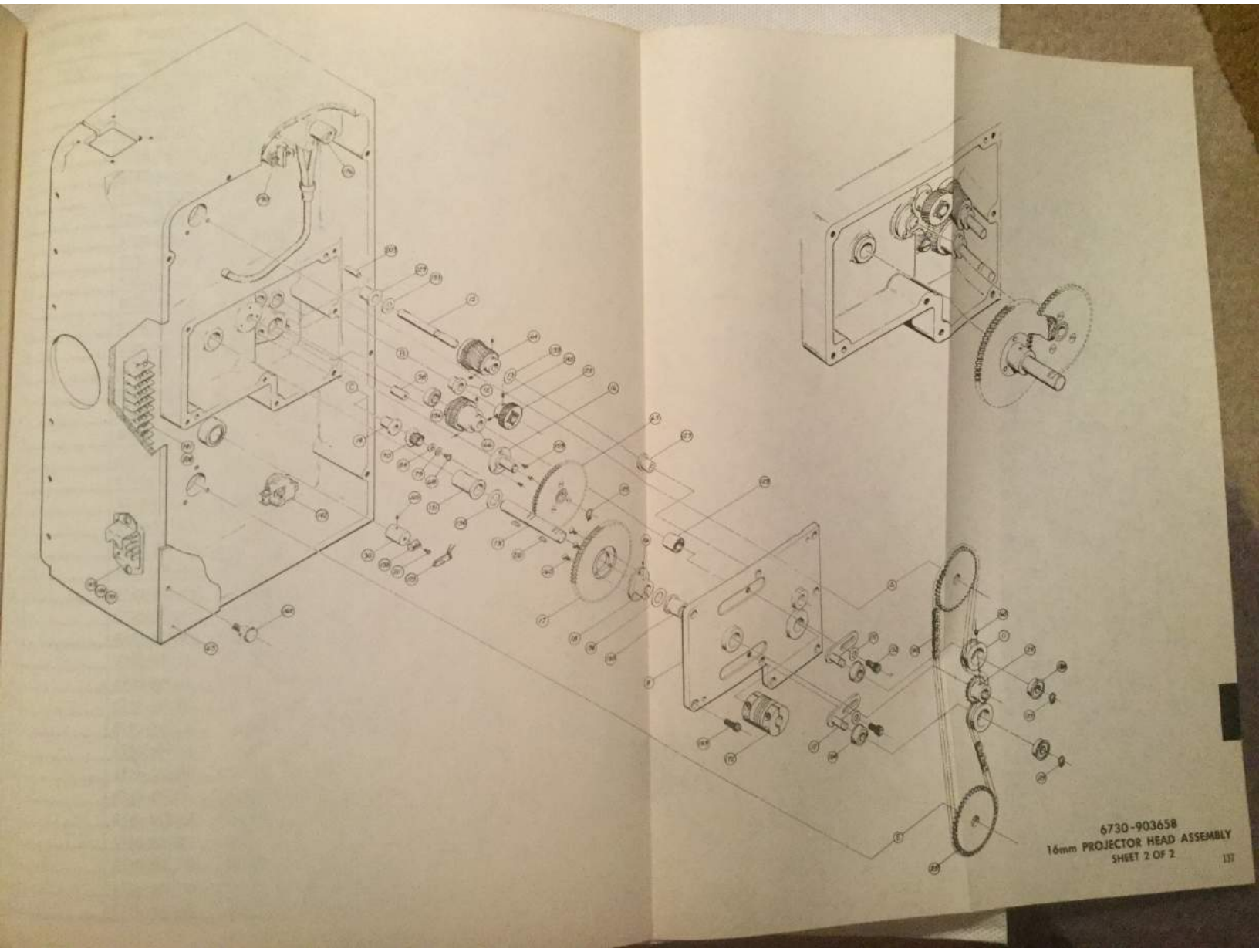
4.2.6 AUTOMATIC SHUTTLE OILER RECOMMENDED SPARE PARTS

DESCRIPTION	SOURCE
1. 6730-903282 Shuttle Oiler Cam	Walt Disney Productions Studio Machine Shop
2. 1-A-24 HQR Minarik Timer Switch	Minarik Electric Co. 224 E. Third St. Los Angeles, California
3. 6730-902690 Dormeyer Solenoid 2005-M-1	Dormeyer Industries Chicago Illinois
4. 1052-A Gits Oil Cup	Gits Bros. MFG. Co. Chicago, Illinois
5. MCV-1 Clippard Check Valve	
6. 11752-2 Clippard Hose Fitting	
7. 3814-4 Clippard Vinyl Hose	Clippard Instrument Lab. 7390 Colerain Road Cincinnati, Ohio 45239
8. MQC-F2 Clippard Hose Connector	
9. 3391-GL Arrow-Hart Switch	Arrow-Hart Inc. Hartford, Connecticut
10. 4730-903510 Oiler Hose Disconnect	Walt Disney Productions Studio Machine Shop

MECHANICAL DRAWINGS



6730-903658
16mm PROJECTOR HEAD ASSEMBLY
SHEET 1 OF 2



6730-903658
16mm PROJECTOR HEAD ASSEMBLY
SHEET 2 OF 2

DWG. 6730-903658 ASSEMBLY, PROJECTOR HEAD

SHEET 1 OF 6

ITEM	WDP NO.	PART NO.	DESCRIPTION	QTY.
1.		6730-901118	SPROCKET, FILM	1
2.		6730-901219	PLATE, BASE	4
3.		6730-901220	SHAFT, ECCENTRIC	4
4.		6730-901221	KNOB, ECCENTRIC	4
5.		6730-901222	ROLLER	16
6.		6730-901223	SHAFT, ROLLER	8
7.		6730-901224	BRACKET, ROLLER	4
8.		6730-901318	COVER, GEAR BOX	1
9.		6730-901320	SHAFT, UPPER SPROCKET	1
10.		6730-901321	BRACKET, S.C. TAKEUP	2
11.		6730-901322	ROLLER, S.C. TAKEUP	2
12.		6730-901323	BEARING, SHUTTER SHAFT	2
13.		6730-901324	BEARING, FRONT CAM SHAFT	1
14.		6730-901325	BEARING, REAR CAM SHAFT	1
15.		6730-901326	SHAFT, IDLER GEAR	1
16.		6730-901330	SHAFT, IDLER GEAR	1
17.		6730-901334	GEAR, S.C. SHAFT	1
18.		6730-901335	HUB, S.C. SHAFT GEAR	1
19.		6730-901336	SHAFT, S.C. DRIVE	1
20.		6730-901337	SHAFT, LOWER SPROCKET	1
21.		6730-901338	HOUSING, SPROCKET DRIVE SHAFT	2
22.		6730-901339	SHAFT, REAR CAM	1
23.		6730-901343	GEAR, SHUTTER SHAFT	1
24.		6730-901346	SPROCKET, S.C. DRIVE	1
25.		6730-901347	SPROCKET, DRIVEN CHAIN	2
26.		6730-901349	BRACKET, SPROCKET FILM GUIDE	2
27.		6730-901350	ROLLER, LOOP SWITCH	1
28.		6730-901351	HUB, LOOP SWITCH	1
29.		6730-901352	SHAFT, LOOP SWITCH	1
30.		6730-901353	COLLAR, MERCURY SWITCH	1
31.		6730-901355	HINGE, DOOR	2
32.		6730-901360	SHAFT, SHUTTER	1
33.		6730-901361	KNOB, TURNOVER	1
34.		6730-901362	HOUSING, INTERMITTENT	1
35.		6730-901363	SHUTTER	1
36.		6730-901365	ASSEMBLY, DELRIN GATE	1
37.		6730-901488	TUBE, INTERMITTENT OILER	1
38.		6730-901495	BUSHING, FRAMER PIVOT	1

DWG. 6730-903658 ASSEMBLY, PROJECTOR HEAD SHEET 2 OF 6

ITEM	WDP NO.	PART NO.	DESCRIPTION		
39.		6730-901500	CAMSHAFT, FRONT		1
40.		6730-901501	SHAFT, FRAMER		1
41.		6730-901502	SHAFT, SHUTTER		1
42.		6730-901504	SHAFT, PRESSURE PLATE RELEASE		1
43.		6730-901505	SPRING, PRESSURE PL. RELEASE		1
44.		6730-901506	MOUNT, LENS HOLDER		1
45.		6730-901507	HOLDER, LENS		1
46.		6730-901508	RACK, LENS FOCUSING GEAR		1
47.		6730-901509	PLATE, LENS HOLDER STOP		1
48.		6730-901511	PLATE, APERTURE		1
49.		6730-901513	RESERVOIR, INTERMITTENT OILER		1
50.		6730-901358	BRACKET, SHUTTER BEARING		1
51.		6730-901588	WICK, INTERMITTENT OILER		1
52.		6730-901643	SCREW, ECCENTRIC SHAFT		1
53.		6730-901644	SPRING, SPROCKET GUIDE		2
54.		6730-901748	DOOR, PROJECTOR		4
55.		6730-901828	SHAFT, 16MM GUIDE ROLLER		1
56.		6730-901829	ROLLER, 16MM GUIDE		1
57.		6730-901630	KNOB, FOCUS		1
58.		6730-902684	PAD, INTERMITTENT OILER		1
59.		6730-902686	BOX, PROJECTOR		1
60.		067402*	COVER ASSEMBLY, SHUTTLE	[2]	1
61.		615925*	NUT, CAM LOCK	[2]	1
62.		611285*	WASHER, REAR CAM RETAINING	[2]	1
63.		6730-902698	COVER, PROJECTOR REAR		1
64.		6730-903284	ASSEMBLY, PRIMARY IDLER GEAR		1
65.		6730-903285	ASSEMBLY, SECONDARY IDLER GEAR		1
66.		6730-903288	ASSEMBLY, ANTI-BACKLASH GEAR		1
67.		4080	SCREW, GEAR RACK	[2]	2
68.		98757	SCREW, SPECIAL BINDER HD		1
69.		061040*	BRACKET ASSEMBLY, APERTURE PL. MTG.		1
70.		061042*	GEAR ASSEMBLY, FRONT CAM		1
71.		061136*	SCREW ASSEMBLY, LENS LOCK		1
72.		061150*	RAIL SUBASSEMBLY,FILM		1
73.		061151*	RAIL SUBASSEMBLY, FILM FLOATING		1
74.		061193*	KIT ASSEMBLY, SHUTTLE CAMS & PIVOT	[18]	1
75.		063112*	BAR ASSEMBLY, FRAMER PIVOT		1
76.		063260*	ASSEMBLY, SHUTTLE	[2]	1

* B & H PART NOS.

DWG. 6730-903658 ASSEMBLY, PROJECTOR HEAD

ITEM	WDP NO.	PART NO.	DESCRIPTION	QTY.
77.		067399*	PLATE ASSEMBLY, SHUTTEL COVER MTG	1
78.		600293*	WASHER, LOCK	2
79.		600789*	WASHER, LOCK	1
80.		600833*	SCREW, RD HD	4
81.		600950*	SCREW, RD HD	2
82.		611251*	WASHER, FRAMER BAR FRICTION	1
83.		611283*	CAM, REAR, HORIZ MOTION	1
84.		611302*	RING, FRONT CAM GEAR LOCK	1
85.		611314*	SPRING SHUTTLE	1
86.		611334*	PINION, FOCUSING	1
87.		611380*	SCREW, FRAMER BAR MTG.	1
88.		611383*	WASHER, FRAMER BAR SPRING	1
89.		611453*	NUT, ELASTIC STOP	1
90.		611469*	SCREW, SPECIAL HD	2
91.		611482*	SPRING, SIDE TENSION BRACKET	1
92.		611483*	WASHER, SIDE TENSION BRACKET	2
93.		611484*	SCREW, SIDE TENSION BRACKET	2
94.		611499*	SCREW, FILM GUIDE	2
95.		611520*	BUTTON, LENS HOLDER FRICTION	1
96.		611521*	SPRING, LENS HOLDER FRICTION	1
97.		611645*	WASHER, SPRING	1
98.		611734*	WASHER, LOCK	6
99.		611773*	SPACER, SHUTTLE PIVOT, INNER	1
100.		611774*	BUSHING SHUTTLE PIVOT	1
101.		611775*	SPACER, SHUTTLE PIVOT, OUTER	1
102.		611779*	WASHER, SHUTTLE PIVOT, BUSHING	1
103.		611783*	CAM, FRONT, VERTICAL MOTION	1
104.		611866*	COLLAR, FRAMER SHAFT LOCKING	1
105.		611973*	COUNTERWEIGHT, FRONT CAM	1
106.		611974*	DISC, FRONT CAM, LUBRICATING	1
107.		611975*	NUT, SPECIAL	1
108.				
109.		613448*	ARM, HOLDER PUSH ROD	1
110.		613449*	DISC, RELEASE ROD GUIDE	1
111.		613450*	ROD, PRESSURE PLATE RELEASE	1
112.		613451*	SPRING, COMPRESSION	1
113.		613453*	KNOB, RELEASE ROD	1
114.		613455*	RAIL, LENS HOLDER SIDE [2]	1

* B & H PART NOS.

DWG. 6730-903658 ASSEMBLY, PROJECTOR HEAD SHEET 4 OF 6

ITEM	WDP NO.	PART NO.	DESCRIPTION		QTY
115.		613457 *	SPRING, LENS HOLDER FLAT	[2]	1
116.		613458 *	PLATE, FLAT SPRING RETAINING		1
117.		614587 *	NUT, ELASTIC STOP		1
118.		620005 *	RAIL, LENS HOLDER TOP		1
119.		620937 *	BRACKET, FRAMER SHAFT		1
120.		613210 *	SCREW, APERTURE MTG. BRACKET	[2]	2
121.		S1KDD7	BEARING	FAFNIR	4
122.		33KDD3	BEARING	FAFNIR	2
123.		MDW4K2	BEARING	FAFNIR	1
124.		F4DD	BEARING	FAFNIR	4
125.		5100-25	SNAP RING, EXT.	[3]	4
126.		5100-12	SNAP RING, EXT.	[3]	5
127.		CF376D-0750	BUSHING	[4]	4
128.		C250A-0406	BUSHING	[4]	1
129.		CF252D-0500	BUSHING	[4]	2
130.		CF376C-0500	BUSHING	[4]	1
131.		CF376Z-0500	BUSHING	[4]	1
132.		5710-36-32	WASHER, SST	[5]	2
133.		5606-16-32	WASHER, NYLON	[5]	2
134.		5606-28-32	WASHER, NYLON	[5]	2
135.		5610-68-32	WASHER, NYLON	[5]	1
136.		Z99R4	BEARING	FAFNIR	2
137.		4477-A5	STANLEY PULL	[10]	1
138.		1MR11-F	CLIP, MERCURY SWITCH	[6]	1
139.					
140.		SC0305	CHAIN, 3/16 SILENT	[7]	30"
141.		670-10	TERMINAL STRIP "B"	[16]	1
142.		8295K8	SWITCH, TOGGLE	[15]	1
143.		P-308-DB	RECEPTACLE, PLUG	[14]	1
144.		11752-2	FITTING, HOSE	[13]	1
145.		MQC-F2	CONNECTOR, HOSE	[13]	1
146.		3814-4	HOSE, VINYL	[13]	A/R
147.		4-40 X 1/4	SCREW, SOC HD, SST		4
148.		6-32 X 1/4	SCREW, SOC HD, SST		8
149.		8-32 X 7/16	SCREW, SOC HD, SST		8
150.		8-32 X 1/2	SCREW, SOC HD, SST		9
151.		8-32 X 3/4	SCREW, SOC HD, SST		6
152.		10-32 X 3/8	SCREW, SOC HD, SST		2

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* B & H PART NOS.

DWG. 6730-903658 ASSEMBLY, PROJECTOR HEAD SHEET 5 OF 6

ITEM	WDP NO.	PART NO.	DESCRIPTION	QTY.
153.		4-40 X 3/16	SCREW, RD HD, SST	2
154.		2-56 X 5/8	SCREW, RD HD, SST	4
155.		8-32 X 3/8	SCREW, TRUSS HD, SST	2
156.		8-32 X 11/16	SCREW, RD HD, SST	1
157.		10-32 X 1/4	SCREW, TRUSS HD, SST	4
158.		10-32 X 3/8	SCREW, TRUSS HD, SST	4
159.		2-56 X 1/4	SCREW, FLAT HD, SST	6
160.		4-40 X 7/32	SCREW, FLAT HD, SST	3
161.		4-40 X 7/16	SCREW, FLAT HD, SST	3
162.		4-40 X 1/8	SET SCREW, SOC HD, BLACK	8
163.		5-40 X 1/8	SET SCREW, SOC HD	2
164.		6-32 X 1/8	SET SCREW, SOC HD, BLACK	2
165.		8-32 X 1/8	SET SCREW, SOC HD, BLACK	4
166.		8-32 X 1/4	SET SCREW, SOC HD	4
167.		6-32 X 1/4	SCREW, BUTTON HD, BLACK	3
168.		8-32 X 3/8	SCREW, THUMB, SST	6
169.		10-32	NUT, HEX	4
170.		1/4-28	NUT, JAM, 22FT-428 [10]	1
171.		10-32	WASHER, FLAT, SST	6
172.		.062 X 1/2	PIN, DOWEL, SST	4
173.		AS419A1	SWITCH, MICRO MERCURY [6]	1
174.		6730-901486	BRACKET, P.E. ANGLE SCANNER	1
175.		6730-901489	SUPPORT, INTMT. OILER TUBE	1
176.		6730-901491	BRACKET, LOWER FILM SHOE	1
177.		6730-901492	SHOE, FILM	2
178.		6730-901493	COVER, MECH. DRIVE SHAFT	1
179.		6730-901494	ANGLE, DOOR STRIKER	1
180.		6730-901901	TUBE, LEFT INTMT. OILER	1
181.		6730-901902	TUBE, CENTER INTMT. OILER	1
182.		6730-901903	TUBE, RIGHT INTMT. OILER	1
183.		6730-902697	NIPPLE, SHUTTLE OILER	1
184.		6730-902984	CLIP, PROJECTOR PLUG	1
185.		620933	GASKET, SHUTTLE COVER [2]	1
186.		M310A	ILLUMINATOR BLOCK [12]	1
187.		EL809	SCANNER [12]	1
188.		11701-FW12	DOOR CATCH [11]	1
189.		#301	OIL CAP, STYLE R [10]	3
190.		47-3202-2900-301	PANEL LIGHT [9]	1

DWG. 6730-903658 ASSEMBLY, PROJECTOR HEAD SHEET 6 OF 6

ITEM	WDP NO.	PART NO.	DESCRIPTION	
191.		6S6 D.C.	LAMP, 125V, 6 WATT	17
192.		AC100-128	COUPLING	18
193.		4-40 X 3/4	SCREW, SOC HD, SST	
194.		1-72 X 1/4	SCREW, RD HD, SST	
195.		2-56 X .100	SCREW, RD HD, SST	
196.		2-56 X 1/8	SCREW, RD HD, SST	
197.		6-32 X 3/16	SCREW, TRUSS HD, SST	
198.		6-32 X 1/4	SCREW, RD HD, SST	
199.		6-32 X 1/4	SCREW, TRUSS HD, SST	
200.		6-32 X 1/2	SCREW, FLAT HD, SST	
201.		6-32	NUT, HEX, SST	
202.		5/16-24	NUT, HEX, SST	
203.		5/32 X 1/2	ROLL PIN, SST	
204.		6-32 X 1/2	SCREW, RD HD, SST	
205.		6730-903686	SCREW, LENS HOLDER MOUNT	
206.		6-32 X 3/4	SCREW, SOC HD, SST	
207.		6730-901827	SPACER, LENS MOUNT	1
208.		.093 X .31	PIN, DOWEL, SST	8
209.		6730-901512	PULL, APERTURE PLATE	1
210.			WOODRUFF KEY #2	1
211.		0-80 X 1/16	SCREW, RD HD, SST	1
212.		1-72 X 1/8	SCREW, RD HD, SST	4
213.		.093 X 1/4	PIN, DOWEL, SST	2

NOTES:

[1] REFERENCE DOCUMENTS: 6110-906838, 6730-902685

[2] A.F. MILLIRON
1198 SO. LA BREA AVE.
LOS ANGELES, CALIF.

[3] WALDES KOHINOOR, INC.
47-16 AUSTEL PLACE
LONG ISLAND CITY, N.Y. 11101

[4] ATLAS BRASS FOUNDRY
1901 SO. SANTA FE
LOS ANGELES, CALIF.

[5] SEASTROM MFG. CO., INC.
701 SONORA AVE.
GLENDALE, CALIF. 91201

[6] HONEYWELL, INC.
200 BOND ST.
WABASH, IND. 46992

[7] MORSE CHAIN
SO. AURORA ST.
ITHACA, N.Y. 14850

[8] HELICAL PRODUCTS
534 N. FRANCISCA AVE.
REDONDO BEACH, CALIF.

[9] DIALIGHT CORP.
60 STEWART ST.
BROOKLYN, N.Y. 11237

[10] DUCOMMUN METALS & SUPPLY
4890 SO. ALAMEDA ST.
LOS ANGELES, CALIF.

[11] HARDWARE SPECIALTIES
1317 SO. HOPE ST.
LOS ANGELES, CALIF. 90015

[12] DOLAN JENNER
200 INGALS COURT
MELROSE, MASS.

[13] CLIPPARD INSTRUMENT LABORATORY, INC.
7390 COLERAIN RD.
CINCINNATI 39, OHIO

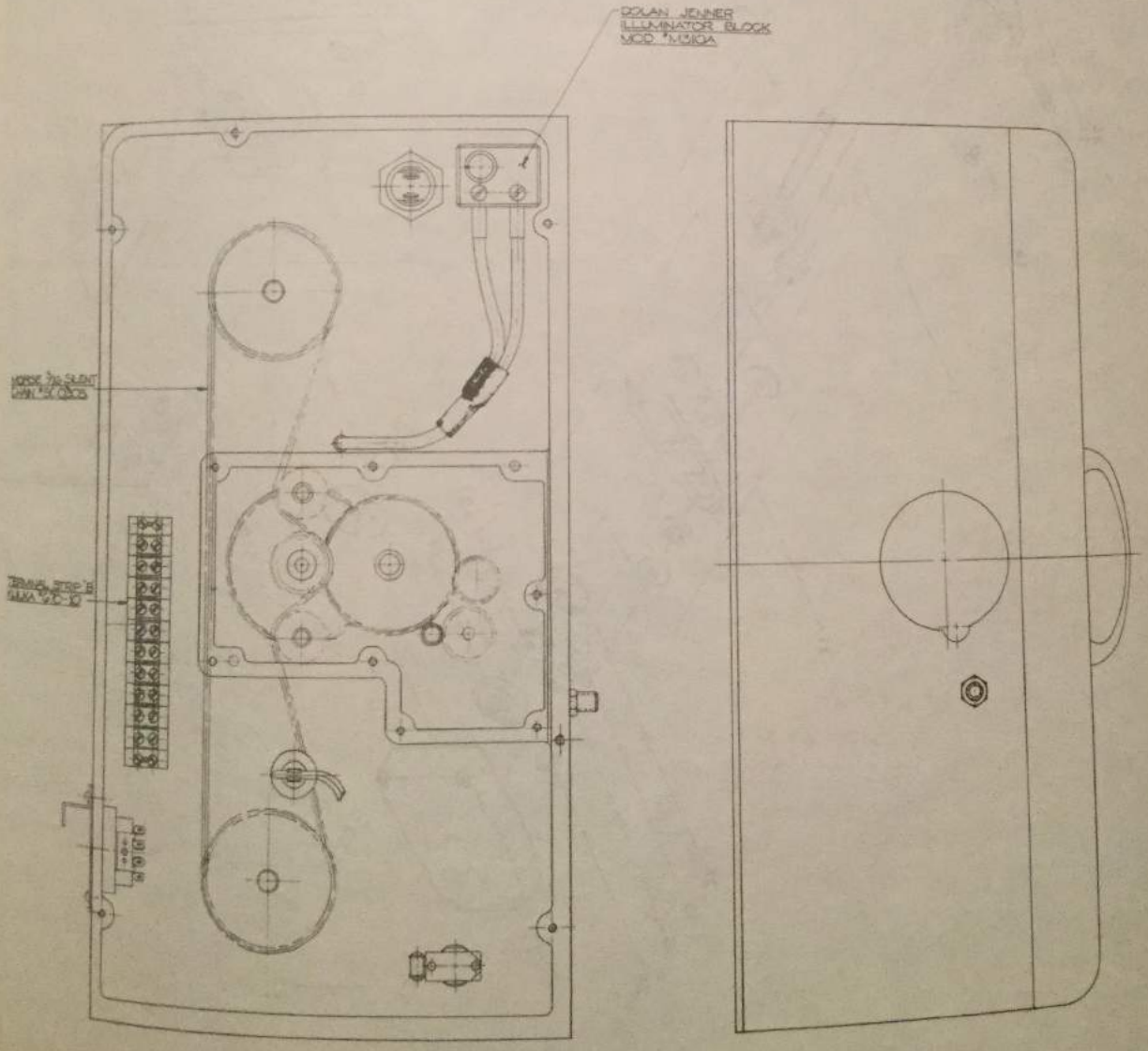
[14] CINCH JONES
1026 SO. HOMAN AVE.
CHICAGO, ILL. 60624

[15] CUTLER HAMMER
4201 NORTH 27th ST.
MILWAUKEE, WISCONSIN 53216

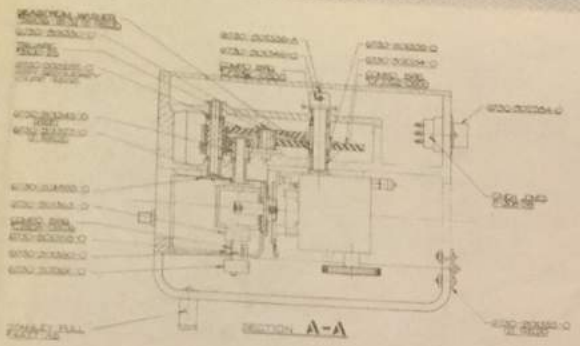
[16] KULKA ELECTRIC CORP.
520 SO. FULTON AVE.
MOUNT VERNON, N.Y. 10551

[17] GENERAL ELECTRIC CO.
M.O.-O. NELA PARK
CLEVELAND, OHIO 44112

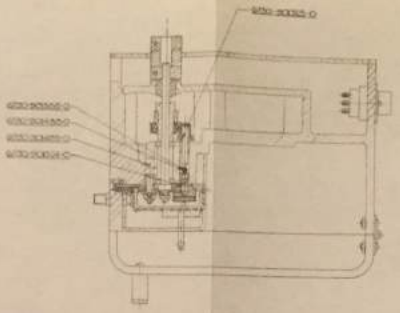
[18] PARTS ARE MATCHED AND ALL MUST BE REPLACED AT THE SAME TIME.



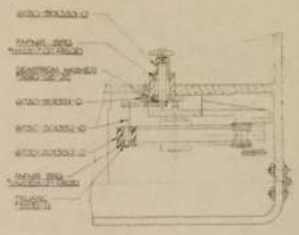
VIEW WITH GEAR BOX
COVER REMOVED



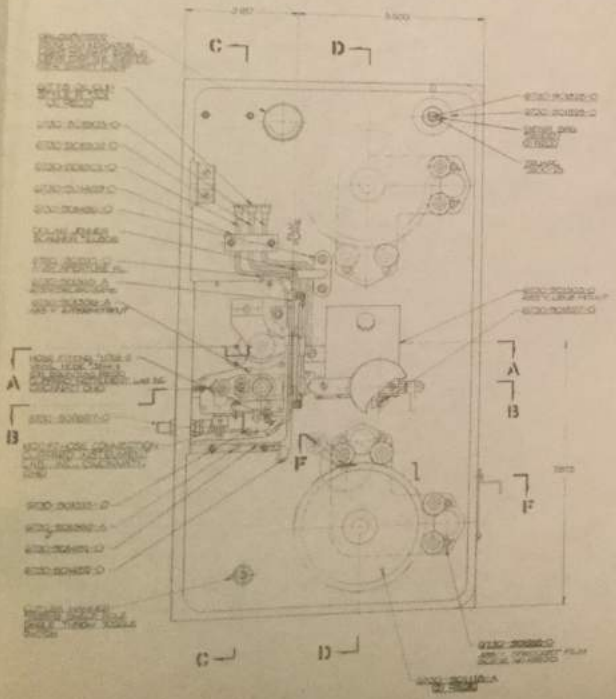
SECTION A-A

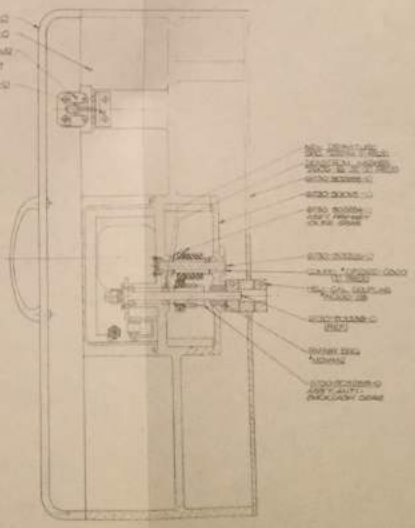


SECTION B-B

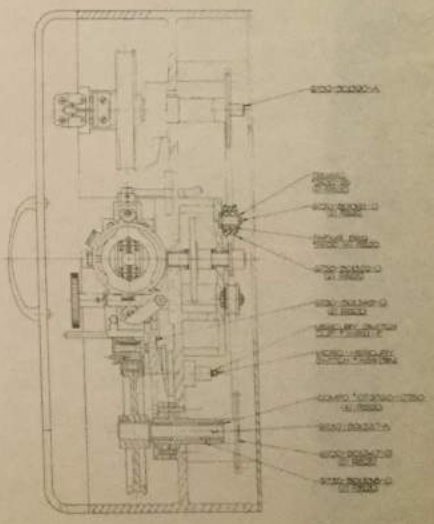


SECTION F-F





SECTION C-C



SECTION D-D

6730-902685
16mm PROJECTOR HEAD ASSEMBLY
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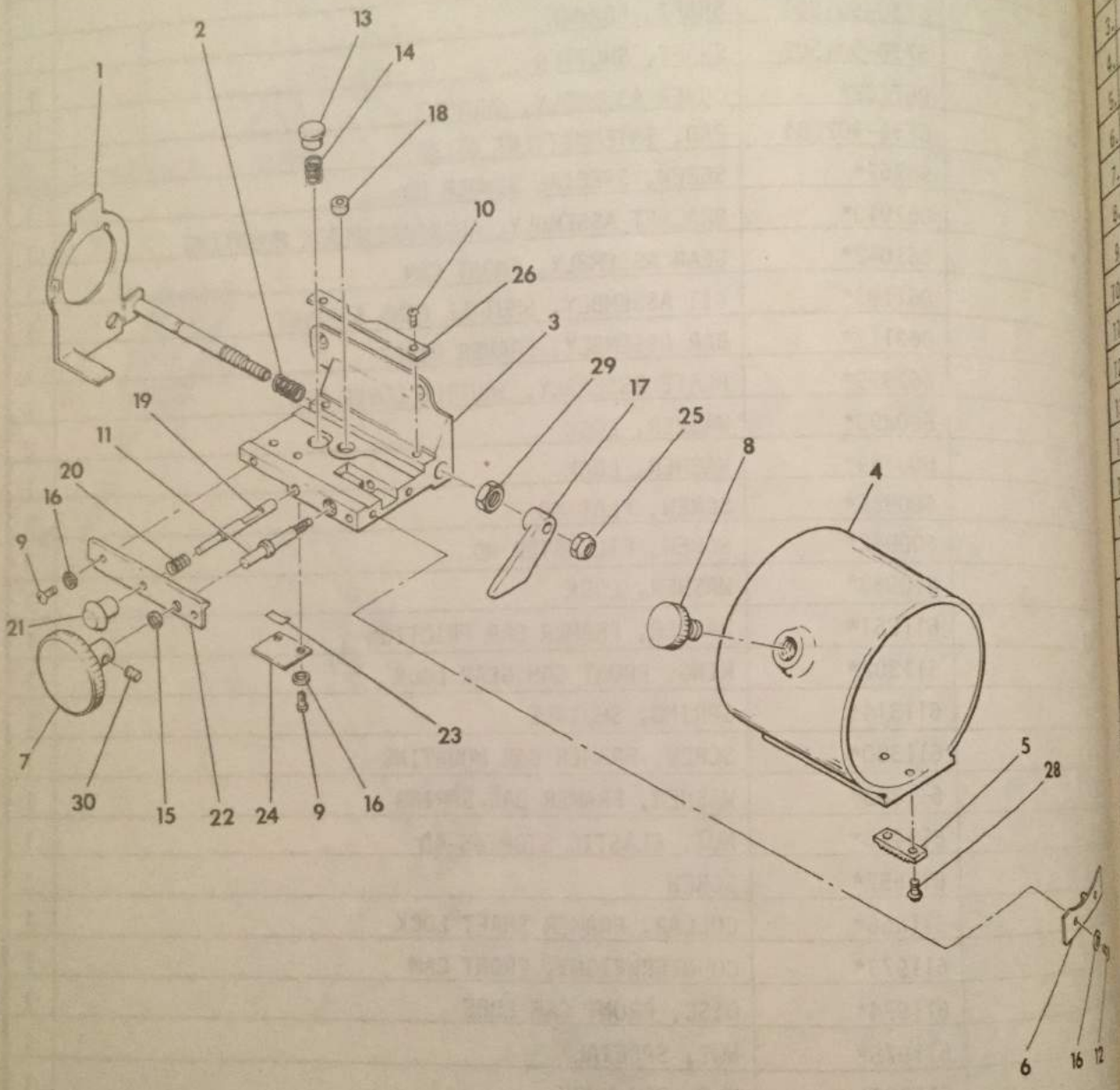
Dwg. 6730-901396 INTERMITTENT ASSEMBLY

ITEM	WDP NO.	PART NO.	DESCRIPTION	QTY.
1.		6730-901339	SHAFT, REAR CAM	1
2.		6730-901343	GEAR, SHUTTER SHAFT	1
3.		6730-901500	CAMSHAFT, FRONT	1
4.		6730-901501	SHAFT, FRAMER	1
5.		6730-901502	SHAFT, SHUTTER	1
6.		067402*	COVER ASSEMBLY, SHUTTLE	1
7.		6730-902684	PAD, INTERMITTENT OILER	1
8.		98757*	SCREW, SPECIAL BINDER HD	1
9.		061040*	BRACKET ASSEMBLY, APERTURE PLATE MOUNTING	1
10.		061042*	GEAR ASSEMBLY, FRONT CAM	1
11.		061193*	KIT ASSEMBLY, SHUTTLE CAMS & PIVOT	1
12.		063112*	BAR ASSEMBLY, FRAMER PIVOT	1
13.		067399*	PLATE ASSEMBLY, SHUTTLE COVER MTG.	1
14.		600293*	WASHER, LOCK	2
15.		600789*	WASHER, LOCK	1
16.		600925*	SCREW, FLAT HD	3
17.		600942*	SCREW, FILLISTER HD	3
18.		610963*	WASHER, LOCK	3
19.		611251*	WASHER, FRAMER BAR FRICTION	1
20.		611302*	RING, FRONT CAM GEAR LOCK	1
21.		611314*	SPRING, SHUTTLE	1
22.		611380*	SCREW, FRAMER BAR MOUNTING	1
23.		611383*	WASHER, FRAMER BAR SPRING	1
24.		611453*	NUT, ELASTIC STOP #5-40	1
25.		611557*	SCREW	3
26.		611866*	COLLAR, FRAMER SHAFT LOCK	1
27.		611973*	COUNTERWEIGHT, FRONT CAM	1
28.		611974*	DISC, FRONT CAM LUBE	1
29.		611975*	NUT, SPECIAL	1
30.		615925*	NUT, CAM LOCK	1
31.		613210*	SCREW, APERTURE MOUNTING BRACKET	2
32.		613497*	SCREW	1
33.		611285*	WASHER, REAR CAM RETAINING	1
34.		620899*	SET SCREW	2
35.		620905*	SET SCREW	2
36.		620933*	GASKET, SHUTTLE COVER	1
37.		620937*	BRACKET, FRAMER SHAFT	1
			NOTE: * BELL & HOWELL PART NUMBERS	



6730-901503
16mm LENS MOUNT ASSEMBLY

DWG. 6730-901503 ASSEMBLY, LENS MOUNT

ITEM	WDP NO.	PART NO.	DESCRIPTION	QTY.
1.		6730-901504	SHAFT, PRESSURE PLATE RELEASE	1
2.		6730-901505	SPRING, PRESSURE PLATE RELEASE	1
3.		6730-901506	MOUNTING, LENS HOLDER	1
4.		6730-901507	HOLDER, LENS	1
5.		6730-901508	RACK, LENS FOCUSING GEAR	1
6.		6730-901509	PLATE, LENS HOLDER STOP	1
7.		6730-901630	KNOB, FOCUS	1
8.		061136*	SCREW ASSEMBLY, LENS LOCK	1
9.		600833*	SCREW, RD HD	1
10.		600950*	SCREW, RD HD	4
11.		611334*	PINION, FOCUSING	2
12.		611469*	SCREW, SPECIAL HD	1
13.		611520*	BUTTON, LENS HOLDER FRICTION	2
14.		611521*	SPRING, LENS HOLDER FRICTION	1
15.		611645*	WASHER, SPRING	1
16.		611734*	WASHER, LOCK	1
17.		613448*	ARM, PUSH ROD HOLDER	6
18.		613449*	DISC, ROD GUIDE RELEASE	1
19.		613450*	ROD, PRESSURE PLATE RELEASE	1
20.		613451*	SPRING, COMPRESSION	1
21.		613453*	KNOB, ROD RELEASE	1
22.		613455*	RAIL, LENS HOLDER SIDE	1
23.		613457*	SPRING, LENS HOLDER FLAT	1
24.		613458*	PLATE, FLAT SPRING RETAINING	1
25.		614587*	NUT, ELASTIC STOP	1
26.		620005*	RAIL, LENS HOLDER TOP	1
27.				
28.		4080	SCREW, GEAR RACK	2
29.		1/4-28	NUT, JAM	1
30.		6-32 X .12 LG	SET SCREW, SOC HD	1

* BELL & HOWELL PART NUMBERS

OPERATING INSTRUCTIONS

MODEL 1000
INTEGRATED 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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CAUTION WARNINGS

WARNING

THE XENON LAMP USED IN THE PROJECTION SYSTEM IS HIGHLY PRESSURIZED AND SUBJECT TO POSSIBLE EXPLOSION. DO NOT REMOVE COVER OF LAMP-HOUSE UNTIL XENON LAMP HAS COOLED FOR AT LEAST 15 MINUTES AND HAS BEEN REMOVED FROM LAMPHOUSE WITH PROTECTIVE LAMP REMOVAL TOOL.

