Film-Tech

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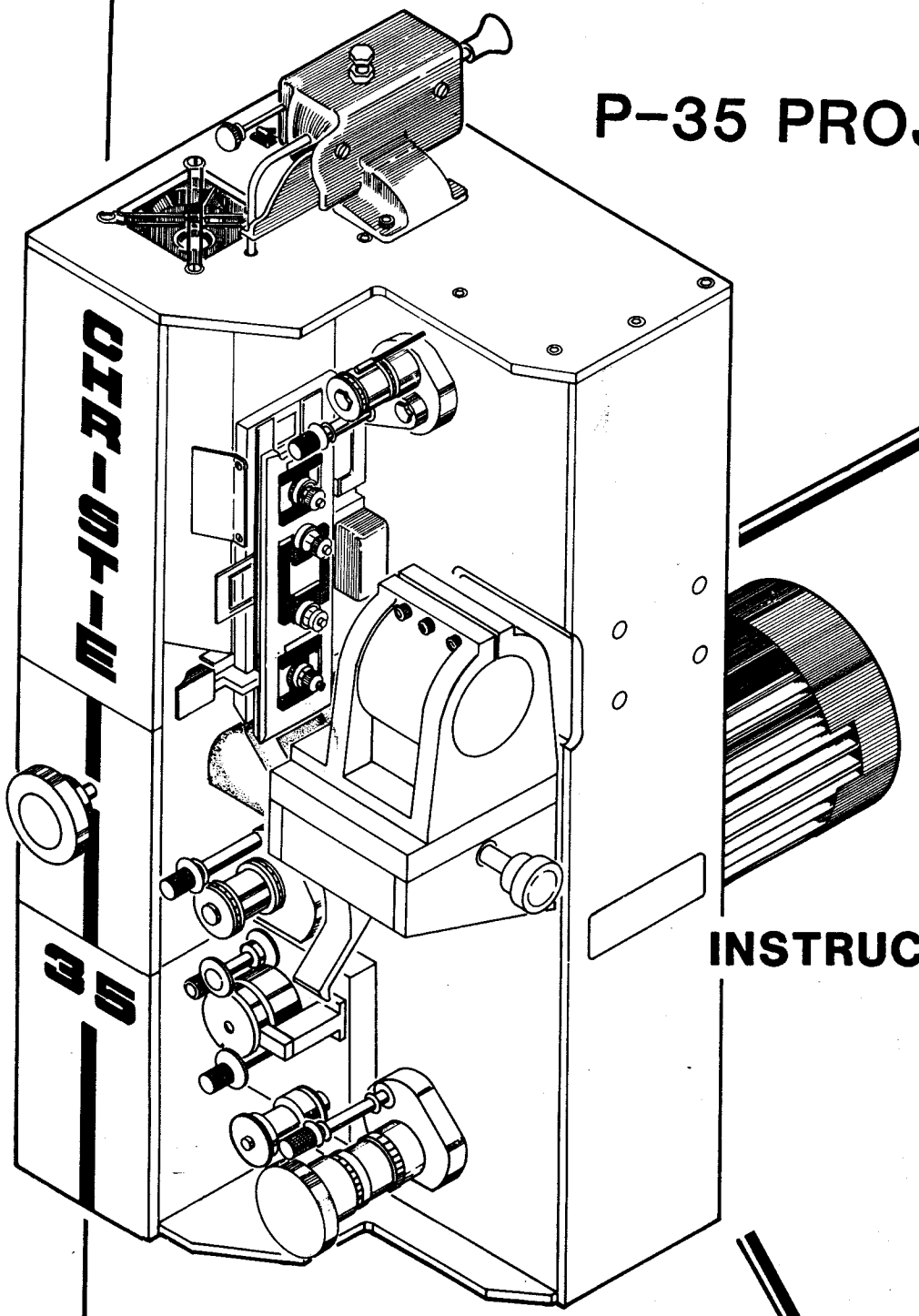
P-35 PROJECTOR



INSTRUCTION MANUAL

CHRISTIE ELECTRIC CORP.
20665 MANHATTAN PLACE
TORRANCE, CALIFORNIA 90501
1-213-320-0808

TD-385

TABLE OF CONTENTS

SECTION I

INTRODUCTION

1-1. GENERAL.

This manual contains installation, operating and operator maintenance procedures for the Christie P-35 Projector, Serial No. P-1201 and subsequent. The P-35 Projector is manufactured by Christie Electric Corp, Torrance, California.

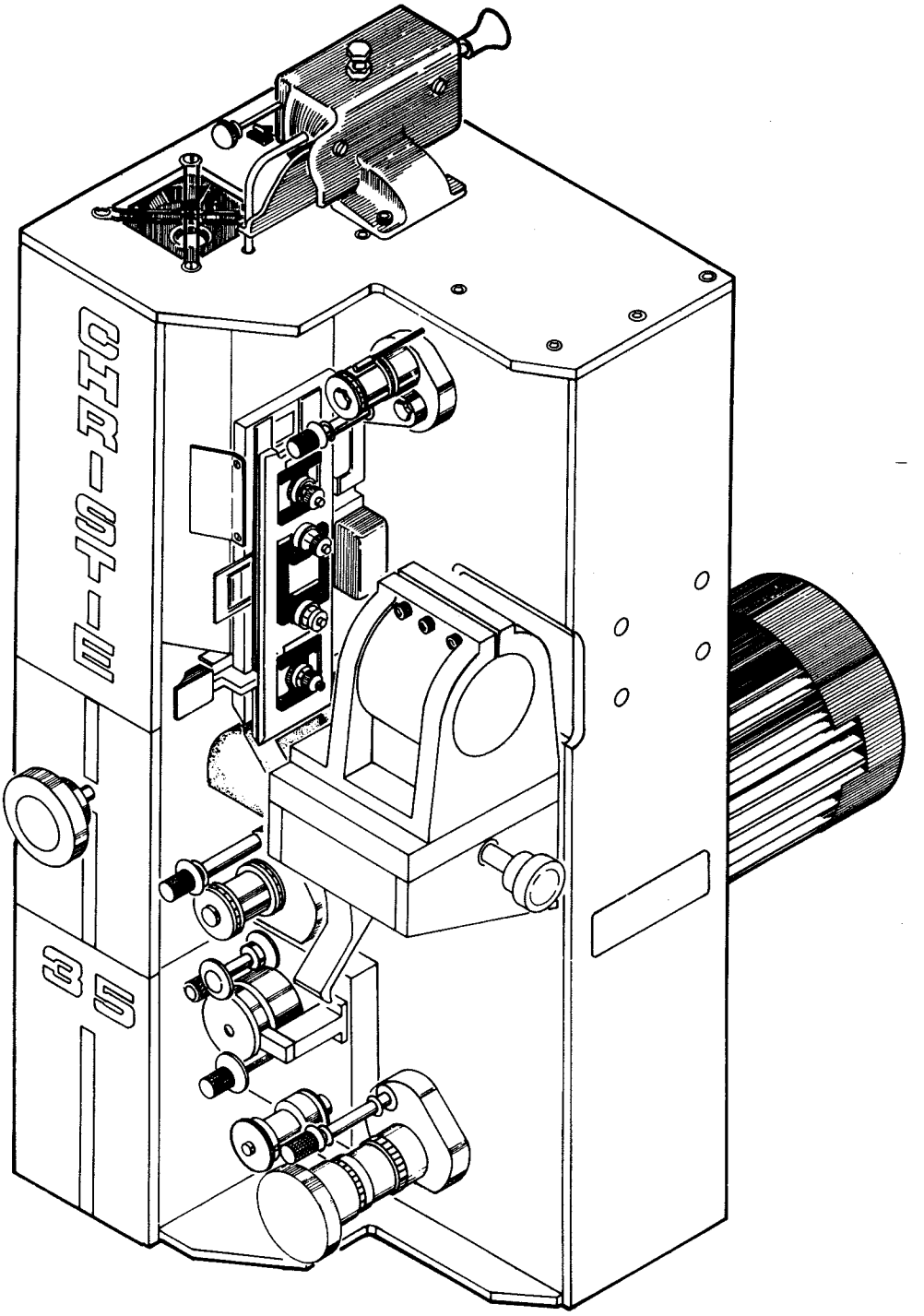
The Christie P-35 Projector (see Figure 1-1) is a single lens 35MM movie projector that operates continuously at 24 frames per second, approximately 90 feet per minute. It employs a revolutionary, sealed, ball-bearing intermittent movement (ultramittent). Both dual and triple lens holder turrets as well as auto lens operative change are available as options from Christie Electric Corp.

