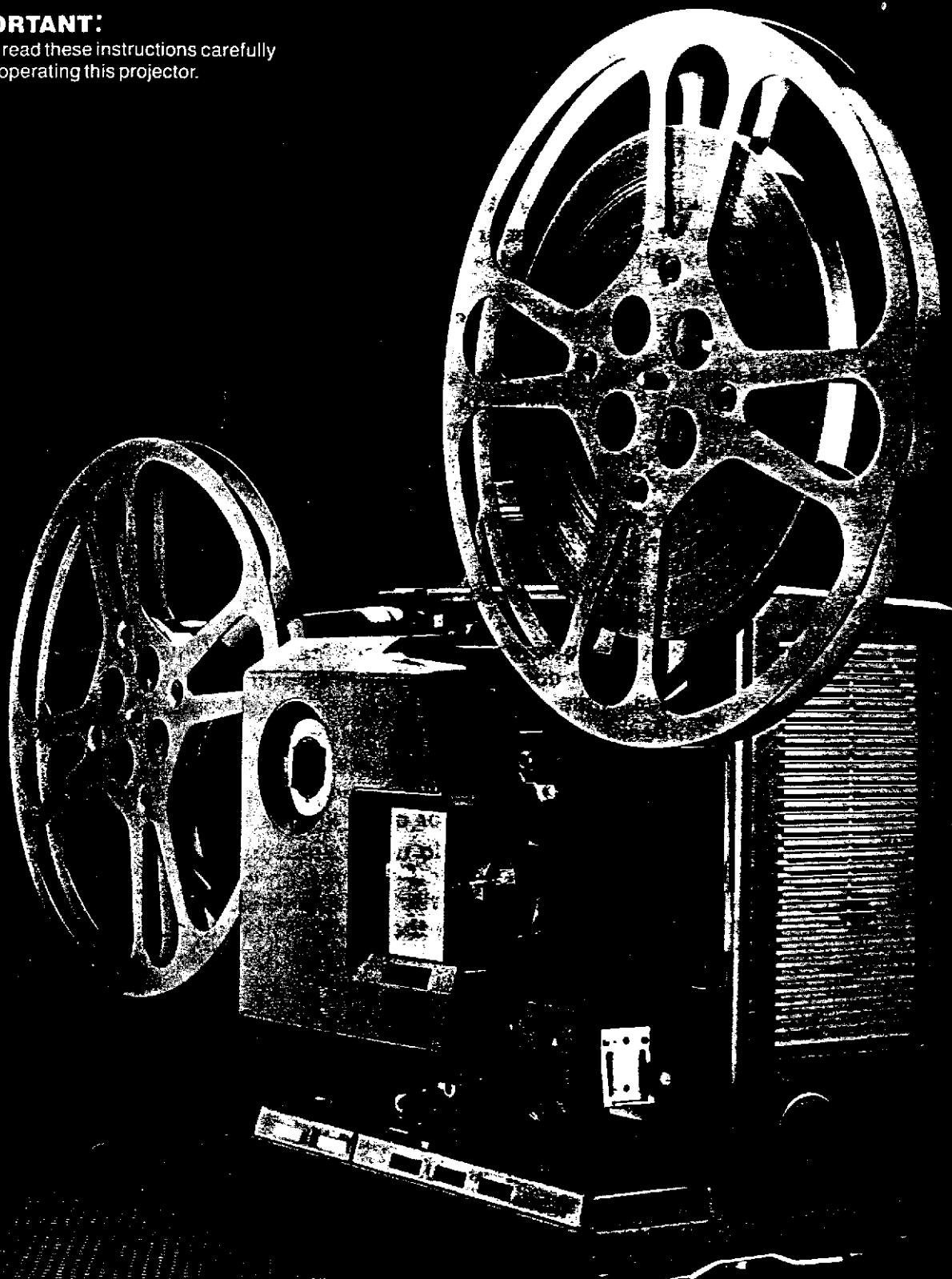


**Bell & Howell Autoload® Filmosound®**  
**16mm Sound Projectors—Models 2585, 2590, 2592**

**Owners and Operators Guide**

**IMPORTANT:**

Please read these instructions carefully  
before operating this projector.



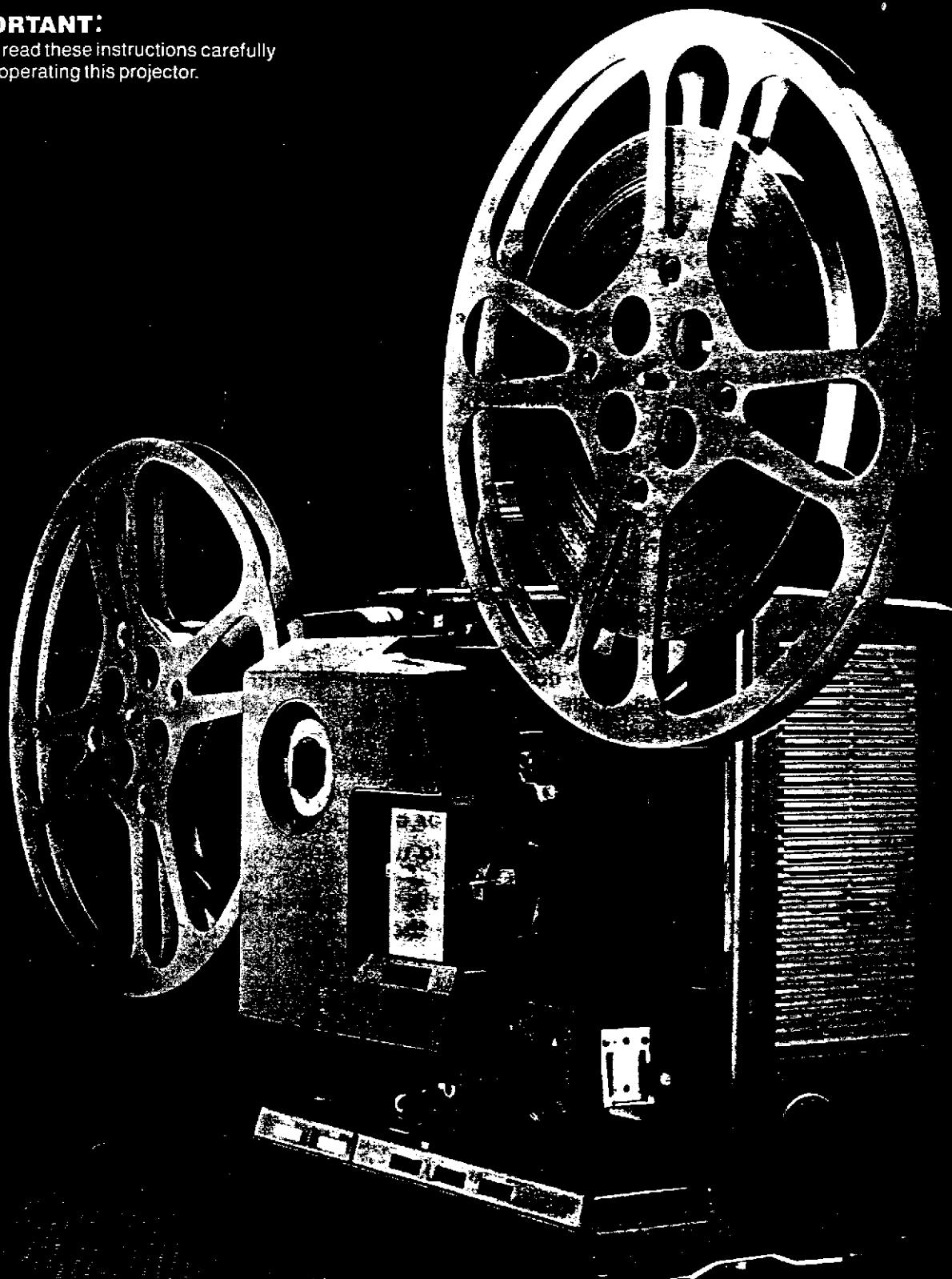
**Visual Communications Group**  
*Audio Visual Products*