WARNING

THE XENON LAMP USED IN THE PROJECTION SYSTEM IS OF EXTREME INTENSITY. DO NOT LOOK DIRECTLY AT LAMP 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 Light Projection System, Model 1000. The system is manufactured by Optical Radiation Corporation (ORC), Azusa, California, and is fully compatible with any 35mm, 16mm or slide projection system.

1-2 RECEIVING-HANDLING

Remove all packing material from around the unit and carefully inspect for damage which 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 upon request if required.

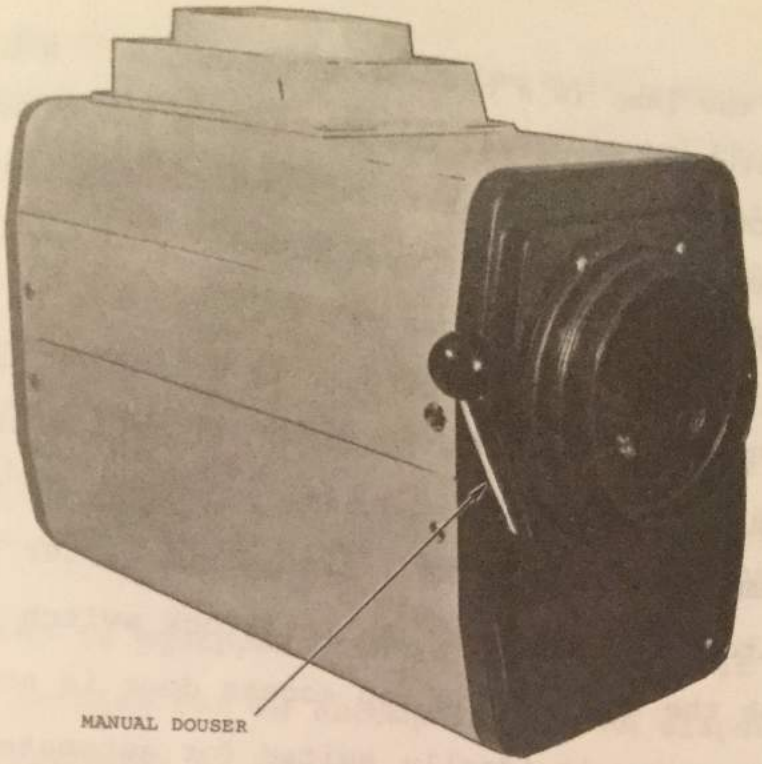
After removing lamphouse/power supply from shipping container, remove top cover and visually check for loose connections which may have resulted in shipping.

Be sure to read all the instructions before attempting to operate the lamphouse/power supply. Damage to equipment or injury to personnel may result if all instructions are not carefully followed.

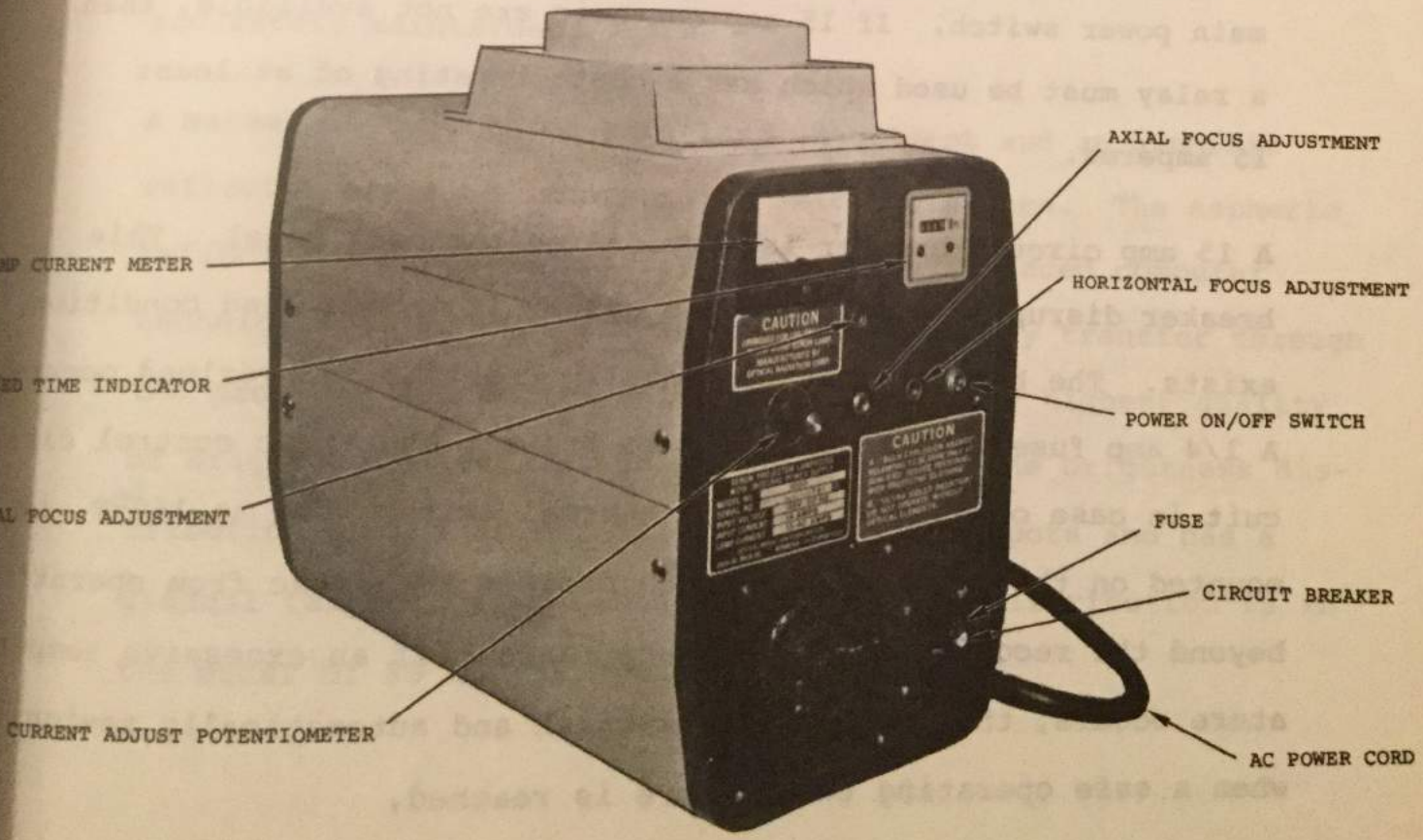
When requesting information concerning the system, always furnish SERIAL and MODEL numbers.

1-3 DESCRIPTION OF XENON LAMPHOUSE/POWER SUPPLY (See Figure 1.

The Model 1000 is uniquely designed with the lamphouse and power supply integrated into the same package. This eliminates the need for hook-up and location of an external power supply. The system is specifically designed and optimized for use with 35mm, 16mm and slide projection systems. It operates from 115VAC single phase power source and draws a maximum of 14 amps input current. The system is equipped with an 8 foot long power cord with a standard UL 15 amp, 115 VAC 3 prong plug. It is designed to operate with both the X1000 and X1600 xenon lamps. The integrated system has DC current regulation in the order of 1% which maintains a current setting independent of line voltage fluctuations. This high degree of current regulation provides a constant screen brightness for optimum projection quality. In addition to current regulation, the system is filtered to provide less than 1% RMS current ripple. This current ripple factor provides optimum lamp life and flickerless projection. Input current can be continuously adjusted by means of a potentiometer on the rear panel of the lamphouse. Current range is from 15 to 40 amps. This current adjustment is accomplished by controlling the firing angle of a triac on the primary side of the power isolation transformer. A current feedback sensing circuit is included to maintain the firing angle of the triac constant at the corresponding current setting, thus providing current regulation.



Front View



Rear View

Figure 1-1. Model 1000 Xenon Lamphouse/Power Supply

Ignition of the lamp is a one-switch operation. When the power on switch is actuated, the fan starts and power is provided to establish the necessary DC open circuit voltage across the xenon lamp. The value of open circuit voltage is approximately 120VDC. When the proper value of voltage is reached, the high voltage RF ignition circuit is triggered and the xenon gas between the electrodes is ionized. After ionization occurs, the power source provides the necessary back-up DC voltage for sustained lamp operation. The ignition time after actuation of the main switch is 4 seconds. An interlock switch is provided to extinguish the lamp if the top access door is not properly in place. The system is ideally suited for automated use which can be accomplished by providing parallel contacts across the main power switch. If 15 amp contacts are not available, then a relay must be used which has a contact rating of at least 15 amperes.

A 15 amp circuit breaker is provided on the back panel. This breaker disrupts AC power to the system if an overload condition exists. The breaker must be manually reset if an overload occurs. A 1/4 amp fuse is also provided to protect the triac control circuit in case of an overload. A thermal switch, set at 160°F, is mounted on the triac heat sink to protect the triac from operating beyond the recommended temperature range. If an excessive temperature occurs, the lamp will extinguish and automatically re-ignite when a safe operating temperature is reached.

The power source consists of three main subassemblies: The transformer rectifier, the triac board, and the triac control board. For ease of maintenance, plug in circuit boards are used and are easily accessible for service when the top cover is removed. The transformer rectifier assembly is located in the lower portion of the lamphouse, and can be removed by loosening 4 screws on the bottom of the lamphouse. The system is modular in design and internal connections are provided so that the unit can be easily disassembled for maintenance.

The system is equipped with an ammeter so that an accurate current setting can be accomplished. An elapsed time indicator is also provided so that the number of operational hours on the lamp can be monitored, and the lamp warranty data can be accurately maintained.

A manual douser, three axis lamp adjustment and an aspheric reflector are also incorporated into the system. The aspheric reflector has been specially designed by advanced computer techniques to provide the maximum light energy transfer through the projection aperture while maintaining the highest quality of brightness distribution on the screen. The brightness distribution on the screen is free of any hot spots and has a gradual fall-off from center to edge. The distribution is in the order of 80 to 85% when properly aligned.

A self-contained forced air cooling system is incorporated in the lamphouse to provide the proper environmental condition for safe temperature operation of the lamp and critical electronic components. In addition, the xenon lamps are ozone free and do not require venting to the outside.

GENERAL SPECIFICATIONS

Current Range	Open Circuit Volts	AC Voltage	Input Current	Approx. Weight		Dimensions In Inches
				Net	Ship	
15-40 Amps DC	120	105-130	14	85	95	13 High 9¼ Wide 18 Long

CAUTION

THE X1000 BULB RATING IS 35 AMPS AND SHOULD NOT BE EXCEEDED. FOR OPERATION WITH THE X1600 LAMP, 40 AMPERE OPERATION IS ACCEPTABLE.

1-4 SAFETY

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

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 front of the manual.

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

WARNING

INSTALLATION, OPERATION 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 IN 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 GENERAL

The Model 1000 need only be plugged into a standard 115 VAC 15 Amp power source for operation. The main panel circuit breaker should be set at 20 amperes to prevent nuisance tripping.

Section 4-3 should be followed for the initial mechanical set-up of the xenon lamphouse with respect to film aperture. Section 4-5 contains all the necessary information for set-up and alignment for 35mm systems.

The lamps are ozone free and the system need not be vented to the outside. Be careful, however, not to restrict the air flow which is required for proper system operation.

2-2 INSTALLATION OF LAMP

The initial installation of the xenon lamp can be accomplished before final positioning of the lamphouse as follows:

WARNING

DO NOT APPLY LATERAL PRESSURE AGAINST LAMP WHEN TIGHTENING ALLEN SCREWS. DO NOT LOOK INTO FRONT OF LAMPHOUSE WHILE INSTALLING LAMP UNLESS PROTECTIVE FACE MASK IS WORN.

a. Remove front nose section (4 screws) from lamphouse.

b. Insert lamp installation/removal tool containing lamp through opening in mirror, and screw lamp into receptacle until it is seated firmly against mating surface.

c. Remove tool without viewing bare lamp and without exerting bending pressure on the lamp.

d. Hook up the anode connection by placing fitting over the lamp stud and tightening with the 9/64" Allen tool provided.

e. Install front nose section. System is now ready for operation.

SECTION 3 - OPERATIONS

3-1 START-UP

The following is the procedure for operating the system:

CAUTION

MAKE SURE AIR FLOW INLET AND EXHAUST ARE NOT RESTRICTED. THE THERMAL SWITCH ON THE TRIAC HEAT SINK WILL SHUT OFF SYSTEM IF ADEQUATE AIR FLOW IS NOT AVAILABLE.

a. Hook up power cord to a 115 VAC power source.

b. Adjust current adjust potentiometer, located on rear panel of lamphouse, to 70% for initial Start-Up.

C. Activate main switch on lamphouse to "ON" position. Lamp will automatically ignite.

Note

If cover is not secured on lamphouse, lamp will not ignite. The lamphouse cover must be secured in order to activate the door interlock switch.

Current to the Model 1000 system with an X1000 lamp installed should not exceed 35 amps, and with an X1600 lamp should not exceed 40 amps. Current will drop approximately 5% within 5 minutes after ignition. If starting current exceeds the above values, adjust the current adjust potentiometer CCW until the desired value is reached. Monitor input current on ammeter at rear of lamphouse.

The nominal current after warm-up for the X1000 lamp is 35 amps, and for the X1600 lamp, 40 amps. The range of adjustment is approximately 15 to 35 amps for the X1000 lamp and 15 to 40 amps for the X1600 lamp. The X1000 and X1600 lamps can run continuously at current levels of 35 amps and 40 amps respectively.

3-2 SHUT-DOWN

To shut-down the system, position main switch on rear of lamphouse to "OFF". Lamp will extinguish and power supply will be de-energized.

WARNING

IF XENON LAMP IS TO BE REMOVED AFTER SHUT-DOWN, ALLOW LAMP TO COOL FOR 15 MINUTES BEFORE REMOVING.

Start-up can be accomplished immediately after shut-down if required without damage to the equipment.

SECTION 4 - OPTICAL ALIGNMENT

4-1 GENERAL

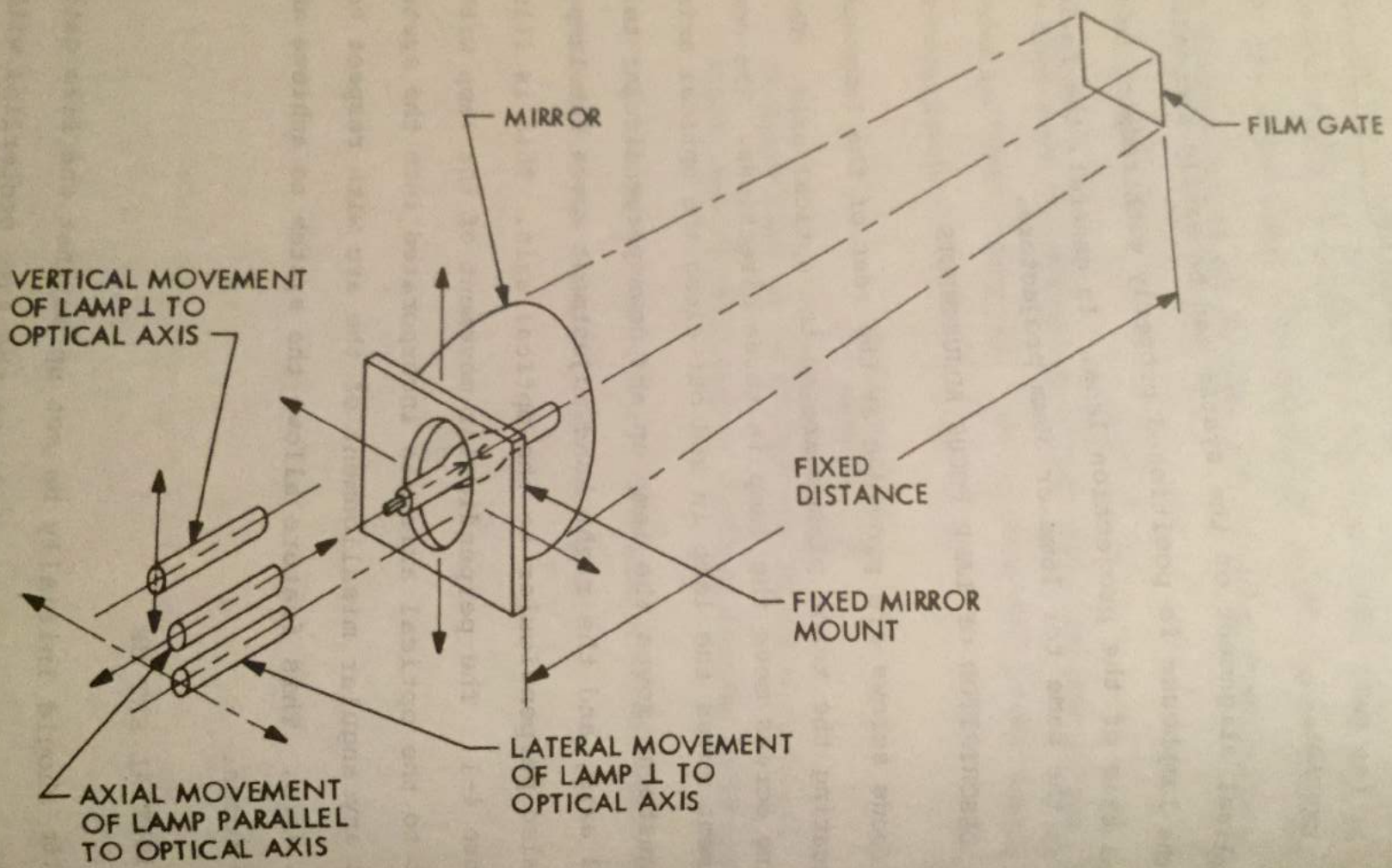
The optical alignment of the system can be easily accomplished once the lamphouse is positioned properly with respect to the optical axis of the projection lens. In general, the following setup is the same for 16mm or 35mm projectors.

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 the system to achieve an optimum focus.

4-3 INITIAL SET UP

The system should initially be set up so that the film gate and the lamphouse are approximately on the same centerline within a


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

1/16", and so that the distance from the film gate to the front of the lamphouse is within the prescribed distance (Figure 4-2). The approximate positioning of the lamphouse can be done by means of simple measuring devices. After the system is turned on, the final positioning of the optical axis of the mirror and projector lens can be accomplished as specified 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 the projector can be turned on.

The center focus screw on the lamphouse should be turned CCW 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 a symmetrical spot. This locates the lamp on the optical axis of the collector but not necessarily 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

Figure 4-2. Lamphouse/Projector Alignment

circle of symmetry should be centered on the screen as shown in figure 4-3. If the bright spot and the circles are not symmetrical, the lamphouse is angularly misaligned. The lamphouse should be aligned until both the bright spot and the circle of symmetry are symmetrical. At this point, the lamphouse should be firmly located and the center focusing screw backed off CW until the screen is filled with uniform illumination. If one side of screen 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 the vertical adjustment should be made to balance the 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 CCW,several different patterns, none of which resemble any defined hot spot, may appear as illustrated in figure 4-4. Also, if the adjustment is turned too far CCW, then a hole will be evident and the adjustment should be turned CW until the hole disappears and some form of a bright spot exists.

In figure 4-4, 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.

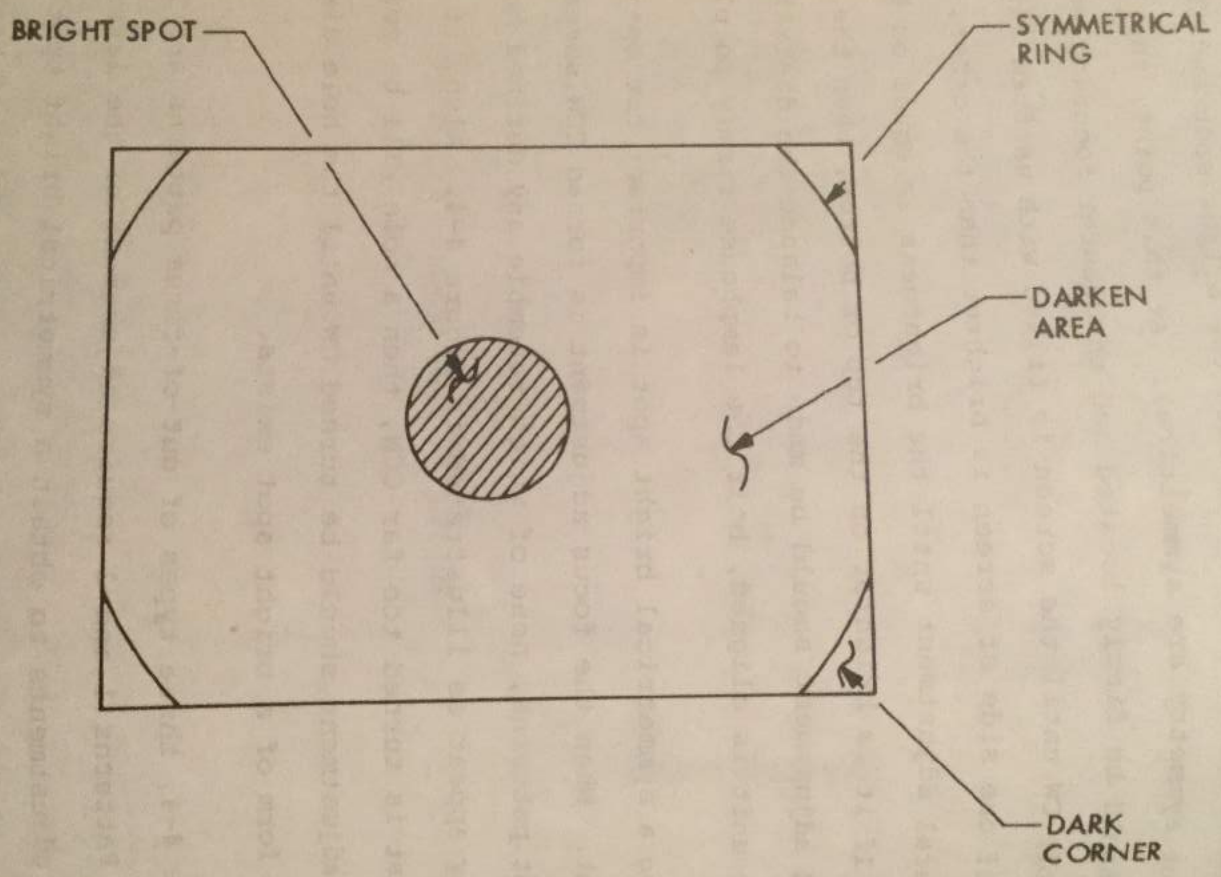


Figure 4-3. Typical Bright Spot on Screen

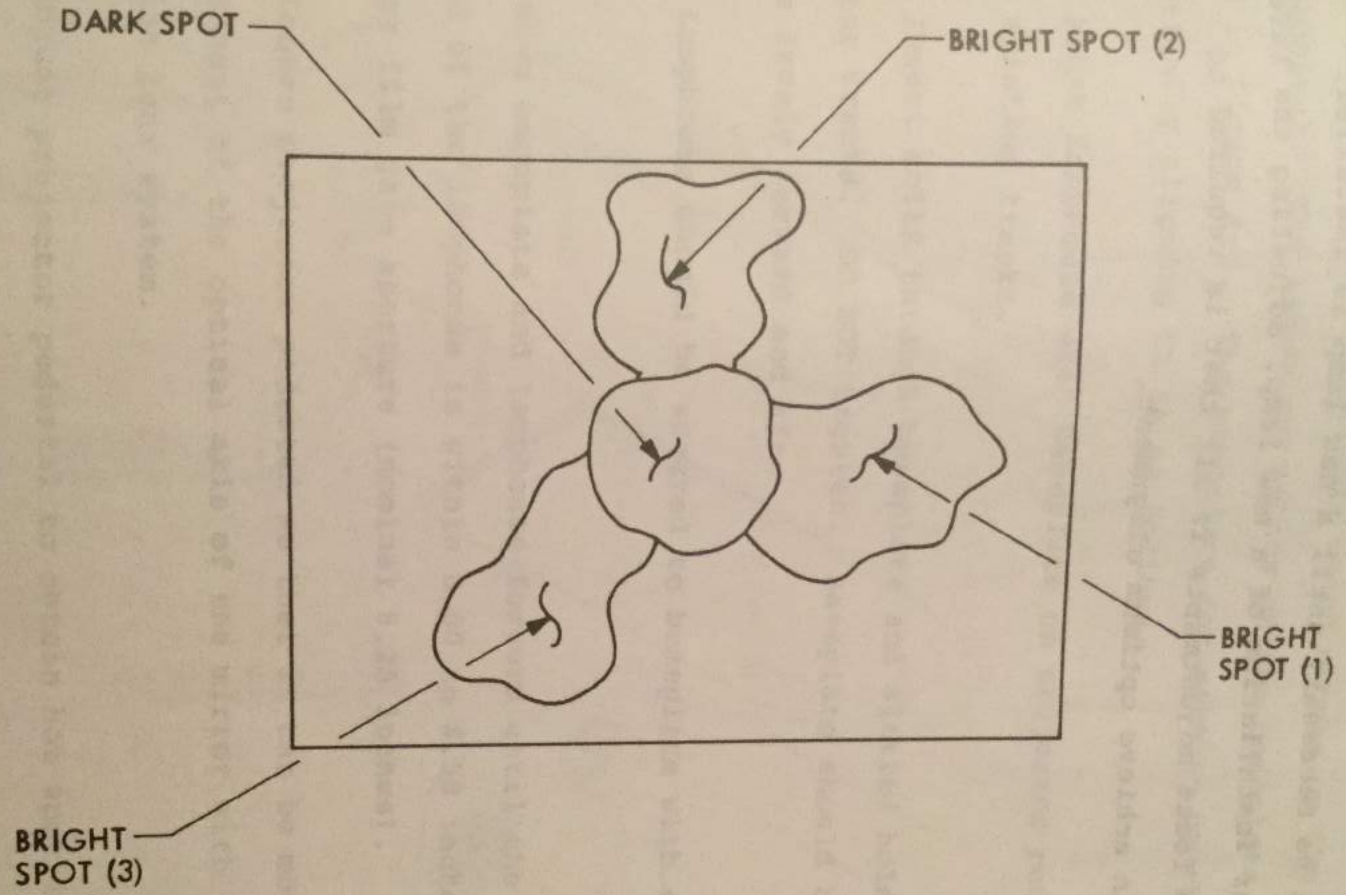
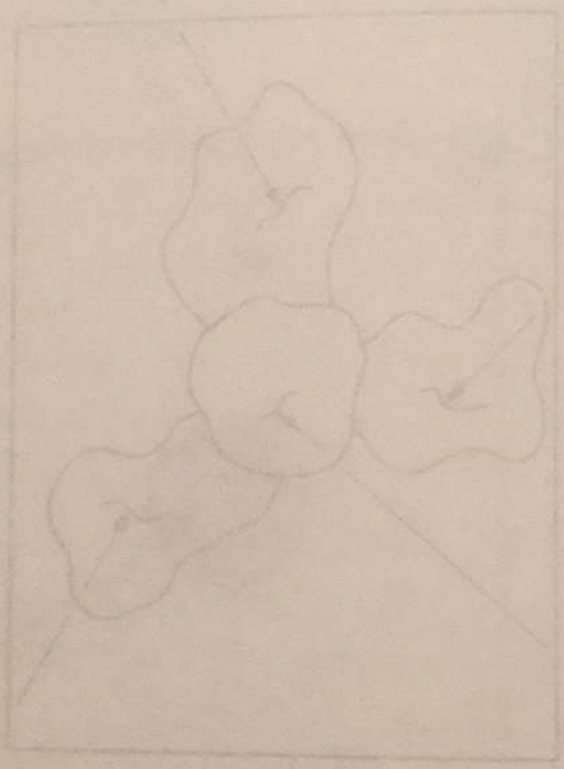


Figure 4-4. Typical Out of Adjustment Screen Patterns

Note

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



4-5 35mm ALIGNMENT

For 35mm projection systems (Simplex, Century, Norelco, etc.), a standard baseplate is available which mounts on the projection pedestal. The lamphouse mounts on the baseplate as illustrated in figure 4-5. The procedure for setting up the system and optically aligning it is as follows:

a. Mount lamphouse with baseplate on projector pedestal in the existing tracks.

b. Insert bolts through baseplate and slotted holes in projector tracks. DO NOT tighten. Baseplate should be able to move freely forward and aft.

c. Lamphouse should be secured to baseplate with shoulder bolt.

d. Move baseplate and lamphouse forward until the front bulkhead of the lamphouse is within 8.00 to 8.50 inches from projector film gate aperture (nominal 8.25 inches).

e. Loosen projector pedestal so that it can be moved freely for alignment of the optical axis of the mirror with that of the projection lens system.

f. Adjust projector pedestal to obtain hot spot in center of the screen, then firmly secure pedestal.

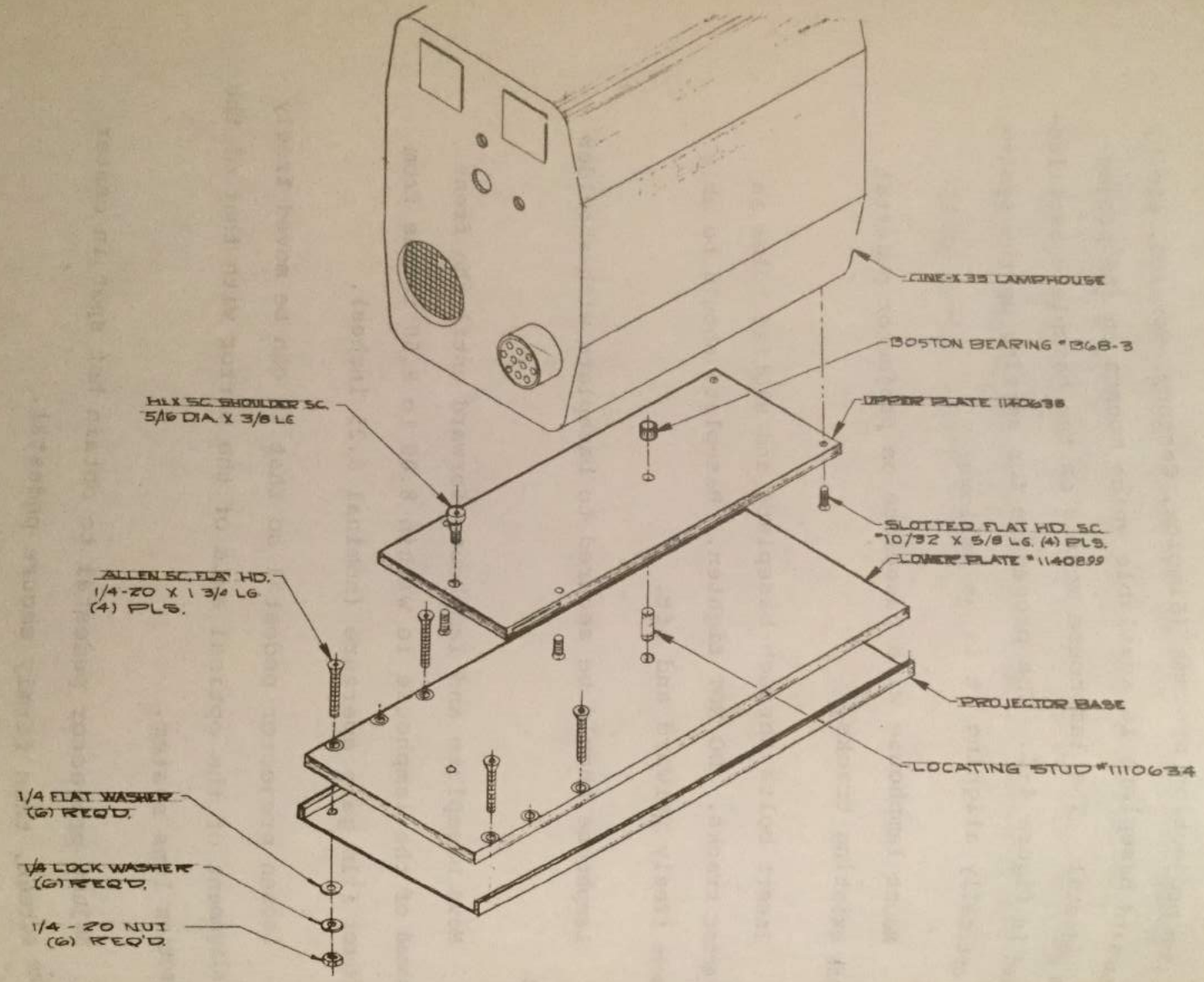


Figure 4-5. 35mm Mounting Kit Swivel Assembly

g.
fille
h.
until
i.

g. Adjust axial focusing adjustment CCW until screen is filled with uniform illumination

h. Move baseplate and lamphouse as a unit forward or aft until best brightness distribution is achieved.

i. Secure lamphouse base to projector pedestal (figure 4-5).

Note

Once baseplate is secured, it will never have to be adjusted during life of the installation.

SECTION 5 - MAINTENANCE

5-1 FAN MOTOR

The fan motor is manufactured with lifetime lubricated bearings and no maintenance is required.

