REWINDING THE FILM

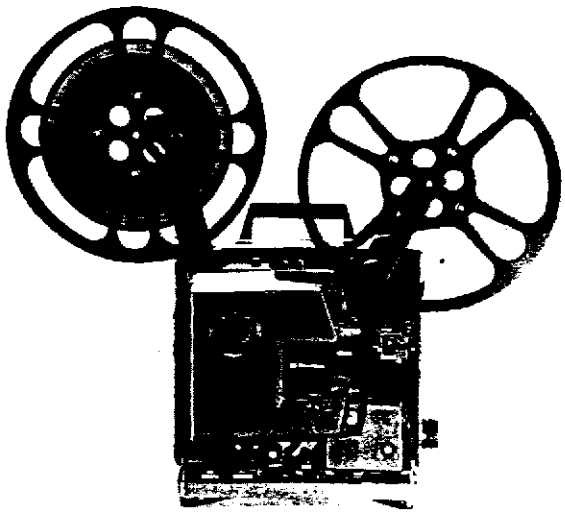
After the film is completely shown and all the film is on the take-up reel turn the motor switch OFF. Raise the rear take-up reel arm to the rewind position by pressing in the reel arm release button while swinging the reel arm upward. It will lock into place. Then, unwind the last few feet of film from the take-up reel and attach the end of the film to the hub of the front film reel from the underside. Rotate the front reel counterclockwise about two turns to secure the film.

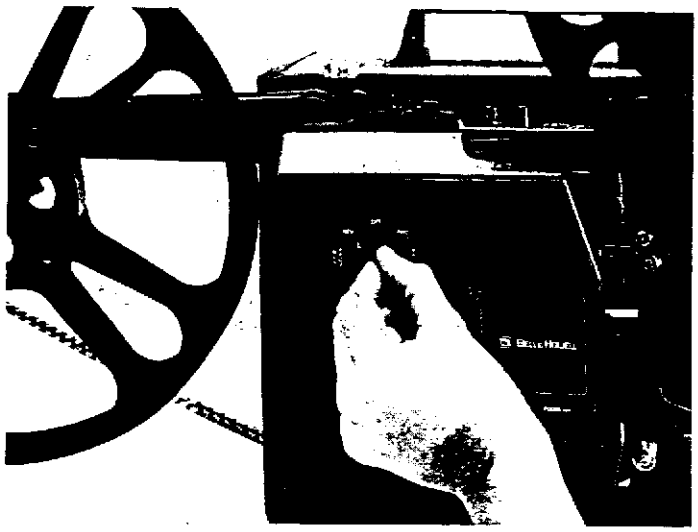
Turn the motor switch to the REVERSE position and the film will begin to rewind. Press and momentarily hold down the rewind button on the top of the projector to rewind the film at a faster speed. The rewind button will return to the up position as finger pressure is removed.

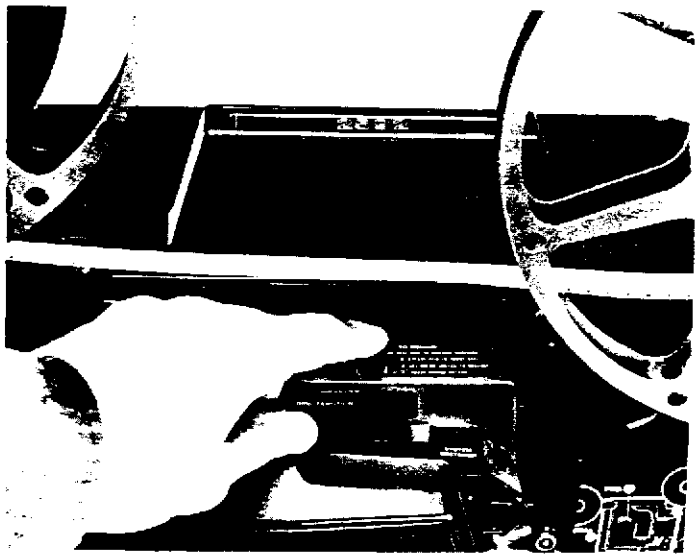
As soon as all the film is back on the front reel, turn the motor switch off. Press the reel arm release button to unlock the take-up reel arm and move it back down to the take-up position.

NOTE:

The rewind mechanism automatically disengages when the motor switch is turned to forward for the next film showing.







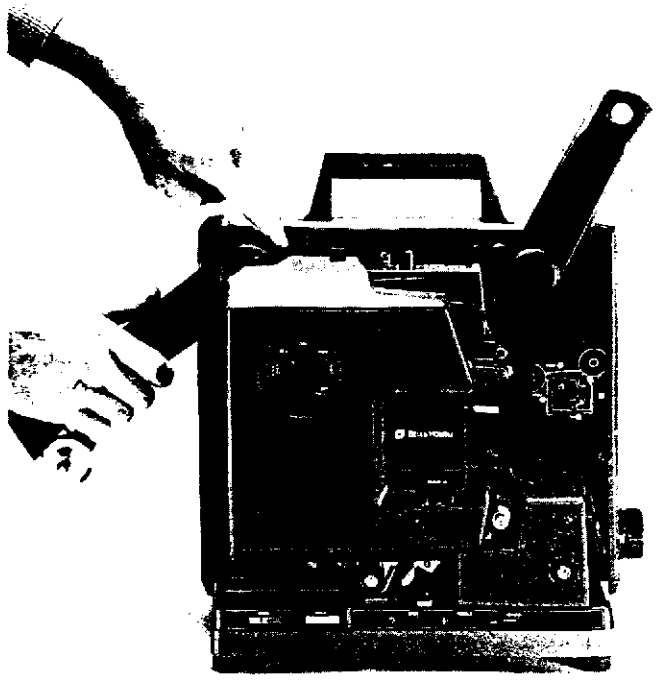
STORING THE PROJECTOR

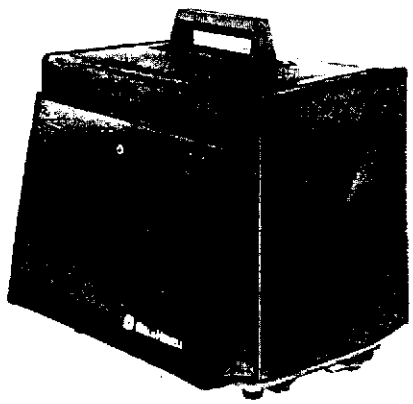
To store the projector after use, first make sure the motor switch is in the OFF position. Disconnect the power cord from the wall socket and wind it around the cord retainer on the side of the projector.

Remove the reels, press in on the reel arm release buttons, and fold in the reel arms. Lower the projector by turning the tilt control knob. Be sure the run/still control is in the RUN position (Model 2592 only).

Place the front cover on the projector by first fitting the cover's tabs into the recesses in the projector base. Swing the top of the cover into place and snap the two locking clamps on top of the projector firmly shut.

For extra protection during storage and carrying, an accessory vinyl cover with a take-up reel storage pocket is available. See ACCESSORIES Page 33.





MANUAL FILM THREADING

Normally when setting up the projector you would use the autoload film threading feature. However, this projector can be threaded manually when necessary, such as starting a film showing in the middle of a reel, for example. To thread manually, follow these instructions and refer to diagram:

Turn motor switch to OFF position. Swing the lamp house cover open by grasping it at the top and pulling it away from the body of the projector. Loosen the exciter lamp cover screw and remove the cover. Open the hinged lens housing by pulling the lens away from the projector.