**Bell & Howell Autoload® Filmosound®  
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**Visual Communications Group**  
*Audio Visual Products*

## IMPORTANT SAFEGUARDS— SAVE THESE INSTRUCTIONS

When using your photographic equipment, basic safety precautions should always be followed, including the following:

1. Read and understand all instructions.
2. Close supervision is necessary when any equipment is used by or near children. Do not leave equipment unattended while in use.
3. Care must be taken as burns can occur from touching hot parts.
4. Do not operate equipment with a damaged cord or if the equipment has been dropped or damaged—until it has been examined by a qualified serviceman.
5. Position the equipment in such a way so as not to block any air intake or exhaust openings.
6. If an extension cord is necessary, a cord with a suitable current rating should be used. Cords rated for less amperage than the equipment requires may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.
7. Always unplug your equipment from electrical outlet when not in use. Never yank cord to pull plug from outlet. Grasp the plug and pull to disconnect.
8. Let equipment cool completely before putting away. Store the power cord properly in the storage area provided.
9. To protect against electrical shock hazards, do not expose this equipment to rain, moisture, or other liquids.
10. To avoid electric shock hazard—do not disassemble this equipment, but take it to a qualified serviceman when service or repair is required. Incorrect reassembly can cause electric shock hazard when the equipment is used subsequently.

The serial number of your projector is included on the name plate located on the base casting of the machine. Record the model number and serial number in the space provided below.

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_

## IMPORTANT

Before operating projector remove protective plastic coverings on all labels. A piece of tape with the adhesive side touched to the label will remove the protective covering.

## TABLE OF CONTENTS

	Page
AUTOLOAD FILMOSOUND 16mm SOUND PROJECTOR	
Important Safeguards .....	2
Your New Projector .....	3
TECHNICAL SPECIFICATIONS, OPTIONS, APPROVALS	
Specifications .....	4-5
Cautions .....	5
OPERATING CONTROLS	
Right Side Controls .....	6
Rear Controls .....	6
BEFORE YOU START	
General Features .....	7-9
GETTING YOUR PROJECTOR READY	
Setting Up The Projector .....	10
Auxiliary Speaker .....	11
USING YOUR PROJECTOR	
Using the Autoload System .....	12
Projecting the Film .....	13-14
Reverse Projection .....	15
Bright-Normal Lamp Selection .....	15
Still Projection .....	16
Speed Changing .....	16
Directamotion® .....	17
Rewinding the Film .....	18
Storing the Projector .....	19
Manual Film Threading .....	20
Manual Unthreading .....	21
CARING FOR YOUR PROJECTOR	
Maintenance and Cleaning .....	22
Cleaning the Film Path .....	22
Cleaning the Aperture and Pressure Plates .....	23
Lens Locking System .....	24
Cleaning the Lens .....	24
Replacing the Exciter Lamp .....	25
Replacing the Projection Lamp .....	26
PROBLEM SOLVING	
Film Condition .....	27
Trouble Shooting .....	27-28
LENS SELECTION, PROJECTION TABLE	
Accessory Lenses .....	29
Filmovara® Zoom .....	29
Anamorphic Lens .....	30
Projection Table .....	31
ACCESSORIES, REPLACEMENT PARTS	
Accessory Lenses .....	32
Filmovara Zoom .....	32
Anamorphic Lens (2X) .....	32
Anamorphic Adapter .....	32
Projection Lamp .....	32
Exciter Lamp .....	32
Film Reels .....	33
Protective Cover .....	33
Orchestron III Speaker .....	33
Directamotion Remote Control .....	33
Speaker Cover .....	33
Hour Meter .....	33
SPECIAL APPLICATIONS	
Key Installation Dimensions .....	34

## YOUR NEW PROJECTOR

Your new Bell & Howell 16mm Filmosound Projector is top quality equipment designed to give years of reliable performance.

Whether in the school room or the board room, the Autoload feature assures a quick, positive, professional presentation every time. Set up time takes only seconds! The film loads fast and easy—threads automatically. The powerful 20-watt amplifier is solid state—no warm-up time is needed. Just turn the projector on, focus, and you're

ready to show your film.

We are proud of this product which was designed to exacting standards of performance, quality, and durability. These high standards are the reason that more Bell & Howell 16mm projectors are in use today than all other brands combined!

The following material will help you use and enjoy your new projector to the fullest extent of its capability.

## SPECIFICATIONS

### ILLUMINATION SYSTEM

**Lamp** ..... Precision-Aligned Tungsten-Halogen Lamp with integral dichroic reflector  
 50 Hour/250-Watt/24 Volt Lamp ANSI (Code ELC)—Models 2592/2585.  
 25 Hour/250 Watt/120 Volt Lamp ANSI (Code BHB)—Model 2590.  
 Bright-Normal Mode Lamp Selection—Models 2592/2585.  
**Shutter** ..... 3-Interruption  
**Standard Lens** ..... Brilliant 2" (51mm) F/1.2 Super Proval Lens—Models 2592/2590.  
 Precision 2" (51mm) F/1.6 Projection Lens—Model 2585.  
 Lens-Locking System prevents unauthorized lens removal.  
**Optional Lenses** ..... 1" (25mm) F/1.6  
 1.5" (38mm) F/1.5  
 2.5" (64mm) F/1.5  
 3" (76mm) F/1.6  
 4" (100mm) F/1.6  
 Filmovara® Zoom Attachment for use with 1.5" (38mm), 2" (51mm), 2.5" (64mm), and 3" (76mm) lenses only.  
 Magnification ratio: 0.875 to 1.125  
 Anamorphic Lens (2X) for use with 1.5" (38mm), 2" (51mm), 2.5" (64mm) and 3" (76mm) lenses only, (no adapter needed)  
 4" (100mm) lens.\*  
 \*Anamorphic lens adapter for 4" (100mm) lens.