5-2 CONNECTORS

Electrical connections (i.e.; circuit boards and connectors) should be checked periodically to ensure good contact and eliminate any possible heating at contact areas.

5-3 CLEANING POWER SOURCE

Periodically blow out the power source portion of the lamphouse, using clean, dry compressed air.

5-4 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 optics surface.

c. Gently clean optics surface with tissue dampened with soap and water.

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

e. Gently wipe dry with tissue to prevent streaking.

5-5 REPLACEMENT OF LAMP ON 35mm INSTALLATION

WARNING

BEFORE REMOVING XENON LAMP, ALLOW 15 MINUTES TO COOL DOWN. WHEN HOT, LAMP IS UNDER HIGHER INTERNAL PRESSURE AND SUBJECT TO EXPLOSION. OBSERVE CAUTION WARNINGS IN FRONT OF MANUAL.

a. Loosen shoulder bolt at rear of lamphouse and swing lamphouse nose away from projector.

b. Remove the upper screw and lower screw from adapter on front bulkhead. Adapter will swing out of the way for lamp removal.

c. Loosen and remove fitting on front of lamp.

d. Insert lamp installation/removal tool over lamp; unscrew and remove lamp from lamphouse and return to Optical Radiation Corporation for replacement along with lamp warranty claim form.

WARNING

LAMP IS UNDER EXTREME INTERNAL PRESSURE. DO NOT REMOVE FROM PROTECTIVE CONTAINER.

e. Insert new lamp with furnished lamp installation/removal tool, and secure front electrical connection with Allen tool provided. See Section 2-2 for instructions.

WARNING

DO NOT APPLY LATERAL PRESSURE AGAINST LAMP WHEN TIGHTENING ALLEN SCREWS. DO NOT LOOK INTO FRONT OF LAMPHOUSE WHILE INSTALLING LAMP UNLESS PROTECTIVE FACE MASK IS WORN.

f. Swing nose of lamphouse back into position and secure to baseplate.

g. Focus lamp by using three focusing adjustments as outlined in Section 4-4.

Note

Do NOT loosen lamp baseplate on projection pedestal since the lamphouse mirror is optically aligned with the centerline of the projection lens.

5-6 TROUBLESHOOTING

Whenever lamphouse fails to operate properly, consult wiring diagram, figure 5-1, as a guide in locating the possible trouble. Table 5-1 is the Troubleshooting Chart. Table 5-2 is a list of test voltages and table 5-3 is the resistance test points.

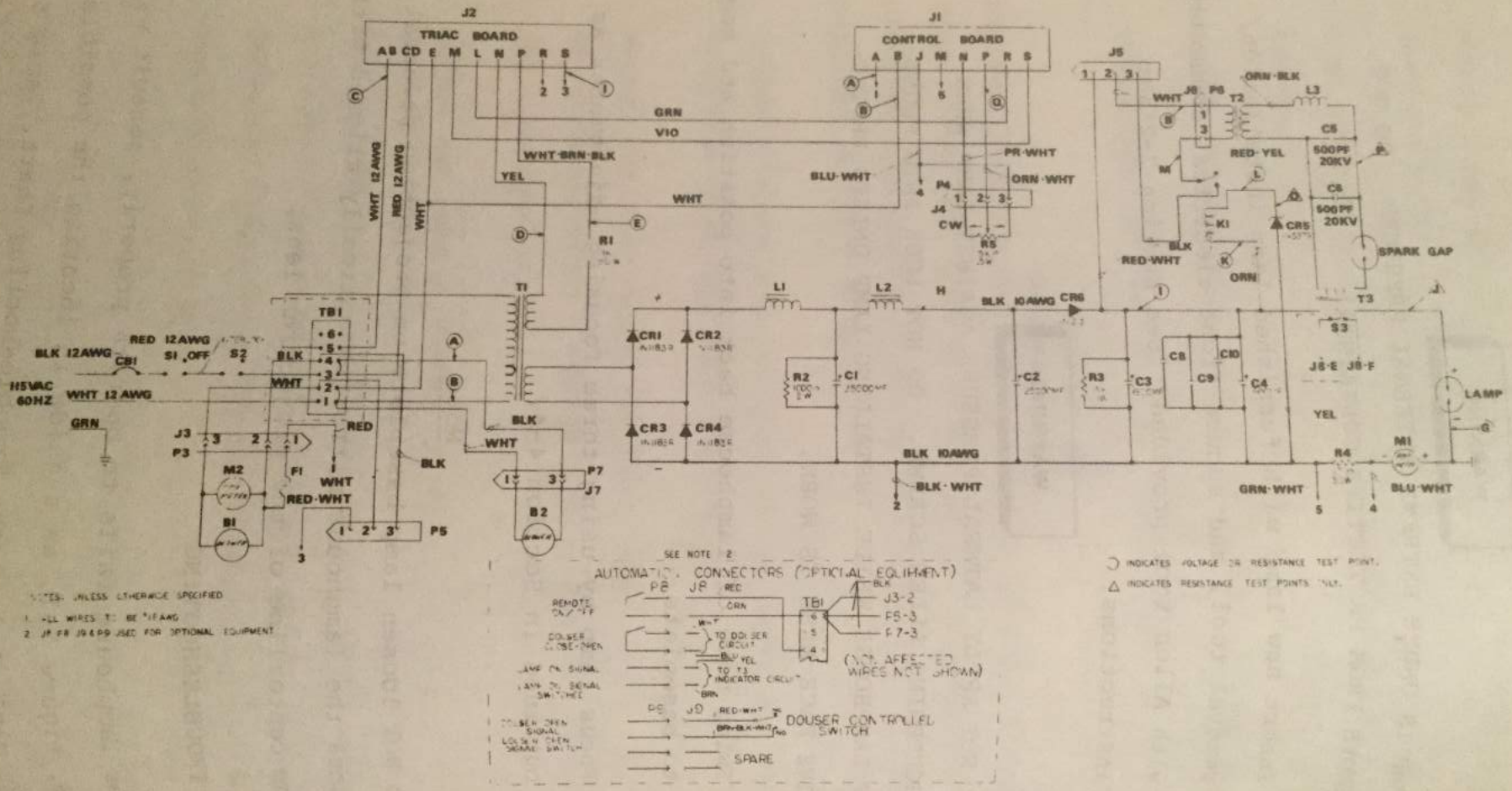


Figure 5-1. Wiring Diagram, Model 1000 Lamphouse

Table 5-1. Trouble Shooting Chart

Table 5-1. Trouble Shooting Chart

Symptom	Probable Cause	Remedy
1. Lamp does not operate when switched on; fans do not operate.	1.1 Circuit breaker tripped.	1.1 Reset circuit breaker.
	1.2 Automation control circuit disconnected or inoperative. (This applies only to power supplies provided with automation control).	1.2 Check automation connector and associated wiring.
2. Lamp flashes but does not remain on.	2.1 Misadjusted control board potentiometer.	2.1 Adjust the middle potentiometer slowly in clockwise direction.
	2.2 Defective control board.	2.2 Replace control board. See circuit board replacement information.
	2.3 Loose connection in DC current circuit (CR1-CR4, L1, L2, C1, C2, C3, CR6.	2.3 Visually inspect all the heavy (DC) wiring for loose connections, especially at the ammeter and capacitor terminal. Retighten as required.
	2.4 Oxidized circuit board connection.	2.4 Remove and insert the circuit boards into their respective connectors.
	2.5 Defective lamp.	2.5 Replace lamp.
	2.6 Defective current control potentiometer.	2.6 Measure resistance. See table 5-3.

Table 5-1. Trouble Shooting Chart (continued)

Symptom	Probable Cause	Remedy
3. Lamp does not flash.	3.1 1/4 amp fuse blown.	3.1 Check & replace if blown.
	3.2 Ignitor relay failure	3.2 Try to manually start the lamp with a momentary jumper across the contacts of K1. If it starts, the K1 relay is defective.
	3.3 Shorted blocking diode (CR6).	3.3 Check voltage on both sides. See figure 5-1 and table 5-2.
	3.4 Check steps 2.1, 2.2, 2.4 or 2.5.	3.4 See 2.1, 2.2, 2.4 or 2.5.
	3.5 Ignitor component failures.	3.5 Check resistance valves of ignitor circuit components T2, T3, C5, C6, etc. See table 5-3.
4. Lamp runs at excessive current; no current control. Current remains on, even when the 1/4 amp fuse on rear bulkhead is removed.	4.1 Shorted triac.	4.1 Replace triac board or triac.
5. Lamp runs at excessive current; no current control. Current goes to 0 when 1/4 amp fuse is removed.	5.1 Defective control board.	5.1 Replace control board.
	5.2 Defective current control potentiometer.	5.2 Check resistance as per table 5-3.

Table 5-1. Trouble Shooting Chart (continued)

is removed.

Table 5-1. Trouble Shooting Chart (continued)

Symptom	Probable Cause	Remedy
6. Lamp current fluctuates slowly by several amperes. Unit makes a grunting sound and trips the circuit breaker when 1/4 amp fuse is removed.	6.1 Defective triac.	6.1 Replace triac board.
7. Unit makes loud buzzing sound. Lamp may or may not light; circuit breaker trips.	7.1 Defective triac.	7.1 If removal of 1/4 amp fuse does not eliminate noise, trouble is defective triac. Replace triac or triac board.
	7.2 Defective control board.	7.2 If removal of 1/4 amp fuse eliminates noise, trouble is defective control board. Replace control board.
8. Apparent normal operation except for a rapid (60 Hz) flicker, and circuit breaker trips when lamp current is above 25 amps. This may also occur only after the unit warms up.	8.1 Loose or intermittent connector on one of the four diodes (CR1-CR4) mounted on transformer assembly.	8.1 Check connections.
	8.2 Defective diode (CR1-CR4)	8.2 Replace defective diodes.
9. Normal operation except for a low frequency (approximately 10 per second) flicker which may occur only at certain current settings.	9.1 Defective control board.	9.1 Check the three electrolytic capacitors on the control board or replace board if defective.
	9.2 Defective triac board.	9.2 Replace triac board.

Table 5-1. Trouble Shooting Chart (continued)

Symptom	Probable Cause	Remedy
10. Unit operates normally except for loud hum or buzz. Sound may change in intensity as unit heats up.	10.1 Defective transformer or filter choke.	10.1 Replace transformer or filter choke.
11. Not possible to obtain maximum lamp current (36A for 1000 lamp or 40A for 1600 lamp).	11.1 Low line voltage.	11.1 Minimum AC line voltage for proper operation @ 44 with a 21 volt lamp is approximately 180 V.
	11.2 High voltage lamp.	11.2 Normal maximum lamp voltage is approximately 21 volts. Replace if higher.
	11.3 Open rectifier diode.	11.3 See symptom No. 5.
	11.4 Control board potentiometers misadjusted.	11.4 Readjust potentiometer.
12. Lamp ignites almost instantly; i.e., does not wait the normal five seconds.	12.1 Zener diode CR5 (on relay) shorted, or defective relay.	12.1 Note that operation under these conditions will likely cause the high voltage transformer in the front of the unit to remain on and burn itself out. *Replace diode CR5 and high voltage transformer if burned out.*

Table 5-1. Trouble Shooting Chart (continued)

front of the unit to rem
on and burn itself out.
Replace diode CR5 and high
voltage transformer if
burned out.

Table 5-1. Trouble Shooting Chart (continued)

Symptom	Probable Cause	Remedy
13. Unit operates normally for a time, then the lamp goes out. Circuit breaker trips. Unit returns to normal after cooling down.	13.1 Thermal overload switch on triac board tripped due to air passage blockage.	13.1 Check for dirt accumulation in the air path and particularly in the air duct under the triac board.
	13.2 Defective thermal overload switch.	13.2 Replace switch or complete triac board.

Table 5-2. Test Voltages

VOLTAGE TEST POINTS	VOLTAGE READING BEFORE LAMP IGNITION	VOLTAGE READING AFTER LAMP IGNITION	NOTES
Ⓐ to Ⓑ	115 VAC	115 VAC	Line voltage.
Ⓑ to Ⓒ	110 VAC	65 V to approximately 110 VAC	Depends on lamp current and type of voltmeter.
Ⓓ to Ⓔ	0 to 5 seconds; Approximately 150 VAC	≈ 20 VAC	Voltage changes 0 to 140 V in about 5 seconds after power is first applied.
Ⓘ (±) to Ⓖ (-)	0 to 5 seconds; Approximately 150 VDC	20 V ± 1 VDC	Lamp voltage.
Ⓗ+ to Ⓖ (-)	40 V	21 V ± 1 VDC	
Ⓙ+	DO NOT MEASURE; THE IGNITION VOLTAGE WILL DESTROY ALMOST ANY VOLTMETER		
Ⓛ (-) to Ⓕ+	≈ 10 to 30 VDC (for less than 1 second)	0 VDC	Ignitor relay coil.
Ⓑ to Ⓜ	115 VAC for about 5 seconds.	0 V	High voltage transformer primary.
Ⓝ (+) to Ⓖ (-)	8 to 12 VDC	8 to 12 VDC	

Note: Refer to Schematic Diagram, Figure 5-1, for test points.

Table 5-3. Resistance Test Points

RESISTANCE TEST POINT	RESISTANCE	NOTES
		Pk Primary

Table 5-3. Resistance Test Points

RESISTANCE TEST POINT	RESISTANCE	NOTES
Ⓐ to Ⓒ	.1Ω	T1 Primary
Ⓓ to Ⓔ	1K	R1 and T1 Secondary
Ⓗ to Ⓖ	900Ω	Use X1 ohmmeter range, polarity sensitive
Ⓜ to Ⓑ	25Ω	T2 Primary
△O to △P	25K	T2 Secondary (Transformer frame is point 0)
Ⓘ to △J	Less than .05 Ω	T3 Secondary
Ⓚ to Ⓛ	5K	Reading is polarity sensitive
Ⓝ to Ⓖ	5 K with control board.	Current adjust potentiometer resistance
Ⓖ to Ⓠ	0 to 5K with control board removed.	Depends on current adjust setting
Ⓗ to Ⓘ	20Ω/2K (appropriate values)	Blocking diode forward and reverse resistance ("in circuit" reading)

Note: Take all resistance measurements with power off.
See schematic diagram, figure 5-1, for test points.

5-7 REMOVAL AND REPLACEMENT OF TRIAC CONTROL BOARD.

The following procedure should be followed in the event that the Control Board or Triac Board is replaced. Refer to Drawing No. 1140859 for locations. Figure 5-2 shows the detailed installation.

Removal of Control Board

a. Remove the Control Board (Part No. 1130845) by removing the two 4-40 screws securing the end of the board opposite the connector to the channel bracket. Do not lose the fiber washers as these are used to space the circuit board away from the channel bracket. Without these washers the circuit wiring will short to ground.

b. Pull the control board straight out from its connector.

Removal of Triac Board

a. Looking down on the channel bracket, loosen screw no. 1 approximately three turns.

b. Completely loosen screw no. 2 which holds the heat sink to the channel bracket. An access hole is provided in the upper lip of the bracket for access to this screw. It is recommended that this screw with its nylon grommet and metal flatwasher be left in place rather than trying to remove completely.

c. Lift up on the channel bracket so that screw no. 2 will clear and pivot the bracket about screw no. 1, pulling the channel bracket away from the heat sink.

d. Pull the triac board straight out from its connector. Do not disassemble triac board from heat sink.

Replacing Triac Board

a. Before replacing the triac board, insert the nylon grommet (from screw no. 2) in the U-shaped mounting hole on the heat sink. Note: New triac boards are shipped with heat sink already installed on board. The thick side of the grommet should be on the bottom. Next, place the screw and flat washer in this nylon grommet.

b. Carefully reinstall the triac board with its attaching heat sink into its connector. While lifting up on the heat sink to hold it away from the bracket, pivot the bracket back to its original position, being careful to properly reinsert the fixed nylon grommet into the second heat sink slot.

c. Tighten screws no. 1 and no. 2.

NOTE

When reinstalling the triac board, be sure that the clearance between the upper lamp adjustment control rod and the circuit side of the triac board immediately above this rod is not less than 1/8 inch. Replacement triac boards are supplied with insulating paper covering this area of the circuitry.

Reinstalling Control Board

Reinstallation of the control board is essentially the reverse of disassembly. Be sure to place the insulating fiber washers between the control board and the channel bracket.

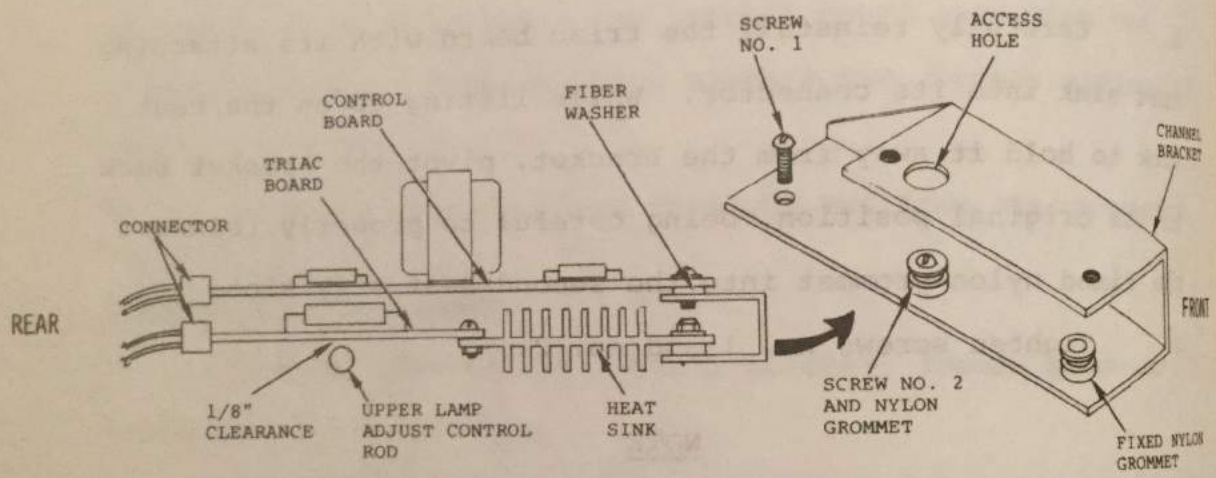


Figure 5-2, Side View of Triac Board Installation

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.....
   .....
   .....

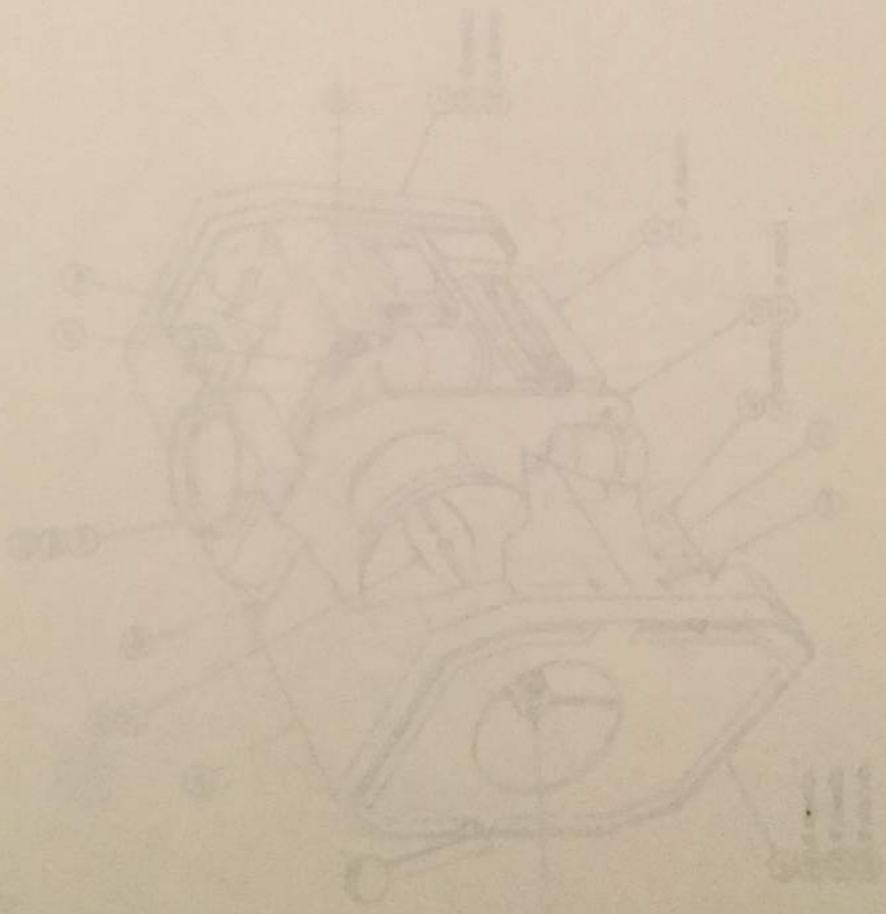
Form Completed By.....Title.....
Company.....
Address.....
Telephone No.....Date.....

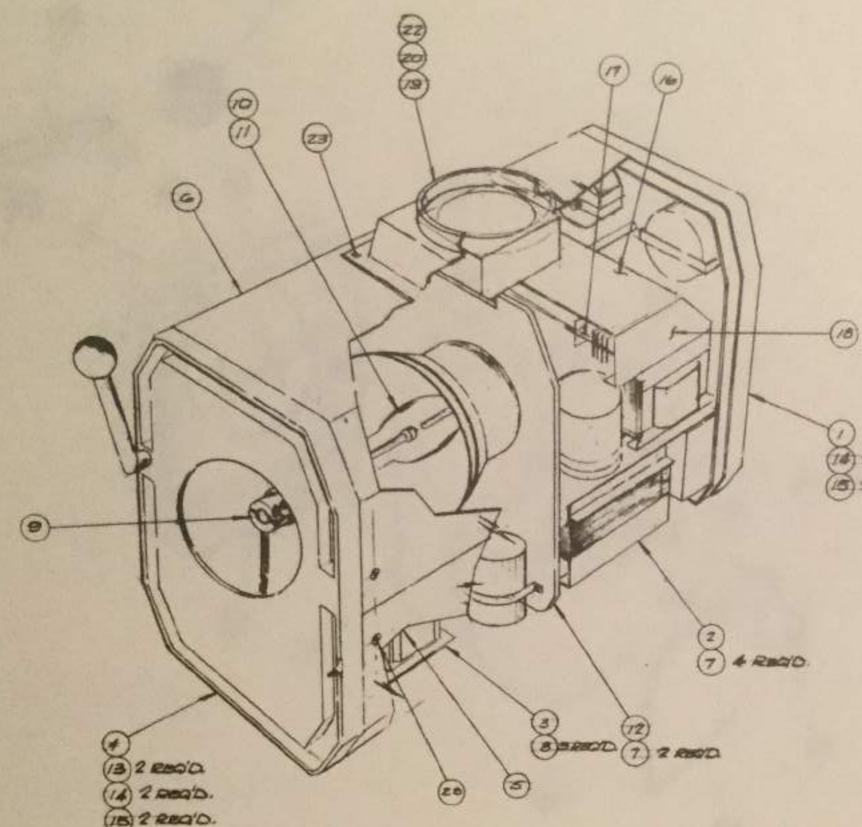
Return To:

OPTICAL RADIATION CORPORATION 2626 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 1000 Lamphouse/Power Supply. When ordering replacement parts, please specify complete part number and quantity required. Consult your local dealer or write Optical Radiation Corporation for prices.





QTY REQD	NOMENCLATURE OR DESCRIPTION	REF DES	CODE IDENT	PART OR IDENTIFYING NO.	SPECIFICATION	MATERIAL OR NOTE	ZONE	ITEM NO.
12	SCREW			UE5605-9				23
1	SCREEN			1120971				22
4	SCREW, PAN HD			6-32X 2 1/4 LG				21
1	FAN			2500 E	PAMOTOR			20
1	EXHAUST HOUSING			1140956				19
	CHANNEL BRACKET			1110840				18
1	TRIAC BOARD			1130844				17
1	CONTROL BOARD			1130845				16
4	NUT, HEX				10-32			15
4	WASHER, STAR				#10			14
2	FLT. OVAL HD. SCREW				10-32X1/4			13
1	CENTER BULKHEAD			1140881				12
1	700 W XENON			1130429				11
1	1 KW XENON			1100266				10
1	FRONT LAMP FIT.			1120438				9
3	SELF TAPPING SCR.				6-32X3/8			8
6	FLAT HEAD SCREW				10-32X1/2			7
1	UPPER WRAP			1140900				6
1	LOWER WRAP			1140901				5
1	FRONT BULKHEAD			1140894				4
1	IGNITER			1140887				3
1	POWER SUPPLY			1140879				2
1	REAR BULKHEAD			1140880				1

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMALS ANGLES
MACHINE FINISH √
DO NOT SCALE DRAWING

DRAWN DC
CHECK B. Ninety
CONTRACT NO. P0506-10

OPTICAL RADIATION CORPORATION

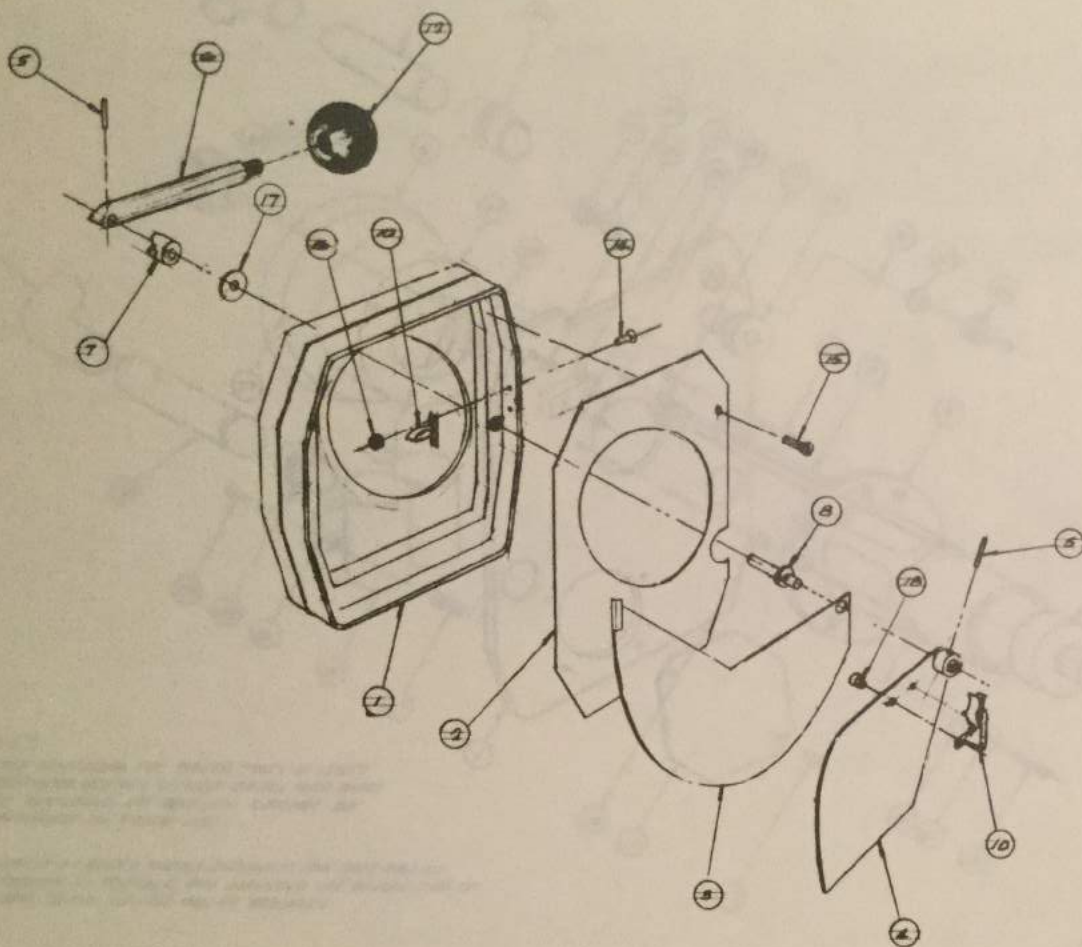
CINE-X 1000
TOP ASSEMBLY

SIZE D | CODE IDENT NO. 33030 | 1140859 | REV 4/6

SHEET 1 OF 1

APPLICATION

ZONE	LTR	REVISIONS DESCRIPTION
	A	ITEM # 17 WAS LOCKING PIN; ITEM # 3 WAS 1100274



QTY REQD	NOMENCLATURE OR DESCRIPTION	REF DES	CODE IDENT	PART OR IDENTIFYING NO.	SPECIFICATION	MATERIAL OR NOTE	ZONE	ITEM NO.
								20
								19
2	FLAT HD RIVET			[illegible]				18
1	FLAT WASHER			[illegible] THK				17
2	HEX NUT			6-32				16
4	FLAT HD SCREW			6-32 x 1/4 LG				15
2	FLAT HD SCREW			6-32 x 1/2 LG				14
								13
1	KNOB			A084500	AMER. TOOL			12
								11
1	CATCH			6118	SEARS			10
								9
1	SHAFT			1100315				8
1	SPACER			1100274				7
1	HANDLE			1100273				6
2	GROOVE-PIN			GP1-090x0750-H	GROOVE PIN			5
1	SHUTTER PLATE			1100313				4
1	SHUTTER PLATE			1140980				3
1	SHUTTER SET PLATE			1100281				2
1	FRONT BULKHEAD			1100254				1

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMALS .XX = ± .01 .XXX = ± .005 ANGLES ± 1/2°
MACHINE FINISH
DO NOT SCALE DRAWING

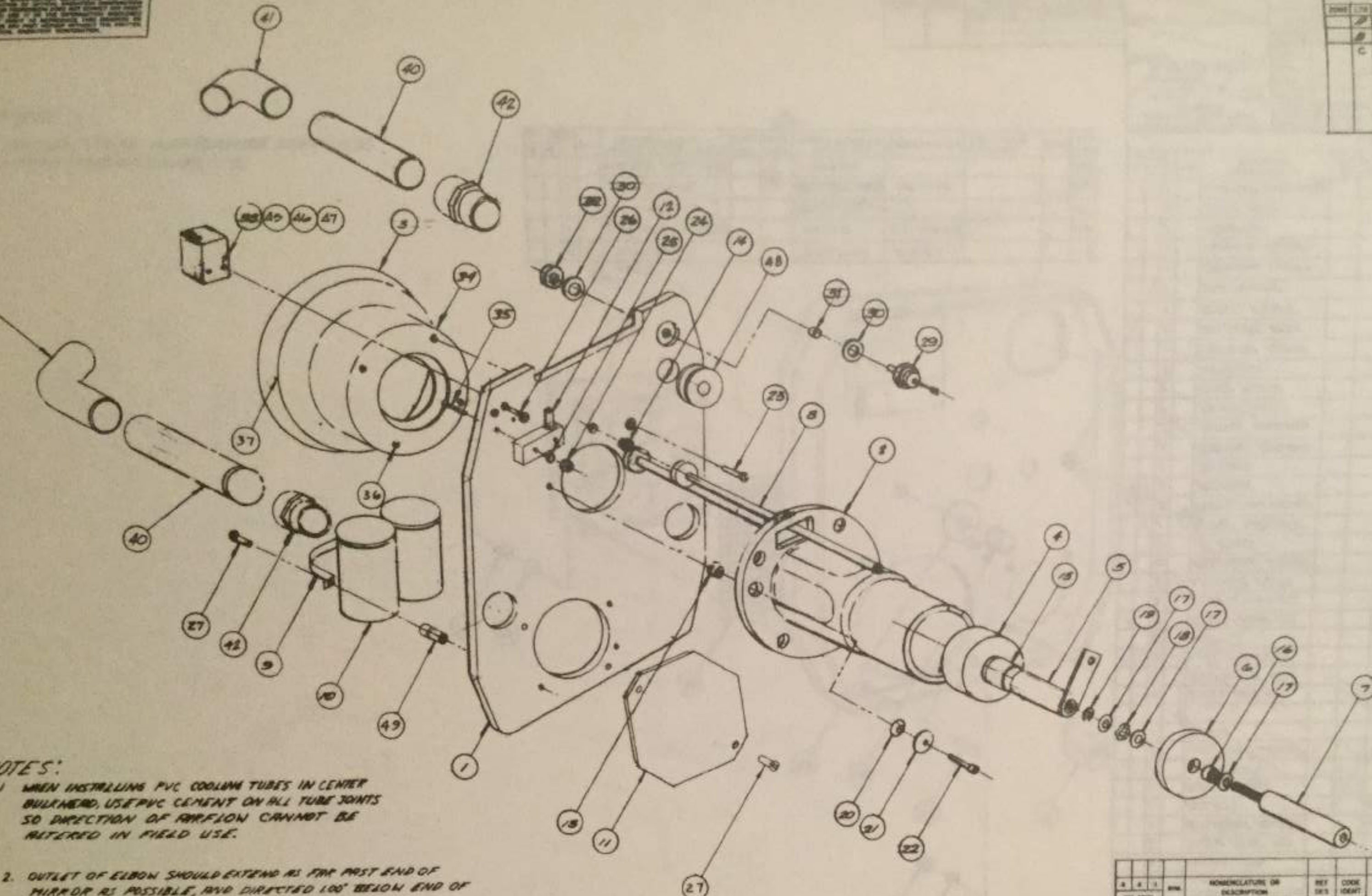
OPTICAL RADIATION CORPORATION

FRONT BULKHEAD ASSEMBLY

SIZE D | CODE IDENT NO. 33030 | 1140894 | REV A

SHEET 1 OF 1

APPLICATION



NOTES:
1. WHEN INSTALLING PVC COOLING TUBES IN CENTER BULKHEAD, USE PVC CEMENT ON ALL TUBE JOINTS SO DIRECTION OF AIRFLOW CANNOT BE ALTERED IN FIELD USE.

2. OUTLET OF ELBOW SHOULD EXTEND AS FAR PAST END OF MIRROR AS POSSIBLE, AND DIRECTED 100° BELOW END OF LAMP SO MAX. COOLING CAN BE ACHIEVED

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	ADDED ASSY NO. ITEM 45	[illegible]	
	B	ITEM 42 QUANTITY 2 WAS QUANTITY 1	[illegible]	
	C	ITEM 26 WAS 6-32 × 3/8 LG, ITEM 33 WAS 41F5000S-516 SIGMA. ITEM 11 WAS GRAYBAR P/N 52C1. ITEM 23 WAS QTY 6. ITEM 27 WAS QTY 2. DELETED ITEMS 28, 33, 43, & 44. ADDED ITEMS 48 & 49.	[illegible]	BN

QTY REQD			SYM.	NOMENCLATURE OR DESCRIPTION	REF DES	CODE IDENT	PART OR IDENTIFYING NO.	SPECIFICATION	MATERIAL OR NOTE	ZONE	ITEM NO.