Push the threading mechanism release roller to the rear of the projector until the threading mechanism snaps open. Open all three sprocket guards—push up on the top two and push down to open the bottom guard.

Thread the film into the projector by slipping it into the threading path from the side starting at the top black roller marked "4". Place the film under this roller.

Place the film under roller "A" and engage the film sprocket holes on the sprocket teeth. Push down to close the sprocket guard.

Position the film in the center of the space between the film guides and seat the film against the aperture plate between the edge guide rails. Be sure the film is against the aperture plate and behind the guide "D".

Place the film under the roller "E", engage the film sprocket holes on the sprocket teeth and place the film under the roller "G". Close the sprocket guard and close the lens housing.

Place the film between the next two film guides and under the tension roller.

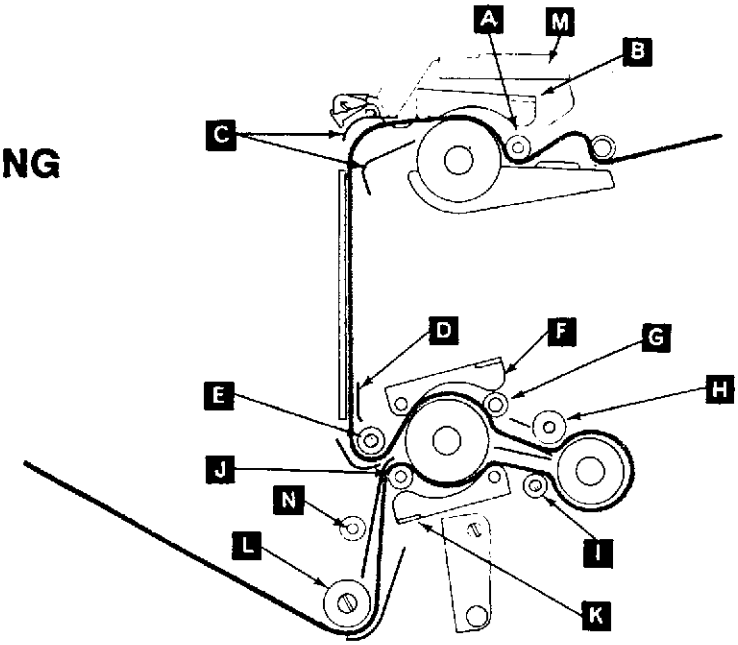
Continue threading the film around the sound drum and over the roller "I". Place the film between the sprocket and the sprocket guard and over the roller "J". Pull on the loose end of the film to separate rollers "H" and "I", then push the film in over the sprocket flange and engage the sprocket holes. Push up to close the sprocket guard.

Place the film in front of guide "N", and under the threading release mechanism roller. Then attach it to the take-up reel.

Replace the exciter lamp cover.

Check the film loop sizes both above and below the aperture for proper size. If the loops are not properly formed, turn the Motor switch to the forward position "3" and press down on the system restorer for at least one second to restore loops.

MANUAL FILM THREADING



MANUAL UNTHREADING

To remove the film in the middle of a reel, **turn motor switch to OFF position,** swing open the lamp house cover. Loosen the exciter lamp cover screw and remove the cover. Pull open the hinged lens housing.

Turn the front film reel clockwise to provide slack in the film. Open the three sprocket guards. In your right hand grasp the film close to the black roller "4" and ease it out from under the roller.

Hold the film at the black roller with your right hand and just behind the sprocket with your left hand. Push your hands toward each other and ease the film off the sprocket teeth and out from under the sprocket guard.

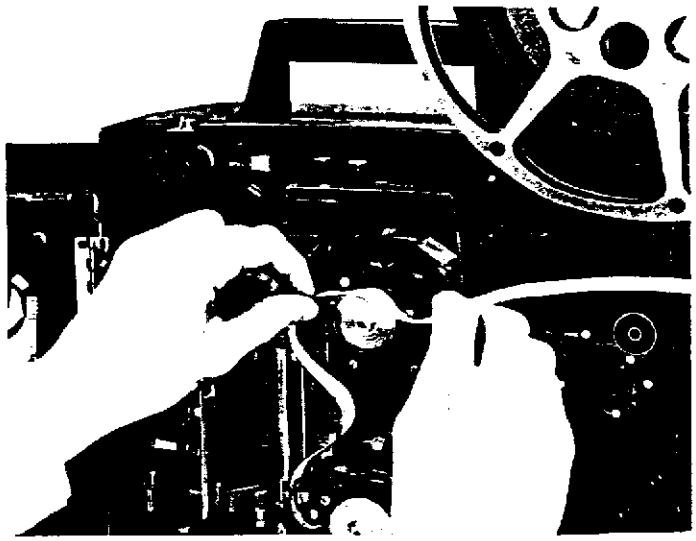
Next, grasp the film under the loop restorer roller with left hand. Place index finger of right hand on top of the sound drum and push it toward the sprocket. Ease film off the sprocket teeth on top of the lower sprocket. Continue to ease film out from under the stabilizing roller and off the sound drum.

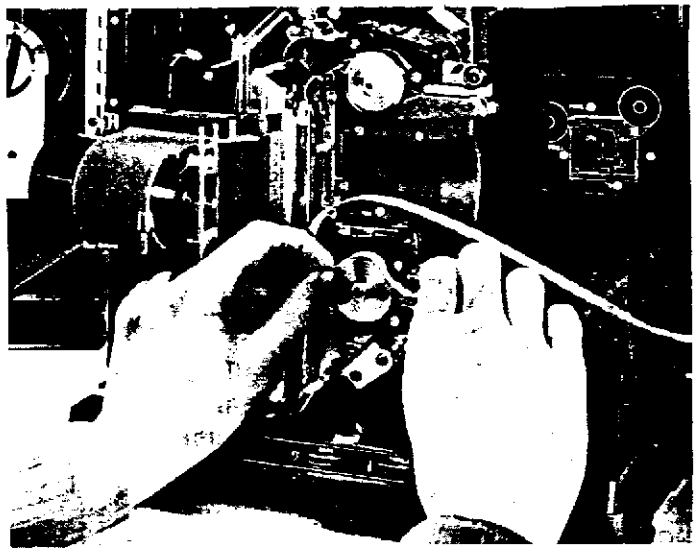
Hold film with left hand at the rear of the lower sprocket and with the right hand below the sound drum. Push upward to ease the film off the sprocket teeth at the bottom of the lower sprocket. Slide the film out of the bottom film channel.

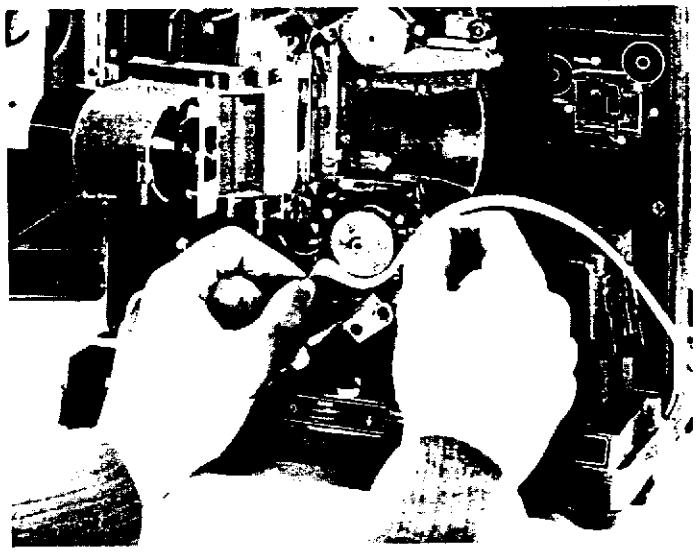
Leaving the reels on the reel arms, proceed with rewinding as described on Page 34. After rewinding, reinstall the exciter lamp cover, close the lens housing, and swing closed the lamp house cover.