1-2. SPECIFICATIONS AND CHARACTERISTICS.

The technical specifications and characteristics for the projector are listed in Table 1-1.

TABLE 1-1. SPECIFICATIONS AND CHARACTERISTICS

Power Requirements:	
Power Input	5 Amps
Voltage	95 to 125 vac 50/60 hz
Dimensions:	
Height	24 1/2 inches
Width	13 3/4 inches
Depth	18 inches
Weight	Approximately 90 lbs.
Operating Environmental Tolerance:	
Temperature	0 to +45°C
Motor	Synchronous, split-phase 1800 rpm (60 cycle) 1500 rpm (50 cycle)



WITH STANDARD LENS HOLDER

FIGURE 1-1. CHRISTIE P-35 PROJECTOR

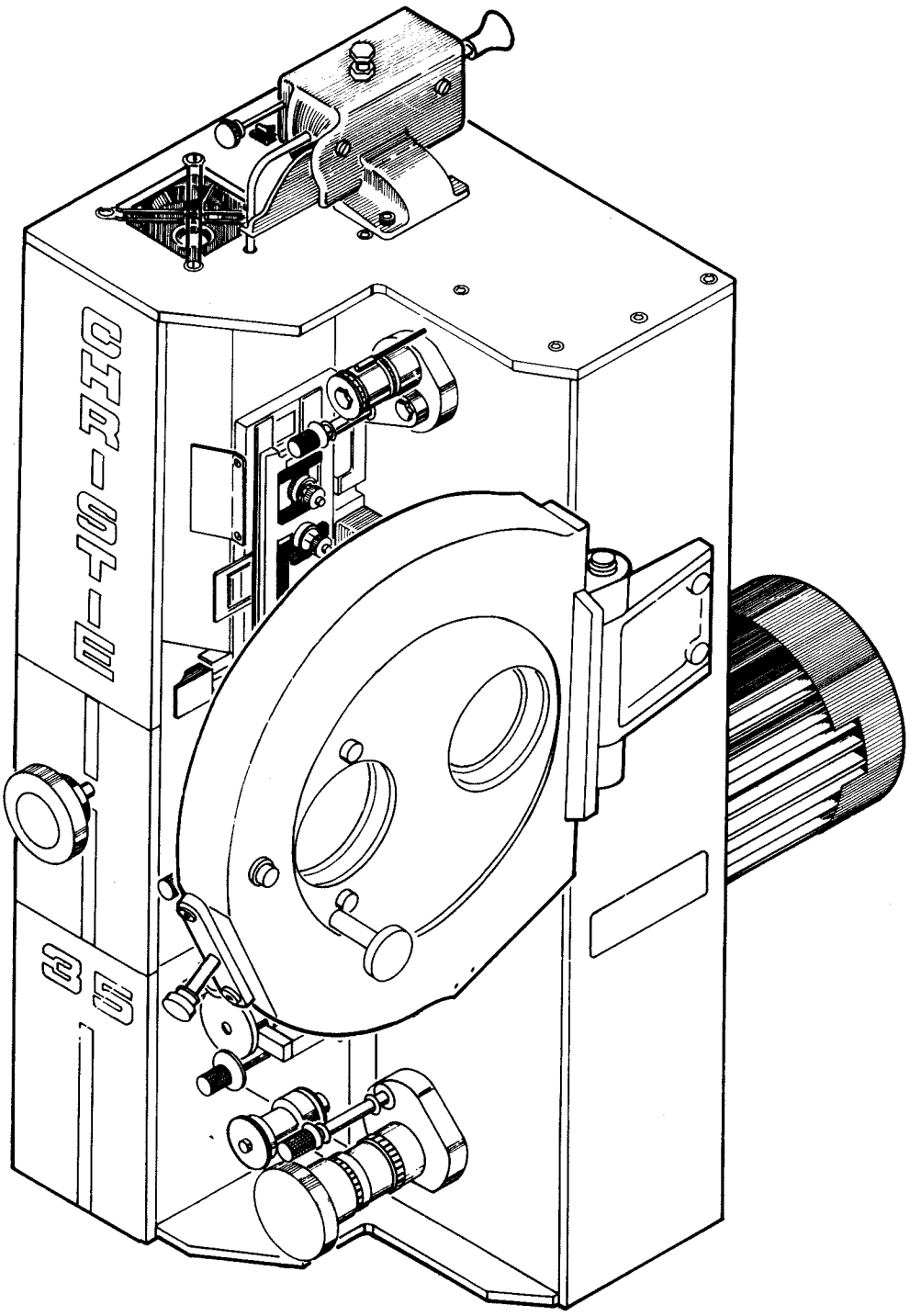


FIGURE 1-2. CHRISTIE P-35 PROJECTOR

1-3. UNPACKING.

To unpack the projector, proceed as follows:

1. Remove projector from shipping carton.
2. Remove sound drum flywheel from carton (beneath projector).
3. Remove belt cover from projector (non-operating side).
4. Remove all protective packing materials.
5. Remove tape from Framing Lamp, gaining access through circular rear opening.
6. Remove all protective tape or ty-wraps from sound head assembly, lens holder and its locking lever.
7. Remove all protective tape from sound scanning drum and drive belt on gear case side of projector.

After unpacking, save the protective packing materials and container for use in reshipment or storage. The projector comes complete including the following:

Lens Holder (Dual Lens Holder Turret, Optional)

Dual Aperture Plate

Exciter Lamp (Installed and adjusted)

Framing Lamp (Installed)

Projector Drive Motor

Sound Scanning Drum Flywheel

Solar Cell (Dolby optional) factory aligned

Instruction Manual

Tool Kit (includes metric allen wrenches for removal/installation of ultramittent)

Package of Miscellaneous Hardware

SECTION II

INSTALLATION AND ASSEMBLY

2-1. GENERAL.

This section contains installation and assembly procedures for the P-35 Projector.

NOTE

1) It is important that a careful review of all installation and parts location diagrams and applicable procedures be made before attempting to install the projector.

2) Some details and dimensions on the installation and parts location diagrams have been ommitted or altered for the sake of clarity.

2-2. TOOLS AND MATERIALS REQUIRED.

The tools and materials required for installing, assembling and maintaining the projector are standard type general tools used in conjuntion with the supplied tool kit. Materials required are specified in the applicable Section/Paragraph.

2-3. INSTALLATION.

To install the projector, once all protective materials have been removed, refer to Figure 2-1 and proceed as follows:

1. Loosen but do not remove nut (4) on projector mounting stud. Check that lockwasher (5) and flat washer (6) are positioned on mounting stud. Lockwasher shall be next to nut followed by flat washer. Install allen head bolt four turns with washers as above.

2. Using two (2) men, mount projector to console or pedestal, then thread three allen head screws (1) with both lockwashers (2) and flat washers (3) into three (3) mounting holes on projector.