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	DC	3/8/71
CHECK	R. Dudley	3/8/71
DESIGN		
ENGR	[signature]	[illegible]
APPR		
APPR		

CONTRACT NO. PD506-10

[signature] APPROVED

APPROVED

OPTICAL RADIATION CORPORATION

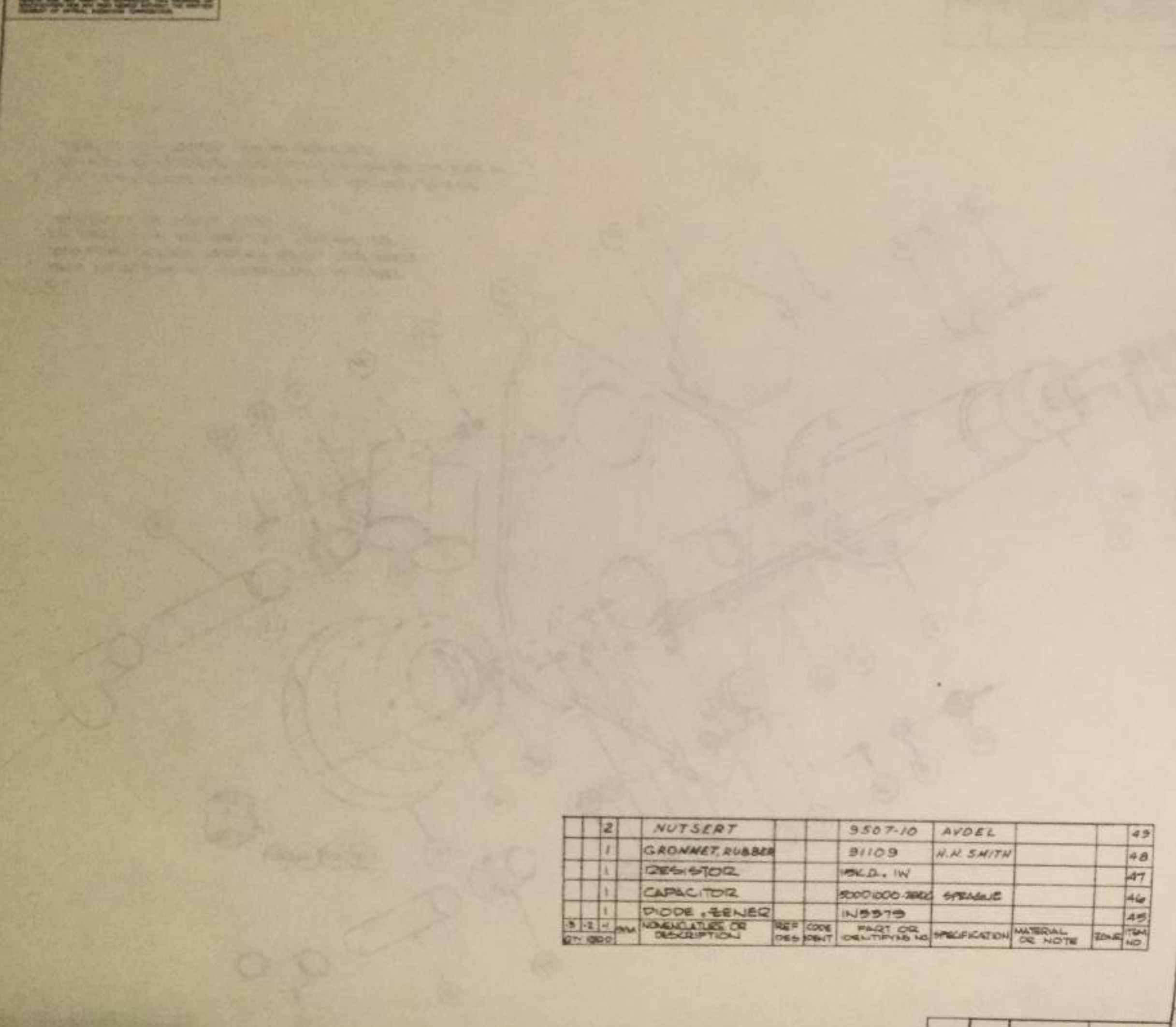
CENTER BULKHEAD ASSY.

SIZE	CODE IDENT NO.		REV
D	33030	1140881	C

SCALE 1/2 | WEIGHT | SHEET 1 OF 1

APPLICATION

QTY/ASSY	DASH NO.	NEXT ASSY	USED ON
1	-1	1130859	PD506-10



QTY REQD	NOMENCLATURE OR DESCRIPTION	REF DES	CODE IDENT	PART OR IDENTIFYING NO.	SPECIFICATION	MATERIAL OR NOTE	ZONE	ITEM NO
2	NUTSERT			9507-10	AVDEL			49
1	GROMMET, RUBBER			31109	H.H. SMITH			48
1	RESISTOR			15K.D., 1W				47
1	CAPACITOR			5000 000-38RG	SPRAGUE			46
1	DIODE, ZENER			IN5379				45

QTY REQD	NOMENCLATURE OR DESCRIPTION	REF DES	CODE IDENT	PART OR IDENTIFYING NO.	SPECIFICATION	MATERIAL OR NOTE	ZONE	ITEM NO
								44
								43
2	ADAPTER PVC			1"MPT-1"PVC				42
2	ELBOW, PVC			1" ELBOW				41
2/12	PVC PIPE			1" SCH 40				40
								39
6	SCREW, PAN HD				#8-32 1 3/4			38
1/2	ADHESIVE			RTV-60	G.E.			37
4	WELLNUTS			#AB-120	GOODYEAR			36
2	SCREW, FLAT HD				#4 DIA			35
1	REFLECTOR HOLDER			1100890-1				34
1	RELAY			[illegible]	POTTER BRUMFIELD			33
1	NUT, BRASS				4-40			32
1	INSULATOR			DF 3H	RCA			31
2	INSULATOR WASHER			4725A	THERMALLOY			30
1	DIODE			IN2151A	I.R.			29
								28
4	SCREW, PAN HD				#4-40 3/4 LG			27
2	SCREW FLT HD				5-40 5/8 LG			26
2	WASHER FLAT				#4			25
2	NUT				#4-40			24
4	SCREW FLAT HD				#10-32, .750			23
2	SCREW, CAP HD				#8-32, 400			22
2	WASHER FLAT			14 OD x .910				21
2	BELLVILLE, WASHER			5806-36-25	SEASTROM			20
1	E RING			5144-25	TRUARC			19
1	WAVE WASHER			5492	[illegible]			18
3	PRECISION WASHER			W2	JOHNSON ABC			17
1	BUSHING			B68-3	BOSTON			16
1	BUSHING			B1016-12	BOSTON			15
2	FLANGE BUSHING			FB-68-3	BOSTON			14
2	FLANGE BUSHING			FB-1012-4	BOSTON			13
1	MICRO SWITCH			BA2RQ1	MICRO SWITCH			12
1	COVER PLATE			1121735				11
2	CAPACITOR			[illegible]	SPRAGUE			10
1	CAPACITOR CLAMP			1120853-1				9
2	CAM SHAFT ASSY			1120622-1				8
1	SCREW SHAFT			1100624-1				7
1	END PLATE			1100163-1				6
1	BEARING SHAFT			1100161-1				5
1	BEARING HOLDER			1100164-1				4
1	MIRROR			1100269-1				3
1	TUBE ASSY			1100165-1				2
1	CENTER BULKHEAD			1100849-1				1

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES

DECIMALS ANGLES

MACHINE FINISH

DO NOT SCALE DRAWING

MATERIAL

DRAWN D.C.

CHECK

DESIGN

ENGR

APPD

APPD

ORC OPTICAL RADIATION CORPORATION

CENTER BULKHEAD ASSY

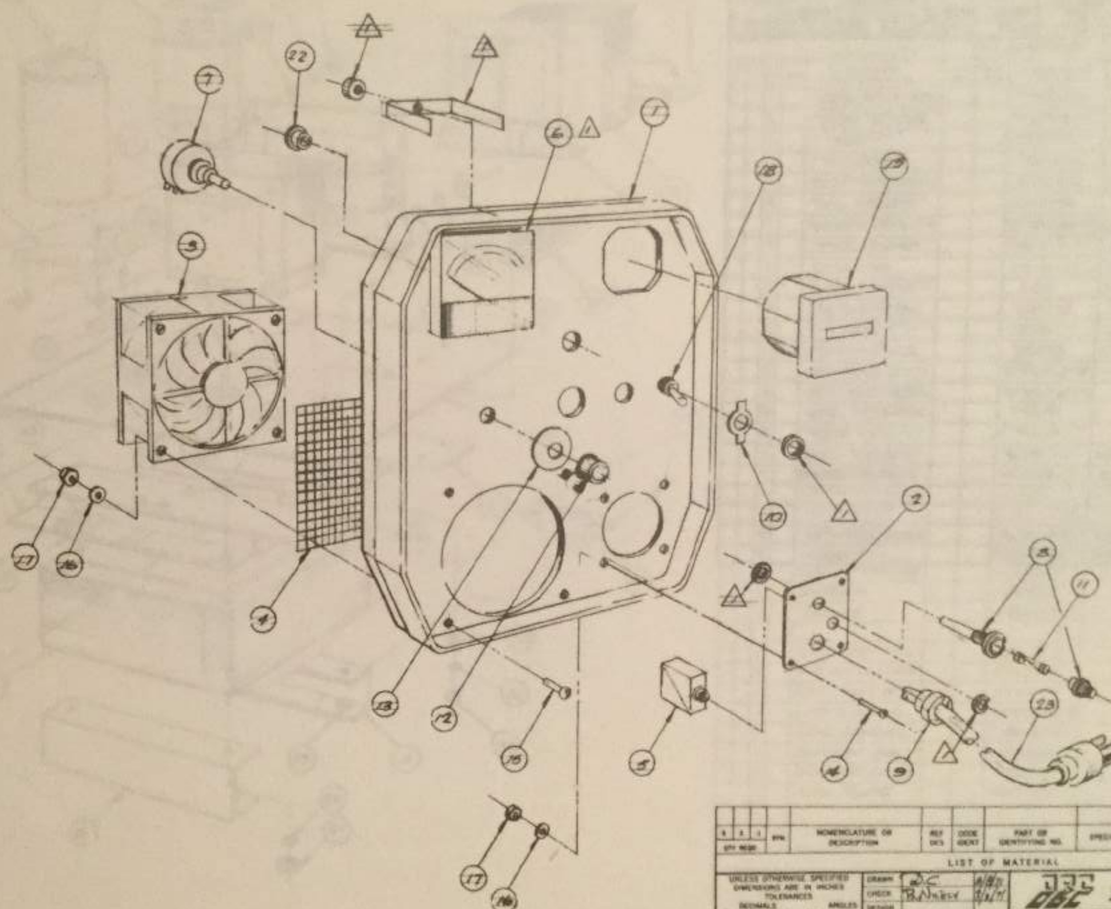
D 33030 1100881 C

NOTES:

△ MOUNTING HARDWARE SUPPLIED WITH COMPONENTS

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	SEE EO 00043	[illegible]	[illegible]
	[illegible]	ITEM 9 WAS P/N 38-487-9	[illegible]	[illegible]



QTY REQD			FPN	NOMENCLATURE OR DESCRIPTION	REF DES	CODE IDENT	PART OR IDENTIFYING NO.	SPECIFICATION	MATERIAL OR NOTE	ZONE	ITEM NO.

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMALS [illegible] ANGLES [illegible]
MACHINE FINISH ✓
DO NOT SCALE DRAWING

MATERIAL:

FINISH:

DRAWN [illegible]
CHECK [illegible]
DESIGN
ENGR [illegible]
APPR
APPR

CONTRACT NO. [illegible]

APPROVED

APPROVED

ORC OPTICAL RADIATION CORPORATION

REAR BULKHEAD ASSY

SIZE D | CODE IDENT NO. 33030 | 1140880 | REV B

SCALE — | WEIGHT | SHEET 1 OF 2

NEXT ASSY | USED ON | DASH NO.

APPLICATION

QTY REQD			FSN	NOMENCLATURE OR DESCRIPTION	REF DES	CODE IDENT	PART OR IDENTIFYING NO.	SPECIFICATION	MATERIAL OR NOTE	ZONE	ITEM NO.
		1		CABLE			1760298	BELDEN			23
		2		FLANGED BSHG			F068-3	BOSTON			22
											21
											20
		1		CURVED TIME METER			4X845	ENM			19
		1		SPST SWITCH			82600	ARROW-HART			18
		8		HEX NUT			NO. 6				17
		8		FLAT WASHER			NO. 6				16
		4		PAN HEAD SCREW			6-32 × 3/4 LG				15
		4		PAN HEAD SCREW			6-32 × 1/2 LG				14
		1		DIAL PLATE			5007	OHMITE			13
		1		KNOB			5151	OHMITE			12
		1		1/4 AMP FUSE			AGC 1/4	BUSS			11
		1		SWITCH PLATE			YO1	H.H. SMITH			10
		1		BUSHING			SR-8P-1	HEYCO			9
		1		FUSE HOLDER			HKP	BUSS			8
		1		VARIABLE RESISTOR			5K, 5W TYPE WW	CENTRALAB			7
		1		AMP METER			3028-19	HOYT			6
		1		CIRCUIT BREAKER			375-215	HOOD ELE.			5
		1		SCREEN			1180851				4
		1		FAN			26005	PAMOTOR			3
		1		FUSE PLATE			1120846-1				2
		1		REAR BULKHEAD			1140701				1

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES DECIMALS .XX = ± .03 .XXX = ± .005 ANGLES ± 1/2° MACHINE FINISH DO NOT SCALE DRAWING

MATERIAL

OPTICAL RADIATION CORPORATION

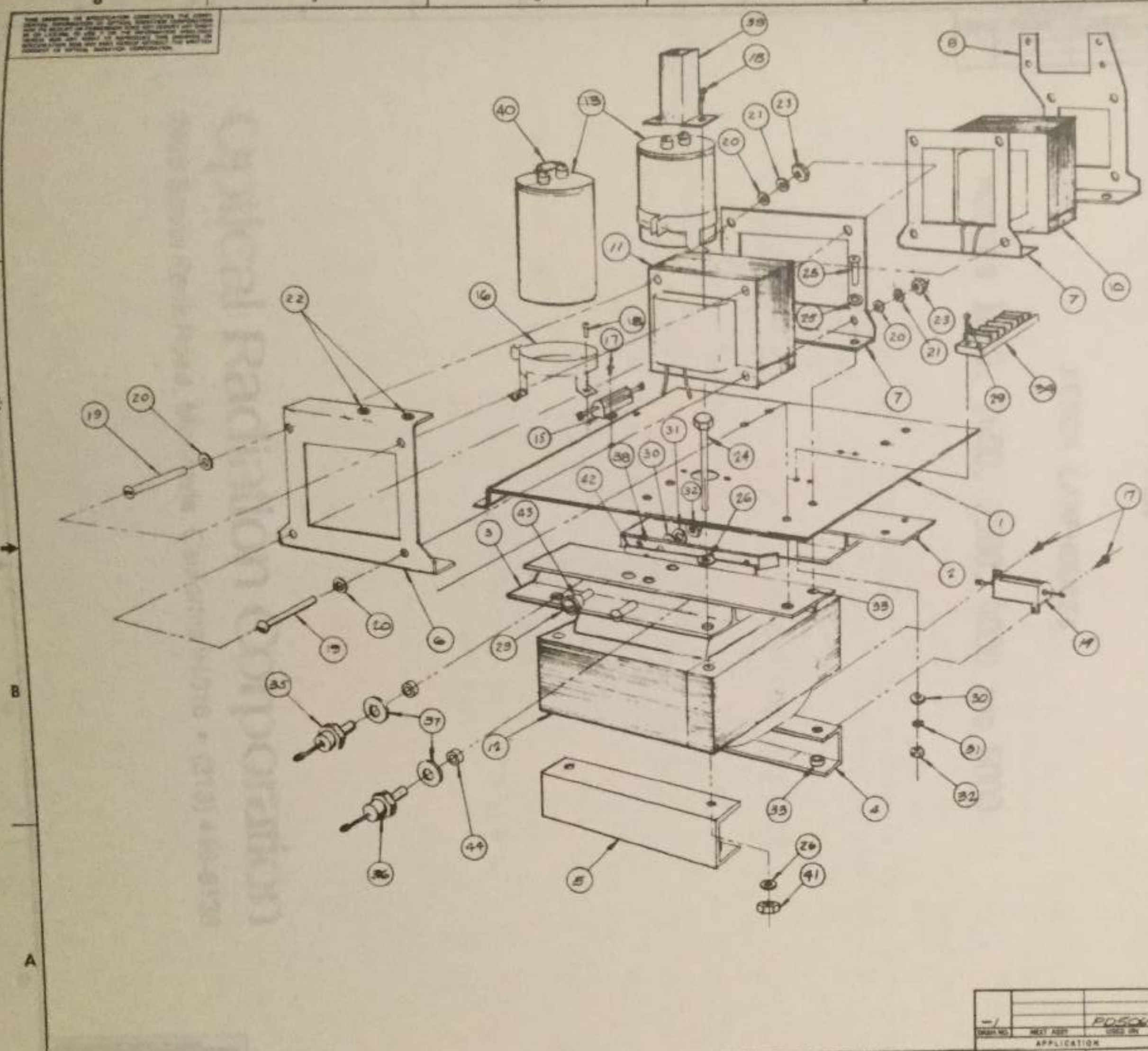
REAR BULKHEAD ASSEMBLY

CONTRACT NO. AF19(604)-

SIZE D CODE IDENT NO. 33030 1140880

ZONE	LTR	REVISIONS DESCRIPTION	DATE	APPROVED
	A	SEE EO 00047		
	B	1) RELOCATED ITEM 14 & MTG. HDW (1) ITEM 24 WAS 10-32 PAN HD (3) ITEM 23 WAS QTY 16 (4) ITEM 24 WAS QTY 8 (2) ITEM 23 WAS QTY 16.		

CONT ON SHEET 2 OF 2



QTY REQD	NOMENCLATURE OR DESCRIPTION	REF DES	CODE IDENT	PART OR IDENTIFYING NO.	SPECIFICATION	MATERIAL OR NOTE	ZONE	ITEM NO.
1	AIRDUCT			1110962-1				39
2	BUSS BAR			1110893-1				38
4	INSULATOR			4726A	THERMALLOY			37
2	DIODE			1N1188R	I.R			36
2	DIODE			1N1188	I.R			35
1	TERMINAL STRIP			354-61-06-001	CINCH-JONES			34
12	NUTSERT			9507-10	AVDEL			33
8	HEX NUT			NO.6				32
8	LOCK WASHER			NO.6				31
8	FLAT WASHER			NO.6				30
8	PAN HEAD SCREW			6-32×1/2 LG				29
8	PAN HEAD SCREW			10-32×3/8 LG				28
								27
8	FLAT WASHER			1/4				26
12	FLAT WASHER			NO.10				25
4	HEX HEAD SCREW			1/4-20×3 1/4 LG				24
8	HEX NUT			NO.8				23
2	NUTSERT			9505-04	AVDEL			22
8	LOCK WASHER			NO.8				21
12	FLAT WASHER			NO.8				20
8	PAN HEAD SCREW			8-32×2" LG				19
7	SELF TAPPING SCREW			NO.6×3/8 LG				18
4	SELF TAPPING SCREW			NO.4×1/2 LG				17
2	CAPACITOR CLAMP			4586-1	SPRAGUE			16
1	RESISTOR			50 W, 1KΩ, 1%	DALE			15
1	RESISTOR			50 W, 1KΩ, 1%	DALE			14
2	CAPACITOR			[illegible]	SPRAGUE			13
1	TRANSFORMER			1140856-1				12
1	CHOKE			1130881-1				11
1	CHOKE			1130881-3				10
								9
1	BKT, CONN MTG			1131726				8
2	MTG ANGLE CHOKE			1131724				7
1	BKT, CHOKE MTG			1131725				6
1	MTG CHANNEL			1130839-3				5
1	MTG CHANNEL			1130839-1				4
1	SUPPORT BRKT			1130838-1				3
1	SUPPORT BRKT			1130837-1				2
1	MTG PLATE			1140850-1				1

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES DECIMALS .XX = ±.03 .XXX = ±.010 ANGLES ±1.0° MACHINE FINISH DO NOT SCALE DRAWING

MATERIAL

FINISH

OPTICAL RADIATION CORPORATION

POWER SUPPLY ASSY

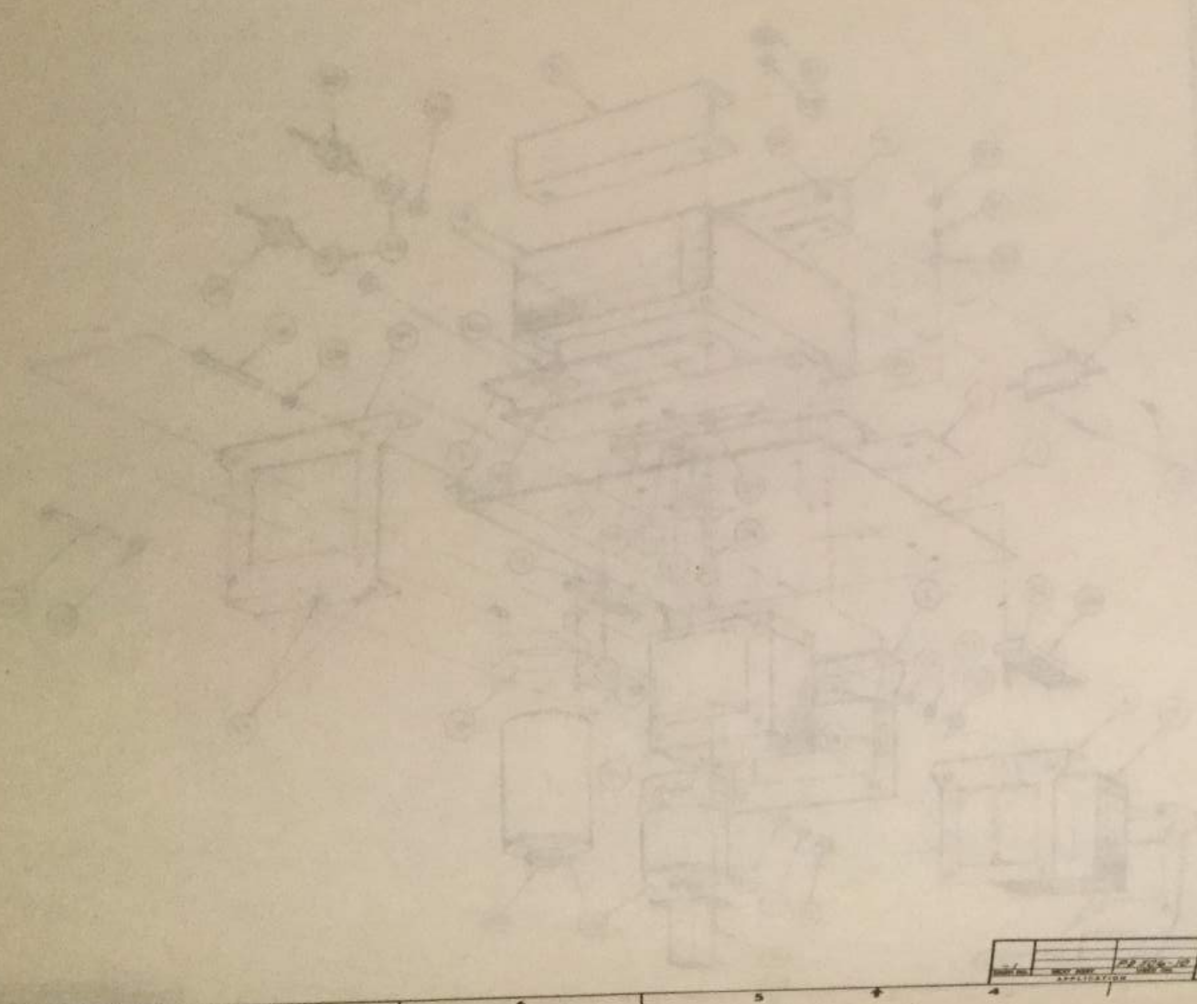
SIZE	CODE IDENT NO.	DWG NO.	REV
D	33030	1140879	C

CONTRACT NO. PD506-10

SHEET 1 OF 2

DASH NO.	NEXT ASSY	USED ON
-1		PD506

APPLICATION



REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	C	1.) ADDED SHEET 2. (2.) RELOCATED ITEMS 40 & 41 FROM SH. 1 TO SH. 2. (3.) ITEM 6 WAS "MTG BKT" #[illegible] (4.) ITEM 7 WAS "CHOKE CLAMP" #[illegible] (5.) ITEM 8 WAS "ANGLE BKT" #1110834 (6.) DELETED ITEM 9. (7.) ITEM 29 WAS QTY 8. (8.) ITEM 30 WAS QTY 8. (9.) ITEM 31 WAS QTY 4. (10.) ITEM 26 WAS QTY 18. (11.) ITEM 27 DELETED. (12.) ADDED ITEMS 42, 43, & 44. (13.) REVISED DWG TO SHOW NEW CHOKE MTG. BRACKETS ITEMS 6, 7, & 8. (14.) ITEM 32 WAS QTY 4.	[illegible]	B.W.

QTY REQD 4	QTY REQD 2	QTY REQD 1	FSN	NOMENCLATURE OR DESCRIPTION	REF DES	CODE IDENT	PART OR IDENTIFYING NO.	SPECIFICATION	MATERIAL OR NOTE	ZONE	ITEM NO.
		4		BUSHING			1121309				44
		4		WASHER, SHLDR			2663	H. H. SMITH			43
		2		INSULATOR			1111723				42
		4		HEX NUT			1/4-20				41
		1		RESISTOR			1000 Ω, 2W				40

LIST OF MATERIAL

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

DRAWN R. [illegible]
CHECK
DESIGN
ENGR
APPR
APPR
CONTRACT NO. PD 506-12

OPTICAL RADIATION CORPORATION

POWER SUPPLY ASSY

SIZE D | CODE IDENT NO. 33030 | 1140873 | REV C

SHEET 2 OF 2

APPLICATION: PD 506-12

SPARE PARTS

PRICE LIST

FOR

XENON LAMPHOUSES

MODELS 1000, 1600, 2500, 4000 AND 6000

Optical Radiation Corporation
2626 South Peck Road, Monrovia, California 91016 • (213) 446-6133

GENERAL TERMS

The prices listed herein are suggested list prices of spare parts on Optical Radiation Corporation's xenon lamphouses and power supplies. Parts identified with an asterisk (*) indicate a recommended spare part for stocking purposes. All prices are FOB Monrovia, California and are subject to change without notice. No adjustments will be made due to price changes. Orders are subject to acceptance by ORC at one of the regional centers.

Subject to Credit Department approval, terms are net 30 days. All remittances should be made to the home office.

GUARANTEE

All merchandise (except xenon bulbs) sold by Optical Radiation Corporation is guaranteed to be free from defects in workmanship and material for one year from date of shipment from ORC. In no event shall ORC be liable for consequential or special damages, and ORC's liability on any claim for loss or damages arising out of or connected with the sale, resale, or use of any product shall (except xenon bulbs) in no case exceed the selling price of such a product or part thereof involved in the claim.

REGIONAL MARKETING AND DISTRIBUTION CENTERS

EASTERN REGION:

7 Balsam Parkway
Sparta, New Jersey
(201) 729-6794

WESTERN REGION AND
HOME OFFICE:

2626 South Peck Road
Monrovia, California
(213) 446-6133

MODEL 1000 XENON LAMPHOUSE

INTEGRATED POWER SUPPLY/LAMPHOUSE

	PART NO.	DESCRIPTION	QTY. PER ASSEMBLY	SYMBOL
*	1130845	CONTROL CIRCUIT BOARD	1	
*	1130844	TRIAC CARD	1	
*	2N5444	TRIAC	1	
*	40526	TRIAC	1	
	3001-T123-B2111	THERMAL SWITCH	1	
*	1N1183	RECTIFIER	2	CR3, CR4
*	1N1183R	RECTIFIER	2	CR1, CR2
*	1N2131A	BLOCKING DIODE	1	CR6
	1130831-1	CHOKE	1	L1
	1130831-3	CHOKE	1	L2
	1140836	TRANSFORMER	1	T1
*	W-W-500	POTENTIOMETER	1	R5
	25005	FAN	2	B1, B2
*	1N5379	ZENER DIODE	1	CR5
	ACG 1/4	FUSE	1	F1
*	45-700P	CIRCUIT BREAKER	1	CB 1
*	82600	SWITCH	1	S1
	36D253G0	CAPACITOR, FILTER	2	C1, C2
*	41F-5000S-SIL	RELAY	1	K1
	RH-50-1000	RESISTOR	1	R1
	2025-19	AMMETER	1	M1
	BAR2Q1	INT. SWITCH	1	S1
*	1140887	IGNITER ASSEMBLY	1	
*	SPSG	SPARK GAP	1	E1
	LPA6011	H.V. TRANSFORMER	1	T2
	1140452	R.F. TRANSFORMER	1	T3
*		FRONT LEAD	1	
*	1100514	NEG. LENS	1	
	1100290	MIRROR ASSEMBLY	1	
	RH-50-.01	RESISTOR	1	R4
	4X845	RUNNING TIME METER	1	M2

SECTION 4.3

MARY POPPINS 16mm PROJECTOR Service Instructions

4.3.1 GENERAL DESCRIPTION

The Disney designed 16mm Projection System used in the Walt Disney Story Show is extremely reliable and a relatively maintenance free unit providing that the daily routine maintenance and service is carried out per the Maintenance Schedule on Page 102 of this section. A Projection System as a whole comprises of six (6) basic units. These are:

1. Projector Head Assembly
2. Projector Base Assembly
3. Film Cabinet
4. Lamphouse Assembly
5. Spotmaster Tape Machine
6. Tape Synchronizer and Motor Power Supply

1. Projector Head Assembly

The Projector is readily accessible for maintenance, and incorporates a Bell & Howell JAN Projector Intermittent Assembly which is modified for continuous duty operation before assembly into the projector head. The automatic oiler assembly designed to insure an adequate and regular supply of oil to the shuttle and cams is mounted external to the projector head on the Projector Base Assembly, Fig.1 . In the event of the projector losing it's loop as the film passes through the projector, a small roller under which the film passes, pulls up, trips a Mercury switch and shuts off the projector drive motor to prevent film damage. Projector shut-off also activates the douser assembly to close. The film loader take up unit is mounted on top of the projector after first removing the upper film tunnel. The electrical connection is made at the accessories receptacle at the rear panel of the projector base assembly.

2. Projector Base Assembly (Fig.2)

This unit houses the Electrical Relays, and the P.E.C. Control Box of the Projection System. The control buttons for the system are mounted on the base front panel as shown in Fig.1 . Essential operating conditions are monitored by DACS through the 20 pin Elco receptacle. This receptacle along with the receptacle connections for the power input, projector drive motor, lamphouse power input, accessories, oiler, humidifier, douser monitor, lamphouse, film

cabinet, and projector head, are mounted on the fixed panel at the rear of the unit. The film loader feed reel is also mounted to this unit when required, and is used with the panel in the down position as shown in Fig.3 . The projector horizontal leveling knob protrudes through the Projector Base Assembly below the projector casting, and no further adjustment need be made once the projected picture and screen are aligned. The Central Control call button and intercom receptacle for the portable intercom phone are mounted in the top of the base assembly, and the automatic oiler system for the projector head is mounted on the end by the power input cable receptacle.

3. Film Cabinet

This enclosure where the film is stored is humidity controlled and requires very little maintenance. After the system is switched on, film travels from the cabinet, through a film tunnel to the projector, and back into the cabinet through another tunnel in an endless loop. In the event of film breakage within the cabinet, a free riding roller (each loop has one) falls, trips a safety lever connected to a Mercury switch and shuts off the projector drive motor to prevent film damage. Periodically, it will be necessary to change the film within the cabinet using the film loader take-up and feed units as shown in Fig.3 . This operation can be achieved quickly eliminating the possibility of scratching the film.

4. Lamphouse Assembly

For information concerning this unit, refer to Page153 in this section of the manual.

5. Spotmaster Tape Machine

The Spotmaster 1/4" Tape Sound Reproducer starts from an optically sensed white cue mark on the film via the P.E.C. Scanner. The Spotmaster Reproducer, modified by the addition of a motor switch on the front panel is controlled by a 60Hz resolver and a motor power supply amplifier.

6. Tape Synchronizer and Motor Power Supply

The 1/4" Tape Synchronizer and Motor Power Supply are used with the Spotmaster 1/4" Tape Sound Reproducer to synchronize the sound with the projected picture. The tape synchronizer and motor power supply furnishes power to the Spotmaster drive motor. The tape synchronizer compares a 60Hz tone recorded on the tape with the 60Hz line frequency. It will adjust the speed of the Spotmaster until the tape frequency matches the line frequency and will then maintain the synchronization. The projector, driven by a synchronous motor maintains a constant rate of speed.

4.3.2 PRELIMINARY OPERATING INSTRUCTIONS

LAMPHOUSE OPERATION

1. Insert the lamphouse power cord plug with the LAMPHOUSE receptacle (on the rear side of the projector base cabinet) and attach the LAMPHOUSE monitor cable to the lamphouse.
2. The power toggle switch at the rear of the lamphouse should be ON (up).
3. Push power ON button on the front panel of the projector base assembly to light the lamp, and set the lamp current to 35 amperes by adjusting the small black knob at the rear of the lamphouse assembly.

PROJECTOR OPERATION

1. Push the RUN button located on the front panel of the projector base assembly. The projector should start and the douser open after a short time delay (approximately 3 - 5 seconds). The delay time can be varied by adjusting the pneumatic timer on relay K5E in the projector base assembly.
2. Check that the fiber-optic sensor of the photo-electric control (P.E.C.) located above the film shoe of the aperture plate is lighted. The white sync. mark on the film is detected by the sensor which pulses the film RUNS counter and starts the remote magnetic tape machine. The sensitivity of the P.E.C. mounted in the projector base assembly should not be set too high or it will be triggered by dust on the film. The sensitivity can be checked by placing a small strip of WHITE paper in front of the sensor.
3. The automatic oiler activates every 6 hours providing sufficient oil to the shuttle cams and pivot. At the start of each day, the oiler should be activated manually by depressing the black button on the side of the automatic oiler box. This ensures the projector does not run in a semi-dry condition before the oiler timer activates.
4. To shut down the projection system, push the power OFF button located on the front panel of the projector base assembly.

AUDIO CABINET

1. Power switches on the Spotmaster Tape Machine, Tape Synchronizer, and the Motor Power Supply should be ON.

2. Insert the correct tape cartridge into the Spotmaster Tape Machine and push the START button. The output of the 60Hz sync track (Channel B) from the Spotmaster is now being fed into the tape synchronizer and the Spotmaster drive motor is now being supplied from the tape synchronizer through the motor power supply. An AC Voltmeter is provided on the motor power supply to indicate the output. This should be 100 - 110 and is adjusted via the VOL control. The input voltage to the tape synchronizer from the Spotmaster Tape Machine should be 4 dbm (1.2 Volts) and is adjusted by means of the Channel B PLAY LEVEL TRIM CONTROL.

3. Turn Sync Adj. Control on the resolver until the microammeter indicates half scale (50 microammeters).

4. The 30Hz cue signal stops the Spotmaster at the end of each run. It restarts automatically each time the sync cue mark on the film is sensed by the Fiber Optic Sensor on the projector.