### FILM HANDLING CAPABILITIES AND CONTROLS

**Reel Arms** .... Folding; Gear Driven Film  
**Capacity** ..... 400 Ft. to 2,000 Ft. (120m to 600m)

**Framing Control** ..... Fixed axis, moves only film  
**Focus Control** ..... Precision Rack and Pinion  
**Shuttle** ..... Three-Tooth Stellite  
**Film Guide**  
**Rails** ..... Carbo-Nitride Treated  
**Elevation Adjustment** ... Knob Type, Rack and Pinion  
**Threading Loop** ..... Automatic  
**Restorer** ..... Automatic Loop Restorer; Systems Restorer; Loop restorer synchronized with shutter.

### ELECTRICAL MODULAR SYSTEMS

**Power** ..... 120VAC, 60 Hz (Operating range 105 to 132VAC), 350 Watts.  
**Line Cord** ..... 18/3 AWG SJT 9 Ft. (2.74m) length  
**Protection** .... Internal via fuses and electronic controls

### AUDIO SYSTEM

**Amplifier Type** ..... Optical sound track. Plug-in, all Solid State with 20-Watt Output Power (per ANSI specification). Turns on automatically; no warm up time is needed. Overload protection circuit automatically shuts down and protects amplifier in the event of shorted external speaker leads.  
**Speaker** ..... Built-in 4" x 6"  
**Auxiliary Speaker** ..... 1/4" phone jack provided for 8-Ohm auxiliary speaker with minimum total power rating of 20 Watts.  
**Tone Control** .. Separate Bass and Treble with approximately 10dB boost and cut (Model 2592).  
 Single Tone Control (Models 2590/2585).

## SPECIFICATIONS (CONT'D)

## FILM TRANSPORT

## Forward

Project ..... Sound Speed: 24  
Frames/Second (All Models)  
Silent Speed: 18  
Frames/Second (Does not apply to Model 2585B)

## Reverse

Project ..... 24 Frames/Second (All Models)  
18 Frames/Second (Does not apply to Model 2585B)

## Additional

## Projection

Capabilities ... (Model 2592 Only)  
Still Picture Control.  
Directamotion® feature shows sequential action by stopping and starting the film, one or more frames at a time, in forward or reverse. It always stops "on frame"—no framing required.  
Directamotion is controlled by lever or remote control.

## Cooling

System ..... Direct Drive Blower

## EXCITER LAMP

Type ..... BAK 4V, 0.75 Amp,  
Approximate Life—300 Hrs.

## SIZE

14 1/4 " Width  
16 " Height  
10 1/4 " Depth

## WEIGHT

34 lbs. (15.4 kg)—Model 2592  
29 lbs. (13.2 kg)—Model 2590  
33 lbs. (15 kg)—Model 2585

## OPTIONS

Accessory Lenses  
Protective Cover  
Orchestron™ III Speaker  
Directamotion® Remote Control (Model 2592 Only)  
Speaker Cover  
Hour Meter

## APPROVALS

UL Listed

Specifications subject to change without notice.

## READ THESE INSTRUCTIONS BEFORE OPERATING THIS EQUIPMENT

## CAUTION

This equipment is designed to operate only on 120VAC, 60 Hz current. Operating from any other source may damage the equipment and void the warranty.

Do not attempt to remove the cover or back of the projector; no internal parts are serviceable without specialized equipment and tools.

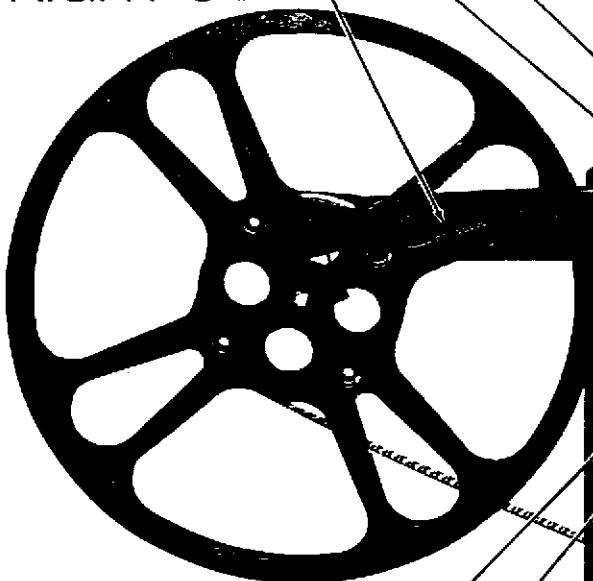
Keep the lamp house door closed except as necessary for access to the projection lamp. Do not open the lamp house door or look directly at the lamp when lighted, nor touch the lamp, lamp base, plug, or socket while the lamp is lighted.

When changing the projection lamp, allow the equipment to cool thoroughly before handling the lamp. Be sure to unplug the power cord from the wall outlet before attempting to remove the lamp plug from its socket.

When connecting extension speakers to the internal sound amplifier, connect no more than two speakers of 8 Ohms each in parallel.

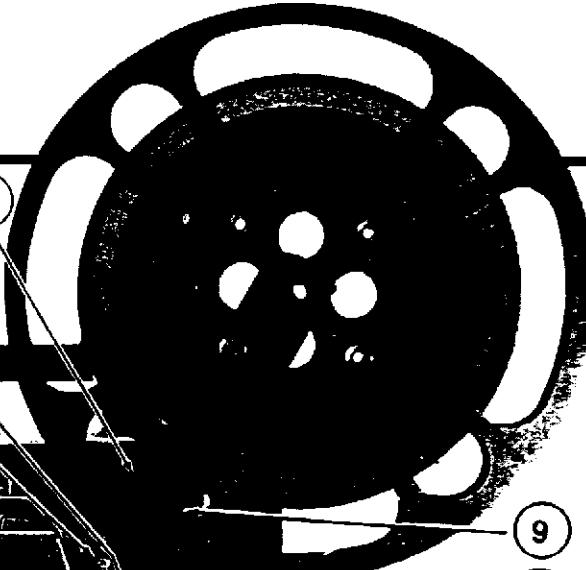
Ground polarity of the system must be observed and the proper plug used to mate with the jack on the projector. See SPECIFICATIONS, and SETTING UP THE PROJECTOR.