NOTE:

If film was manually unthreaded because of poor splices or torn perforations, be sure the damaged section is removed and the film properly spliced before rewinding.



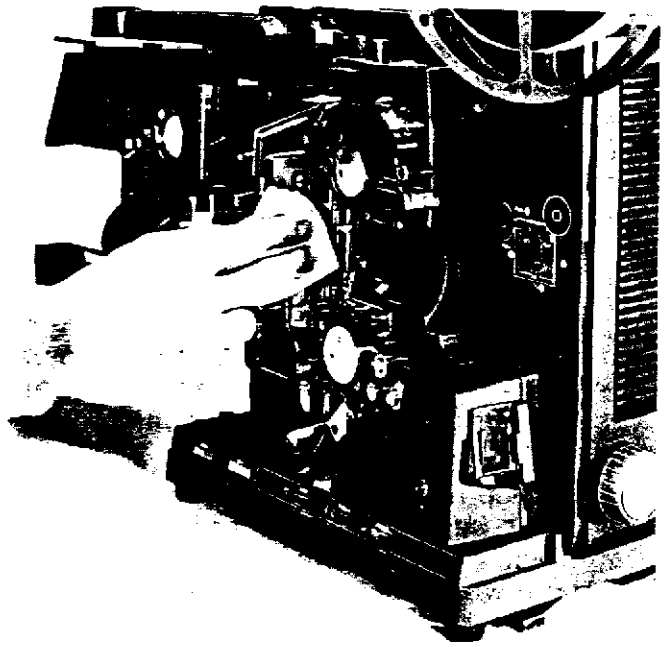




MAINTENANCE AND CLEANING

Your Bell & Howell projector has been designed and engineered for long, trouble-free service with a minimum of maintenance. Factory lubrication is built-in; you'll never need to oil this projector. Permanently lubricated bearings mean extended service and longer life. Many parts which normally wear are adjustable, eliminating the need for frequent replacement.

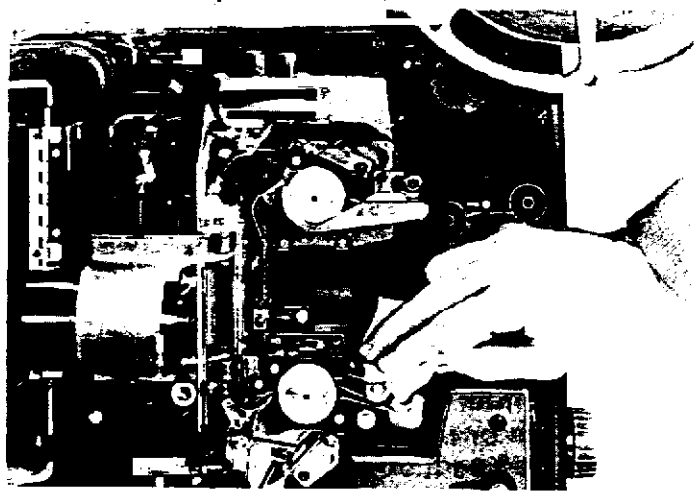
Periodic maintenance is required, including cleaning and occasional replacement of some parts. Instructions for simple procedures follow. We recommend that you seek factory approved service from your Bell & Howell Approved Service Station periodically to assure that your equipment remains in first-class operating condition.



CAUTION:

Do not attempt to remove the back cover of the projector; no internal parts are serviceable by the user. Specialized equipment and tools are necessary.

CLEANING THE FILM PATH

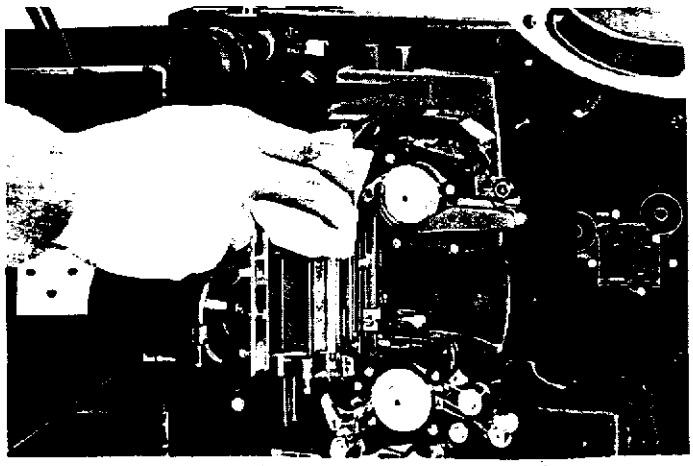


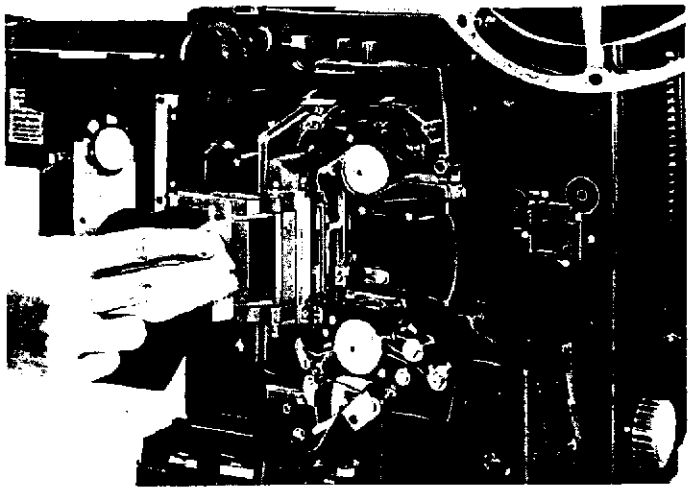
To prevent damage to the film, all surfaces that contact the film must be cleaned frequently. **Projector and lamp must be turned off before beginning cleaning.**

To reach the film path swing open the lamp house cover. Wipe all threading guides with a soft cloth or brush which has been moistened with any naphtha-based agent such as lighter fluid. Remove the exciter lamp cover (see section on replacement of exciter lamp) to clean the sound drum and the film guide that is part of the exciter lamp cover. Gently clean both sound drum stabilizing rollers. Remove any loose particles that may have become lodged in the film threading path. Before cleaning this area of the projector, be sure all projector parts have cooled.

CLEANING THE APERTURE AND PRESSURE PLATES

Assure that the projector and lamp are turned off. Open the lens housing by swinging it out from the projector. Gently wipe the aperture and pressure plates with a cloth moistened with lighter fluid or naphtha based solvent to remove accumulated dirt or emulsion. Also clean the aperture side tension rails and the aperture opening. Be sure to press in on the side tension rail and clean the area of the aperture plate behind the side tension rail. After cleaning, gently swing the lens housing back into position; be sure the pressure plate seats properly. Snap the housing closed.