3. Tighten nut on mounting stud using 9/16" deep socket wrench.

4. Tighten allen head screws using applicable allen wrench.

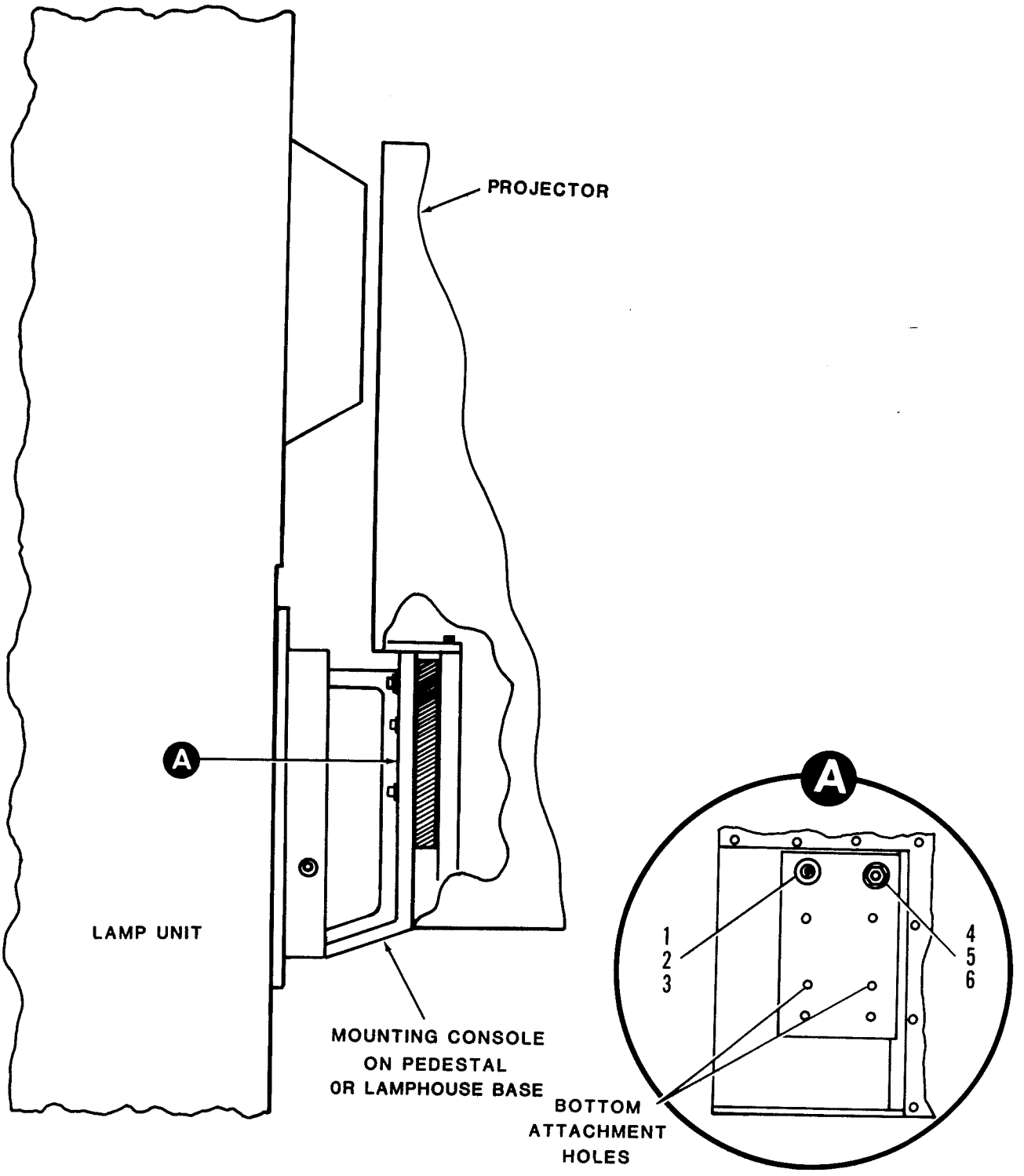


FIGURE 2-1. INSTALLATION, P-35 PROJECTOR

2-4. ELECTRICAL CONNECTIONS.

Prior to wiring the projector, refer to Figure 2-2, wiring interface diagram. Use stranded wire where possible and strip and tin wire with solder prior to connecting. Use crimp connectors on all sound connections.

NOTE

For exciter lamp power use No. 14 gage stranded wire under twenty (20) feet and No. 12 gage stranded wire for runs over twenty (20) feet.

2-5. Solar Cell Wiring.

Solar cell wiring requires the use of a two-conductor shielded audio cable. The shield is not connected at the projector end. Cut off shield, connect black lead to black and red lead to red on audio interface terminal block TB-3. Refer to sound system instruction manual for proper connection to sound system.

NOTE

For stereo solar cell wiring, refer to Figure 2-2 and the instruction manual provided with your stereo sound system.

2-6. AC Projector Wiring.

AC wiring to the projector requires No. 14 gage stranded wire. Be sure to follow all local and national electrical codes for AC wiring. AC wiring (motor switch lead, picture changeover, open and close coils and framing lamp) is through the 3/4" threaded "knockout" closest to you as you face the belt side of the projector. A total of six (6) wires are required for AC projector wiring.

TB1 Terminal Number for Connection

1 - Motor (AC Neutral)
3 - Motor switch lead (AC hot, switched externally)
5 - Changeover open coil (AC hot, switched externally)
6 - Changeover open and close coils (AC hot, switched externally)
4 - Framing lamp and Cooling fan (AC hot)
7 - Framing lamp and Cooling fan (AC Neutral)

Refer to Figure 2-2 and connect the six (6) AC projector wires as indicated.

WARNING

DO NOT PLUG IN OR RUN PROJECTOR AT THIS TIME.

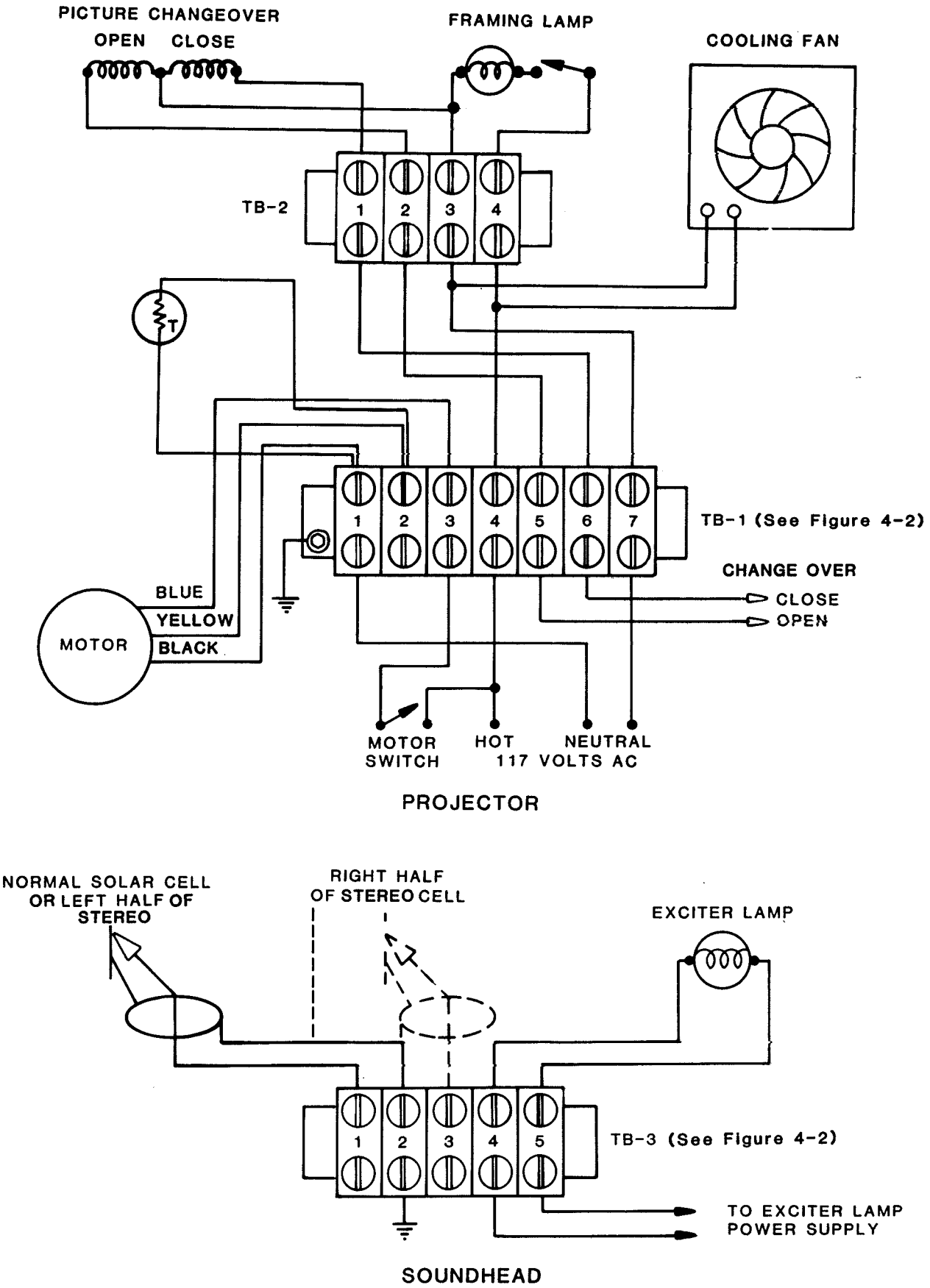


FIGURE 2-2. WIRING INTERFACE DIAGRAM

2-7. Pre-Operating Procedures.