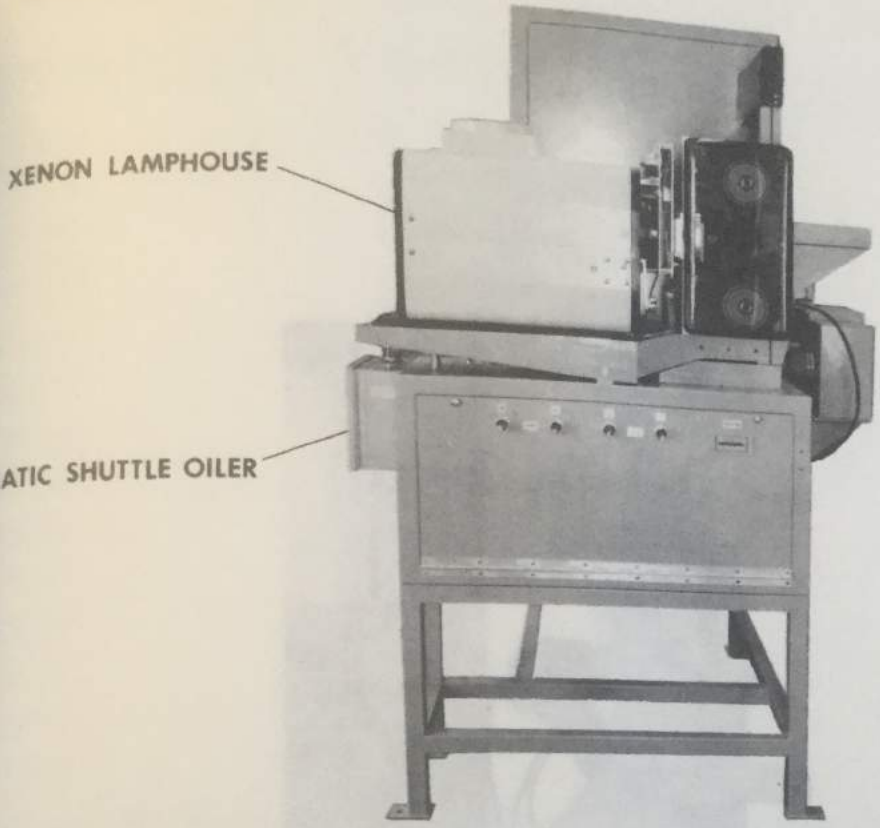


FIGURE 1
PROJECTOR AND BASE ASSEMBLY

FIGURE 2
PROJECTOR BASE ASSEMBLY

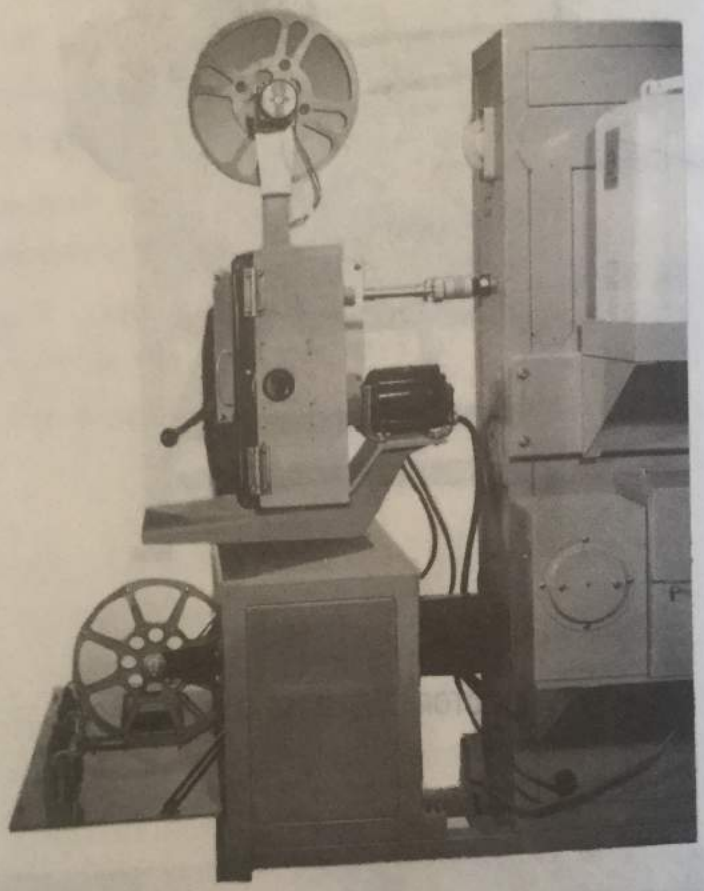


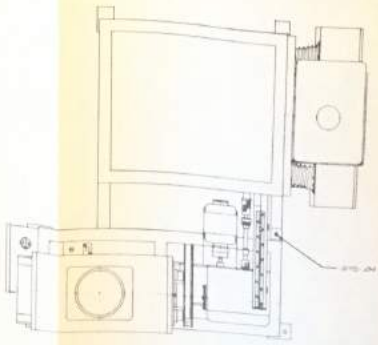
FIGURE 3
FILM LOADER TAKE-UP AND FEED UNITS

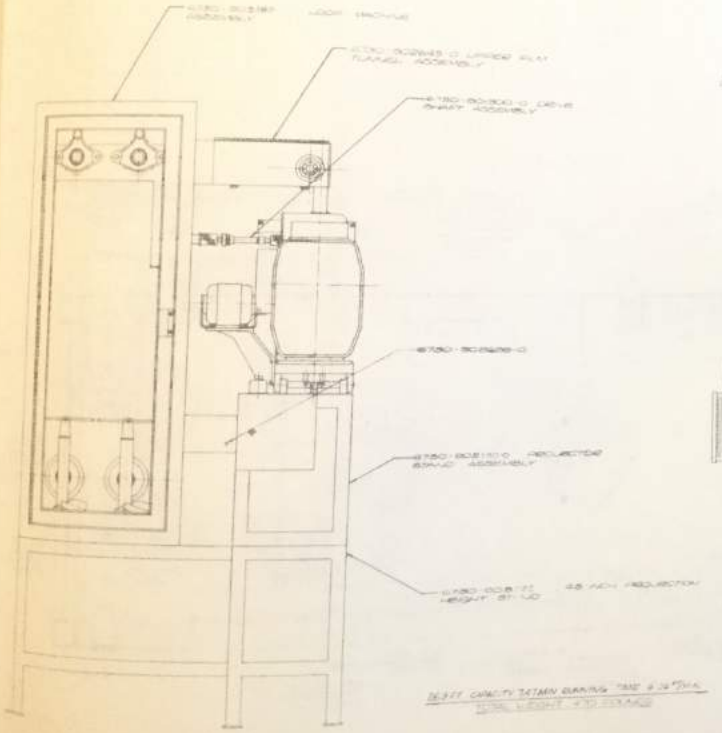
MECHANICAL DRAWINGS

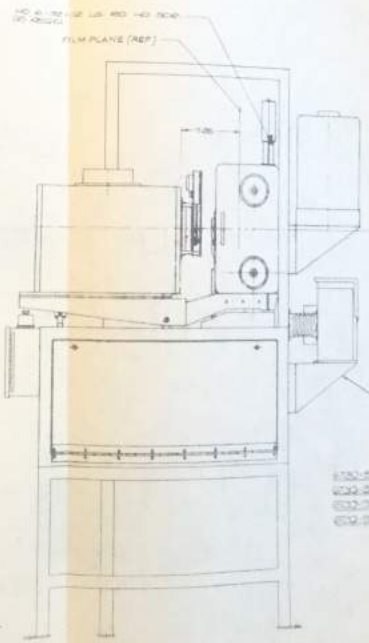
MARY POPPINS PRE-SHOW

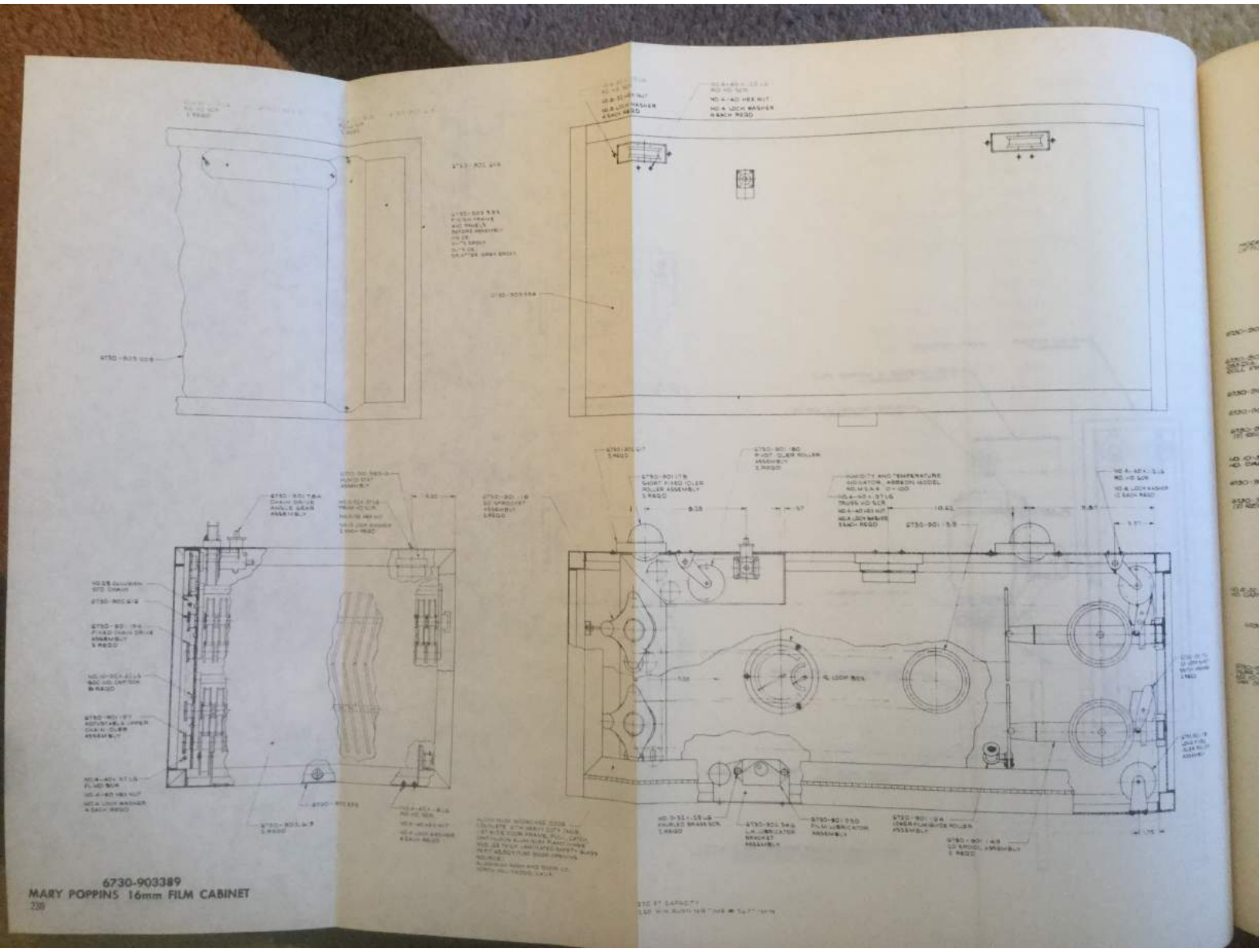
DWG NUMBER	DESCRIPTION
*6730-903388	Mary Poppins Projector System
6730-901300	Drive Shaft
6730-902643	Upper Film Tunnel
6730-903034	Humidifier Installation
*6730-903389	Mary Poppins Film Loop Cabinet
6730-901116	20 Sprocket
6730-901149	20 Spool
6730-901164	Lower Film Guide Roller
6730-901178	Short Fixed Idler Roller
6730-901179	Long Fixed Idler Roller
6730-901180	Pivot Idler Roller
6730-901194	Fixed Chain Idler
6730-901197	Adjustable Idler
6730-901753	20 Loop Safety Switch
6730-901784	Chain Drive
6730-901930	Film Lubricator
6730-901985	Humidistat
6730-902346	Lubricator Bracket
*6730-903390	Mary Poppins Projector Stand
6730-901181	Fixed Idler Roller
6730-901232	Projector Drive Motor
6730-902685	16MM Projector
6730-902687	Shuttle Oiler
6730-903143	Automatic Douser

* These drawings are incorporated as a part of this section. All others are available from Supervisor, Projection Equipment, Maintenance, D/L.

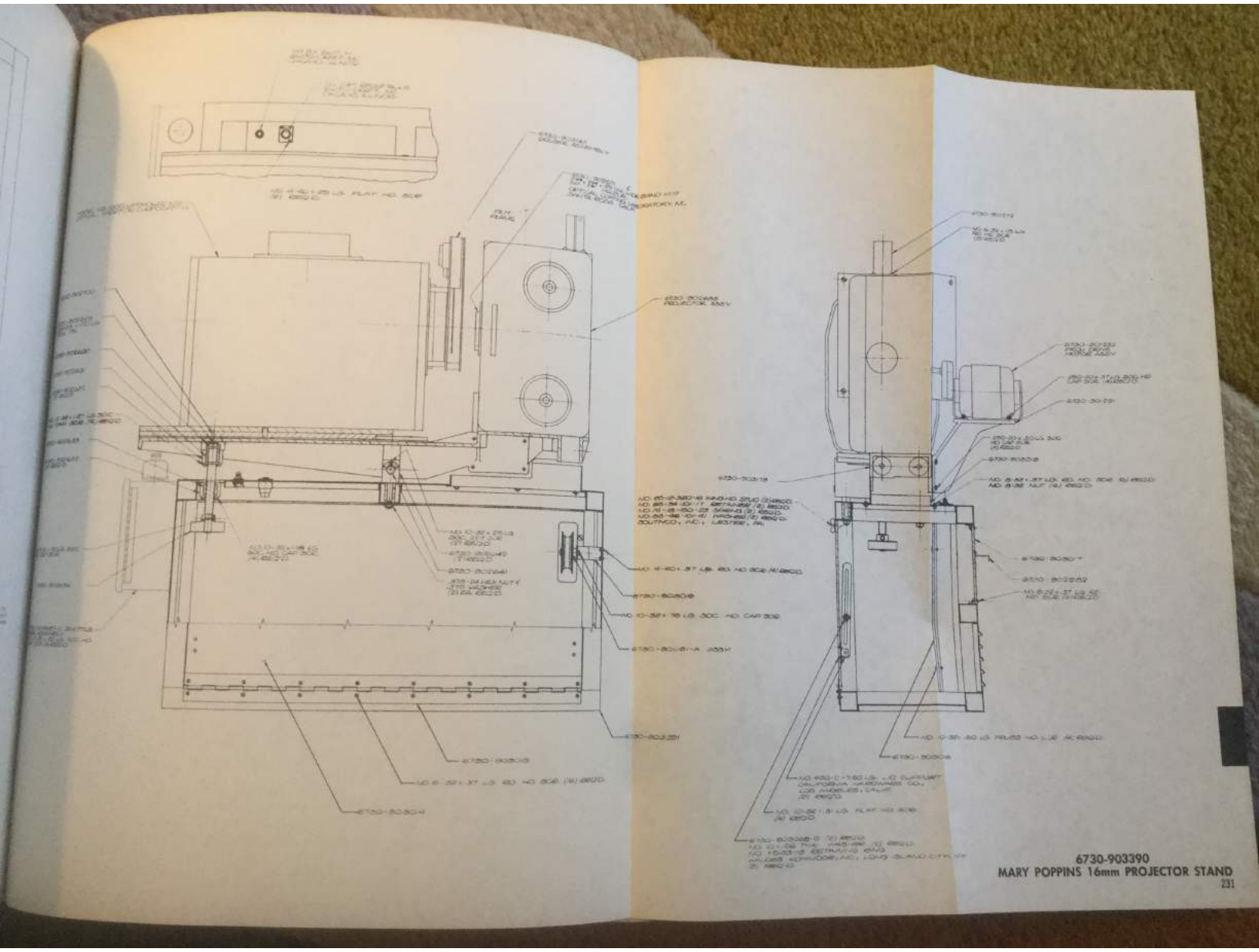






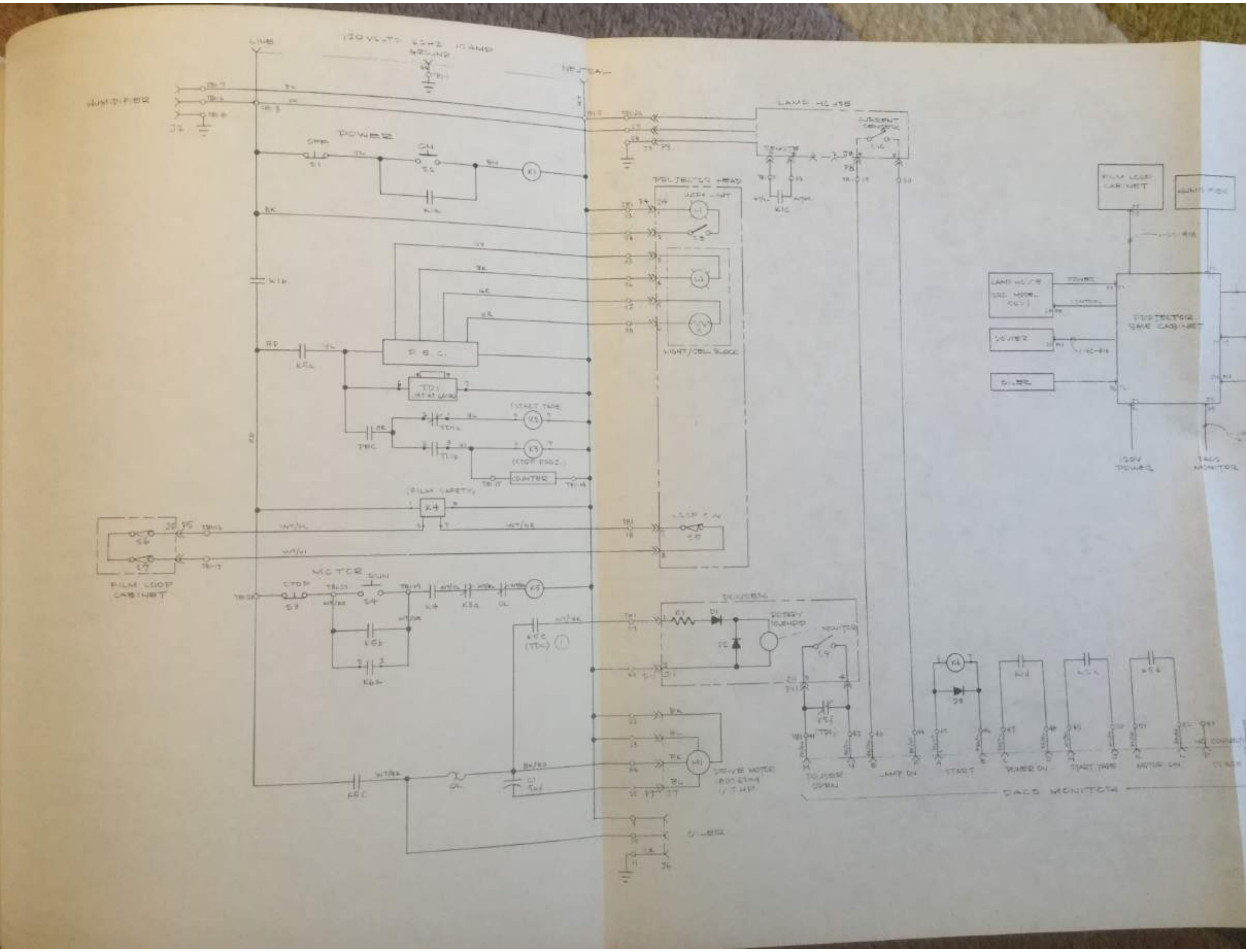


6730-903389
MARY POPPINS 16mm FILM CABINET

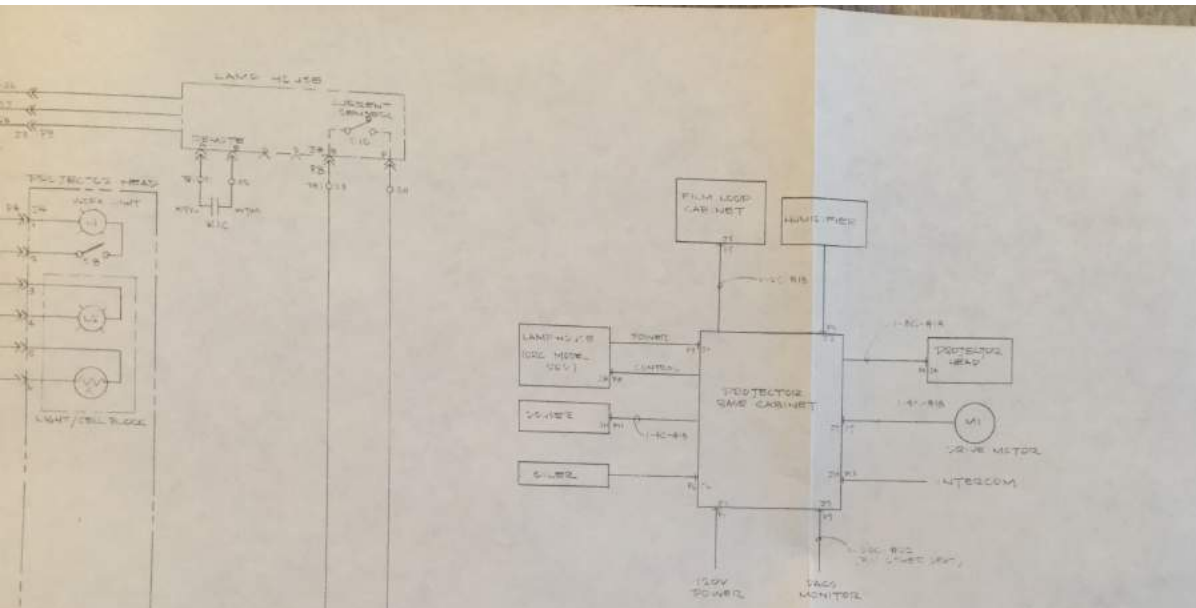


6730-903390
MARY POPPINS 16mm PROJECTOR STAND

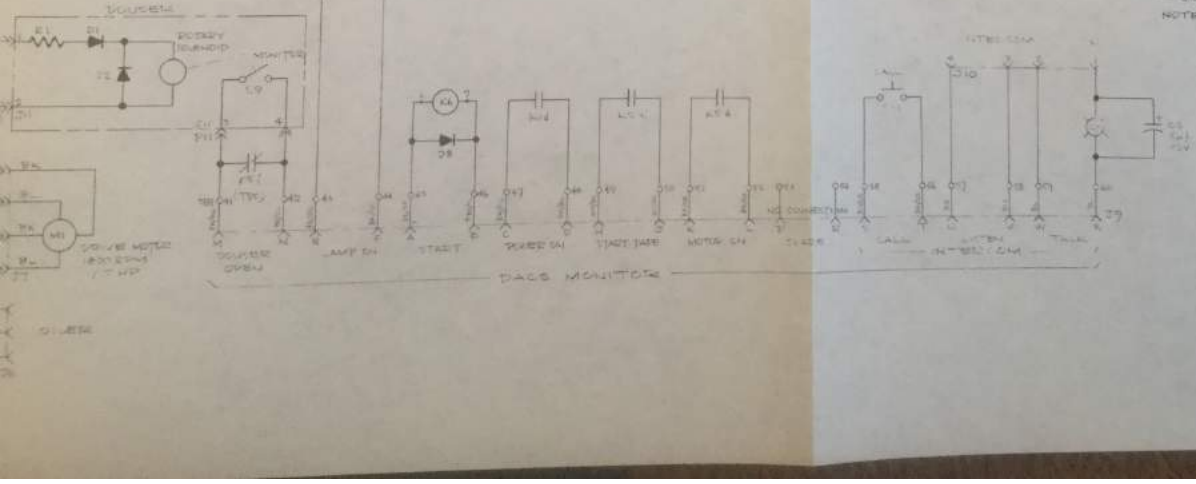
ELECTRICAL DRAWINGS



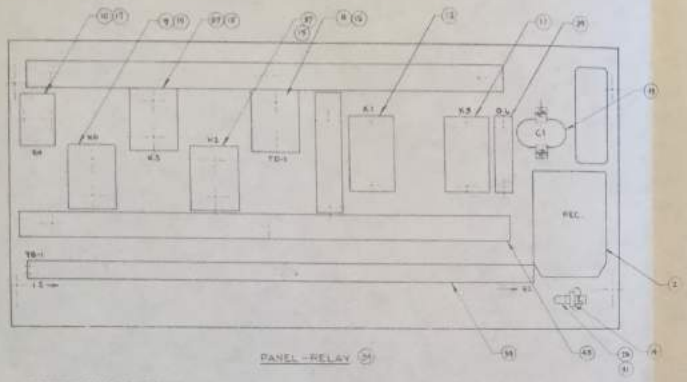
120 VOLTS 60HZ 15 AMP
LINE
NEUTRAL
GROUND
HUMIDIFIER
POWER
OFF
ON
LAMP HOUSE
CURRENT SENSOR
PROJECTOR HEAD
LIGHT/CELL BLOCK
P.E.C.
START TAPE
STOP TAPE
COUNTER
FILM SAFETY
FILM LOOP CABINET
MOTOR
STOP
RUN
DOUSER
ROTARY SOLENOID
DRIVE MOTOR
OILER
FILM LOOP CABINET
HUMIDIFIER
LAMP HOUSE
OILER
PROJECTOR BASE CABINET
120V POWER
DACS MONITOR
DOUSER OPEN
LAMP ON
START
POWER ON
START TAPE
MOTOR ON
DACS MONITOR



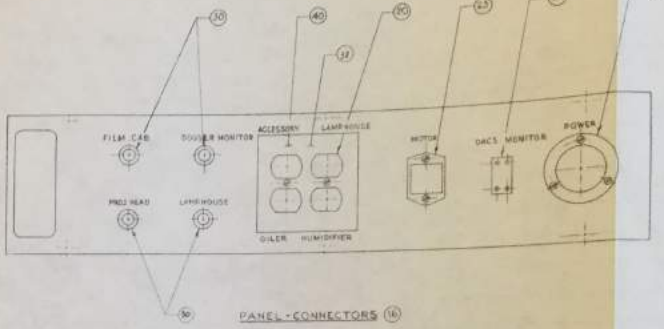
2. TDO - TIME DELAY OPENING CONTACTS
TDC - TIME DELAY CLOSING CONTACTS
(1) ADJUST TDC TIME DELAY TO OPEN DOUSER ONLY AFTER LAMP IGNITES.
NOTES: UNLESS OTHERWISE SPECIFIED



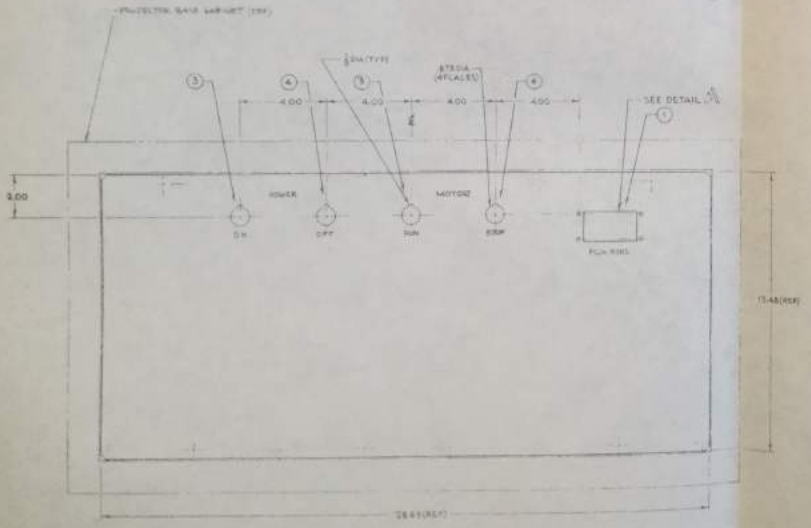
6110-906838
MARY POPPINS 16MM PROJECTOR
SCHEMATIC DIAGRAM



PANEL - RELAY (14)

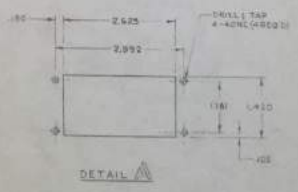


PANEL - CONNECTORS (16)



PANEL - FRONT (15)

NOTES:
1. FOR SCHEMATIC DIAG. SEE DWG NO 6110-906838



DETAIL A

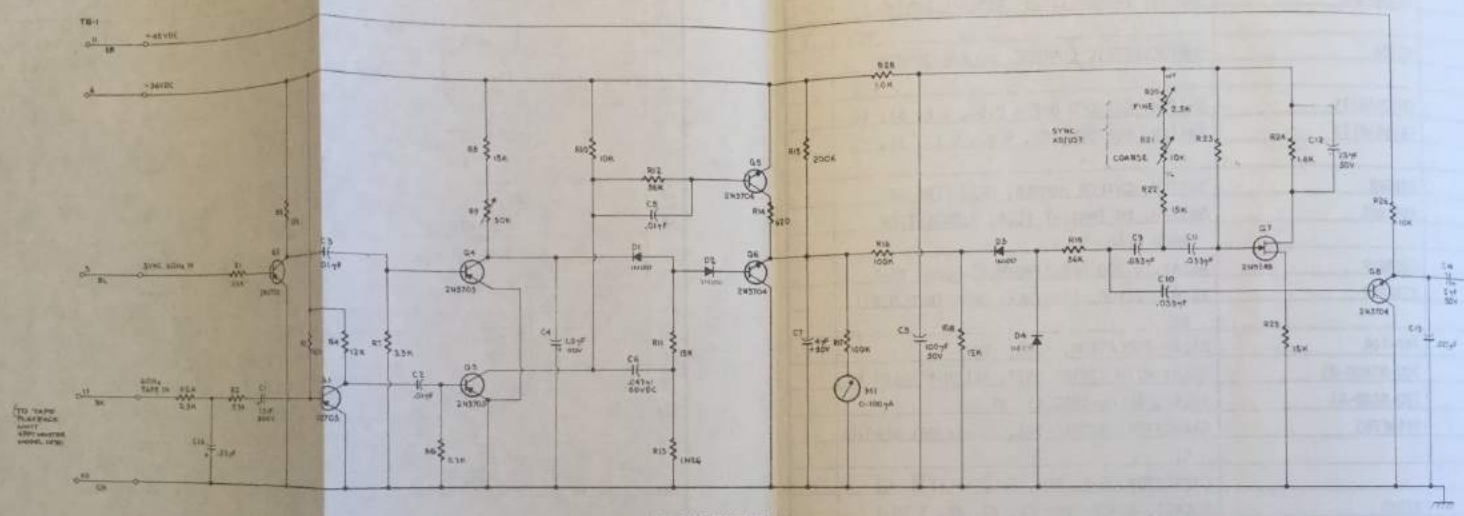
6110-906839
MARY POPPINS 16MM PROJECTOR
BASE ASSEMBLY

DWG 6110-906839 BASE ASSY, 16MM PRE-SHOW PROJECTOR SHEET 1 OF 2

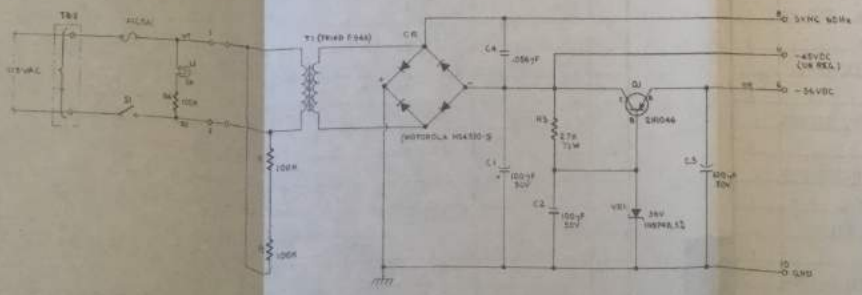
ITEM	WDF NO.	PART NO.	DESCRIPTION	QTY.
1.		CE16BP602	COUNTER 120VAC I.T.T. GENERAL CONTROLS "M"	1
2.		M310A	PHOTOELECTRIC CONTROL, DOLAND-JENNER PEC	1
3.		CR104A8115	SWITCH, GUARDED GREEN P.B., G.E. S2, S4	1
4.		CR104A8113	SWITCH, GUARDED RED, P.B., G.E. S1, S3	1
5.				1
6.		8295K8	SWITCH, CUTLER HAMMER, PROJ HEAD S8	1
7.		AS419A1	SWITCH, IN IMR11-F CLIP, MICROSWITCH PROJ HEAD S5,6,7	3
8.		236ABXP	RELAY, 2-200 SEC STRUTHERS-DUNN TD-1	1
9.		219XBXP	RELAY, 24VDC, STRUTHERS-DUNN (D.P.D.T.) K6	1
10.		FRP-104	RELAY-ISOLATION, ALCO, K4	1
11.		700-NT400-A1	RELAY WITH TIMING UNIT, ALLEN-BRADLEY K5	1
12.		700-N400-A1	RELAY, ALLEN-BRADLEY K1	1
13.		P149F265	CAPACITOR, 330VAC 5μE, 66 c/s MAX AEROVOX C1	1
14.			CAPACITOR, 5 F, 50V, ELECTROLYTIG C2	1
15.		27390	SOCKET, DUNCO FOR K1, K3, K6, & TD-1	4
16.		6730-903017(D)	PANEL-CONNECTORS	1
17.		N-8	SOCKET, MASTER ELECTRONIC CONTROL, FOR K4	1
18.		10D2	DIODE, SILICON I.R., D1, D2, D3	3
19.		2315	FLANGED INLET 2P, 3W, 20A, HUBBELL (P-1, PLUG 2313) J-1	1
20.		1460	OUTLET, 3W, 2P, 20A, 125V, DUPLEX, SIERRA IVORY J2, J3, J6	3
21.		S-308-CCT	PLUG, CINCH-JONES (J-3, RECEP., P-308-DB) (J-3, RECEP, P-308-DB) PROJ HEAD P-4	1
22.		7464	PLUB, 2W, HUBBEL (J-5, REC 7466) FILM LOOP CASE P-5	1
23.		S-404-DB	RECEPTACLE, CINCH-JONES (P-7, PLUG P-404-CCT) J-7	1
24.		MS3106A14S-06S	PLUG, BENDIX J-8 LAMP HOUSE P-8	1
25.		816-020-000-007	RECEPTACLE, 20P, ELCO J-9	1
26.		1CH-34	MOTOR-DRIVE, 1/15 HP, 1800 RPM, BODINE (REF) M-1	1
27.		D4F J-10	RECEPTACLE-SOCKET, SWITCHCRAFT ELECTRONICS	:

DWG. 6110-906839 BASE ASSY, 16MM PRE-SHOW PROJECTOR

ITEM	WDP NO.	PART NO.	DESCRIPTION	QTY.
28.		313	LAMP, INCANDESCENT G.E. L3	1
29.		815-B0V4	RELAY-OVERLOAD, ALLEN-BRADLEY N7 HEATER	
			OL	1
30.		.187-.312	BUSHING, APPLETON	4
31.		1931	SOCKET, LIGHT H.H. SMITH	1
32.		47-3202-2900-301	LIGHT, INSTRUMENT DIALCO 6S6DC-125V BULB	
			L1	1
33.		6730-903014	PANEL-FRONT	1
34.		6730-903016	PANEL-RELAYS	1
35.		201	SWITCH, P.B., SWITCHCRAFT S8	1
36.		V3-1001	SWITCH, W/JV-5 ACTUATOR MICROSWITCH	
			DOUSER S9	1
37.		219XBXP	RELAY, 120VAC, STRUTHERS-DUNN K2, K3	1
38.		S-82N	2-CANG S/S WALL PLATE, SIERRA	1
39.		670-30	TERMINAL BLOCK, KULKA TB-1	2
40.		1460X	OUTLET-DUPLEX, 20A, 125V, 2R3W SIERRA	
			BROWN J6,J12	2
41.		RH-25	RESISTOR, 200Ω, 25W DALE DOUSER R1	1
42.		810-497-532	SOLENOID, ROTARY LEDEX DOUSER RS	1
43.			PANDUIT	A/R

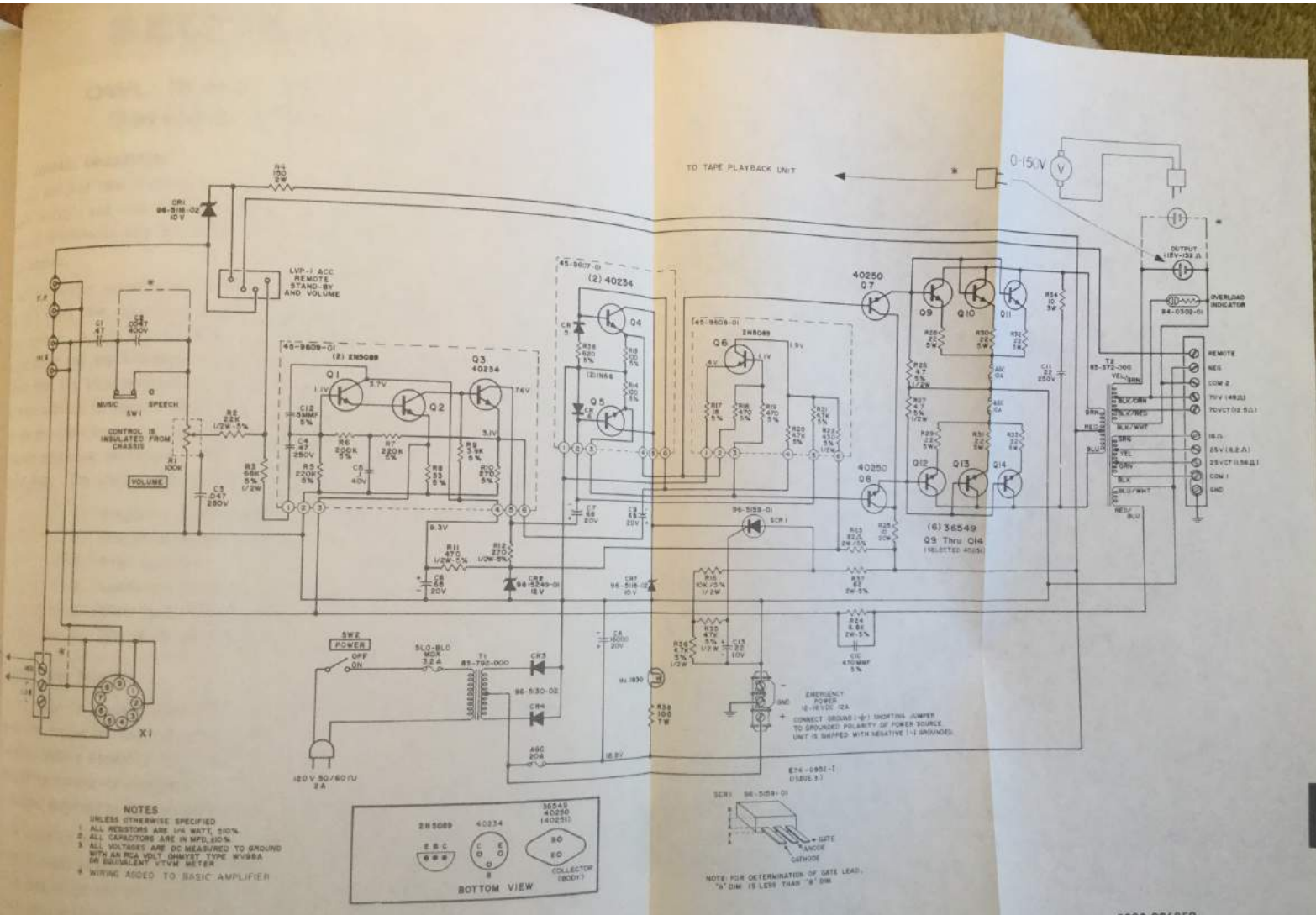


60Hz TAPE SYNCHRONIZER



POWER SUPPLY

5830-906849
TAPE RESOLVER SCHEMATIC DIAGRAM
STEPHENS MODEL 110



5830-906850
MOTOR DRIVE AMPLIFIER SCHEMATIC DIAGRAM
BOGEN MODEL MT100

SECTION 4.4

OWL 16 mm PROJECTOR Service Instructions

4.4.1 GENERAL DESCRIPTION

The Disney designed 16mm Projection System used in the Walt Disney Story Show is an extremely reliable and relatively maintenance free unit, providing that the daily routine and maintenance service is carried out per the maintenance schedule on page 102 of this section.