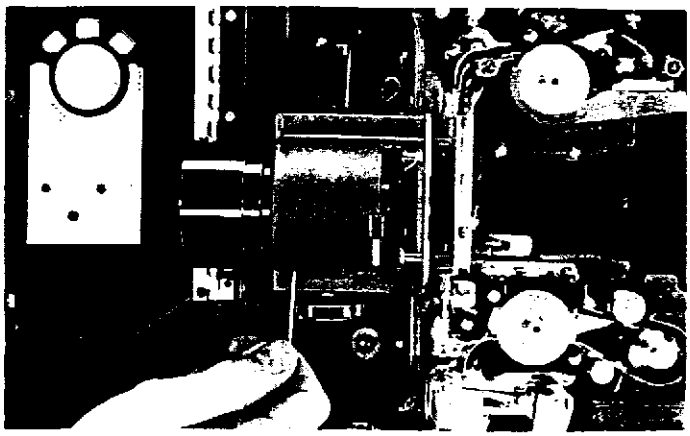


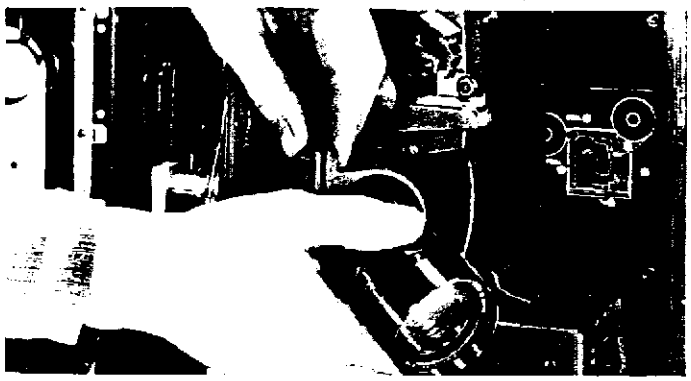
CLEANING THE LENS

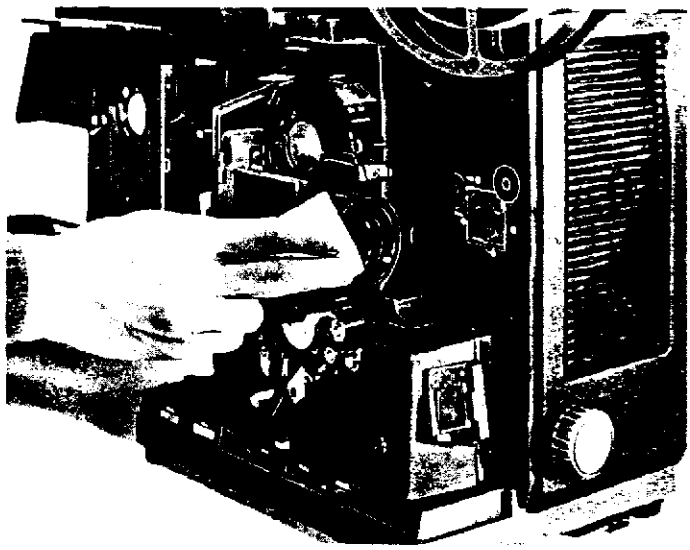
To discourage unauthorized removal, the projection lens may be secured in the lens housing with a lens locking system consisting of an Allen screw and wrench (supplied with the projector). To install the screw, pull the lens housing out and insert the screw in the threaded hole at the bottom of the housing. Have the lens focused all the way in when inserting the screw. To remove or change the lens, just back the screw out with the wrench. Store the wrench in a safe place.

If the lens locking screw has been installed, take the Allen wrench and back the screw out far enough so that the lens can be removed. Turn the focus knob to the left to move the lens out as far as it will go. Then, grasp the lens barrel and remove it from the housing. Use a lens tissue or soft cloth moistened with lens cleaner to wipe dust and fingerprints off front and rear lens surfaces. When lens is clean, insert it back into the lens housing, turning the focus knob to the right to engage the lens. If the lens locking screw has been used, turn it back to secure the lens.

After cleaning is complete, close the lens housing and shut the lamp housing.





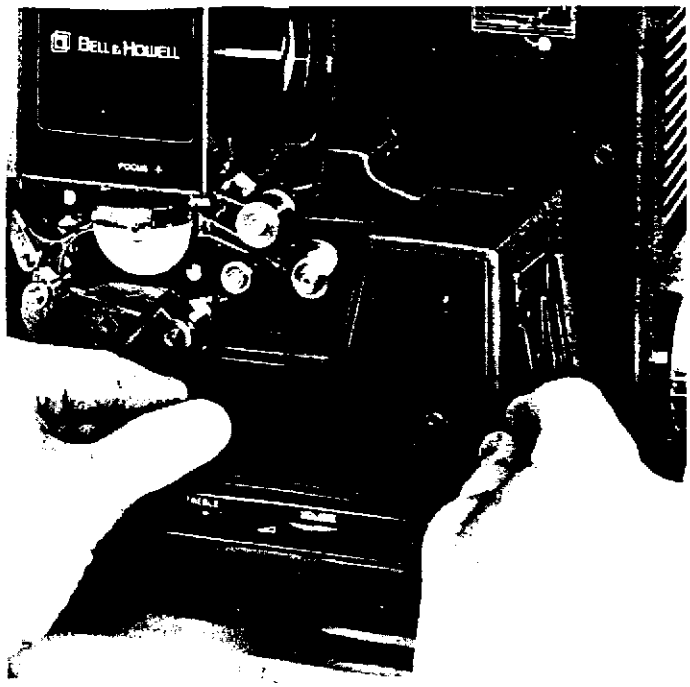


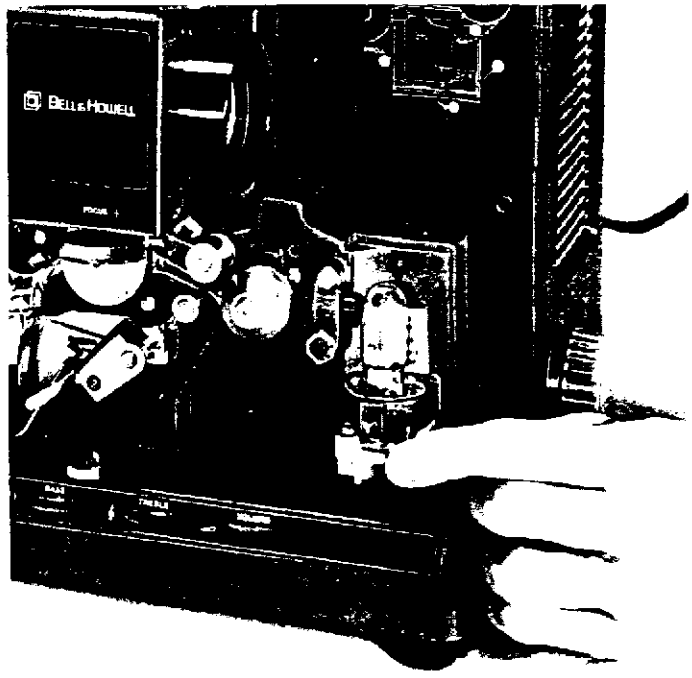
REPLACING THE EXCITER LAMP

Before starting to replace the exciter lamp, turn the motor switch to the OFF position and disconnect the power cord. Loosen the exciter lamp cover screw and remove the cover by pulling straight out. Note the registration pins which align the cover. Move the exciter lamp lock lever to the right to release the lamp. Then rotate the lamp counterclockwise and lift it off the guide pins.

Place the new lamp (ANSI Code BAK) over the guide pins and rotate the lamp clockwise. Move the lamp lock lever to the left to lock the lamp base firmly in place. The notch in the lamp base flange should be facing forward when installing the new lamp.

Replace the exciter lamp cover; be sure to match the two registration pins to the two holes in the projector to align the cover. When the cover is firmly seated in place, hold it securely and tighten the screw.