After all the wiring has been completed, proceed as follows:

1. Refer to Figure 4-1 and install sound drum flywheel (5) on sound shaft. Be sure setscrew is in place and backed out far enough to allow flywheel placement on shaft without scoring shaft or damaging threads on setscrew.

2. Slide sound drum flywheel (5) slowly onto shaft, using extreme caution, until flywheel seats itself against stop.

3. Position setscrew over flated portion of shaft, then tighten setscrew securely.

4. Spin sound drum flywheel by hand and check for free and smooth operation.

5. Refer to manufacturer's instructions and install upper and lower reel arms. The take-up belt pulley on the lower constant speed sprocket (refer to Fig. 4-10) is designed for Rounthane type belt- ing or 3L Vee belt.

NOTE

It is recommended that any accesory items being used with the projector be installed at this time, i.e. failsafe cue detectors, platter film guidance systems, etc.

6. Refer to manufacturer's instructions and install lamphouse.

NOTE

If the optional dual lens turret is being installed, perform steps 10 through 13 only.

7. Refer to Figure 3-1. Install lens system in lens holder (1). If it is necessary to open the lens holder more than normal, a spreader screw is available in the hardware kit for this. Refer to Figure 3-1 (25).

8. Secure lens with allen head screws (2) located on top side of holder.

9. Set focus knob (3) at its mid position (see alignment marks on lens holder for centering). Focus lens by sliding within lens holder until in focus. Then tighten allen head screws (2).

10. Remove single lens holder (1) (if furnished) by releasing single lens locking lever (28), then lift out lens holder.

11. Remove single lens holder mounting block by removing four allen head screws, located beneath lens holder mounting block.

12. Install dual lens holder turret by positioning turret on guide pins located on front of main frame.

13. Secure dual lens holder turret with four allen head screws.

WARNING

DO NOT OPERATE, ADJUST OR PERFORM MAINTENANCE ON THE PROJECTOR WITH POWER "ON". ENSURE THAT BELT SIDE OF PROJECTOR HAS COVER INSTALLED PRIOR TO AND DURING OPERATION. DO NOT ATTEMPT BELT ADJUSTMENT ETC., WITH COVER REMOVED AND POWER APPLIED.

14. Before operating the projector, manually turn projector using manual turn down knob (10) a minimum of three turns.

CAUTION

DO NOT OPERATE PROJECTOR FOR AT LEAST ONE HOUR AFTER INSTALLATION TO ALLOW HEAVY LUBRICANT IN ULTRAMITTENT TO SETTLE TO PROPER LEVEL.

15. The projector power switch may now be switched on. Check for smooth and quiet operation. Allow projector to run for approximately fifteen minutes.

SECTION III

OPERATION

3-1. GENERAL.

Prior to operating the projector for the first time, INSURE that the operator checks that all phases of installation and assembly as outlined in Section II of this manual have been completed.

WARNING

DO NOT OPERATE, ADJUST OR PERFORM MAINTENANCE ON THE PROJECTOR WITH POWER "ON". ENSURE THAT BELT SIDE OF PROJECTOR HAS COVER INSTALLED PRIOR TO AND DURING OPERATION. DO NOT ATTEMPT BELT ADJUSTMENT ETC., WITH COVER REMOVED AND POWER APPLIED.

CAUTION

DO NOT OPERATE PROJECTOR FOR AT LEAST ONE HOUR AFTER INSTALLATION TO ALLOW HEAVY LUBRICANT IN ULTRAMITTENT TO SETTLE TO PROPER LEVEL.

3-2. OPERATION.

To operate the projector, refer to Figures 3-1 and 3-2 and proceed as follows:

1. Open all three pad roller arms (4) and ultramittent pressure shoe arm (5).

2. Open film trap (6) by pressing film trap latching lever (7), then set framing with framing knob (8) to center of travel or midpoint.

3. Set ultramittent (9) at its rest position (no sprocket movement when manual pull down knob (10) is turned), then thread test film in projector.

3-3. Threading the Film.

To properly thread the film through the sound module on the projector, proceed as follows:

1. Pull film over lower constant speed sprocket until film is taut without moving the sound idle rollers (11) up or down. Note where sprocket holes fall over sprocket teeth, then pull film one sprocket hole tighter past this point and close pad roller arm.

NOTE

If a film reel is used, be sure take-up tension is in accordance with reel manufacturer's instructions.

2. Rotate manual pull down knob (10) and check film motion through projector. Film movement should be smooth and flawless.

NOTE

The framing lamp is turned on or off via the black rocker switch (12) located on the top of the projector. The framing lamp is functional with the picture change-over in either position.