## RIGHT SIDE



- 1 Retractable Rear Reel Arm
- 2 Rear Reel Arm Release Button
- 3 Run/Still Control Knob (Model 2592 only)
- 4 Framer Knob
- 5 System Restorer
- 6 Autoload Film Guide Roller
- 7 Carrying Handle
- 8 Front Reel Arm Release Button
- 9 Retractable Front Reel Arm
- 10 Sprocket Guards (Behind Cover)
- 11 Film Insert Channel
- 12 Speaker
- 13 Lens
- 14 Stabilizing Rollers (Behind Cover)
- 15 Sound Drum

- 16 Exciter Lamp Indicator
- 17 Tilt Knob
- 18 Film Trimmer
- 19 Exciter Lamp Cover Screw
- 20 Exciter Lamp Cover
- 21 Volume Control
- 22 Treble Control (Model 2592 only)
- 23 Tone Control (Models 2585 and 2590)
- 24 Bass Control (Model 2592 only)
- 25 Focus Knob
- 26 Lamp House Cover
- 27 Directamotion Control Lever (Model 2592 only)
- 28 Fast Speed Rewind Button
- 29 Motor Switch
- 30 Control Panel
- 31 Autoload Threading Lever



## REAR

Directamotion® Remote Control Outlet (Model 2592 only)

- 31 External Speaker Jack



## GENERAL FEATURES

**The Carrying Handle** is located atop the projector at a balance point which makes it easy to pick up and move the equipment.

**Both Front and Rear Reel Arms** are retractable. Each pivots upward from the storage position and locks in the operating position. To retract an arm, depress the **Reel Arm Release Button** by pressing in toward the projector body while moving the arm downward.

**The Motor Switch** turns the projector On and Off and selects **Forward** or **Reverse** projection and lamp **Off**, **On Normal** and **On Bright**.

**The Framer Knob** allows you to properly center the picture within the frame aperture. Turning the knob clockwise raises the image in the aperture; counterclockwise lowers the image.

When rewinding film, raise the **Reel Arm** to upper lock position for reel to reel rewind at the fastest possible speed.

Torn perforations or bad splices will sometimes cause loss of the lower loop below the film gate. The **Automatic Loop Restorer** will reset the lower loop.

If a large portion of film is damaged and the tension is lost around the sound drum, pressing down on the **System Restorer** for at least one second will normally restore the film to the proper threading path.

The **Lamp House Cover** protects the lamp from damage and shields extraneous light from the projection area. Keep the door closed when the lamp is lighted. To open the compartment door, grasp the cover at the top near the **Framer Knob** and pull away from the body of the projector. The **Cover Door** is hinged at the left side and will swing open easily. Spring clips hold the door closed.

The **Focus Control** moves the projection lens forward and back to focus the image on the screen.

Various lenses allow you to obtain optimum screen image size at any distance. See Page 31 for projection table. Each lens is a high quality, multi-element, coated device capable of projecting sharp, bright images.

## GENERAL FEATURES

The **Lens Locking System** allows you to secure the projection lens within the **Lens Housing** and discourage unauthorized removal. An Allen head screw and wrench are supplied for locking and unlocking the lens in the lens housing.

**Stabilizing Rollers** keep the film in proper relationship with the **Sound Drum** during projection, assuring high quality sound reproduction.

A **Tilt Knob** allows you to raise the front of the machine for projection on a screen located above the horizontal axis. To retain a square image, the top of the screen should be tilted toward the projector when the machine is tilted upwards.

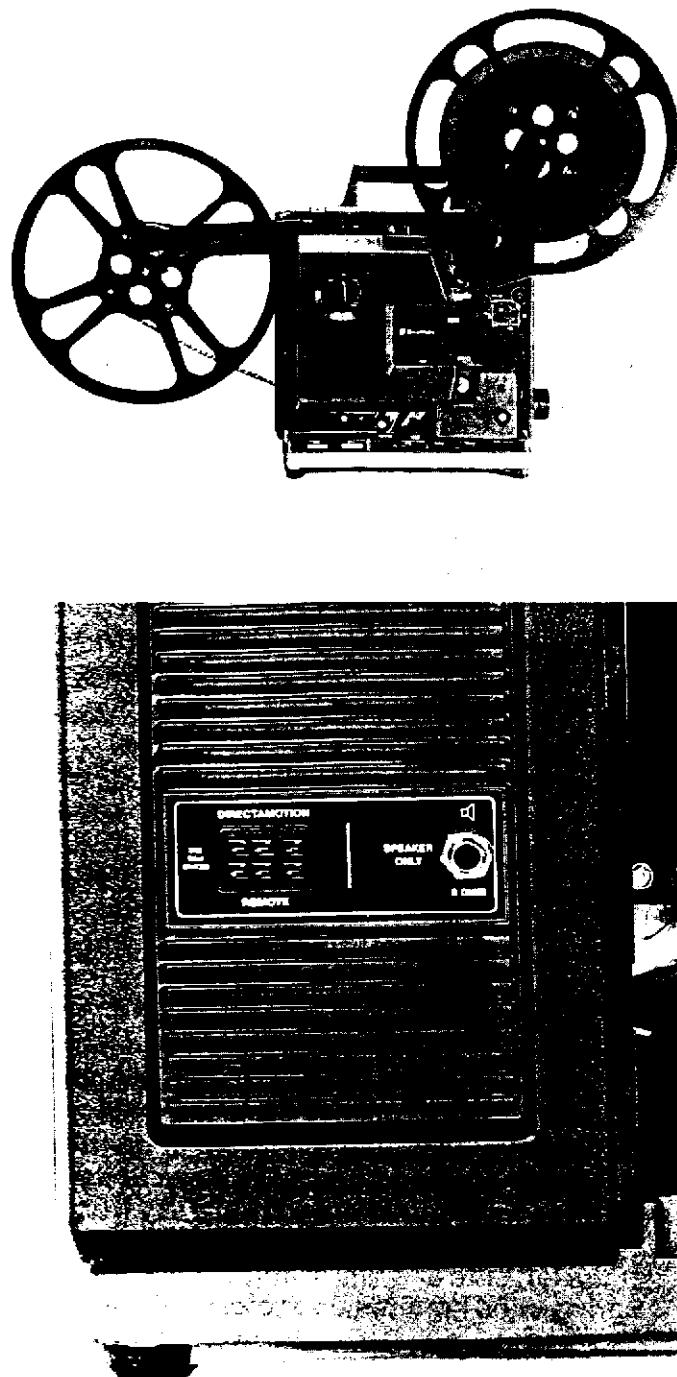
An **Exciter Lamp Indicator** monitors the exciter lamp. This convenient indicator assures that this portion of the sound system is ready for normal operation.

The **Exciter Lamp Cover** protects the lamp from damage and prevents extraneous light from escaping. The **Exciter Lamp Cover Screw** secures the cover in a closed position.

The **Still Picture Control** feature (Model 2592 only) allows you to project just a single frame of film. The projector must be running when you move the **Run/Still Control** to the **Still** position.

The **Directamotion**® feature (Model 2592 only—does not apply to export model) allows showing frames one-by-one—in forward or reverse. Directamotion always stops "on frame". To advance frames a few at a time, move the **Run/Still Control** to **Still**, then simply press down and release the ribbed end of the **Directamotion Control Lever**. To show several frames or a length of film continuously, press and hold down the lever. The Directamotion feature may also be operated with the accessory **Directamotion Remote Control unit**. See **ACCESSORIES**, on Page 33. Illumination level is decreased during **Still** and **Directamotion** feature use because a heat absorbing filter is inserted to protect film.