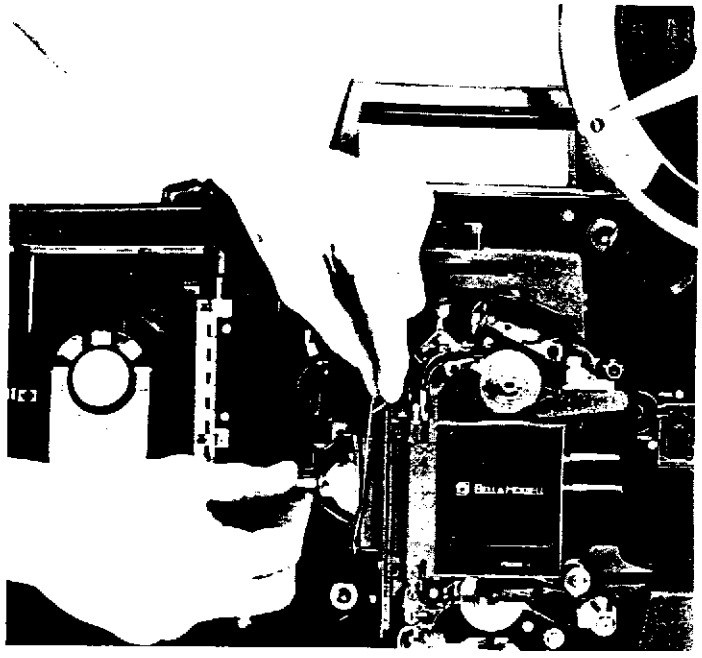


REPLACING THE PROJECTION LAMP

Turn the motor switch to the OFF position and disconnect the power cord. Allow the equipment to cool before attempting to handle the lamp.

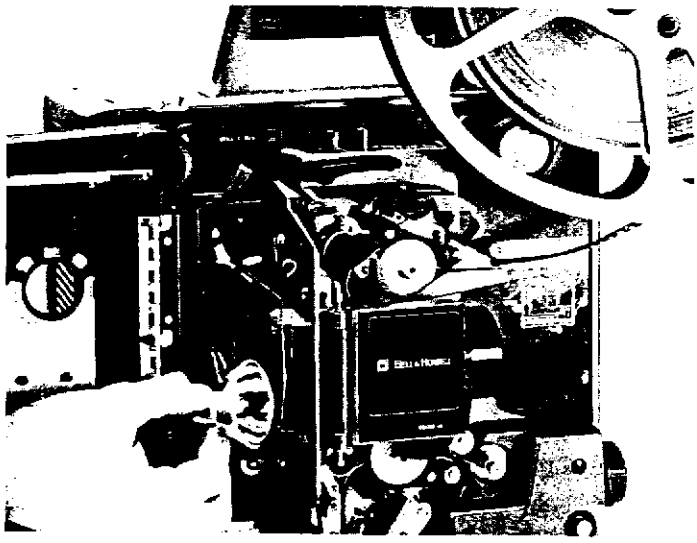
FOR MODELS 2592/2585:

Swing the lamp house cover open. Press the top of the lamp retainer to release it from the clip; it is flexible enough to be out of the way for replacing the lamp. Then unplug the lamp from the socket, plug in the new lamp and place the new lamp in position in the projector. The socket wires must point downward toward the projector base. Refasten the lamp retainer and close the lamp house door.



FOR MODEL 2590:

Swing the hinged lamp housing out and to the rear. Swing the lamp holder clamp downward. Grasp the lamp by the black rear portion and pull it straight out. CAUTION: If the lamp is still warm or hot, use a glove or heavy cloth to hold the lamp base. Insert the new lamp, reflector forward, by aligning the pins with the socket and pushing straight in. Push the lamp clamp back up until it snaps into position. Swing the lamp housing closed, insuring that it has snapped firmly into place.



NOTE:

Use ANSI Code ELC lamps with models 2592/2585. Use ANSI Code BHB lamp with model 2590.

Remember, handle the lamp only by the outer reflector shell or ceramic base; do not touch the inside of the reflector or bulb.

FILM CONDITION

Your projector is designed with special features to help protect your film from damage. Although it is designed to accept film in virtually every conceivable condition, there are certain film irregularities that the projector may not handle properly or which may cause threading difficulties.

Should your film be forced up and out of the projector's threading mechanism, immediately turn the motor switch OFF and remove the film for inspection and repair.

The following conditions can cause threading difficulties:

FILM LEADER—The first three feet of film (the leader) is very important in an autoload system. If there is any doubt about the condition of the leader, splice on new leader material.

DRY FILM—It has a tendency to crack and break. The film end should be replaced with new leader and in many cases all of the film on the reel should be cleaned and relubricated.

MARKED LEADER—Leader with tape, staples, grease pencil, or identifying marks on it should be corrected or replaced.

TORN PERFORATIONS—Whether at the leader end of the film or within the reel, torn perforations should be cut out. Replace with new leader at the start of the film.

BUCKLED OR WARPED FILM—Replace with new leader.

FILM CURL—If curl is tighter than 4" diameter, replace the leader.

SPLICES—If a splice should break in the middle of a showing, stop the projector, trim the end of the film from the front reel, rethread the projector and continue the film using another rear reel. When rewinding, stop the film at the break and splice.

BUCKLED OR WARPED SPLICES—Correct to prevent future problems.

MISALIGNED SPLICES—A misaligned splice can cause projection problems especially if it is in the leader portion of the film. Resplice correctly.

STAPLED SPLICES—For emergencies only. Be sure they are taken out before the film is rewound or reshown.

TAPE SPLICES—Take care to see that they align perfectly with the sprocket holes in the film.

NOTE:

Film being used for the first time must be trimmed using the film trimmer. Any ragged end, bend, or extremely tight curl must be cut off to allow proper film threading.

TROUBLE SHOOTING

The following information includes a variety of symptoms, a test which will pinpoint the nature of the trouble, the cause of the trouble, and a remedy. Many of the symptoms described may not ever be encountered during the life of the projector; this information is provided as a guide should the condition ever exist.

SYMPTOM	TEST	CAUSE	REMEDY
Projector completely inoperative.	Is power cord plugged in? Is motor switch in forward position? Does electrical outlet have current?	If yes to all tests, internal power supply is not working.	Return projector to service station.

TROUBLE SHOOTING (CONT'D)

Film does not thread automatically.	Is autoload lever #2 pushed forward? Is motor switch in forward position? Is film leader in good condition and properly trimmed? Is the lens housing closed, the exciter lamp cover firmly in place, the film threading path free of obstructions? Is the run/still control (Model 2592) in the run position?	If yes to all tests, electrical/mechanical problem.	Return projector to service station.
SYMPTOM Exciter lamp lights but no sound comes from speaker.	**TEST** Is the film properly threaded? Is the volume turned up? Is the film soundtrack adequate? Remove film from projector. Turn motor switch to forward. Make sure run/still control (Model 2592) is in the run position. Pass a card swiftly back and forth between the sound drum and the lens adjacent to the exciter lamp; listen for thumping noise. If external speaker is used, unplug and check for proper operation with internal speaker.	**CAUSE** Internal failure. If thump, faulty film soundtrack. Faulty external speaker system.	**REMEDY** Return projector to service station. Replace or repair external speaker.
SYMPTOM Exciter lamp does not light; no sound from speaker. Sound volume is not adequate; fuzzy, garbled.	**TEST** Is exciter lamp burned out? Is external speaker(s) at 4 Ohm minimum load? Check for overload shut-down condition. Is volume control set high enough? Is tone control set properly? Is film tight around the sound drum? Is film clean? Is exciter lamp filament damaged?	**CAUSE** Exciter lamp is bad. Auxiliary speaker may be loose. Internal failure.	**REMEDY** Replace lamp. Tighten speaker cable. Return projector to service station. Correct overload. Clean film. Replace exciter lamp. If symptom continues, return projector to service station.
SYMPTOM No picture	**TEST** Is motor switch in the project position? Is projection lamp burned out?	**CAUSE** If setting is right, bad lamp.	**REMEDY** Replace lamp. If symptom continues, return projector to service station.