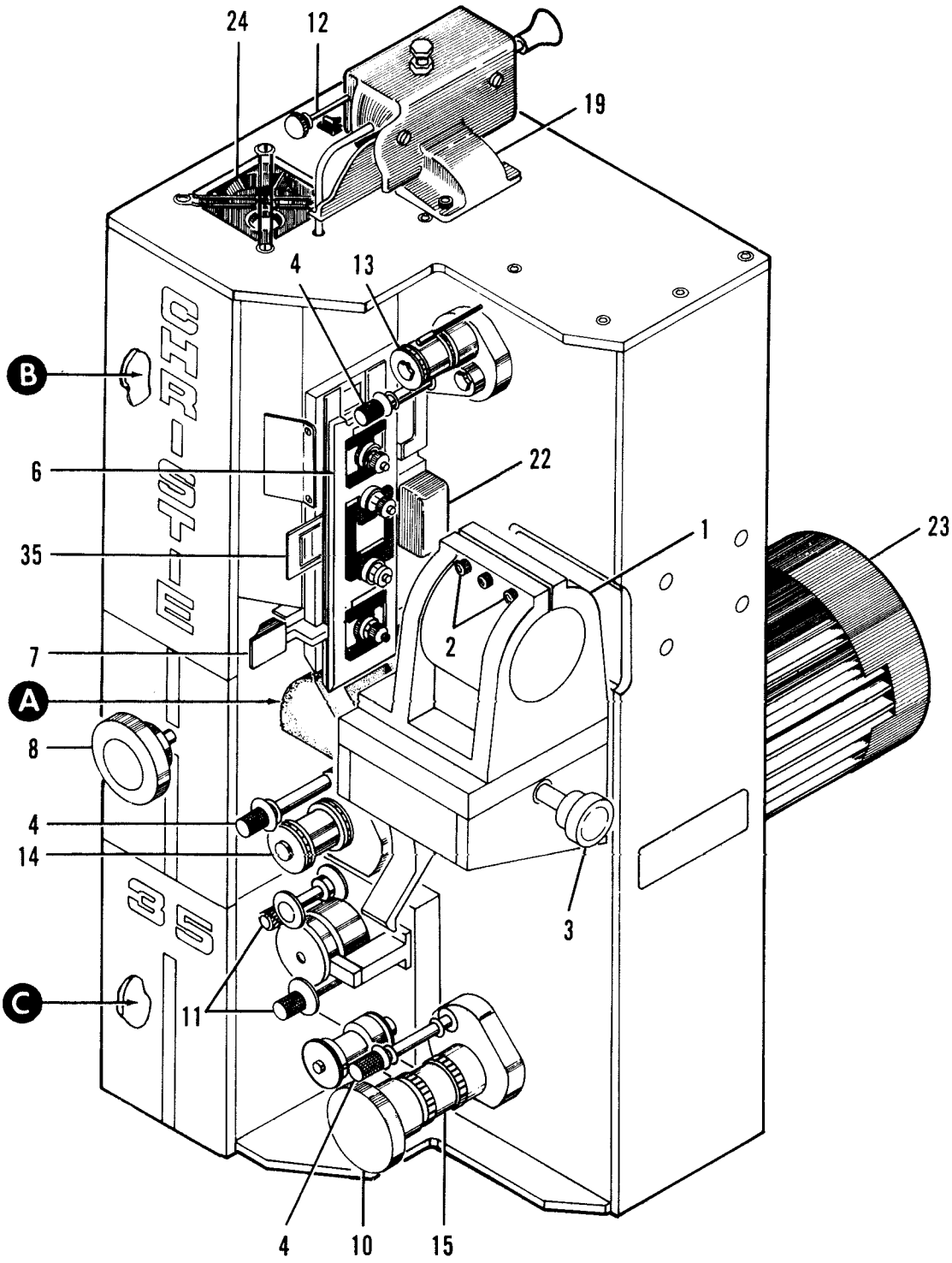


FIGURE 3-1. PROJECTOR PARTS LOCATION

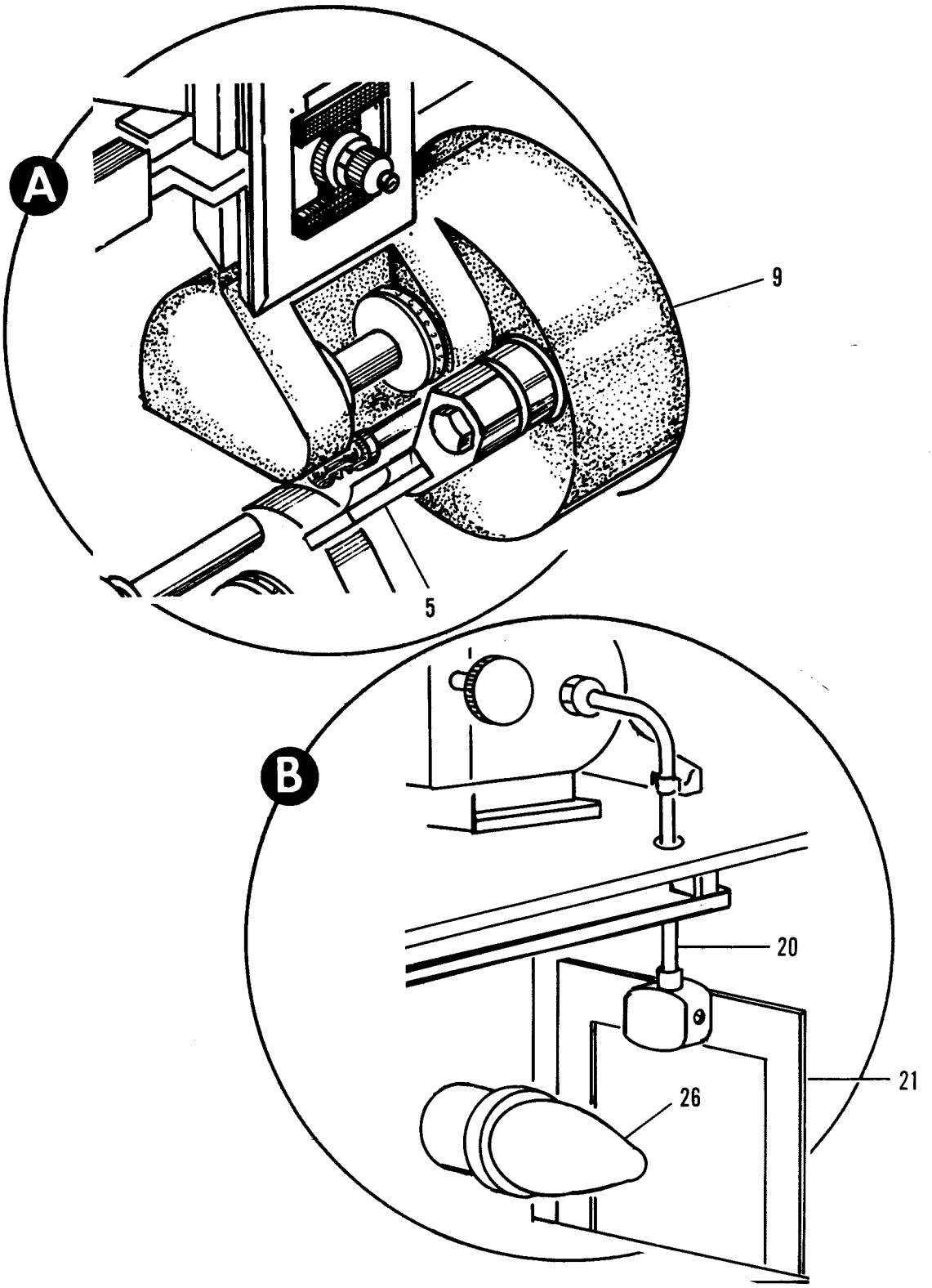


FIGURE 3-2. PROJECTOR PARTS LOCATION

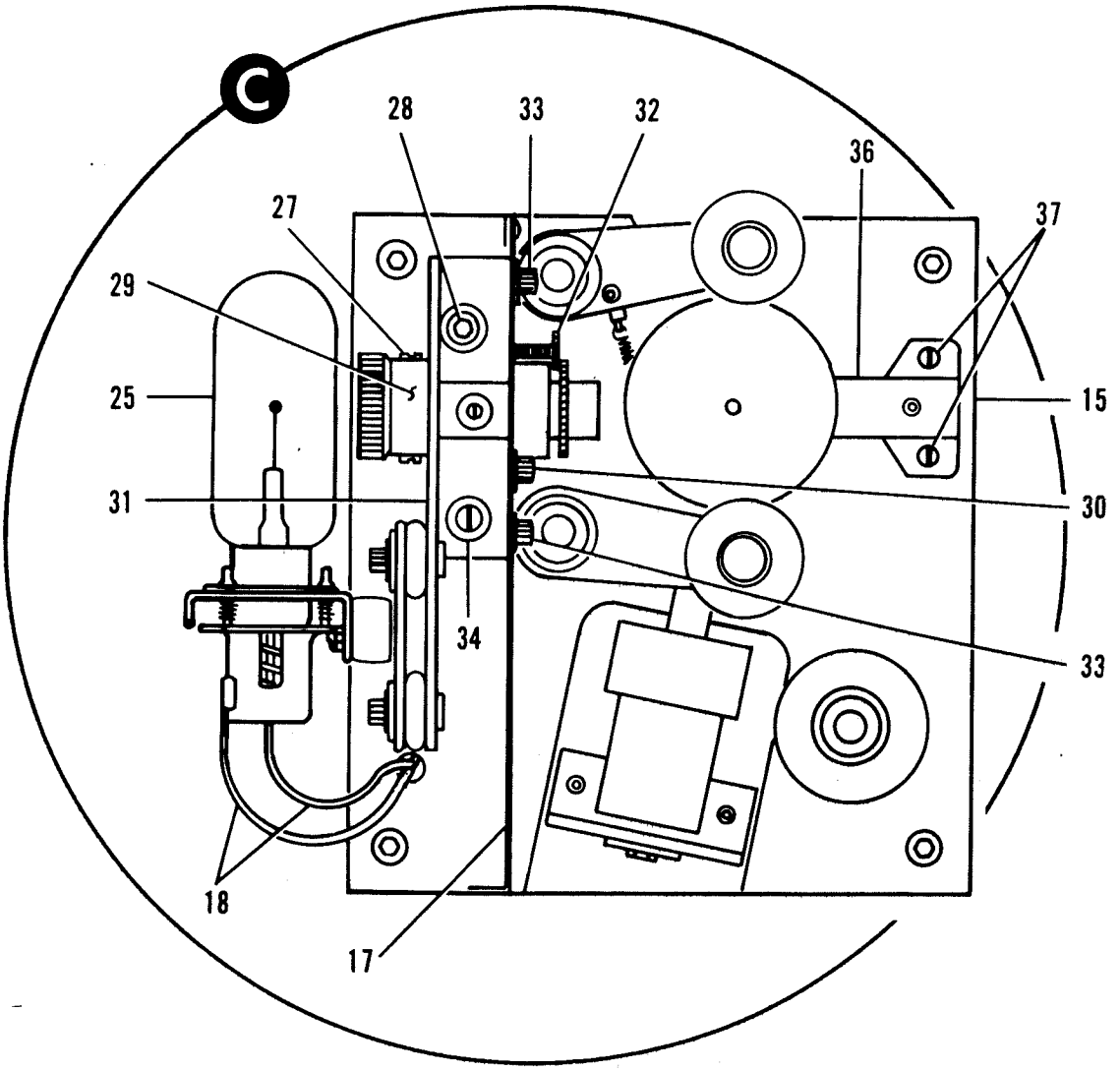


FIGURE 3-3. PROJECTOR PARTS LOCATION

SECTION IV

MAINTENANCE

4-1. GENERAL.