The "Owl" Projection System consists of a 16mm projector electrically inter-locked to an RCA 6 track 35mm sprocketed magnetic tape reproducer by means of a selsyn distributor system. A soft start circuit is provided to prevent interlock motor runaway. The distributor and the lamphouse douser are remotely controlled by means of 24 volt DC pulses from the show programmer. Switches are provided at the projector and distributor cabinet to permit local operation of the system. The projector is located in the pre-show area, and the distributor cabinet is located on an adjacent wall outside the projector enclosure. The RCA sound reproducer is located in the Main Projector Room. The projection system as a whole consists of six basic units. These are:

1. Projector Head Assembly
2. Projector Base Assembly
3. Film Cabinet
4. Lamphouse Assembly
5. Distributor Cabinet Assembly
6. RCA FR-10 Sound Reproducer

1. Projector Head Assembly

The Projector is readily accessible for maintenance and incorporates a Bell & Howell JAN Projector Intermittent Assembly which is modified for continuous duty operation before assembly into the projector head. The automatic oiler assembly designed to insure an adequate and regular supply of oil to the shuttle and cams is mounted externally to the projector head on the Projector Base Assembly.

In the event of the projector losing its loop as the film passes through the projector, a small roller under which the film passes, pulls up, trips a mercury switch, and shuts off the projector drive motor to prevent film damage. Projector shutoff also activates the douser assembly to close. The film loader take-up unit is mounted on top of the projector after first removing the upper film tunnel. The electrical connection is made at the nearest convenient energized 120 volt wall outlet.

2. Projector Base Assembly

This unit houses some of the Electrical Relays, and control buttons of the projection system, the latter being mounted on the base front panel as shown in Fig. 1 . Essential operating conditions are monitored by DACS through the 20 pin Elco Receptacle. This receptacle along with the receptacle connections for the projector drive motor, lamphouse power input, oiler, douser monitor, lamphouse, film cabinet, and projector head, are mounted on the fixed panel at the rear of the unit. The film loader feed reel is also mounted to this unit when required, and is used with the panel in the down position, as shown in Fig.1 . The projector horizontal leveling knob protrudes through the Projector Base Assembly below the projector casting, and no further adjustment need be made once the projected picture and screen are aligned. The Central Control call button and intercom receptacle for the portable intercom phone are mounted in the top of the base assembly, and the automatic oiler system for the projector head is mounted on the end by the oiler receptacle.

3. Film Cabinet

This enclosure where the film is stored is humidity controlled and requires very little maintenance. After the system is switched on, film travels from the cabinet, through a film tunnel to the projector, and back into the cabinet through another tunnel in an endless loop. In the event of film breakage within the cabinet, a free riding roller (each loop has one) falls, trips a safety lever connected to a Mercury switch and shuts off the projector drive motor to prevent film damage. Periodically, it will be necessary to change the film within the cabinet using the film loader take-up and feed units as shown in Fig.1 . This operation can be achieved quickly, eliminating the possibility of scratching the film.

4. Lamphouse Assembly

For information concerning this unit, refer to Page153 in this section of the manual.

5. Distributor Cabinet Assembly (Fig. 2)

This unit houses some of the electrical relays and control buttons, also the contactors and associated equipment of the projection system. The single and 3 phase lock "ON" and "OFF" buttons, RUN DISTRIBUTOR and STOP button, and the POWER ON and OFF switch are all mounted on the front of the unit. On the right side of the cabinet assembly, just above the distributor handwheel mounts the DACS Monitor Receptacle.

4.4.1 GENERAL DESCRIPTION (CONT.)

6. RCA FR-10 Sound Reproducer (Fig. 3)

For information concerning this unit, refer to the Audio Components Systems Reference Manuals.

4.4.2 PRELIMINARY OPERATING INSTRUCTIONS

LAMPHOUSE OPERATION

1. Connect the lamphouse into the nearest convenient 120 volt wall socket. Attach the lamphouse monitor cable to the lamphouse.
2. Push the power toggle switch at the rear of the lamphouse to the ON (up) position. The lamp should light after approximately 5 seconds. If lamp fails to light, consult the Lamphouse Operating Manual on Page 153 of this section.
3. Set the lamp current to 35 amperes by adjusting the small black knob at the rear of the lamphouse assembly.

PROJECTOR OPERATION

1. Position the 16mm film, the 35mm magnetic tape, and the distributor handwheel in their correct starting positions, ensuring that the film and tape are properly threaded.
2. Turn on power to the system by switching the POWER ON/OFF circuit-breaker on the front of the distributor cabinet assembly to the ON (up) position. The POWER ON lamp on the front of the projector base assembly should light.
3. Ensure DOUSER REMOTE/LOCAL switch on the projector base assembly front panel is in the REMOTE position.
4. Push the 1 Ø (Phase) LOCK ON button on the front of the distributor cabinet assembly. The button should light.
5. Push the LOCK button on the front of the projector base assembly. The button should light.
6. Push the INTLK button on the RCA FR-10 Sound Reproducer. The button should light. The RCA Sound Reproducer is now interlocked with the Projector.

NOTE: If any motion is detected when each machine is locked, this means that the machine was not in its correct starting position.

7. Push the 3 Ø LOCK ON button on the front of the distributor cabinet assembly. The button should light, and the 1 Ø LOCK ON button should extinguish. The Projector and RCA Sound Reproducer are now in 3 Ø (HARD) lock.

8. The Projector and RCA Sound Reproducer will start when a RUN command from the show programmer energizes K5 Relay (on schematic diagram) in the distributor cabinet assembly. The system can also be started manually by pushing the RUN DISTRIBUTOR button on the front of the distributor cabinet assembly. Adjust the soft start acceleration time via the dial on timer TD1, located in the distributor cabinet assembly (if necessary).

9. The FILM RUN counter on the front panel of the projector base assembly will step at the start of each show.

10. The douser will open and close as commanded by the show programmer through relays K7 and K8. Placing the DOUSER REMOTE/LOCAL switch on the projector base assembly front panel in the LOCAL position causes the douser to operate automatically.

11. The system will stop when a STOP command from the show programmer energizes K6 relay in the distributor cabinet assembly. The system may also be stopped manually, by pressing the STOP button on the front of the distributor cabinet assembly. The system will return to 3 Ø LOCK, and be ready for the next start.

12. Film breakage in the projector head, loop cabinet, or loss of the take-up loop due to torn film perforations will cause the projector drive motor to stop, the douser to close, and the system to return to 3 Ø LOCK.

13. A break in the 35mm magnetic tape will cause the RCA Sound Reproducer to drop out of lock.

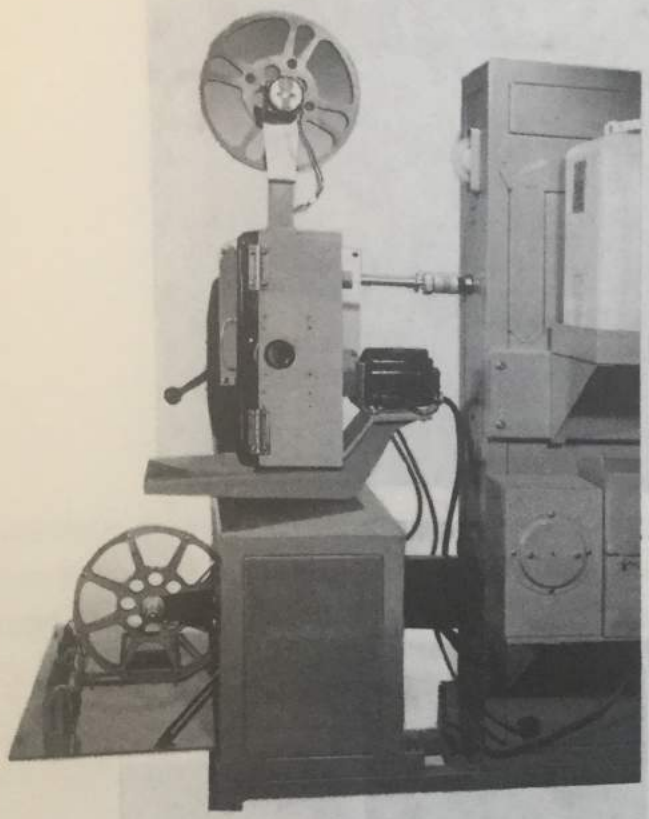


FIGURE 1
FILM LOADER TAKE-UP AND FEED UNITS

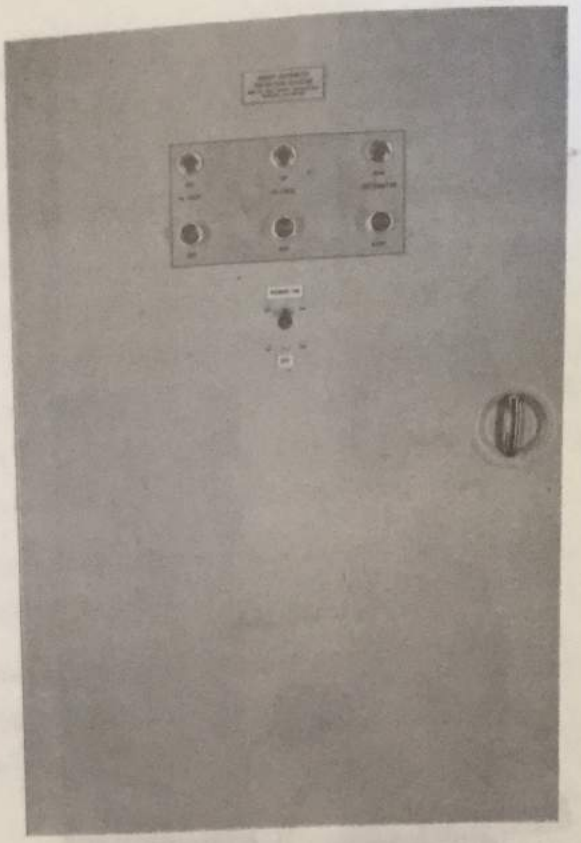


FIGURE 2
DISTRIBUTOR CABINET

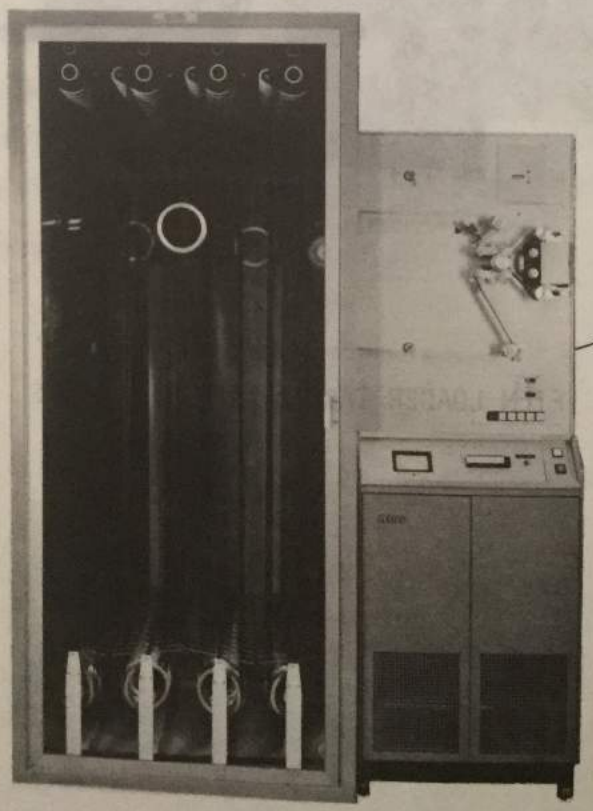


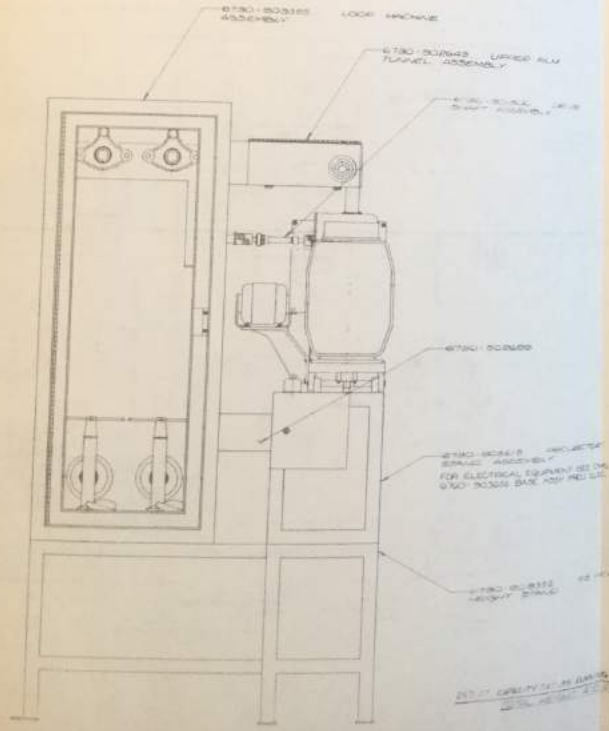
FIGURE 3
PRE-SHOW SOUND

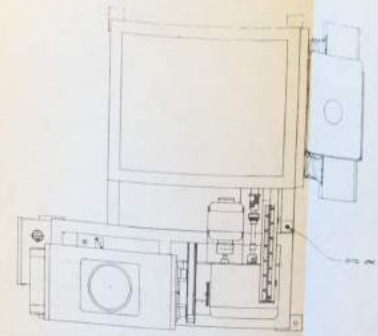
MECHANICAL DRAWINGS

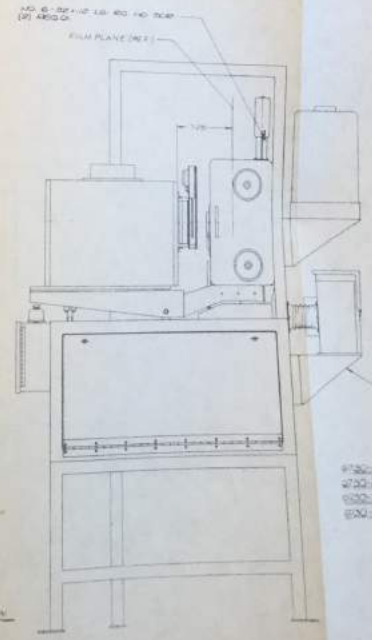
OWL PRE-SHOW

DWG NUMBER	DESCRIPTION
*6730-903617	Owl Projector System
6730-901300	Drive Shaft
6730-902643	Upper Film Tunnel
6730-903034	Humidifier Installation
*6730-903389	Owl Film Loop Cabinet
6730-901116	20 Sprocket
6730-901149	20 Spool
6730-901164	Lower Film Guide Roller
6730-901178	Short Fixed Idler Roller
6730-901179	Long Fixed Idler Roller
6730-901180	Pivot Idler Roller
6730-901194	Fixed Chain Idler
6730-901197	Adjustable Idler
6730-901753	20 Loop Safety Switch
6730-901784	Chain Drive
6730-901930	Film Lubricator
6730-901985	Humidistat
6730-902346	Lubricator Bracket
*6730-903618	Owl Projector Stand
6730-901181	Fixed Idler Roller
6730-901718	Projector Drive Motor
6730-902685	16MM Projector
6730-902687	Shuttle Oiler
6730-903143	Automatic Douser

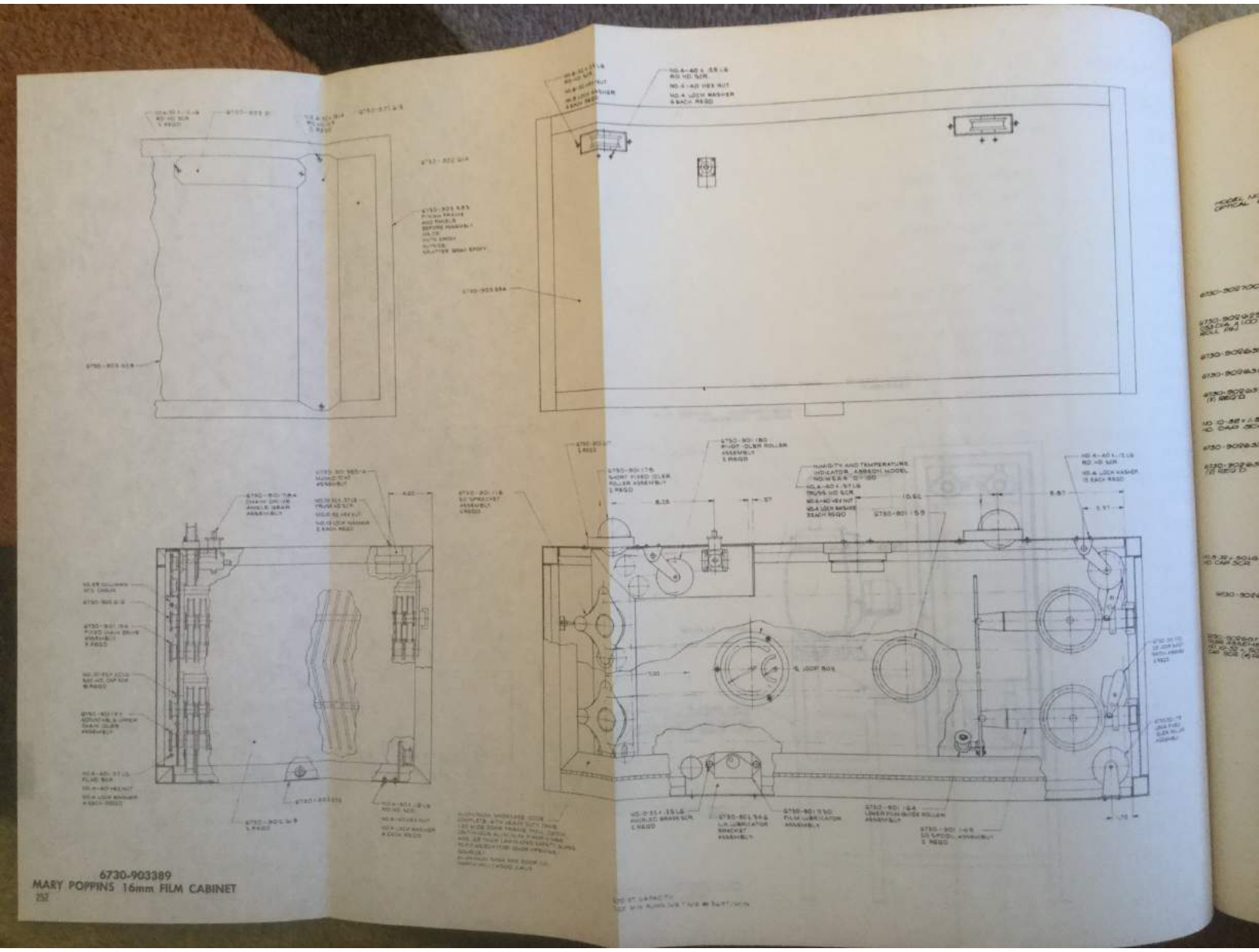
* These drawings are incorporated as a part of this section. All others are available from Supervisor, Projection Equipment, Maintenance, D/L.



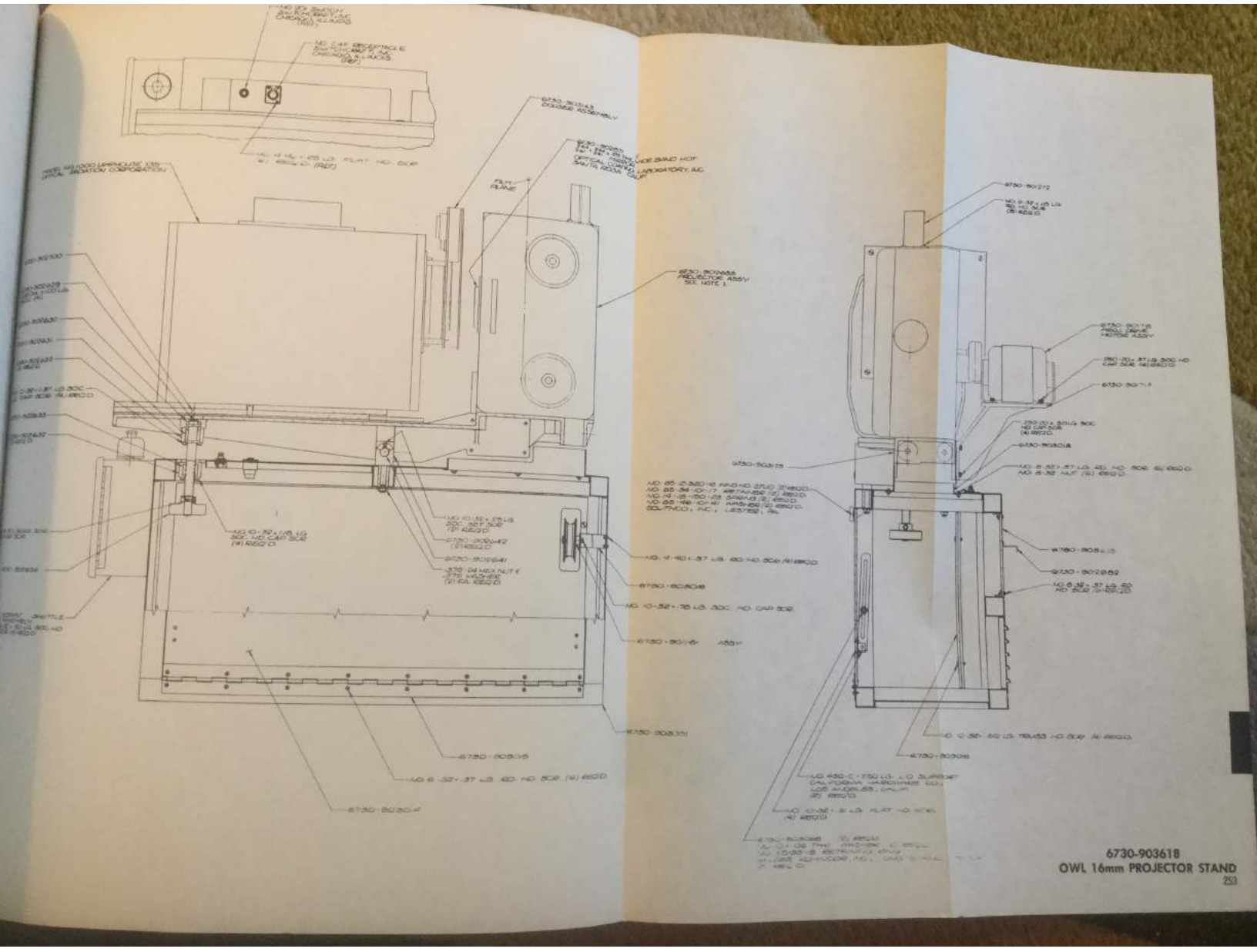




6730-902507 PROJECTOR MAINTENANCE TRAY
6730-902572 60K SPLICER ASSEMBLY
6730-901503 FILM LOADER TAKE UP ASSEMBLY
6730-902061 FILM LOADER FEED ASSEMBLY
AVAILABLE AS REQ'D

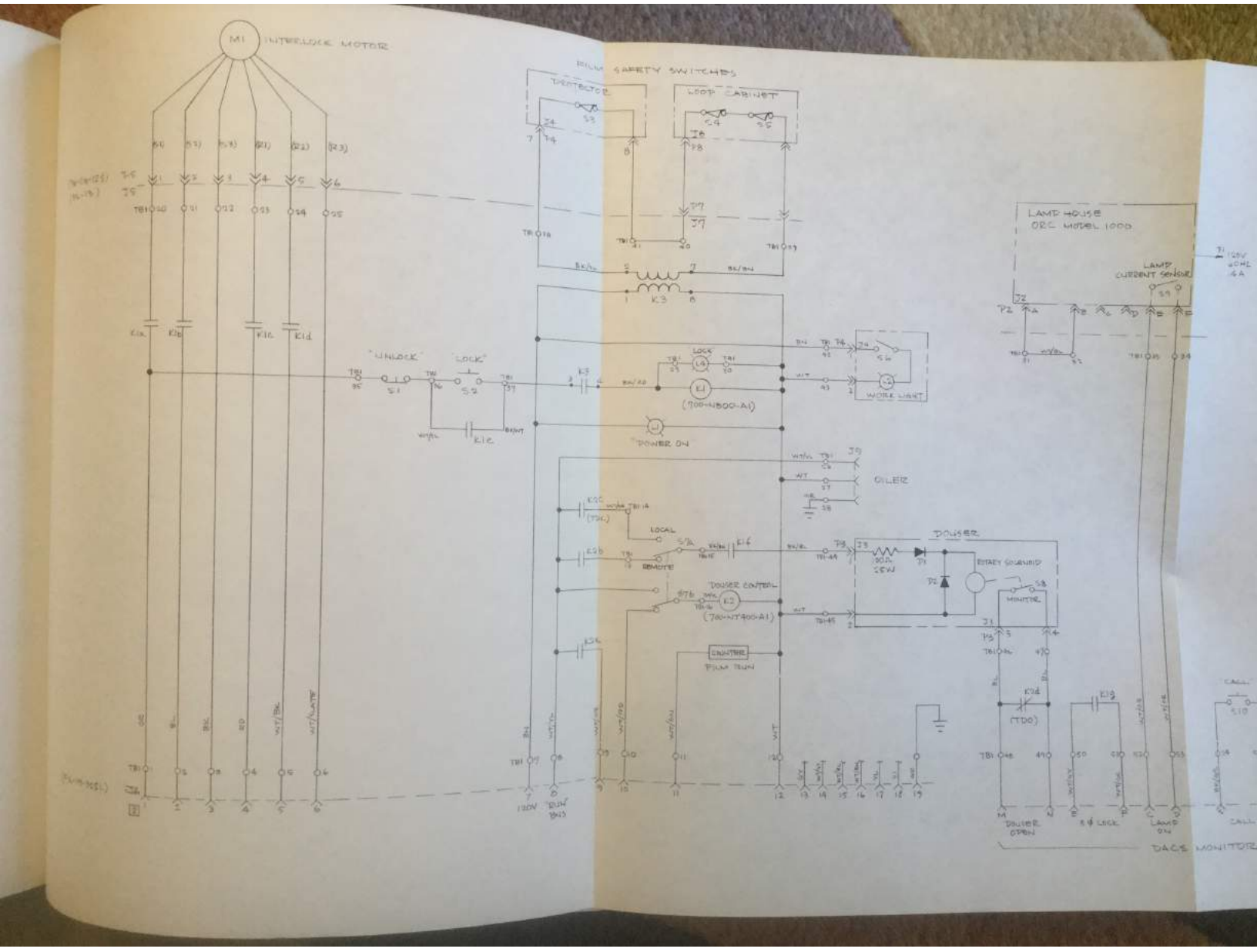


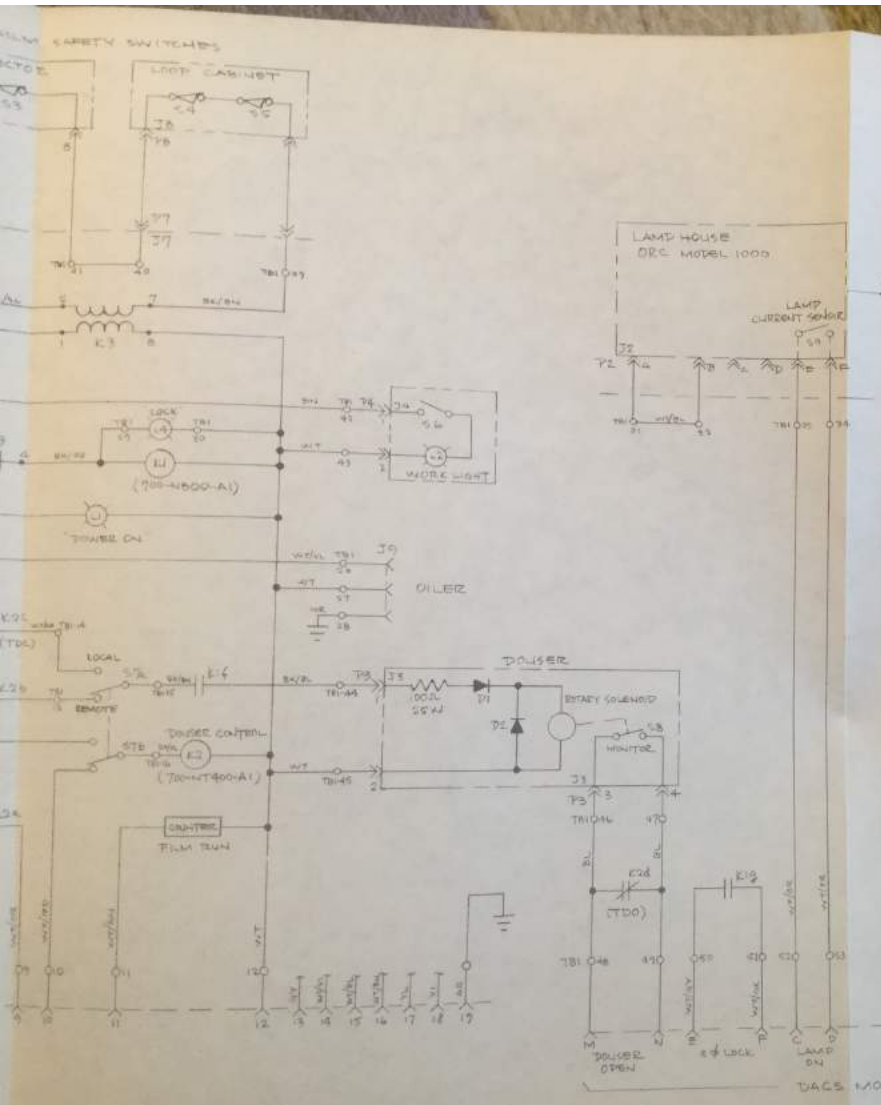
6730-903389
MARY POPPINS 16mm FILM CABINET
252

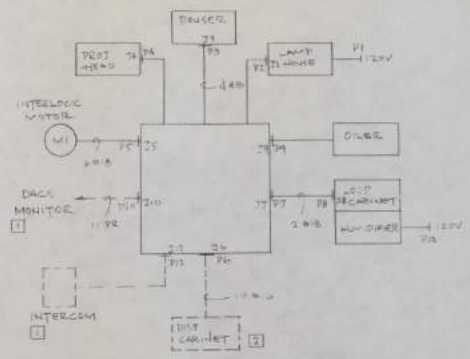


6730-903618
OWL 16mm PROJECTOR STAND

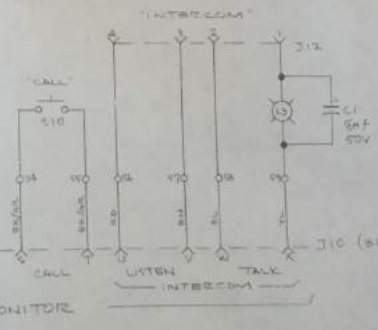
ELECTRICAL DRAWINGS


M1 INTERLOCK MOTOR
SAFETY SWITCHES
DETECTOR
LOOP CABINET
S3
S4
S5
K3
K1a
K1b
K1c
K1d
"UNLOCK"
"LOCK"
S1
S2
K12
LOCK
(700-N800-A1)
WORK LIGHT
"POWER ON"
OILER
DOUSER
LOCAL
REMOTE
S7a
S7b
K2
(700-NT400-A1)
DOUSER CONTROL
COUNTER
FILM TRAN
ROTARY SOLENOID
MONITOR
(TDO)
LAMP HOUSE
ORC MODEL 1000
LAMP CURRENT SENSOR
DOUSER OPEN
DOUSER CLOSE
LAMP ON
DACS MONITOR