ACCESSORY LENSES

A variety of accessory projection lenses are available to give sharp, brilliant movies in every projection situations. Ranging from 1" (25 mm) through 4" (100 mm) in discrete lenses, and including Filmovara® Zoom Attachment, and Anamorphic attachments (may not be used together), virtually every screen size can be filled at projection distances up to 200 feet. It is best to have a lens of the right focal length to fill the screen. The focal length required will vary according to screen size and distance between the projector and screen. The projection table that follows will show the relationship between lens focal length, screen size, and distance. It is best to have the projector located as far toward the rear of the room as possible to avoid obstructing the view of your audience.

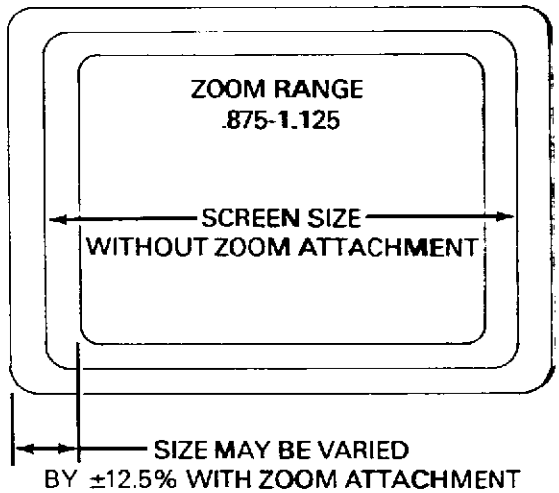
FILMOVARA® ZOOM ATTACHMENT

The Filmovara Zoom Attachment will enable you to project a variety of image sizes with a single lens. The Filmovara attachment can be used with the following lenses:

1.5" (38 mm) F/1.5
2" (51 mm) F/1.2 or F/1.6 standard lens
2.5" (64 mm) F/1.5
3" (76 mm) F/1.6

The magnification ratio ranges from .875 to 1.125. See projection table for the span of screen size/distances you can achieve with this attachment.

To use the Filmovara Zoom Attachment, screw it clockwise onto the front of the projection lens. Revolve the rear, black, knurled collar of the attachment until the image fills the width of the screen at the selected projection distance. Clockwise rotation of the ring decreases picture size; counterclockwise rotation increases picture size. Sharpen the image with the focus knob as with any other lens.



ANAMORPHIC LENS (2X)

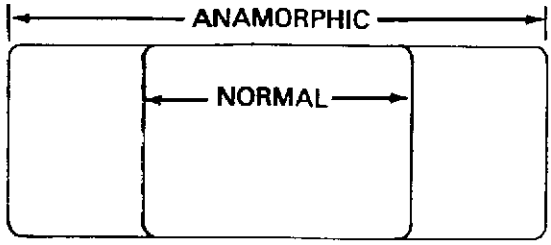
The Anamorphic lens will enable you to show wide-screen 16 mm films. This lens doubles the width of the projected image without altering the height. This accessory fits the following lenses:

1.5" (38 mm) F/1.5
2" (51 mm) F/1.2 or F/1.6 (standard lens)
2.5" (64 mm) F/1.5
3" (76 mm) F/1.6
4" (100 mm) F/1.6 (with special adapter)

To use the Anamorphic lens:

1. Screw the Anamorphic lens into the front of the projection lens.
2. Rotate the two assembled lenses to orient the image on the screen.
3. Position the projector to fill the width of the screen.
4. Set the projection distance on the Anamorphic lens barrel.
5. Sharpen the image with the FOCUS CONTROL. (See Page 13).

The Anamorphic lens cannot be used with the Filmovara Zoom lens.



Note:

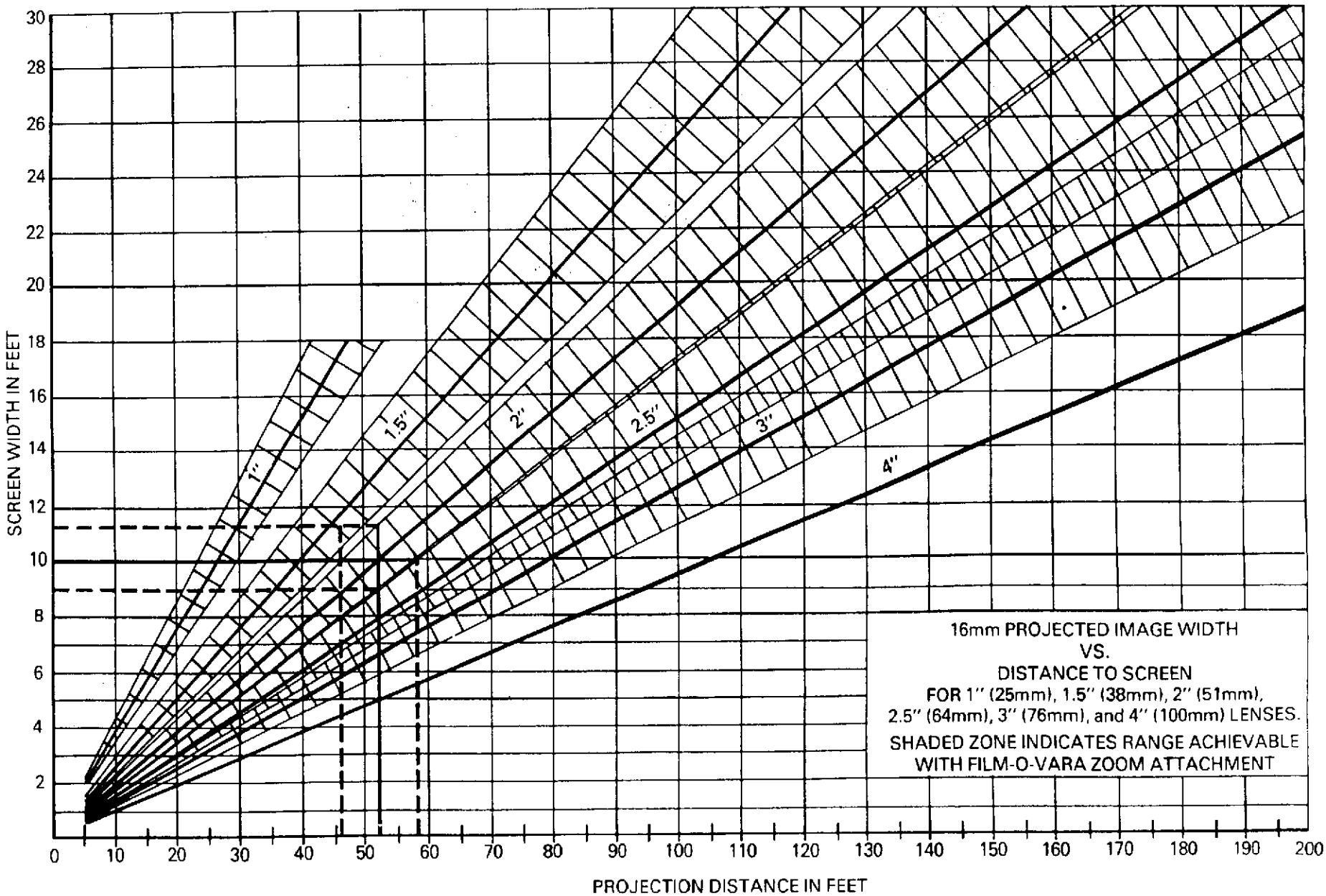
This projector is equipped with a lens locking system (the lens lock works only with standard 2" lenses). See the section on CLEANING THE LENS Page 24 for instructions on changing lenses.