The projector has been designed to provide many years of optimum performance with only routine maintenance and cleaning. However, a periodic maintenance program is recommended as an aid in obtaining maximum life operating efficiency. A schedule of recommended operational checks and preventive maintenance is provided in Table 4-1. Procedures describing the operation listed in the table are presented in the subsequent paragraphs.

4-2. TOOL, EQUIPMENT AND MATERIALS REQUIRED.

The tools, equipment and materials required for proper maintenance of the projector are listed in Table 4-2.

TABLE 4-1. PREVENTIVE MAINTENANCE SCHEDULE

Time Interval	Maintenance Operation	Paragraph
Daily	Visual Inspection	4-3
Daily	Cleaning Projector	4-4

TABLE 4-2. TOOLS, EQUIPMENT AND MATERIALS REQUIRED

Tools:		
	Tool Kit Provided	(General Maintenance)
Equipment:		
	Oscilloscope	
	AC Voltmeter	
		For Sound Head Alignment Only
Materials:		
	7 KHZ Test Loop	
	SMPTE Buzz Track Test Loop	
	560 Ohm Load Resistor	

4-3. VISUAL INSPECTION.

Visually inspect the projector for signs of excessive dust/dirt, physical damage, frayed or damaged cables and for loose hardware. Remove, replace and repair as necessary.

Visually inspect the inner and outer timing belts. If belts are frayed or show signs of wear, they should be replaced.

NOTE

1) Every 30 days minimum, the ultramittent should be visually checked for any possible oil seepage. If a leak is detected, immediately contact Christie Electric Corp. and arrange for a loaner. You may continue to operate your ultramittent for 30 - 90 days after a slow leak is detected. If large amounts of fluid are leaking, it will considerably shorten this time.

2) If a defective assembly or damaged component is noted during the inspection procedure, initiate corrective action as required.

4-4. CLEANING.

Projector should be kept clean at all times.

Clean projector and associated assemblies as follows:

1. Remove dust and/or foreign matter from projector and associated assemblies using soft lint free cloth or compressed air not greater than 20 psig.

2. Remove dust and/or foreign matter from pad roller arms, ultramittent pressure pad, sound idler rollers and runners in Trap and Gate Assembly, using camels hair brush or tooth brush (provided).

3. Remove dirt/dust from slit lens, using cotton tip swabs.

4-5. REMOVAL/REPLACEMENT AND REPAIR.

The following paragraphs contain instructions and procedures necessary to remove and replace assemblies and/or components of the projector. While performing these procedures, only the tools supplied should be used, as the use of improper tools or maintenance techniques can cause damage to the assemblies or components. A list of replaceable assemblies, component and their part numbers are provided in Table 4-3.

Removal and replacement of assemblies not covered in the following paragraphs are to be performed by an authorized service representative only. Repair other than minor tasks such as repairing a broken lead, solder connection, timing belts are best accomplished by removing and replacing the defective assembly. Assemblies requiring repair may then be returned to the manufacturer for rework.

NOTE

When ordering replacement parts use part numbers listed in Table 4-3.

TABLE 4-3. REPLACEABLE ASSEMBLIES AND COMPONENTS

Part No.	Description	Ref Fig.	Paragraph
119235-001	Upper Constant Speed Sprocket Assy	3-1 (13)	4-9
119236-001	Center Constant Speed Sprocket Assy		4-10
119237-001	Lower Constant Speed Sprocket Assy		4-11
119450-001	Ultramittent Assy		4-12
119246-001	Sound Head Assy		4-13
119249-001	Electric Changeover Assy		4-14
119233-001	Shutter Gear Box Assy		4-15
119234-001	Trap and Gate Assy		4-16
598931-179	Inner Timing Belt		4-8
598931-178	Outer Timing Belt		4-7
119215-001	Exciter Lamp (GE BXM 4 Amp, 9V, 8 candlepower)		4-19
598931-215	Framing Lamp (GE 7C7 or OC10-7, 130V, 7W)		4-20
119247-002	Motor Assy - 60 cycle operation		4-17
119247-003	Motor Assy - 50 cycle operation		4-17
598931-204	Blower Assy		4-18
119248-001	Mono Solar Cell Assy		4-13
119248-002	Stereo Solar Cell Assy		4-13
119254-001	Shutter Blade		4-13

4-6. Removal of Trap and Gate Assembly. (6, Figure 3-1)

To remove the trap and gate assembly, proceed as follows:

1. Open trap and gate assembly (6) by releasing film gate latching lever (7), then remove two allen head screws (captive) that secure trap and gate assembly to main frame. Remove trap and gate assembly (6).

Removal of Timing Belts.

4-7. Outer Timing Belt. To remove the outer timing belt, refer to Figure 4-1 and proceed as follows:

1. Loosen outer timing belt idler pulley locking screw (1) and relieve tension on outer timing belt (2).

2. Remove bearing (3) by removing bearing retainer nut and washers.

3. Remove outer bearing retainer (4) by removing two allen head screws that secure outer bearing retainer to main frame.

4. Remove outer timing belt (2) from its associated pulleys and drive gears.

4-8. Inner Timing Belt. To remove the inner timing belt, refer to Figure 4-2 and proceed as follows:

1. Remove outer timing belt (paragraph 4-7).

2. Loosen inner timing belt idler pulley locking screw (1).

3. Remove three belt retainer guide blocks (2) by removing two allen head cap screws located at each constant speed sprocket drive pulley (upper, center, lower).

4. Remove inner timing belt (3) from its associated pulleys and drive gears.

4-9. Removal of Upper/Center/Lower Constant Speed Sprocket Assembly. (Figure 3-1)

To remove the constant speed sprocket assemblies, proceed as follows:

1. Remove inner timing belt from applicable constant speed sprocket drive pulley.

2. Remove three allen head screws securing constant speed sprocket assembly to main frame, then remove constant speed sprocket assembly (13, Figure 3-1).

4-10. Removal of Ultramittent Assembly. (9, Figure 3-2)

To remove the ultramittent assembly, proceed as follows:

1. Relieve tension on outer timing belt.

2. Remove two allen screws and remove bearing and gear assembly (6, Figure 4-1).

3. Remove allen head screw that secures idler pulley (7, Figure 4-1) to main frame, then remove idler pulley.

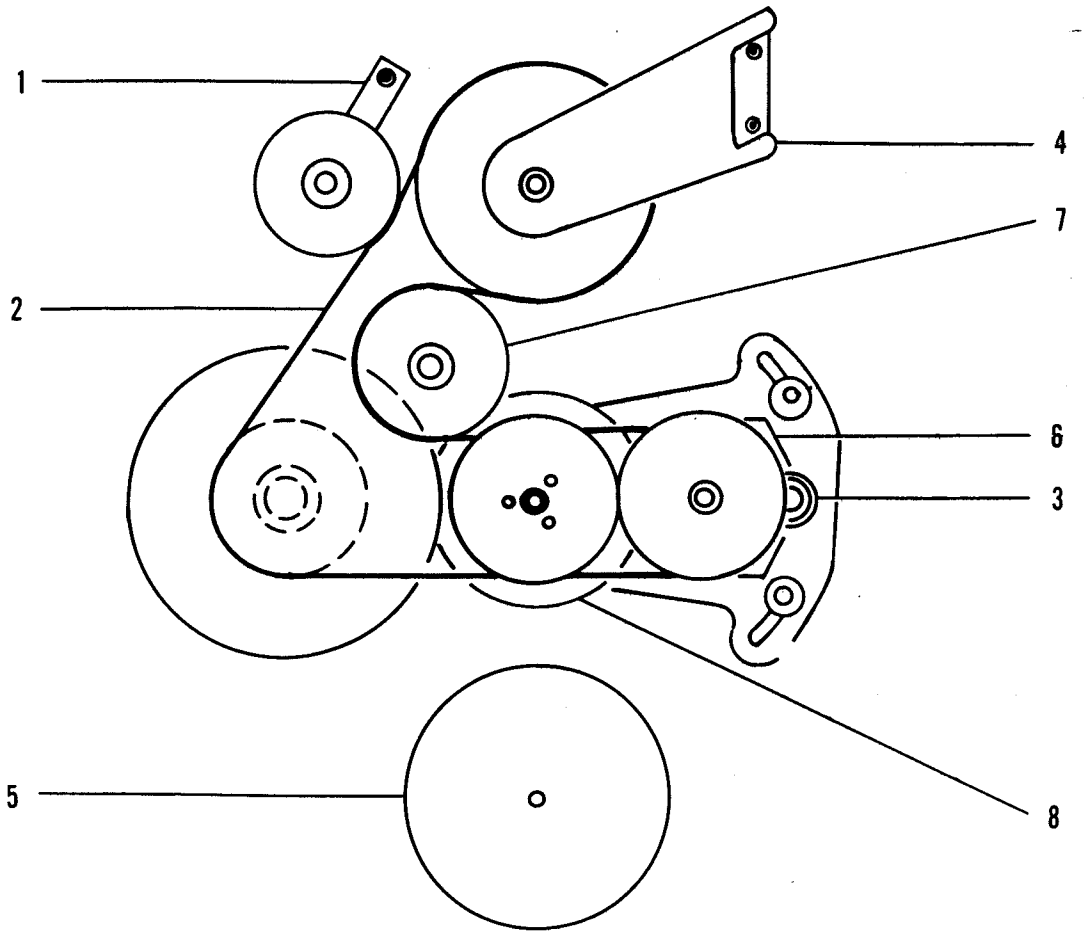


FIGURE 4-1. OUTER TIMING BELT

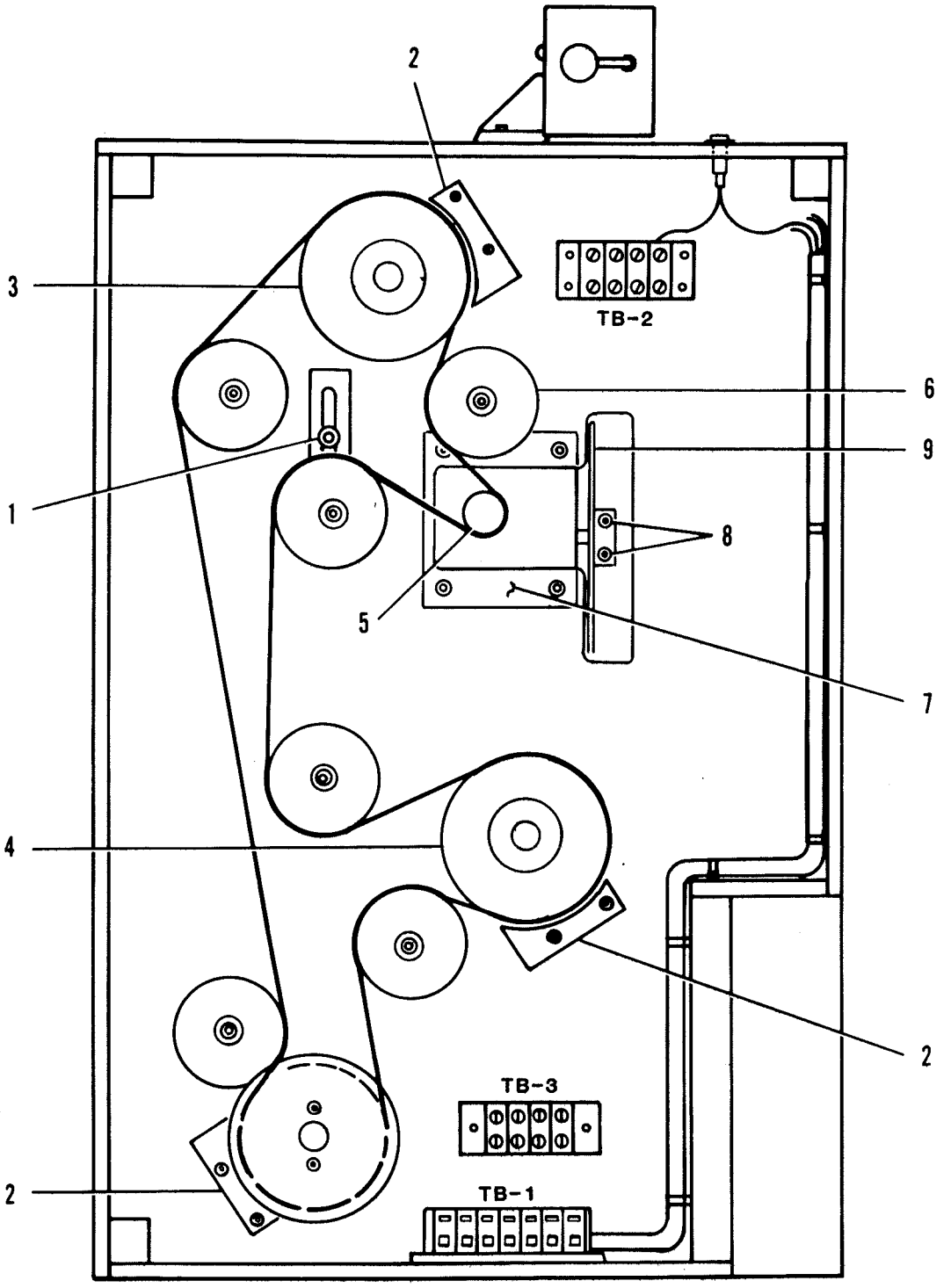


FIGURE 4-2. INNER TIMING BELT

4. Remove four allen head screws and washers securing ultramittent assembly to main frame, then remove ultramittent assembly (8, Figure 4-1).

WARNING

DO NOT DISASSEMBLE ULTRAMITTENT ASSEMBLY. DO NOT ATTEMPT REPAIR OF ULTRAMITTENT COMPONENTS. ATTEMPTED REPAIR OR DISASSEMBLY VOIDS WARRANTY.

4-11. Removal of Sound Head and Solar Cell Assemblies. (15, Figure 3-3)

If removal of solar cell assembly (36, Figure 3-1) is required, disconnect wiring at terminal block TB-3, remove screws (37, Figure 3-1) and remove solar cell assembly. To remove the sound head assembly, proceed as follows:

1. Remove bracket (17, Figure 3-3) by removing two phillips head screws and two allen screws.

2. Disconnect two exciter lamp leads (18, Figure 3-3) at terminal block TB-3. If solar cell assembly (36, Figure 3-3) has not been removed, disconnect wiring at terminal block TB-3.

3. Remove four allen head screws securing sound head assemby to main frame, then remove sound head assembly (15, Figure 3-3).

4-12. Removal of Electric Changeover Assembly. (19, Figure 3-1)

To remove the electric changeover assembly, proceed as follows:

1. Disconnect three electric changeover leads at terminal block TB-2.

2. Remove flexible shaft (20, Figure 3-2) from Dawson blade (21, Figure 3-2) by loosening allen screw securing flexible shaft to Dawson blade.

3. Remove two allen head screws securing electric changeover assembly to top of projector, then remove electric changeover assembly (19, Figure 3-1).

4-13. Removal of Shutter Gear Box Assembly. (22, Figure 3-1)

To remove the shutter gear box assembly, proceed as follows:

1. Rotate framing knob (8, Figure 3-1) fully CW.

2. Remove two allen head cap screws securing outer bearing retainer (4, Figure 4-1) to main frame.

3. Relieve tension on inner timing belt, then remove inner timing belt from shutter drive sprocket (5, Figure 4-2).

4. Remove allen head screw securing idler pulley (6, Figure 4-2) to main frame, then remove idler pulley.

5. Remove four allen head screws securing gear box assembly (7, Figure 4-2) to main frame, then remove shutter gear box assembly.

4-14. Motor Assembly. (23, Figure 3-1)

To remove the motor assembly, proceed as follows:

1. Disconnect motor electrical leads at terminal block TB-1.

2. Relieve tension on outer timing belt.

3. Remove four allen head cap screws securing motor mounting plate and motor to main frame, then remove motor assembly (23, Figure 3-1)..

4-15. Blower Assembly. (24, Figure 3-1)

To remove the blower assembly, proceed as follows:

1. Disconnect blower electrical leads at terminal block TB-2.

2. Remove four screws and washers securing blower assembly (24) to top plate of projector, then remove blower assembly.

4-16. Removal of Exciter Lamp. (25, Figure 3-3)

To remove the exciter lamp, open exciter lamp compartment and remove exciter lamp (25) by turning lamp CCW.