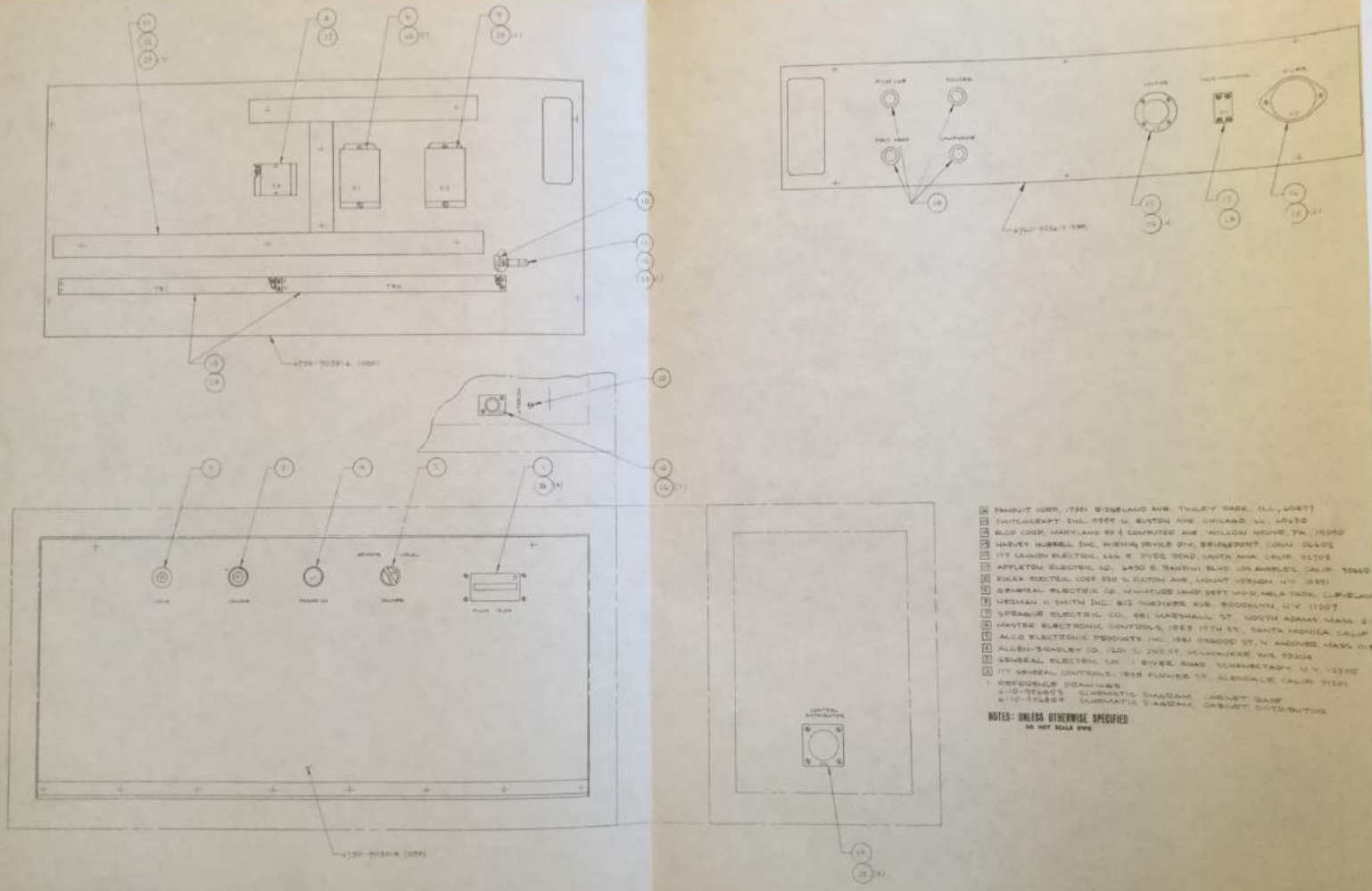




[2] SEE DRAWING NO. 6110-906854
[1] BY WED/MAPO
NOTES: UNLESS OTHERWISE SPECIFIED



6110-906853
OWL 16MM PROJECTOR BASE CABINET
SCHEMATIC DIAGRAM

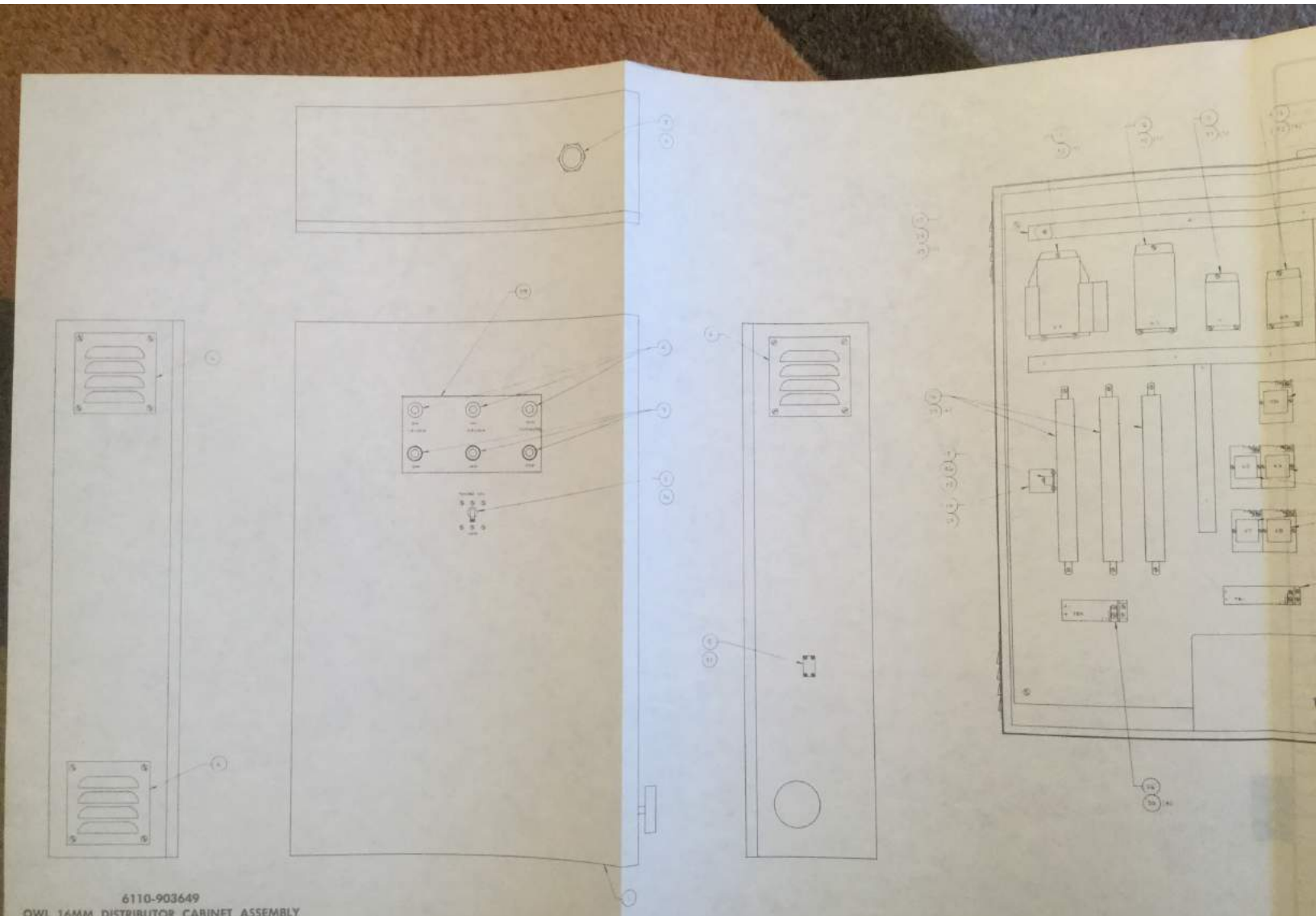


6760-903651
OWL 16MM PROJECTOR BASE ASSEMBLY
258

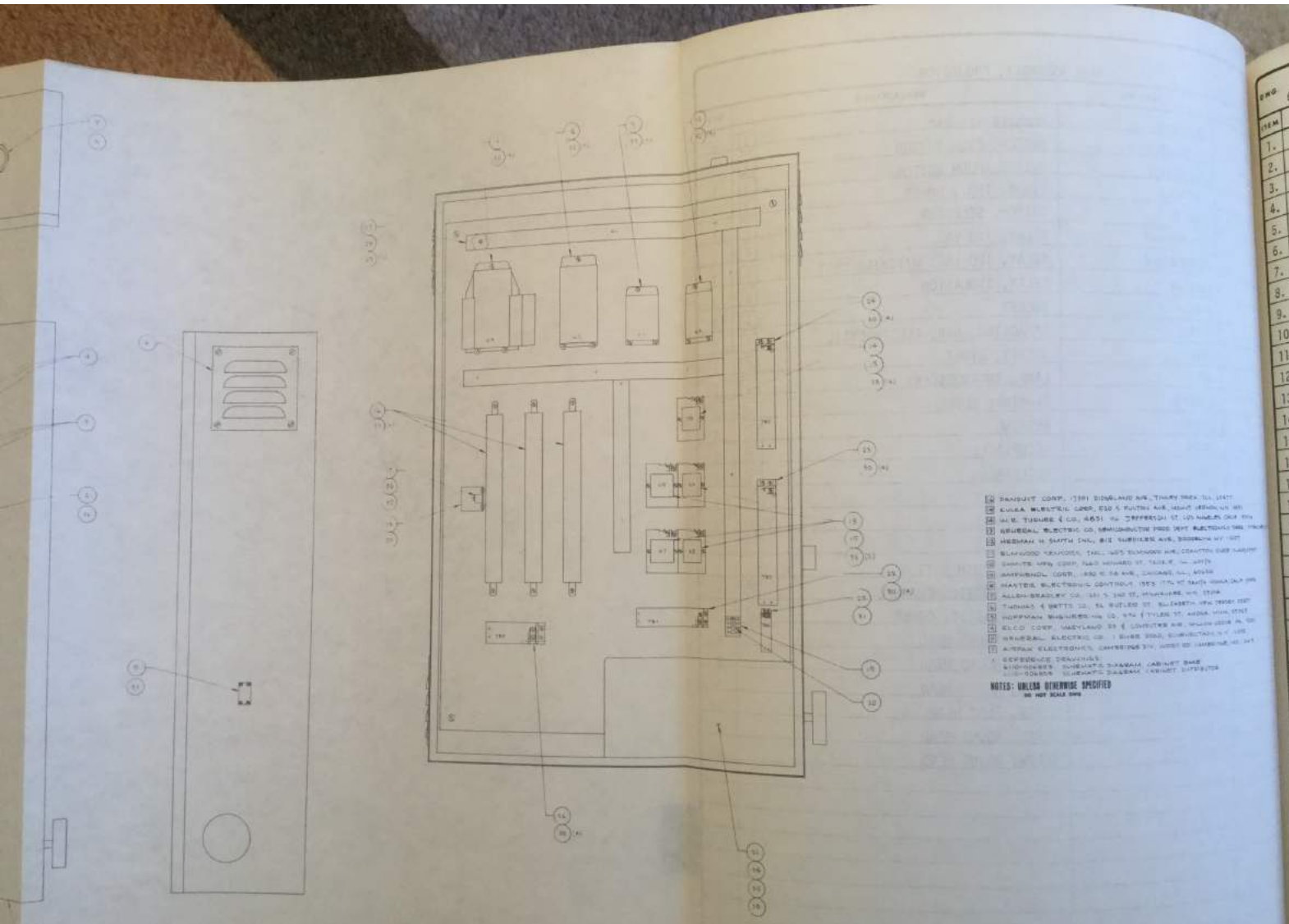
DWG. 6760-903651

BASE ASSEMBLY, PROJECTOR

ITEM	WDP NO.	PART NO.	DESCRIPTION	QTY.
1.		CE61BP602	COUNTER 120 VAC.	1
2.		CR104A8113	SWITCH, PUSH BUTTON [2]	1
3.		CR104E5321	SWITCH, PUSH BUTTON [3]	1
4.		CR104C432	LIGHT, IND., AMBER [3]	1
5.		CR104B121	SWITCH, SELECTOR [3]	1
6.		700-N800-A1	RELAY, 120 VAC. [3]	1
7.		700-NT400-A1	RELAY, 120 VAC. W/TIMING UNIT [4]	1
8.		FRP-104	RELAY, ISOLATION [4]	1
9.		N-8	SOCKET [5]	1
10.		TE1303	CAPACITOR, 5μF, ELECTROLYTIC [6]	1
11.		1931	SOCKET, LIGHT [7]	1
12.		313	LAMP, INCANDESCENT [8]	1
13.		670A-30	TERMINAL BLOCK [9]	1
14.		CG1838	BUSHING [10]	2
15.		P6-13	RECEPTACLE [11]	4
16.		5256	RECEPTACLE [12]	1
17.		816-020-000-707	RECEPTACLE [13]	1
18.		D4F	RECEPTACLE [14]	1
19.		FK-19-32SL	RECEPTACLE [15]	1
20.		201	RECEPTACLE [12]	1
21.		E1X1LG6	SWITCH, PUSH BUTTON [15]	1
22.		C1LG6	DUCT, PLASTIC, CHANNEL [16]	1
23.		6-32 X 1/4	DUCT, PLASTIC, COVER [16]	1
24.		10-32 X 1/2	SCREW, ROUND HEAD	8
25.		10-32 X 1/4	SCREW, ROUND HEAD	8
26.		4-40 X 1/4	SCREW, ROUND HEAD	4
27.		4-40 X 7/8	SCREW, FLAT HEAD	10
28.		2-56 X 1/2	SCREW, ROUND HEAD	2
			SCREW, ROUND HEAD	4



6110-903649
OWL 16MM DISTRIBUTOR CABINET ASSEMBLY
280



NOTES: UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DWG

ENG. 6110-90

ITEM	WDF N
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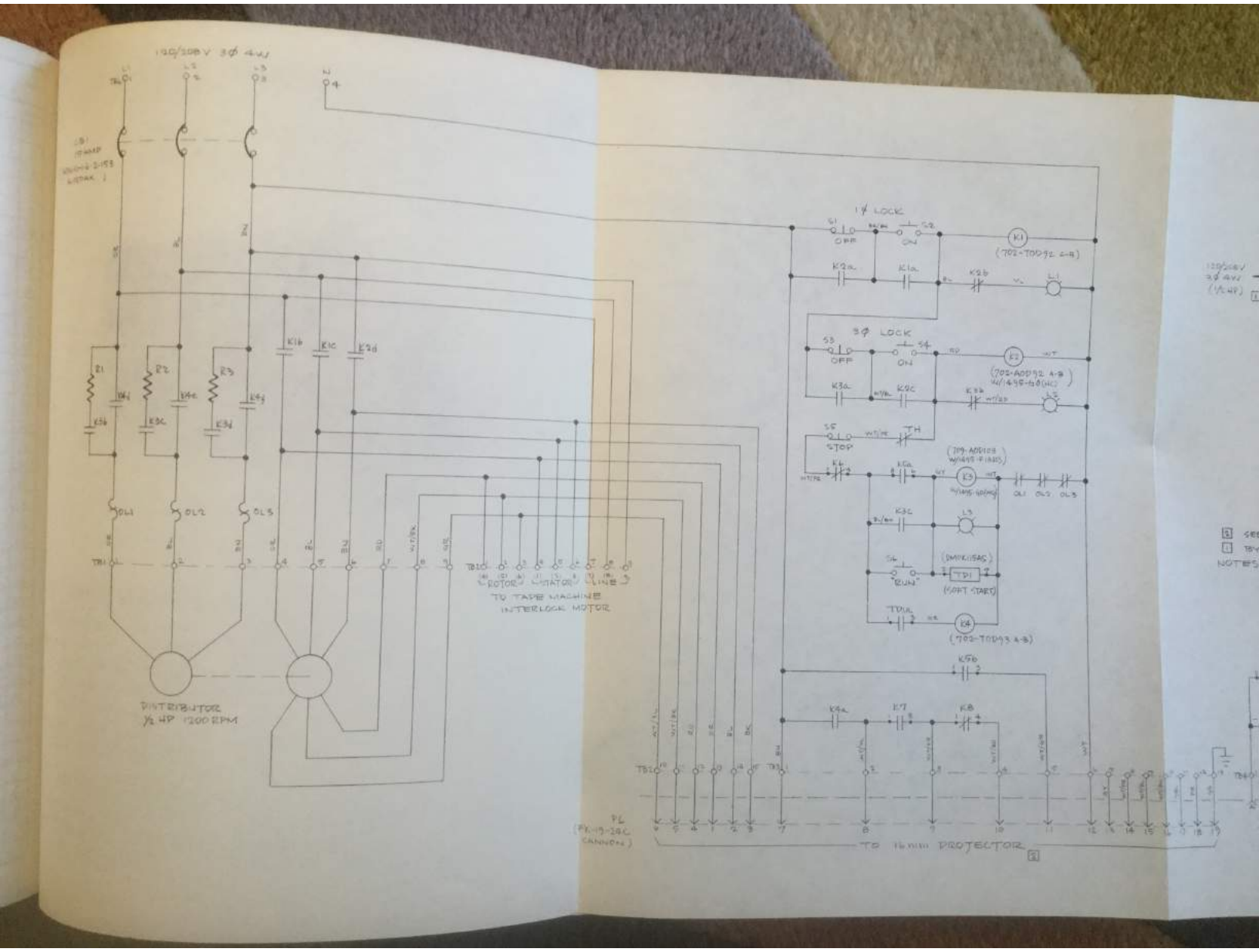
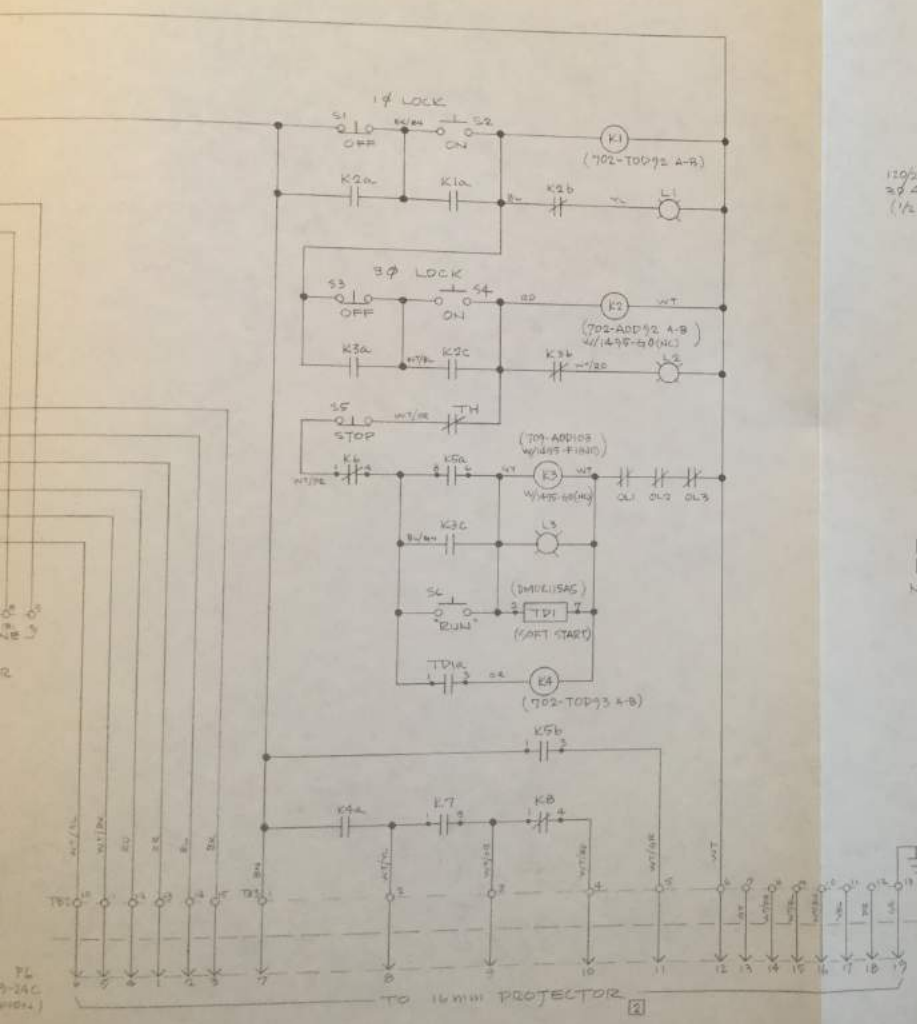
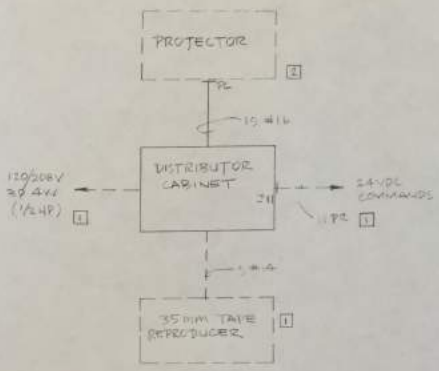
6110-903649 CABINET ASSEMBLY, DISTRIBUTOR

ITEM NO.	WDP NO.	PART NO.	DESCRIPTION	QTY.
1.		5975-903650 SHEETS 1 2	CABINET, DISTRIBUTOR	1
2.		APG111-1-6-2-153	CIRCUIT BREAKER	1
3.		CR104A8113	SWITCH PUSH BUTTON (RED) [2]	1
4.		CR104E5321	SWITCH PUSH BUTTON (ILL GRN) [3]	3
5.		8016-020-000-707	RECEPTACLE [3]	3
6.		AVK44	LOUVER PLATE KIT [4]	1
7.		2542	CONNECTOR, PORTABLE CORD [5]	3
8.		143AL	LOCKNUT [6]	1
9.		702-T0D92	CONTACTOR AC, 2 POLE [6]	1
10.		702-A0D93	CONTACTOR AC, 3 POLE [7]	1
11.		702-A0D103	CONTACTOR AC, 3 POLE [7]	1
12.		702-T0D93	CONTACTOR AC, 3 POLE [7]	1
13.		GV-24VDC-DPDT	RELAY DPDT, 24 VDC [7]	1
14.		DMOK115A5	RELAY, DPDT, 115V [8]	4
15.		146-103	SOCKET, RELAY [8]	1
16.		5Ω, 225W 1356	RESISTOR, AJUSTABLE [9]	5
17.		L250-3455-87-69	SENSOR, THERMOSTATIC [10]	3
18.		6730-906732	BRACKET, SUPPORT [11]	1
19.		2811	TERMINAL BOARD, SCORED [12]	1
20.		10D2	DIODE, SILICON [13]	4
21.		6S6112-4L8	MOTOR, DISTRIBUTOR [14]	1
22.		671-9	TERMINAL BLOCK [15]	1
23.		670-15	TERMINAL BLOCK [15]	1
24.		670-13	TERMINAL BLOCK [15]	1
25.		410-8	TERMINAL BLOCK [15]	1
26.		672-5	TERMINAL BLOCK [15]	1
27.		E1X1LG6	DUCT, PLASTIC, CHANNEL [16]	2
28.		C1LG6	DUCT, PLASTIC, COVER [16]	2
29.		6-32 X 3/8	SCREW, ROUND HEAD	18
30.		6-32 X 5/8	SCREW, ROUND HEAD	12
31.		2-56 X 3/8	SCREW, ROUND HEAD	4
32.		10-32 X 3/8	SCREW, ROUND HEAD	12
33.		6-32 X 1	SCREW, ROUND HEAD	4
34.		1/4-20 X 1/2	BOLT, HEX	4
35.		1/4-20	NUT, HEX	4
36.		6-32 X 1/4	SCREW, ROUND HEAD	2
37.		6-32	NUT, HEX	2
38.		1/4	WASHER	4

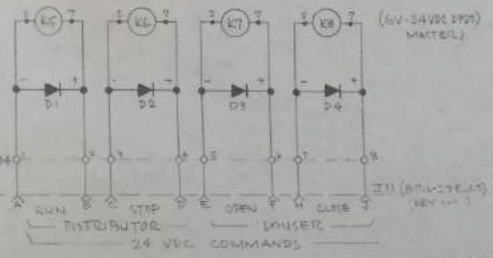

120/208 V 3Φ 4W
DISTRIBUTOR
½ HP 1200 RPM
TO TAPE MACHINE
INTERLOCK MOTOR
1Φ LOCK
3Φ LOCK
OFF
ON
STOP
"RUN"
(SOFT START)
TO 16mm PROJECTOR





BLOCK DIAGRAM

2 SEE DRAWING NO. 6110-906853
1 BY WED/MAPO
NOTES: UNLESS OTHERWISE SPECIFIED



6110-906854
OWL 16MM PROJECTOR DISTRIBUTOR CABINET
SCHEMATIC DIAGRAM

SECTION 4.5

35mm PROJECTOR Service Instructions

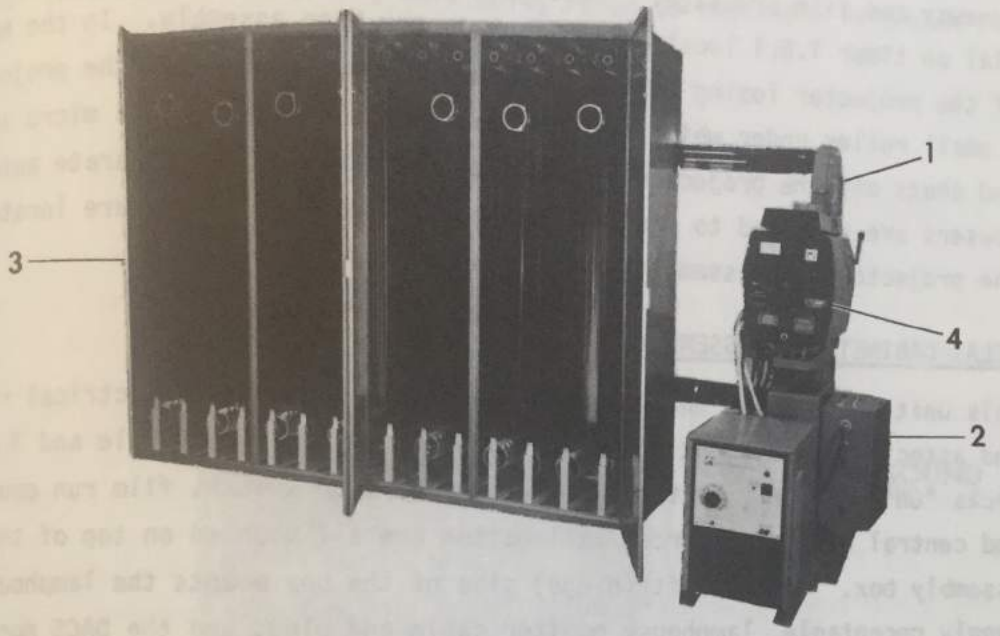


FIGURE 1

4.5.1 GENERAL DESCRIPTION

The 35MM Projector System for the Walt Disney Story comprises of (5) basic units. These are:

(1) Projector Head
(2) Relay Cabinet Base Assembly
(3) Film Cabinet
(4) Lamphouse Assembly
(5) RCA Sound Reproducer

(1) PROJECTOR HEAD ASSEMBLY

The Pro 35MM projector head is electrically interlocked to an RCA 6 track 35MM sprocketed magnetic-tape reproducer for sound. Should it be necessary to disconnect the film cabinet due to mechanical failure or extensive film

damage during daily operational hours, a take-up torque motor and controls are provided for reel to reel operation. The system is normally controlled by the Theater Control Cabinet, but manual operation from the projector is provided. A soft - start circuit is incorporated to prevent interlock motor runaway and film breakage. The acceleration time can be adjusted via the dial on timer T.D.1 located in the projector base assembly. In the event of the projector losing its loop as the film passes through the projector, a small roller under which the film passes, pulls up, trips a micro switch, and shuts off the projector to prevent film damage. Two separate automatic dousers are utilized to prevent further film damage. These are located in the projector head assembly, and lamphouse assembly.

(2) RELAY CABINET BASE ASSEMBLY

This unit, mounted on the projector pedestal, houses the electrical relays and associated equipment of the projection system. The single and 3 phase locks "ON" and "OFF" buttons, with the reel/loop switch, film run counter and central control intercom call button are all mounted on top of the relay assembly box. On the left (hinge) side of the box mounts the lamphouse power supply receptacle, lamphouse monitor cable and plug, and the DACS monitor receptacle. On the right hand side of the box mounts the drive motor, projector head, take-up torque motor, P.E.C., central control intercom and the projector loop switch receptacles, along with the system circuit breaker, and the relay box power input cable. On the underside of the box mounts the loop cabinet safety switch receptacle. The projector horizontal leveling knob protrudes through the projector pedestal below the projector casting and once the projected picture and screen are aligned, no further adjustment need be made.

(3) FILM CABINET

This enclosure where the film is stored is humidity controlled and requires very little maintenance. After the system is switched on, film travels from the cabinet, through a film tunnel to the projector, and back into the cabinet through another tunnel in an endless loop. See Figure 1 . In the event of film breakage within the cabinet, a free riding roller (each loop has one) falls, trips a safety lever connected to a mercury switch, and shuts off the projector to prevent film damage.

4.5.1 GENERAL DESCRIPTION (cont.)

(4) LAMPHOUSE ASSEMBLY

For information concerning this unit, refer to page 323 in this section of the manual.

(5) RCA FR-10 SOUND REPRODUCER

For information concerning this unit, refer to the Audio Reference Manuals.

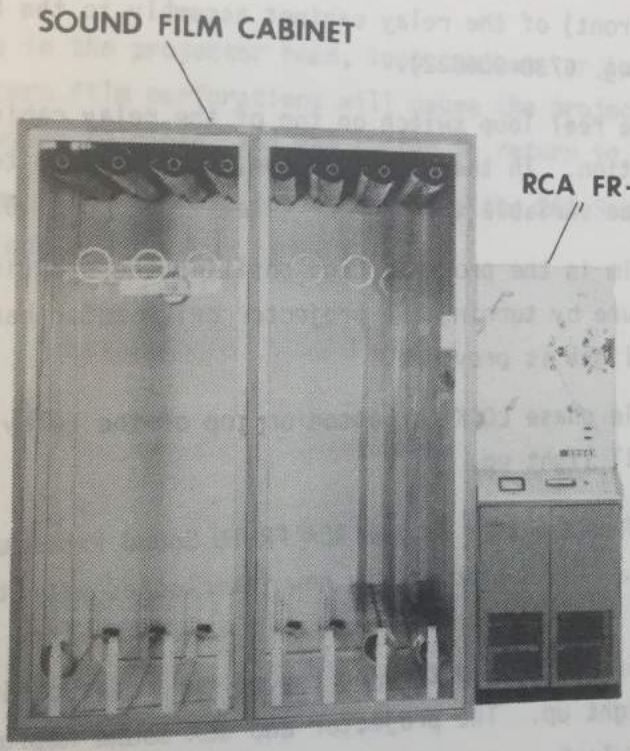


FIGURE 2

4.5.2 PRELIMINARY OPERATING INSTRUCTIONS

LAMPHOUSE OPERATION

1. Switch ON (Up) the power overload circuit breaker on the power supply below the end of the Lamphouse assembly.
2. Check that the standard-remote switch on the power supply is in the standard position.
3. Push system ON button on Lamphouse to light lamp. Adjust current control on power supply for lamp current of approximately 125 amperes (use Hanovia Lamp L5212).

PROJECTION OPERATION

1. Turn on power to the projector by switching the power circuit breaker on the right side (front) of the relay cabinet assembly to the ON (up) position. (Item #8 on Dwg. 6730-906832).
2. Check that the reel loop switch on top of the relay cabinet assembly is in the loop position. In the reel position, film take-up tension is controlled by means of the variable transformer (Item #10 on Dwg. 6730-906832).
3. Thread the film in the projector and position the starting frame in the framing aperture by turning the projector drive motor handwheel. An aperture illumination light is provided.
4. Push the single phase LOCK ON button on top of the relay cabinet assembly. The button will light up.
5. Push the INTERLOCK button on the RCA FR-10 Sound Reproducer. The button will light up. The Reproducer is now interlocked with the projector.
6. Push the 3 Phase LOCK ON button on top of the relay cabinet assembly. The button will light up. The projector and RCA Sound Reproducer are now in 3 Phase (Hard) lock.
7. The projector and RCA Sound Reproducer will start when contact closure (K8 on schematic diagram) is produced by the Theater control cabinet. The system can also be started manually by pushing the RUN button on top of the relay cabinet assembly.
8. Adjust the soft start acceleration time via the dial on timer TD1 in the relay cabinet assembly if necessary.

4.5.2 PRELIMINARY OPERATING INSTRUCTIONS (cont.)

PROJECTION OPERATION (Cont'd.)

9. The FILM RUNS counter on top of the relay cabinet assembly will step at the start of each show.

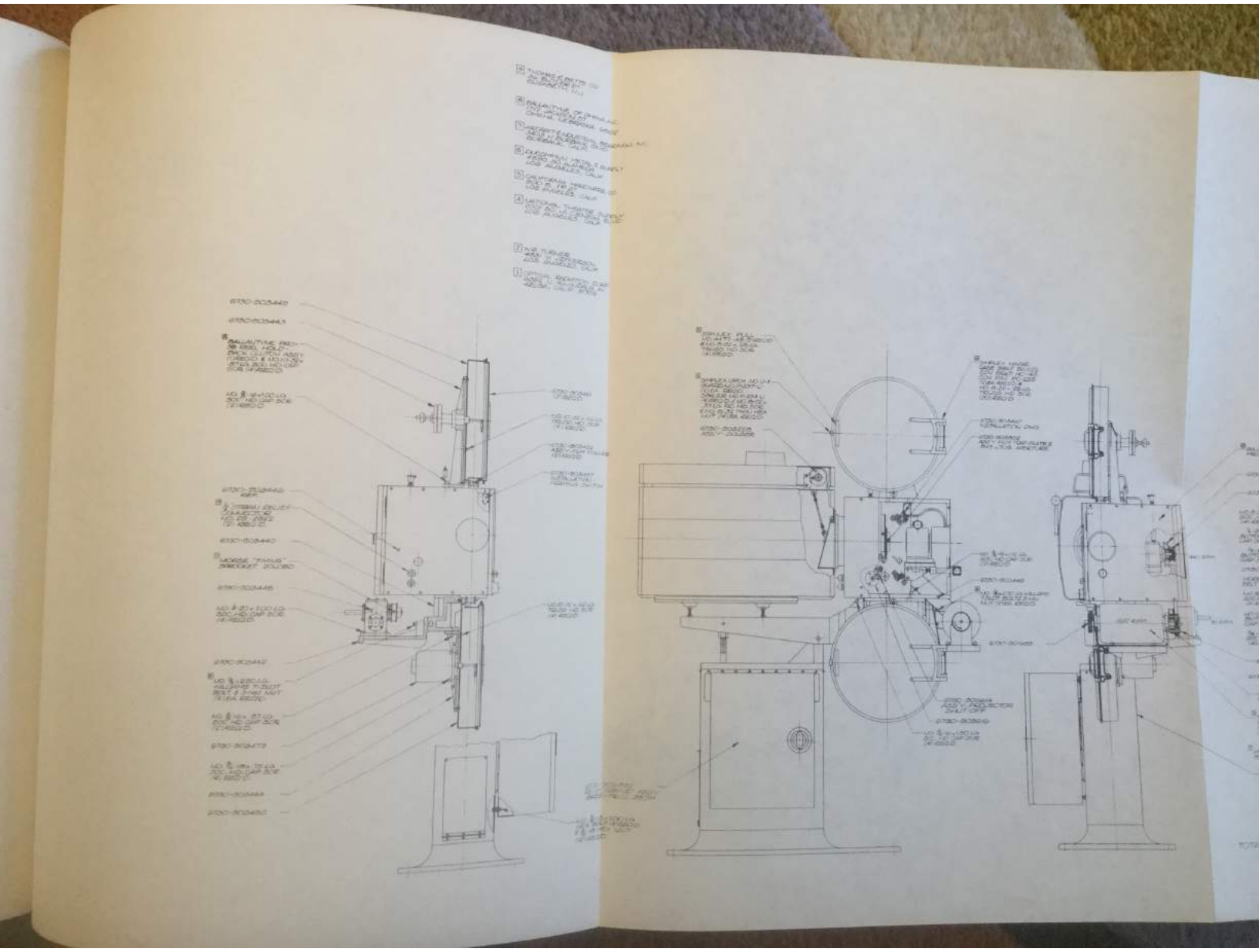
10. The Automatic Dousers in the projector head and the lamphouse will open after the pneumatic timer (contacts K4F and K4E respectively) relay K4 times out.