A 4" x 6" built-in **Speaker** is included. An auxiliary speaker (8 Ohms minimum recommended) may be plugged into the **External Speaker Jack**.



## GENERAL FEATURES

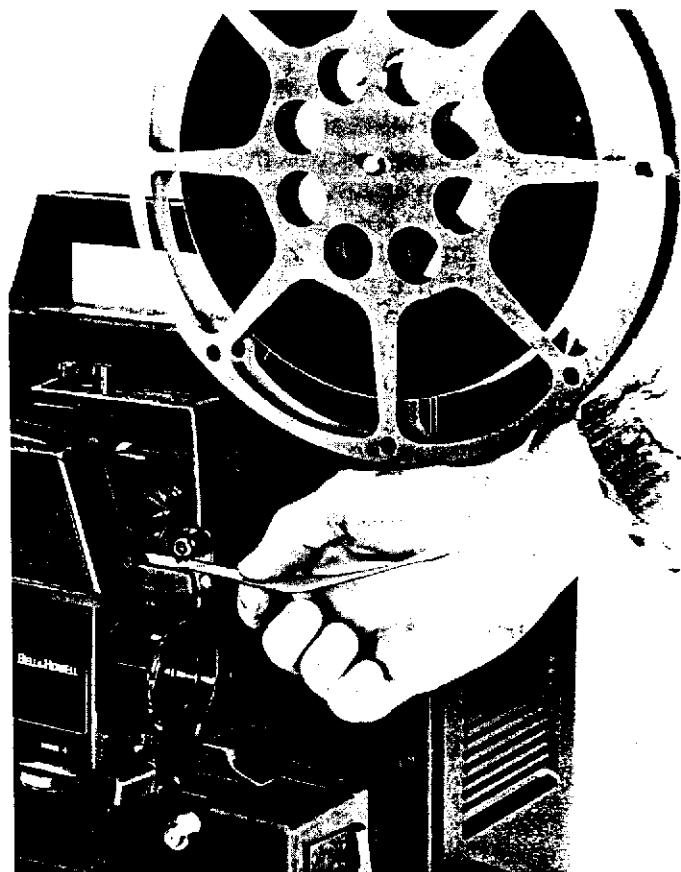
The **Film Trimmer** is used to properly trim the film leader if it is damaged or torn.

The **Film Insert Channel** is the opening into which the end of the leader is first inserted as a part of the automatic threading procedure.

**Sprocket Guards** keep the film in the path and engaged with the sprocket teeth.

When preparing to load film automatically, the **Autoload Lever** is moved forward until it locks into position.

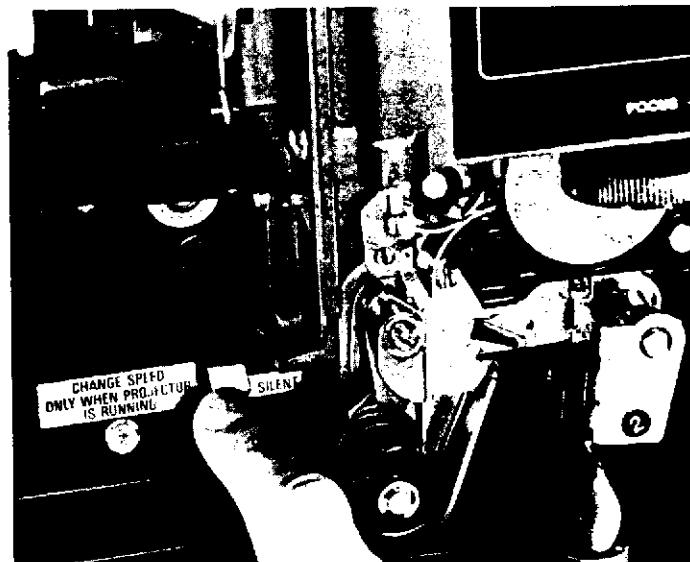
**Bright-Normal Lamp** selection lets you choose the level of screen illumination that best suits room conditions (Models 2585 and 2592 only). For maximum lamp life, the **Normal Position** will extend life to as much as 300 percent of rated life.



The projector may be operated either at sound speed (24 frames per second) or silent speed (18 frames per second). The **Projection Speed Lever** is locked in the Sound Speed position with the **Speed Lever Locking Screw**. Change from sound to silent speeds by moving the **Projection Speed Lever**. Always be sure the motor is running while changing speeds.

### NOTE:

This does not apply to Model 2585B. It operates only at the sound speed (24 frames per second).



(2590 Pictured)



## GETTING YOUR PROJECTOR READY

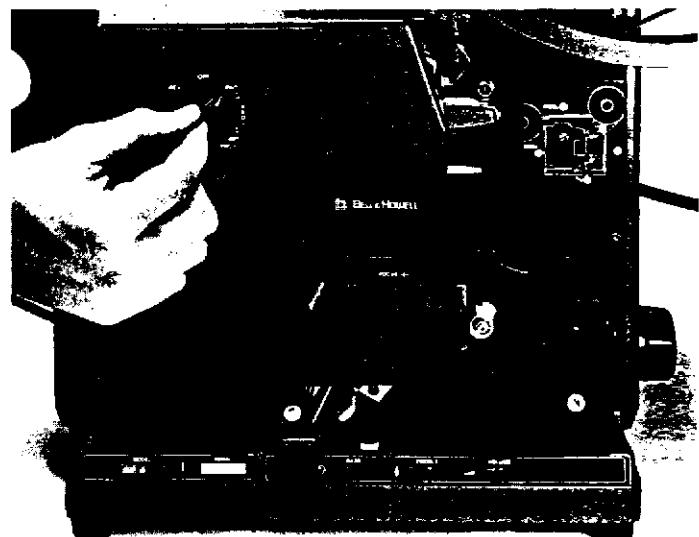
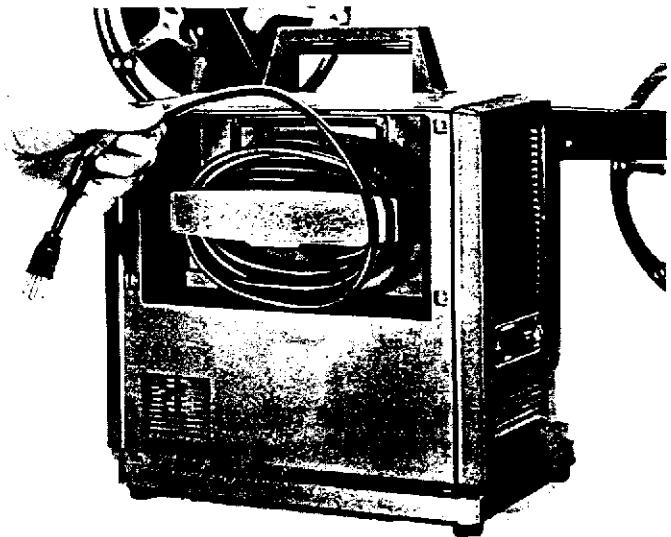
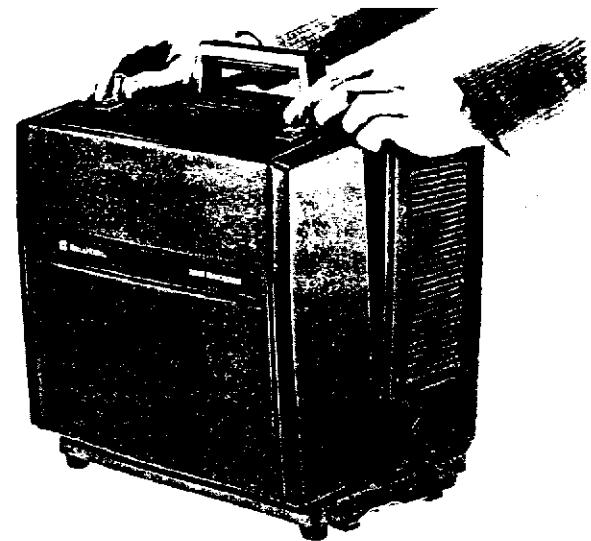
### SETTING UP THE PROJECTOR