4-17. Removal of Framing Lamp. (26, Figure 3-2)

To remove the framing lamp, open framing lamp compartment which is secured by Zeus fasteners, and remove framing lamp (26) as you would remove an ordinary lamp bulb.

4-18. Replacement of Assemblies/Components.

There are no special procedures for installing or replacing assemblies/components. Install or replace all assemblies/components in the reverse sequence of removal.

NOTE

If any assemblies are removed and then re-installed, retime shutter in accordance with paragraph 4-23.

4-19. CALIBRATION, ALIGNMENT AND ADJUSTMENT PROCEDURES.

The projector has been factory aligned, calibrated and adjusted prior to shipment. However, the following paragraphs contain the necessary information to calibrate, align or adjust various components and/or assemblies of the projector. Observe standard safety precautions and maintenance practices when checking and/or replacing system components/ assemblies.

NOTE

If the projector is configured for Dolby Stereo use, the sound lens focus and alignment has been factory adjusted prior to shipment and no further adjustment is necessary.

WARNING

OBSERVE STANDARD SAFETY PRECAUTIONS WITH POWER APPLIED TO PROJECTOR.

4-20. Sound Head Calibration - Mono (For Stereo, See 4-21.)

To perform calibration of the sound head assembly, refer to Figure 3-3 and proceed as follows:

NOTE

Be sure that the exciter lamp is operating at peak efficiency. Replace if necessary.

1. Loosen lens slit width adjustment screws (27), then open lens slit width by rotating lens (29) approximately 1/2 to 2/3 CW.

2. Loosen lens barrel azimuth locking screw (28), then rotate entire lens barrel until white line is in center of azimuth viewing port.

3. Retighten azimuth locking screw (28) and slightly loosen exciter lamp bracket locking screws (30).

4. Adjust exciter lamp bracket (31) until filament of exciter lamp (25) is centered with center of lens barrel, then retighten locking screws (30).

5. Thread 7 KHZ Test Loop through projector, and connect AC voltmeter with at least -40DB scale across Solar Cell terminals 1 and 2 of terminal block TB-3.

6. Connect 560 ohm load resistor across terminals 1 and 2 of terminal block TB-3, then turn on projector.

7. Observe reading on AC voltmeter, if any.

8. Slightly loosen lens barrel azimuth locking screw (28) and while holding lens barrel to maintain approximate azimuth, rotate knurled focus adjustment screw (32) for a peak or maximum reading on AC voltmeter.

NOTE

If the proper exciter lamp voltage is being supplied, an output reading for mono Solar Cell should be -28 to -34DB's. Be sure to move the lens barrel past peak readings and then back to peak reading on both focus and azimuth adjustments to insure against false peaks.

9. Tighten lens barrel azimuth locking screw (28) after maximum reading has been obtained.

NOTE

Use a oscilloscope (in place of the AC voltmeter) for proper azimuth adjustment. If azimuth adjustment is not correct, the waveform will not be symetrical.

10. Re-loosen exciter lamp bracket (31) for maximum reading on AC voltmeter, then retighten locking screws (3).

11. Repeat steps 1 through 10 as necessary for optimum fine tuning of Sound Head Assembly.

12. Remove power from projector and remove 7KHZ Test Loop.

4-21. Sound Head Calibration - Stereo

4-22. Lateral Guide and Lens Slit Width Adjustment.

With the AC voltmeter and 560 ohm load resistor connected as described in paragraph 4-24, steps 5 and 6, refer to Figure 3-3 and proceed as follows:

1. Thread SMPTE Buzz Track Test Loop through projector, then turn on projector.

2. Loosen two lateral guide screws (33), then turn lateral guide adjusting screw (34) and center the scanning beam visually on sound track.

NOTE

The projector does not move the film across the scanning beam itself. This is accomplished by rotating the lateral guide adjustment screw (34).

3. Alternately move lateral guide adjustment screw (34) back and forth to obtain maximum scanning beam width on film sound track.

4. Loosen line slit locking screw (27), then simultaneously, narrow the slit width with lens barrel slit adjustment ring (on rear of lens barrel) until 300 Hz or 1000 Hz signal can be heard or observed on AC voltmeter or oscilloscope. This is accomplished by turning slit adjustment ring one half turn in either direction.

5. Tighten lateral guide locking screws and lens slit locking screws (27).

6. Repeat steps 1 through 5 as necessary for optimum fine tuning of Lateral guide and lens slit width adjustment.

4-23. Shutter Timing.

To time the shutter, proceed as follows:

1. Loosen shutter clamp screws (8, Figure 4-2) just enough so that shutter can be rotated on its shaft. It should be snug, not free wheeling.

2. Remove aperture plate (35, Figure 3-1) and lens holder (1, Figure 3-1).

3. Turn projector by hand with manual pull down knob (10, Figure 3-1) until ultramittent sprocket (9, Figure 3-1) is in its top position.

4. With sharp pencil, carefully rest its point on ultramittent casting (9, Figure 3-2) pointing to one sprocket.

5. Without moving pencil, turn projector by hand with manual pull down knob (10, Figure 3-1) until pencil point is pointing at third tooth of ultramittent sprocket (9, Figure 3-1) from starting point.

CAUTION

HOLD MANUAL PULL DOWN KNOB TO INSURE PROJECTOR DOES NOT TURN OVER WHILE ROTATING THE SHUTTER.

6. Rotate shutter (9, Figure 4-2) by hand until crosshairs are centered in aperture. Make certain that shutter is not hitting anything.

7. Tighten shutter clamp screws (8, Figure 4-2). Be sure not to allow shutter (9, Figure 4-2) to move on its shaft after centering crosshairs.

8. Check correctness of shutter timing by repeating steps 5 and 6.

NOTE

The shutter timing can be checked precisely at any time using steps 4 and 5 and noting the position of the crosshairs. It is also recommended that shutter timing be checked whenever the inner or outer timing belts are removed or replaced.

4-24. Inner and Outer Timing Belt Adjustment.

Belt tension is difficult to specify, but belts should be kept loose as possible, but tight enough to drive the mechanism. A certain amount of "trial and error" may be the best way to arrive at the proper tension. To adjust the belt tension on the inner or outer timing belts, proceed as follows:

CAUTION

DO NOT OVER TIGHTEN BELTS. IF BELTS ARE TOO TIGHT, PROJECTOR WILL NOT OPERATE PROPERLY AND/OR WILL CAUSE RAPID WEAR OF PROJECTOR COMPONENTS.

WARNING

DO NOT APPLY POWER WHILE ADJUSTING BELTS.

4-25. Inner Timing Belt.

1. Refer to Figure 4-2 and loosen inner timing belt idler pulley locking screw (1).

2. Adjust inner timing belt idler pulley (2) until required tension is obtained.

4-26. Outer Timing Belt.

1. Refer to Figure 4-1 and loosen outer timing belt idler pulley locking screw (1).

2. Adjust outer timing belt idler pulley (2) until required tension is obtained.

WARRANTY

COVERING

P-35 PROJECTOR

Manufactured by: CHRISTIE ELECTRIC CORP.
(herein referred to as "Christie")

Christie warrants the apparatus sold to the extent of the parts necessary to correct any defect in workmanship or materials which may develop under proper or normal use for a period of one (1) full year (90 days on electric motors) from date of installation (except as noted below) but not to exceed eighteen (18) months from date of shipment from Christie Electric Corp. Christie reserves the right to have the apparatus returned, freight prepaid, to the Christie factory to effect the warranty repairs.

Replacement parts for warranty repairs will be shipped promptly by Christie f.o.b. factory, and invoiced to the customer. Credit will be issued upon return of the defective part or parts, prepaid, to the Christie factory.

The above shall constitute a fulfillment of all Christie liabilities in respect to said apparatus.

This warranty does not cover the following items:
Special customer specified purchased parts, materials or components modified to customer specifications.

This warranty does not apply to parts of any Christie product which have been opened disassembled, repaired, or altered by anyone other than Christie, or subjected to misuse or abuse.

Christie shall not be liable for any consequential damages.

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CHRISTIE

ELECTRIC CORP.

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