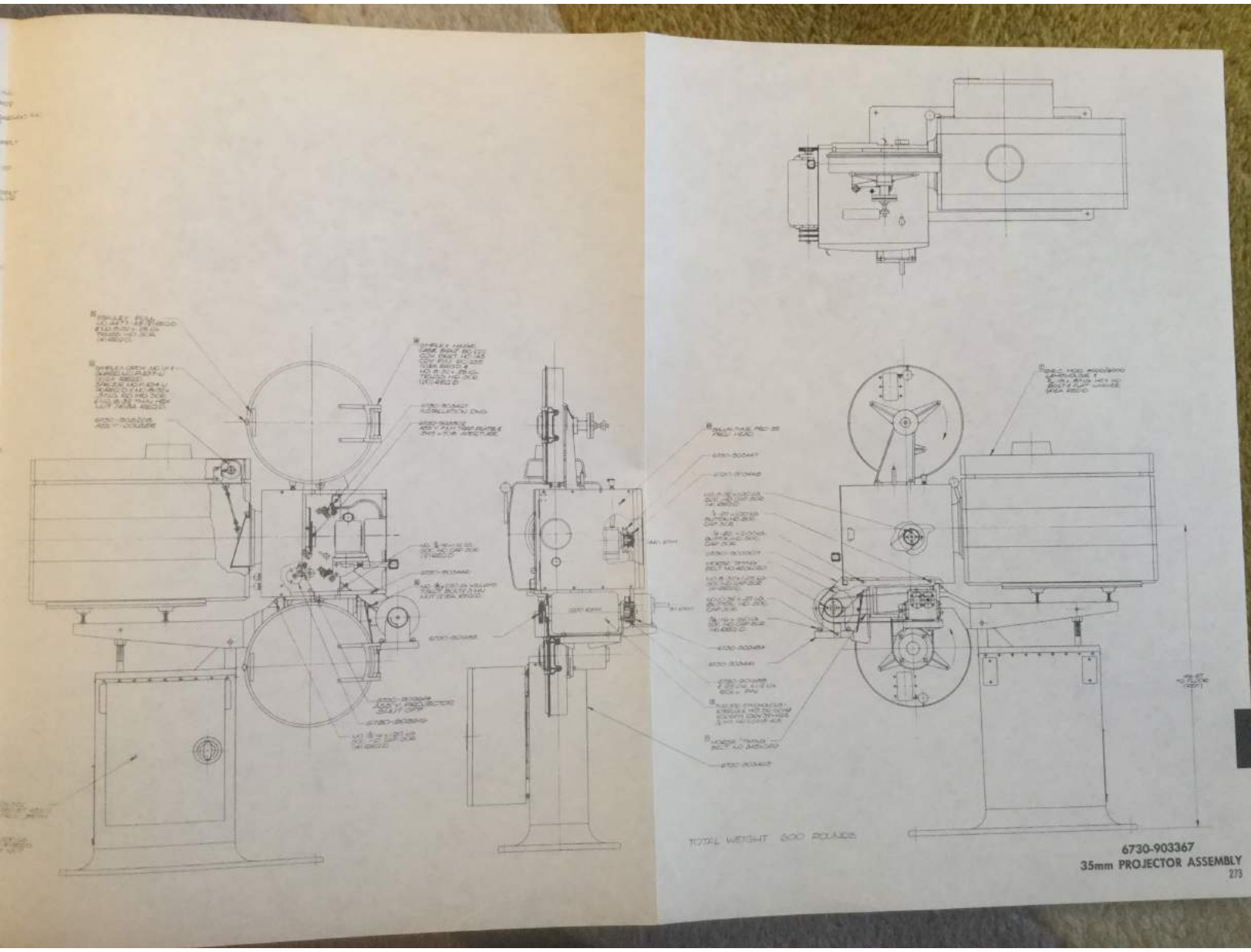
11. The fiber optic photoelectric control (PEC) was provided to sense a white cue mark on the film near the end of the show. This signal is conditioned by the pulse stretcher (TD2) to provide a contact closure (TD2b) of sufficient duration to start the show program timer. This function, however, is now provided by a tone on the 35MM tape so that the PEC may be used for other purposes.

12. Film breakage in the projector head, loop cabinet, or loss of the take-up loop due to torn film perforations will cause the projector drive motor to stop, the dousers to close, and the system to return to 3 Phase lock.

13. A break in the 35mm magnetic tape will cause the RCA Sound Reproducer to drop out of lock.

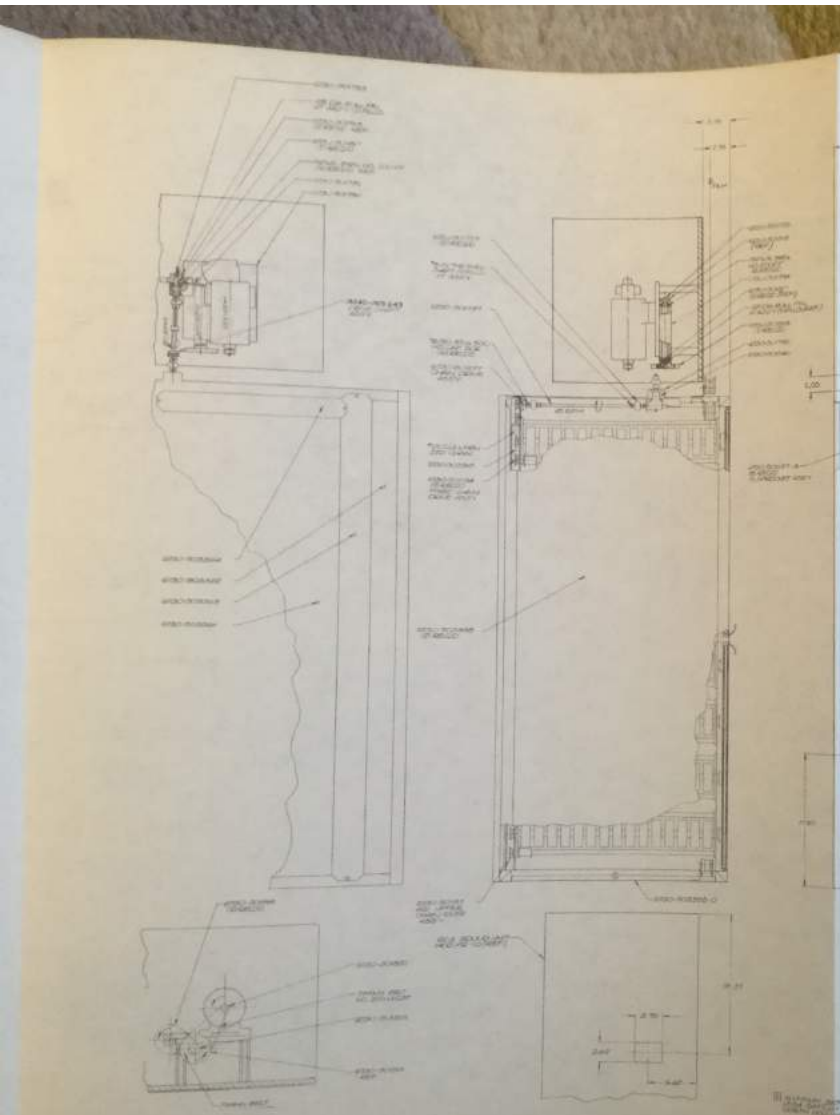
MECHANICAL DRAWINGS

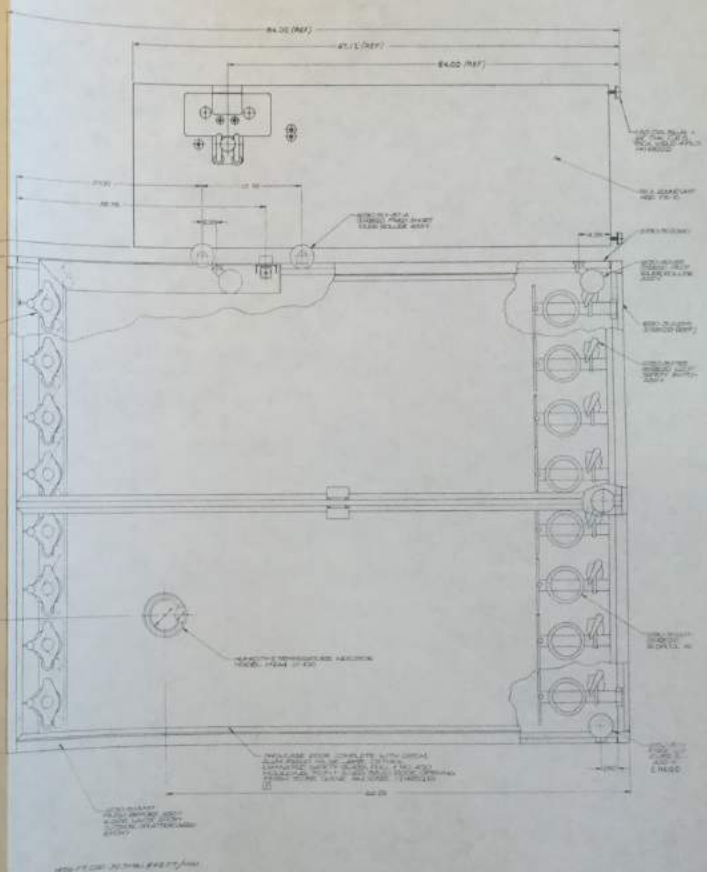




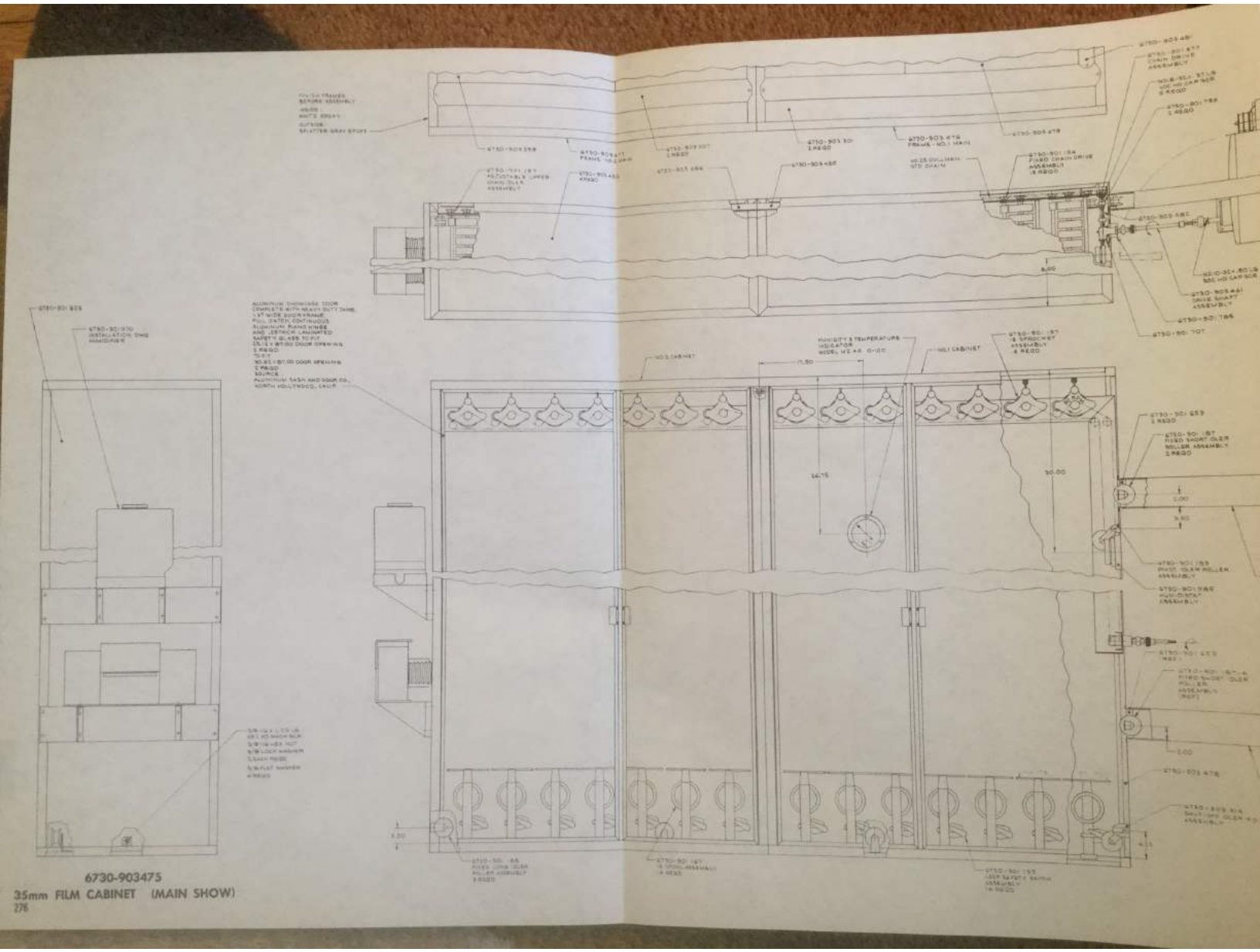
TOTAL WEIGHT 600 POUNDS

6730-903367
35mm PROJECTOR ASSEMBLY
273



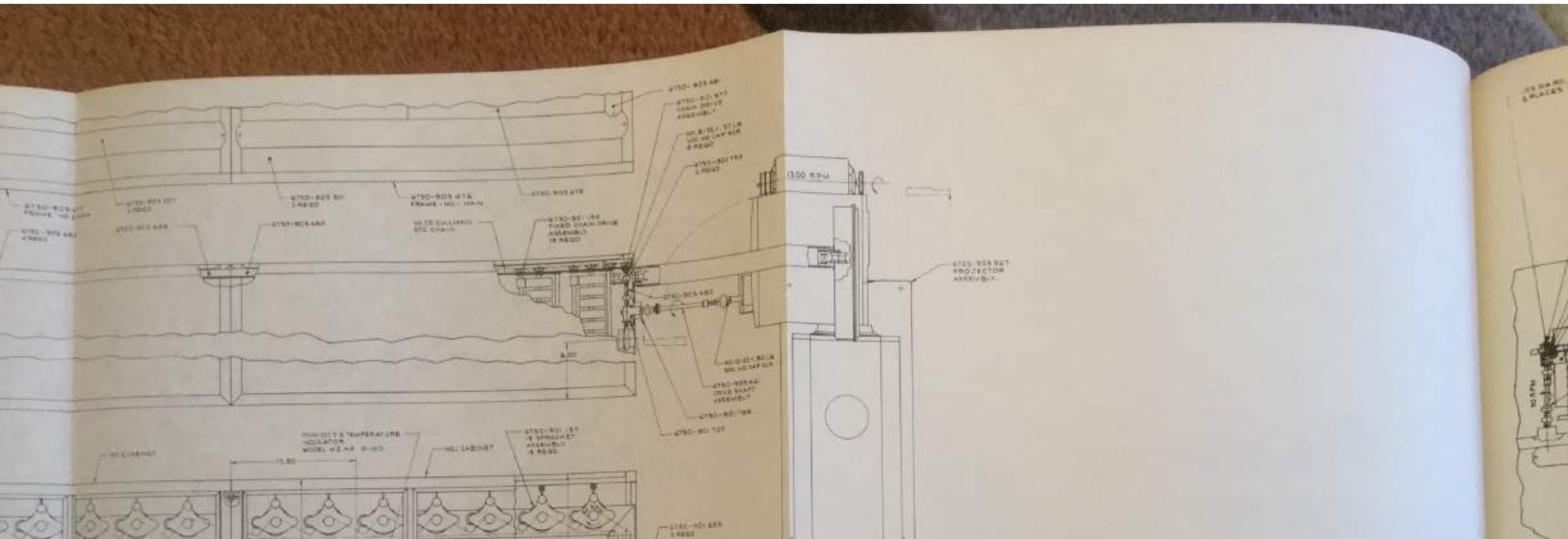


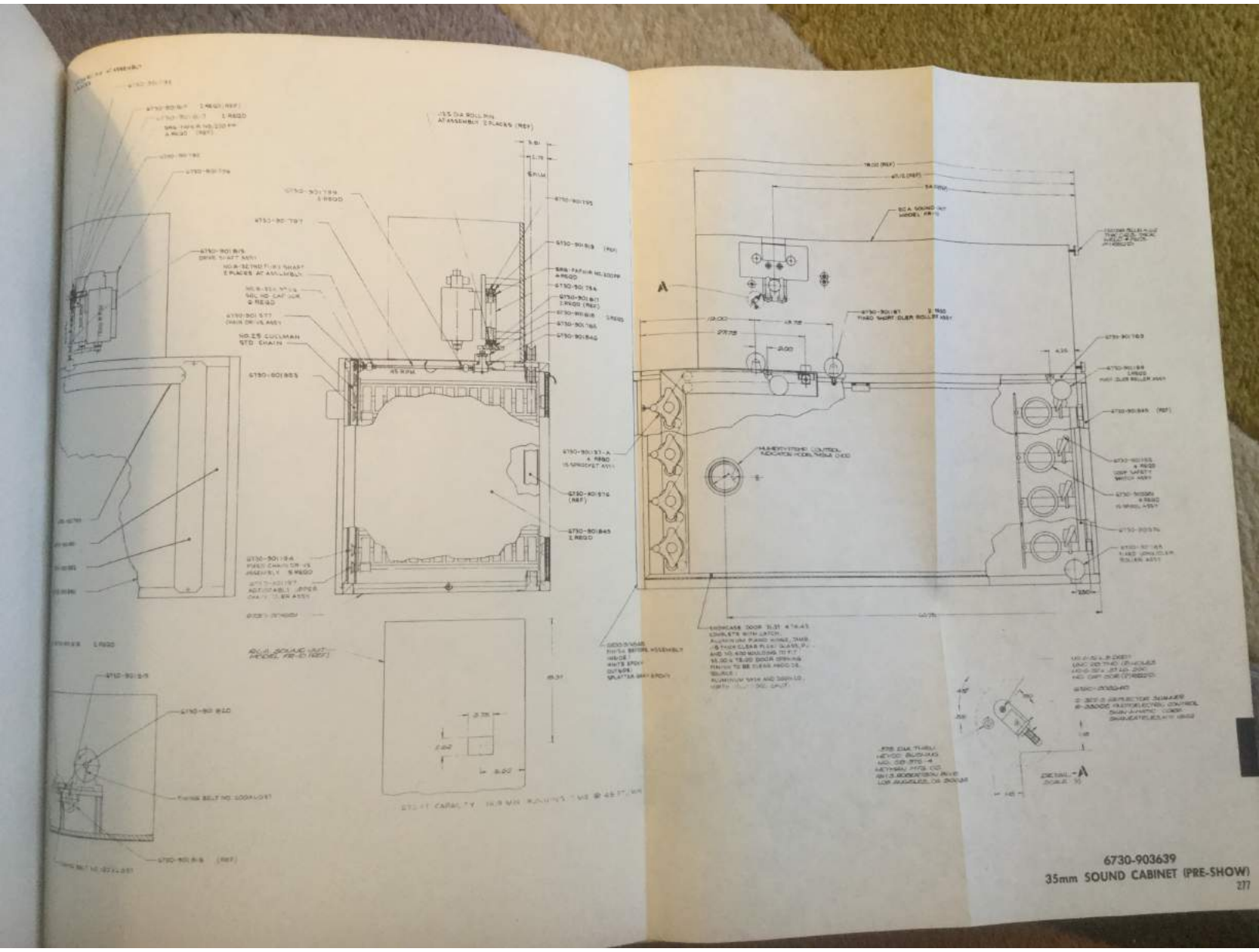
6730-903356
35mm SOUND CABINET (MAIN SHOW)
275



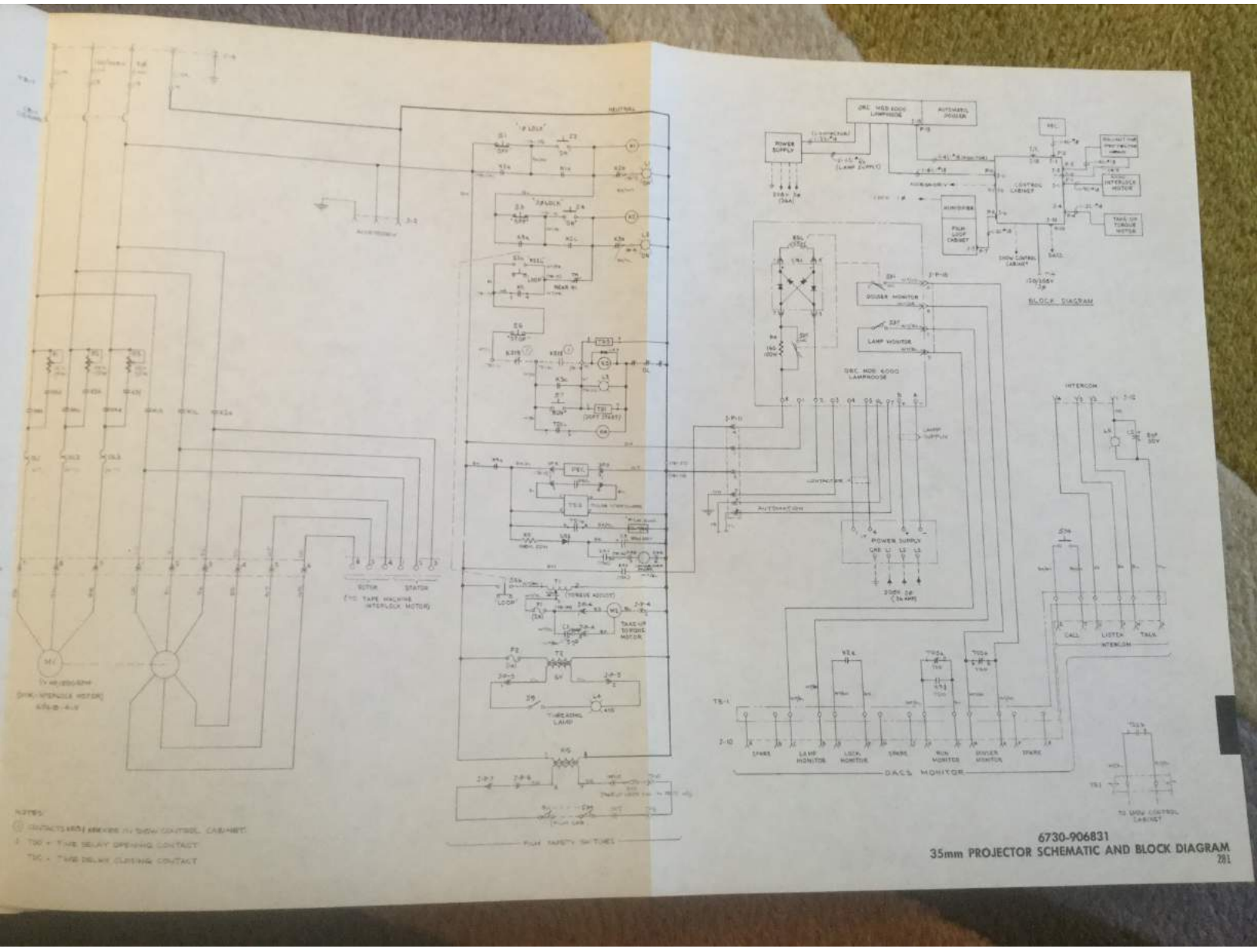
6730-903475

35mm FILM CABINET (MAIN SHOW)

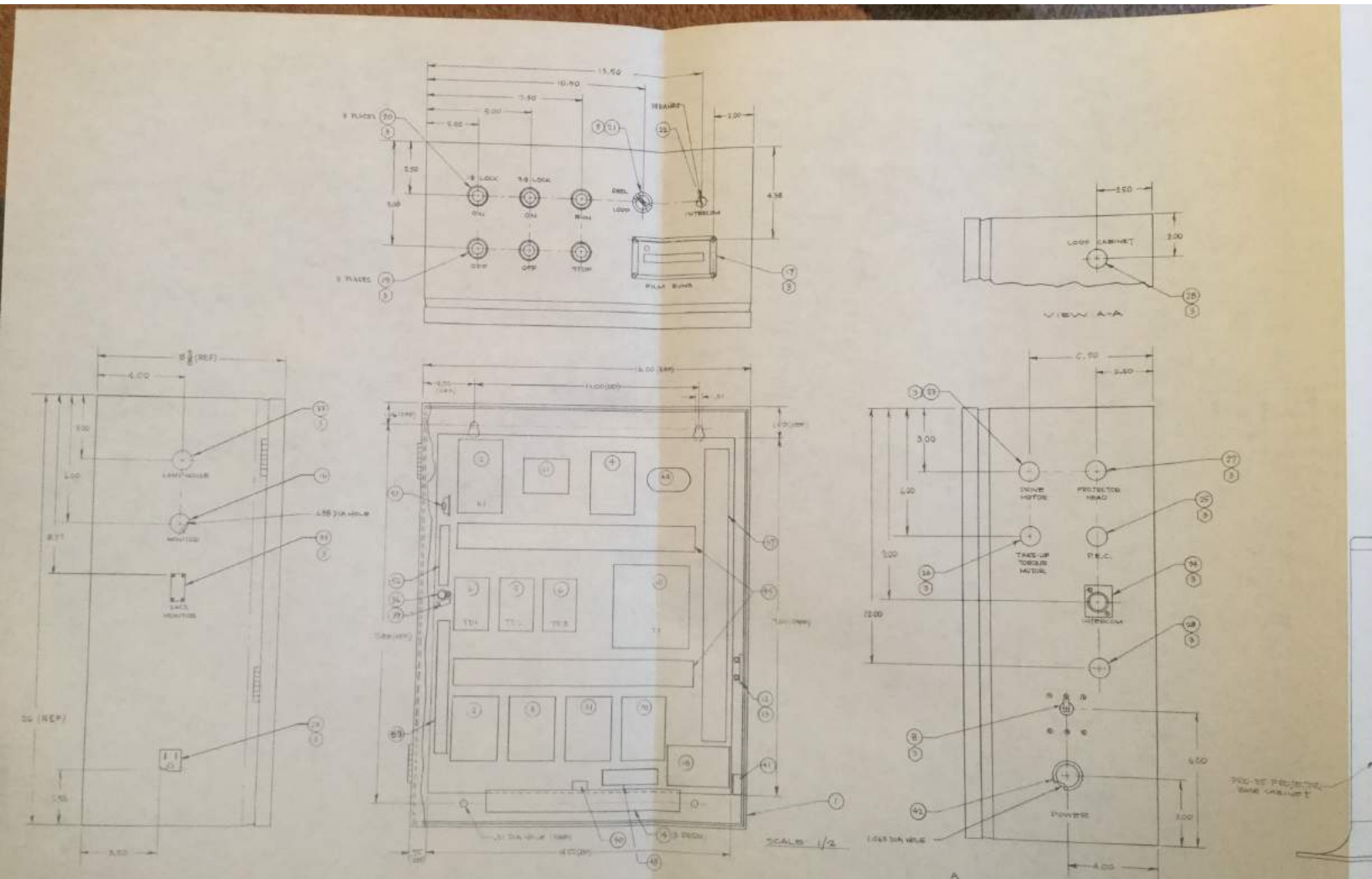

1300 RPM
PROJECTOR ASSEMBLY
HUMIDITY & TEMPERATURE INDICATOR
NO.1 CABINET
TUNNEL IDLER ROLLER ASSEMBLY
AUXILIARY DRIVE UNIT ASSEMBLY
FILM LOADER ASSEMBLY
2700 FT CAPACITY
RUNNING TIME @ 90 FT/MIN



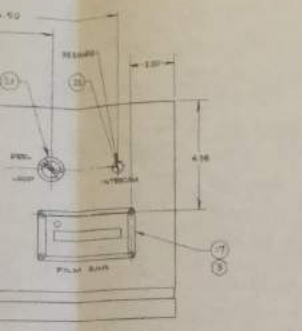
6730-903639
35mm SOUND CABINET (PRE-SHOW)
277

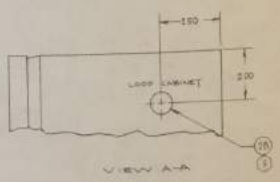


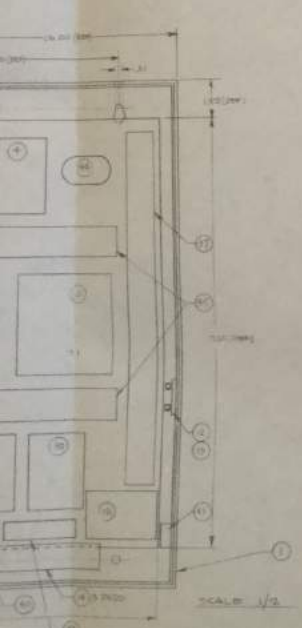
6730-906831
35mm PROJECTOR SCHEMATIC AND BLOCK DIAGRAM
201

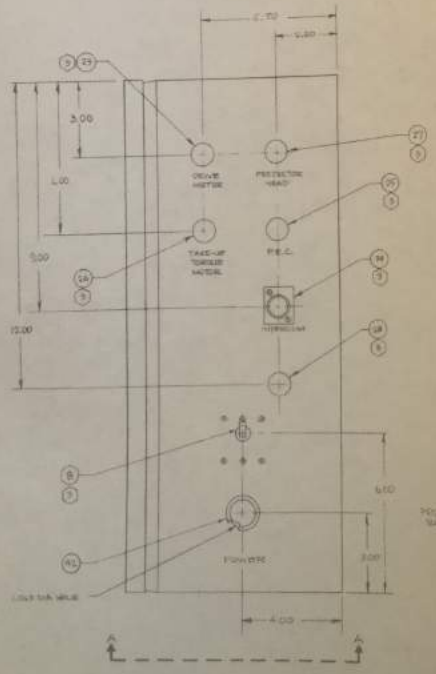


6730-906832
35mm RELAY CABINET ASSEMBLY
282

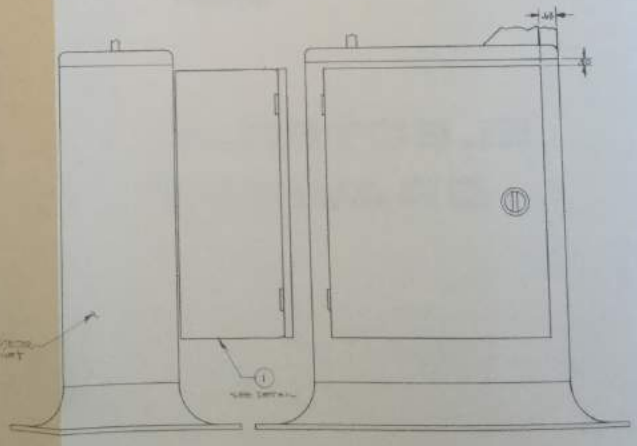








NOTES:
1. FOR SCHEMATIC DIAGRAM SEE DWG NO 9730-906831.
2. COMPONENTS ARE TO BE LOCATED APPROX. AS SHOWN. USE MOUNTING HARDWARE AS REQUIRED FROM STOCK.
3. FOR MOUNTING HOLE PATTERNS SEE DRAWING NO. 9730-906829-4 AND REMARKS COLUMN.



ITEM	
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DWG. 6730-906832 RELAY CABINET ASSEMBLY, BASE PROJECTOR 35MM SHEET 1 OF 2

ITEM	WDP NO.	PART NO.	DESCRIPTION	QTY.
1.		A-20N16B	CABINET, NEMA TYPE 1 ENCL. HOFFMAN	1
2.		700-N400-A1	RELAY, 120VAC, 4 CONTACTS, (K1)	
			ALLEN-BRADLEY	1
3.		700-N600-A1	RELAY, 120 VAC, 6 CONTACTS (K2)	
			ALLEN-BRADLEY	
4.		FRP-104	RELAY, ISOLATION (K5) ALCO	1
5.		DSOK115A5	RELAY-DELAY ON SINGLE SHOT (TD2)	
			MASTER ELEC. CONT.	1
6.		DMOK115A5	RELAY-DELAY ON MAKE (TD1,TD3)	
			MASTER ELEC. CONT.	2
7.		N-5	SOCKET-RELAY, SPADE MASTER ELECTRONIC	3
8.		APG-111-1-6-0-153	CIRCUIT BREAKER, 3P, 15A (CB1) AIRPAX	1
9.		M310A	PHOTOELECTRIC CONTROL (PEC) DOLAN-JENNER	1
10.		10B	TRANSFORMER-VARIABLE (T1) SUPERIOR	1
11.		17-7237	TRANSFORMER, 120/6V (T2) TRIAD	1
12.		356	FUSE MOUNTING 3AG (F1) LITTLEFUSE	1
13.			FUSE, 2A (F2)	1
14.		1158	RESISTOR, 25Ω, 175W (R1,2,3)OHMITE	3
15.		6730-906732 (A)	BRACKET, FOR T1	1
16.		CG1838	BUSHING APPLETON	1
17.		CE61BP602	COUNTER, 120VAC (M) ITT GEN'L CONTROLS	1
18.		815-B0V16	RELAY, OVERLOAD, 3 POLE (OL1,2,3)	
			ALLEN-BRADLEY	1
19.		CR104A8113	SWITCH, RED, PUSHBUTTON (S1,3,6) G.E.	3
20.		CR104E5321	SWITCH, GREEN, ILLUM, PUSHBUTTON	
			(S2-L1, S4-L2, S7-L3) G.E.	3
21.		CR104B122	SWITCH-SELECTOR, BLACK (S5) G.E.	1
22.		201	SWITCH, P.B. (S18) SWITCHCRAFT	1
23.		GK-9-31SL	RECEPTACLE-SOC., (P-1,PLUG, GK-9-22C-)	
			(J-1) CANNON	1
24.		227	OUTLET (J-2) KULKA	1
25.		P4-13	RECEPTACLE-SOCKET,(P3-PLUG,P4-CG-12S)	
			(J3) CANNON	1
26.		P3-13	RECEPTACLE-SOC.,(P4-PLUG,P3-CG-12S)	
			(J4) CANNON	1
27.		P5-13	RECEPTACLE-SOC.,(P5-PLUG,P2-CG-12S)	
			(J-5) CANNON	1
28.		7468	RECEPTACLE,FLN'G OUTLET(J6,J15) HUBBELL	1

DWG. 6730-906832 RELAY CABINET ASSEMBLY, BASE PROJECTOR 35MM SHEET 2 OF 2

ITEM	WDP NO.	PART NO.	DESCRIPTION	QTY
29.		7466	RECEPTACLE (J-7) HUBBELL	1
30.		700-NT600-A1	RELAY, W/PNEUMATIC TIMING UNIT (K3)	
			ALLEN-BRADLEY	1
31.		700-N400-A1	RELAY, W/PNEUMATIC TIMING UNIT (K4)	
			ALLEN-BRADLEY	1
32.		816-020-000-007	RECEPTACLE-SOCKET (J-10) ELCO	1
33.		P6-13	RECEPTACLE-SOCKET (P-11,PLUG,P6-CG-12S)	
			(J-11) CANNON	1
34.		D4F	RECEPTACLE-SOCKET (J-12) SWITCHCRAFT	1
35.		91-MC4F1	PLUG (J-13 RECEPT. 91-PC4M) (P-13)	
			AMPHENOL	1
36.		7-20	LAMPHOLDER W/313 BULB (L6) LEECRAFT G.E.	1
37.		670A-30	TERMINAL BLOCK (TB-1) KULKA	1
38.		2511	PLUG (J-14 2510 OUTLET) (P-14) HUBBELL	1
39.		TE1303	CAPACITOR, 5μF, 50V (C2) SPRAGUE	1
40.		L250-34-55-87-69	THERMOSTAT (T4) ELMWOOD	1
41.		670A-5	TERMINAL BLOCK (TB2) KULKA	1
42.		CG6275	BUSHING APPLETON	1
43.		671-4	TERMINAL BLOCK (TB3) KULKA	1
44.		P149F265	CAPACITOR, 5 μf, 330VAC (C1) AEROVOX	1
45.			PLASTIC WIRING DUCT PANDUIT	A/R
46.		3Z2RWB22-A2	SWITCH, ROLLER LEVER (S35,S36)MICROSWITCH	2
47.		0605	RESISTOR, 150 Ω, 100W, STYLE 27-100	
			(R4) OHMITE	1
48.		MDA1591-4	RECTIFIER BRIDGE ASSEMBLY (CR1)MOTOROLA	1
49.		S-8211-027	ROTARY SOLENOID (RSL) LEDEX	1
50.		AEP16J	CAPACITOR, 80 μf, 450VDC (C3) AEROVOX	1
51.		10D2	DIODE (D2) G.E.	1
52.		0321	RESISTOR, 150 Ω, 50W (R5) OHMITE	1
53.		410-22	TERMINAL BLOCK (TB4) KULKA	1