Place the projector on a sturdy projection stand or a solid table facing the screen. Be sure the projector is high enough to clear the audience. Release the two locking clamps at the top of the projector housing, unlatch the cover and remove it from the unit. Extend the reel arms; they lock into place with an audible "snap". Select an empty reel of the same size or larger than the reel of film to be projected and place it on the rear take-up arm. Place the reel containing the film to be projected on the front arm.

Make sure the motor switch is in the OFF position. Unwind the power cord from its storage recess and plug it into a 120VAC, 60 Hz grounded outlet.

#### CAUTION:

This equipment is designed to operate only on 120VAC, 60 Hz current. Operating from any other source may damage the equipment and void the warranty.



Use grounded electrical outlets or an adapter. If an adapter is used, be sure the green wire on the adapter is attached to the screw on the wall outlet plate for proper grounding. Have a trained electrician install the adapter and check the outlet wiring to guard against shock hazard. Faulty wiring may cause damage to the equipment and injury to you.

Turn the motor switch clockwise past position "3" (forward) to the project position. Adjust the tilt control knob and the focus knob to center and sharpen the image area on the screen. Then, turn the switch to the OFF position.



## AUXILIARY SPEAKER

If you wish to use an auxiliary speaker or speaker system, it must have a standard 1/4" phone plug to fit into the external speaker jack on the rear of the projector. Locate the auxiliary speaker near the screen for realistic sound.

Optimum performance and sound quality is obtained when using a speaker, or combination of speakers, with a total effective impedance of 8 Ohms, and a minimum total power rating of 20 watts. Reliable operation may also be obtained when using a total load impedance other than 8 Ohms, provided it is not less than 4 Ohms.

### CAUTION:

The sound amplifier will automatically turn off in the event of a circuit overload, protecting your projector from any damage. Should this occur, turn off the projector, disconnect the external speaker(s), wait a few seconds, and then restart the projector. If the built-in speaker is operating, the problem is in the auxiliary speaker system. Either the load impedance is less than 4 Ohms, making it incompatible with the projector, or the wiring is faulty. Inspect the auxiliary speaker(s) and the wiring and correct any problems.

Do not attempt to connect this projector to a public address system before consulting your dealer or a qualified serviceman. Proper electronic matching must be provided to prevent system or projector damage.

You may obtain a special instruction sheet for public address system installation by writing to:

General Service-Department 8154

Bell & Howell Company

7100 McCormick Road

Chicago, Illinois 60645

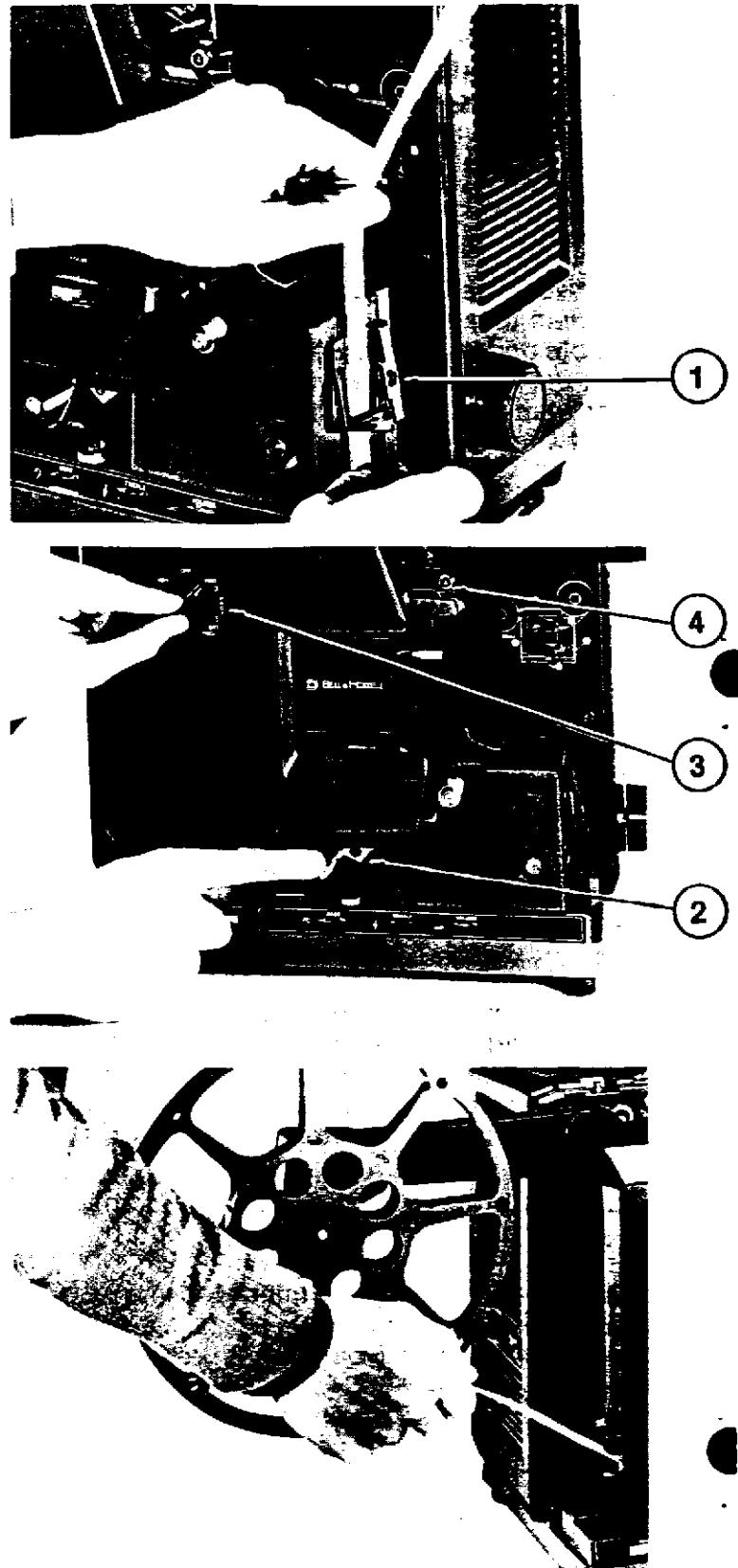
Specify your projector model and serial numbers, if possible, include a schematic or input specifications of the PA system amplifier.