PROJECTION TABLE

This table shows the relationship between lens focal length, screen size and distance. It is based on the equation:

$$\text{Screen Width (feet)} = \frac{.38 \times \text{Projection Distance (feet)}}{\text{Focal Length (inches)}}$$

For example: a 10 foot wide screen used with a 2" (50mm) lens requires a projection distance of 52 feet. When Filmovara® Zoom attachment is used, the projection distance can vary from 46 feet to 58 feet. Or, the Filmovara attachment could be used to adjust the image width from 9 feet to 11.2 feet at a fixed projection distance of 52 feet.



ACCESSORY LENSES
1″ (25mm) F/1.6
Bell & Howell Part No. 204595
1.5″ (38mm) F/1.5
Bell & Howell Part No. 204441
2.5″ (64mm) F/1.5
Bell & Howell Part No. 204442
3″ (76mm) F/1.6
Bell & Howell Part No. 204443
4″ (100mm) F/1.6
Bell & Howell Part No. 201004

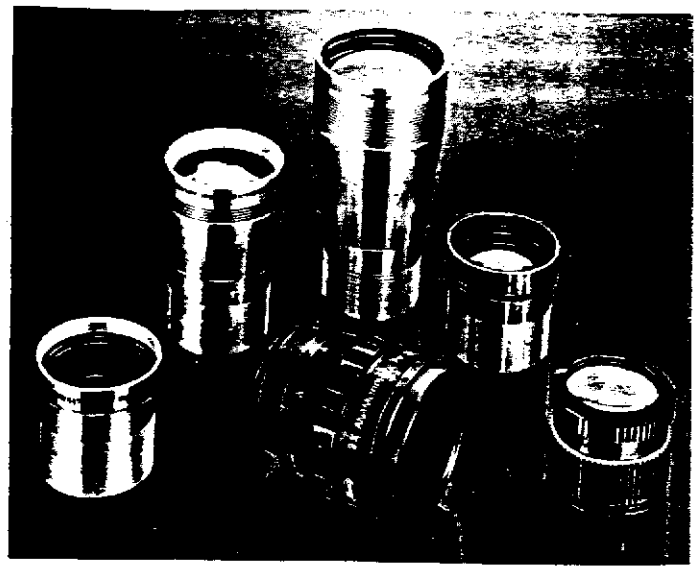
FILMOVARA® ZOOM ATTACHMENT
Bell & Howell Part No. 204665
For use with 1.5″ (38mm), 2″ (51mm), 2.5″ (64mm), and 3″ (76mm) lenses.
Magnification ratio: .875 to 1.125.

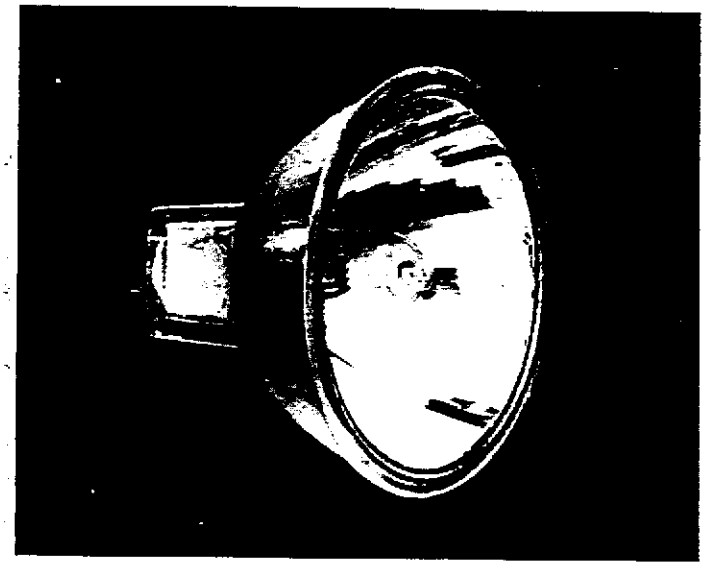
ANAMORPHIC LENS (2X)
Bell & Howell Part No. 204440
For use with 1.5″ (38mm), 2″ (51mm), 2.5″ (64mm), 3″ (76mm), and *4″ (100mm) lens.

***ANAMORPHIC ADAPTER**
Bell & Howell Part No. 204287
Required with 4″ lens.

PROJECTION LAMPS
Bell & Howell Part No. 710396 (ELC)
Bell & Howell Part No. 44223 (BHB) (not shown)

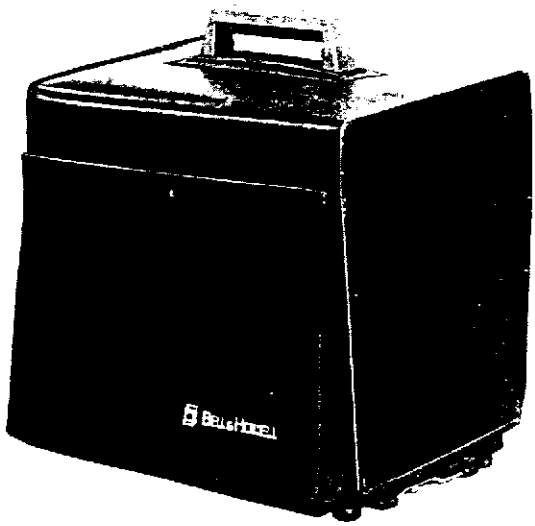
EXCITER LAMP
Bell & Howell Part No. 34884 (BAK) (not shown)



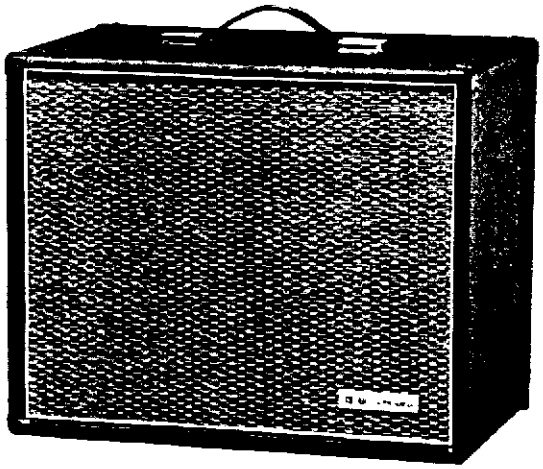


FILM REELS (not shown)
400′ (120m) Plastic Take-Up Reel
Bell & Howell Part No. 710365
400′ (120m) Standard Metal Reel
Bell & Howell Part No. 710138
1600′ (500m) Standard Metal Reel
Bell & Howell Part No. 01873
2000′ (600m) Standard Metal Reel
Bell & Howell Part No. 03727

PROTECTIVE COVER
Bell & Howell Part No. 44468
Bell & Howell Part No. 707788 (for projectors with speaker covers)
This cover slips over the projector and protects it from dust and damage while in storage and while being transported from place to place. Built-in pocket will hold a large film reel.