## USING THE AUTOLOAD SYSTEM

Check the leader on the film. The first three feet of film (leader) must be free of any defects. If the tip of the film is damaged or torn, insert it into the film trimmer (1") to trim the end. Be sure to engage film perforation on the registration lug of trimmer.

Now you are ready to thread the film with the Autoload system. Push the autoload lever ("2") toward the front of the projector until it locks into the forward position. Make sure the STILL/RUN control lever is in the "RUN" position. Turn the motor switch to the forward position ("3") and insert the leader into the film channel under the roller ("4"). Push the film in until it engages the sprocket. The autoload mechanism will thread the film through the projector. After two feet of leader has passed through the projector, turn the motor switch off. Then pull lightly on the end of the leader until you hear a "click" which signals release of the threading mechanism. Attach the leader end to the take-up reel and rotate the reel clockwise to take up the film slack.



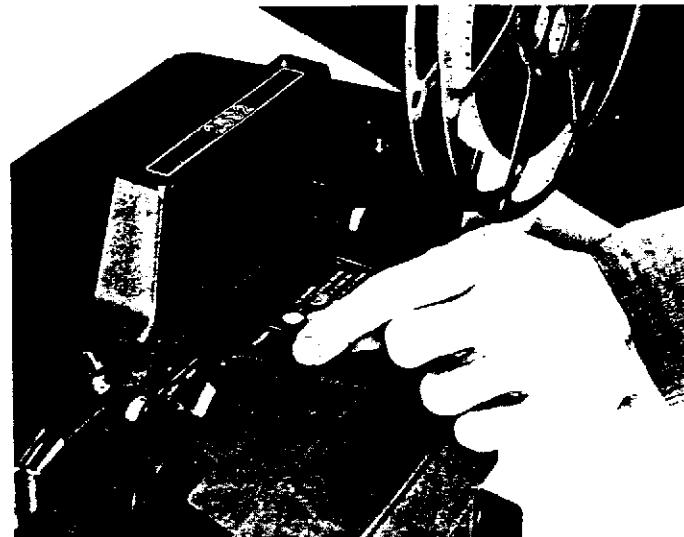
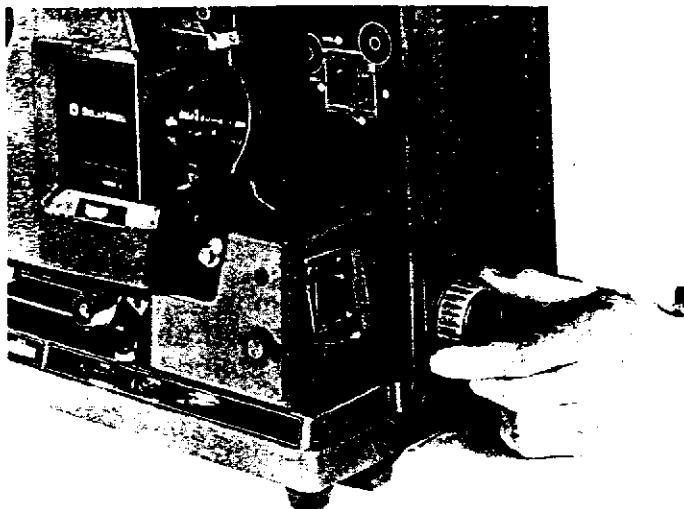
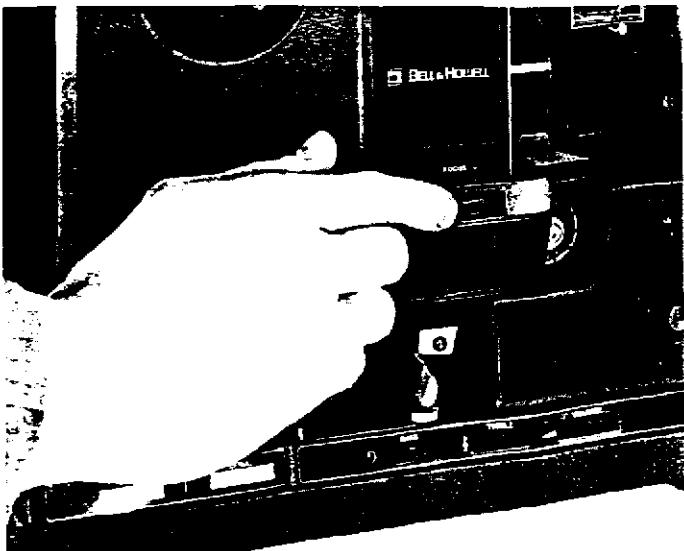
## PROJECTING THE FILM

Before the actual showing, whenever possible, the film should be partially projected so that all the operating adjustments can be made ahead of time:

**FOCUS CONTROL**—Move this knob in either direction to sharpen the image on the screen. It may be necessary to readjust the focus if several types of film are being shown on the same reel.

**TILT KNOB**—Turn this knob to raise the projector front and center the projected image on the screen.

**FRAMER KNOB**—Turn this knob to properly center the picture within the frame aperture.



**VOLUME CONTROL**—Keep the volume at a low setting while the film is being threaded. As soon as the sound appears, turn the control up to a comfortable listening level for the room.

**TONE CONTROL**—Adjust the bass and treble controls (Model 2592) for the most pleasing tone. On Models 2590 and 2585, a single tone setting adjusts the balance between bass and treble.

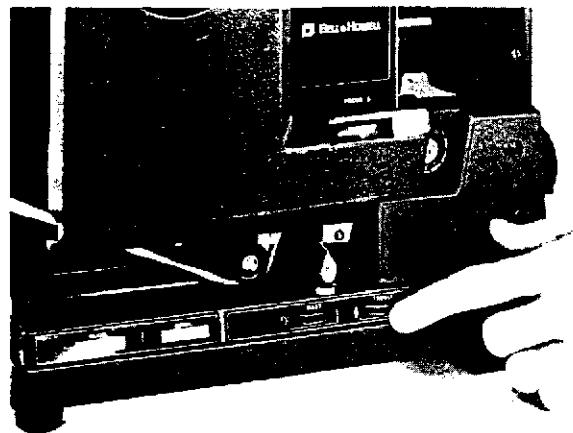
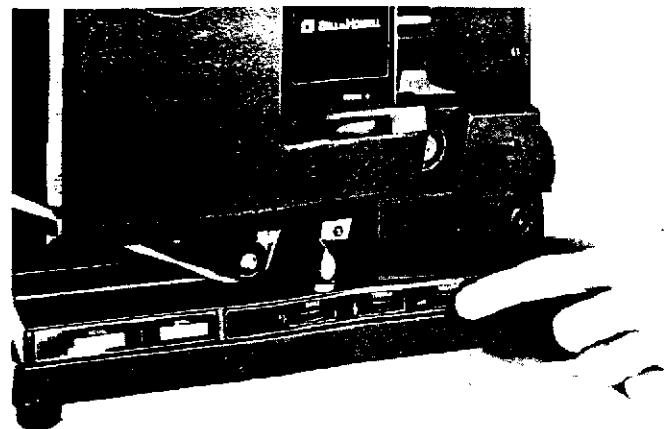
**AUTOMATIC LOOP RESTORER**—Torn perforations or bad splices may sometimes cause a loss of the lower loop below the film gate. If this happens, the automatic loop restorer will correct this loop loss and reset the proper lower loop size automatically.

**SYSTEM RESTORER**—If a larger portion of film is damaged and if tension is lost around the sound drum, pressing down on the system restorer for at least one second will normally restore the film to the proper threading path.

#### NOTE:

If a very large portion of film is damaged, the projector must be turned off and the damaged film removed and spliced. (See **MANUAL THREADING AND UNTHREADING**.) No loop restoration is possible during reverse projection.

If you have partially projected your film ahead of time to make all necessary adjustments, be sure to reverse the film to the starting position before the actual presentation.



## REVERSE PROJECTION

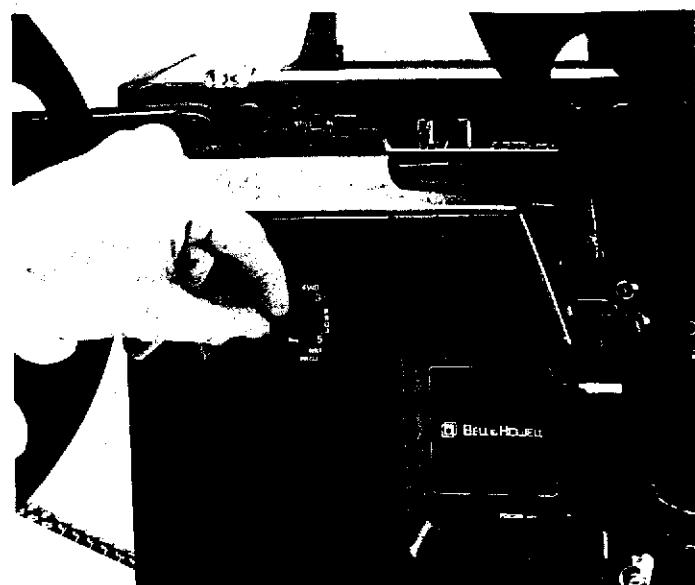
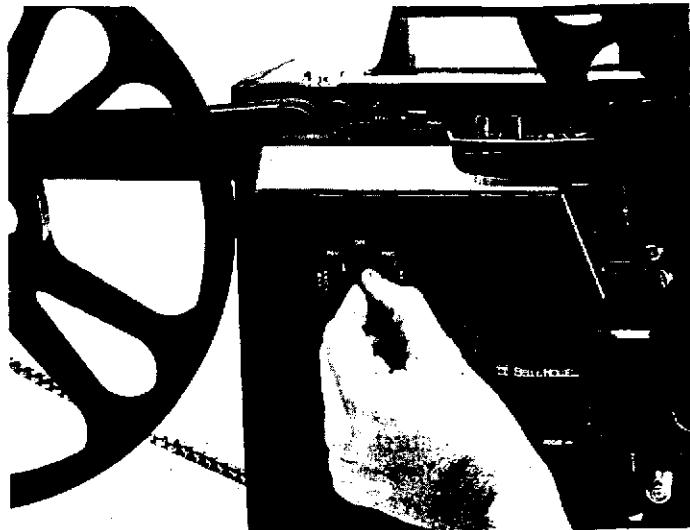
To show your film in reverse or to back the film up to a previous scene, turn the motor switch counterclockwise to the OFF position, pause momentarily, then continue turning past the REVERSE position to the REVERSE PROJECTION position. It may be necessary to reframe the picture. The sound system of the projector does not operate when showing films in reverse (or when showing still or Directamotion pictures—Model 2592 only).

### NOTE:

When switching between forward and reverse projection, a momentary pause at the OFF position is necessary to allow the motor to stop and change direction. If the switch is rotated too rapidly, the motor will not change direction.

## BRIGHT-NORMAL LAMP SELECTION (Models 2592/2585)

The NORMAL PROJECT position gives lamp illumination for projection under normal conditions and also prolongs the life of the projection lamp. However, at certain times more screen illumination is required. Turn the motor switch clockwise past "5" to the BRIGHT PROJECT position for added illumination when showing films in large auditoriums with long projection distances.



## STILL PROJECTION (Model 2592 only)

The run/still control allows you to stop the film in order to view just a single frame of film. For forward or reverse projection in the normal manner this knob is in the RUN position. For still projection, move the control to the STILL position.

### NOTE:

The run/still control should be moved to the STILL position only while the projector is running. Moving this control to the STILL position while the projector is turned off may cause damage to the film when the projector is started. When showing a still picture, the image will be dimmed by a heat absorbing filter which prevents damage to the film.



## SPEED CHANGING

The projector operates at either sound speed—24 frames per second or silent speed—18 frames per second. Should you wish to change from sound to silent speeds, remove the speed lever locking screw, plug in the projector and turn the motor switch to the forward "3" position so that the motor is running. With the motor running, move the projection speed lever to the SILENT position.

To prevent damage to the equipment, always be sure that the projector's motor is running before moving the projection speed lever. When the projector is being operated in the new position, replace the speed lever locking screw to prevent accidental movement of the lever.

### NOTE:

This does not apply to Model 2585B. This projector operates at sound speed (24 frames per second) ONLY.



(2590 Pictured)

Speed Lever  
Locking Screw

## DIRECTAMOTION® (Model 2592 only)

The Directamotion feature allows you to show frames a few at a time—in forward or reverse.

To use the Directamotion feature, turn the motor switch to either the forward project or the reverse project positions. Then, move the run/still control to the **STILL** position.

To advance and then view a frame, just press and release the ribbed end of the Directamotion control lever. To advance several frames, or to show a length of film at regular projection speed, press and hold the lever down. Release the lever to stop the film motion.

The Directamotion feature may also be operated with a remote control accessory. The remote control has a sliding button which is used in the same manner as the Directamotion control lever. This remote control accessory plugs into the socket on the rear of the projector.

To resume normal film projection after using the Directamotion feature, just turn the run/still control back to the **RUN** position.

### NOTE:

The run/still control should be moved to the **STILL** position only while the projector is running.