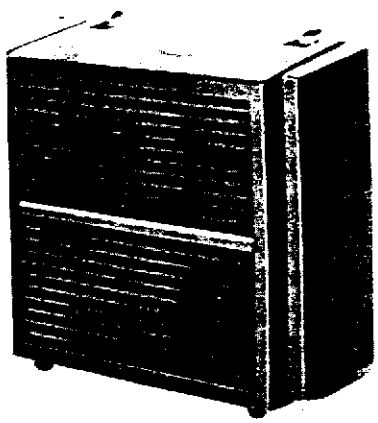
ORCHESTRICON™ III SPEAKER
Bell & Howell Part No. 077799
This 12″ (30cm) accessory speaker provides the ultimate in extension sound. Complete with 50′ (11m) of cord.

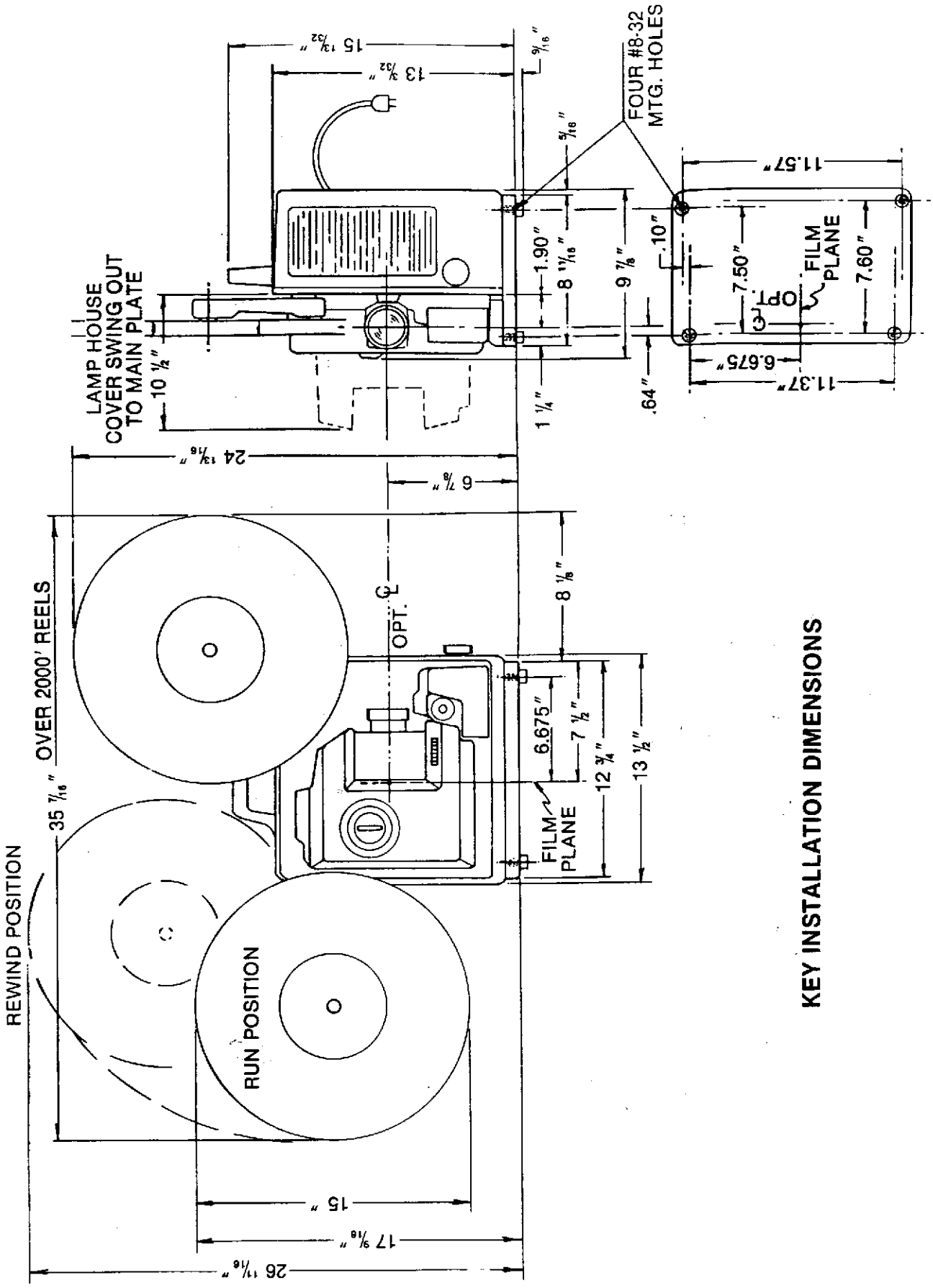


DIRECTAMOTION® REMOTE CONTROL (not shown)
Bell & Howell Part No. 014128
(For Model 2592 only)
Allows the operation of the Directamotion feature from a distance. Plugs into the socket on the rear of the projector.

SPEAKER COVER
Bell & Howell Part No. 078146
This convenient extension speaker doubles as the projector's cover for maximum portability and storage convenience. Complete with 35′ (10.6m) self-storing cord.

HOUR METER (not shown)
Bell & Howell Part No. 078826
This instrument is used to accurately measure projector utilization, lamp longevity, and projector performance. Helps in the scheduling of regular projector maintenance based on hours of use. Installed by service station only.





KEY INSTALLATION DIMENSIONS

Bell & Howell Limited Warranty

This Bell & Howell equipment is warranted to be free from defects in both materials and workmanship. Should any part of this equipment be defective, it will be repaired or replaced, at Bell & Howell's option, free of charge (except incoming shipping charges) for a period of **one (1) year** from the date of original purchase. No charge will be made for parts or labor during this period.

Notice: Your sales receipt is your warranty validation. Dated proof of purchase (such as bill of sale or cancelled check) must be provided when requesting warranty work to be performed.

This warranty is void if:

(a) the equipment has been damaged by negligence, accident or mishandling, or has not been operated in accordance with the procedures described in the operating instructions; or

(b) the equipment has been altered or repaired by other than a Bell & Howell approved service station or one of the following factory service centers (approved service station list will be made available upon request), or adaptations or accessories other than Bell & Howell's have been made or attached to the equipment which, in the determination of Bell & Howell, shall have affected the performance, safety, or reliability of the equipment.

(c) The equipment's original serial/data plate has been modified or removed.

NO OTHER WARRANTY EXPRESSED OR IMPLIED, INCLUDING MERCHANTABILITY, APPLIES to the equipment, nor is any person or company authorized to assume any other warranty for Bell & Howell. **BELL & HOWELL DOES NOT ASSUME ANY RESPONSIBILITY FOR ANY CONSEQUENTIAL DAMAGES,** including unsatisfactory or damaged film, inconvenience or interruption in operation. Bell & Howell warranty service is limited to the duration of the warranty period.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

In case of unsatisfactory operation, the equipment should be sent directly (or through a Bell & Howell authorized dealer) to a Bell & Howell approved service station or one of the factory service centers listed within this catalog, with a description of the problem. Please do not include personal material with the returned equipment as Bell & Howell does not accept responsibility for these items.

Bell & Howell
Visual Communications Group

Audio Visual Products, 7100 North McCormick Road, Chicago, IL 60645 (312) 673-3300

Specifications subject to change without notice.

Part No. 950114
Form No. LT 16792 Rev184

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