

FILM-TECH

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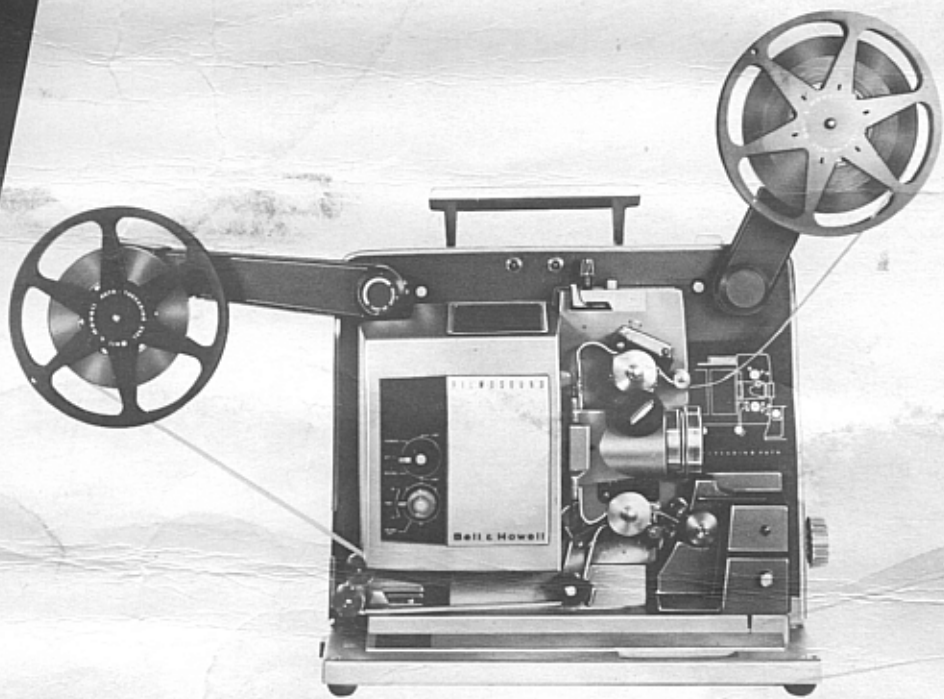
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HOW TO
OPERATE YOUR
Bell & Howell
FILMOSOUND

MODEL
535



Bell & Howell GUARANTEE

This new Bell & Howell product is guaranteed to be free from imperfections in both material and workmanship for one year from date of original purchase. Should any part of this equipment be defective, it will be replaced or repaired free of charge (except for transportation) provided the equipment has been operated according to the instructions accompanying it. Expressly excepted from this guarantee are vacuum tubes, capacitors, and lamps.

No liability is assumed for film which is damaged or is unsatisfactory for any reason and no liability is assumed for interruptions in operation of equipment. This guarantee is void if:

- a) Equipment has not been registered with Bell & Howell (please use card supplied);
- b) Equipment has been damaged by accident or mishandling;
- c) Equipment has been serviced by other than Bell & Howell Approved Service Stations (location of nearest Approved Service Station will be furnished on request);
- d) Adaptations or accessories other than Bell & Howell have been made or attached.

The foregoing is in lieu of all other warranties express or implied and Bell & Howell Company neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with this product.

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Welcome to

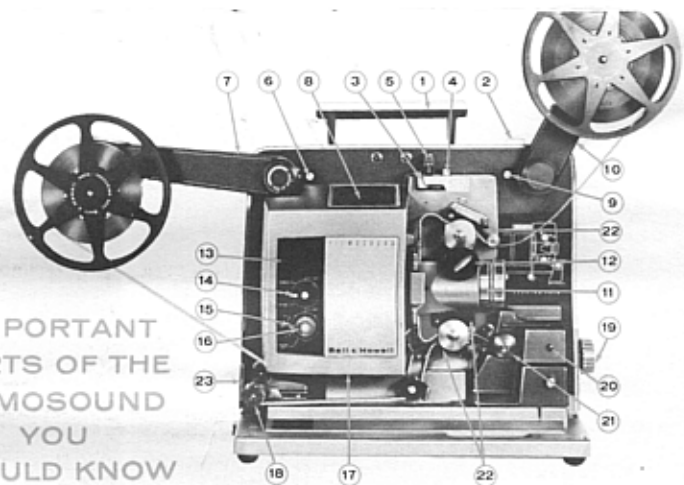
Bell & Howell OWNERSHIP

We know you will be proud of your Filmosound. This instruction book is provided to teach you how to operate the projector.

Here is a 16mm sound projector with such advance features, it sets a new standard in the industry. Bell & Howell's combination of unmatched quality and painstaking workmanship has never been better expressed. In the Filmosound, the culmination of the finest in research, engineering and precision manufacturing offers you an outstanding 16mm projector that will give years of unsurpassed performance and pleasure—in the best Bell & Howell tradition.

Before you begin to operate your projector be certain you have read this book completely. If you have any questions either contact the dealer who sold you the machine or write directly to: Customer Relations, Bell & Howell Company, 7100 McCormick Road, Chicago 45, Illinois.

IMPORTANT PARTS OF THE FILMOSOUND YOU SHOULD KNOW



- | | |
|---------------------------------|--------------------------------|
| 1 Handle | 12 Focusing Dial |
| 2 Cover Latch Button | 13 Finger Span Control Panel |
| 3 Speed Control Selector | 14 Forward and Reverse |
| 4 High Speed Rewind Button | 15 Three Position Tone Control |
| 5 Framing Knob | 16 Amplifier On-Off and Volume |
| 6 Rear Reel Arm Release Button | 17 Lamp House Door |
| 7 Retractable Rear Reel Arm | 18 Rear Snubber Roller |
| 8 Air Exhaust | 19 Tilt Knob |
| 9 Front Reel Arm Release Button | 20 Exciter Lamp Cover |
| 10 Retractable Front Reel Arm | 21 Sound Drum |
| 11 Lens Mount | 22 Sprocket Guards |
| | 23 Speaker Jack |

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THE EASIEST PROJECTOR IN THE WORLD TO SET-UP

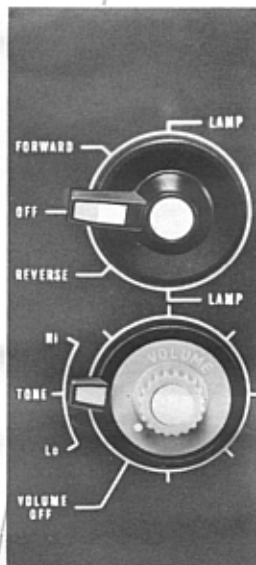
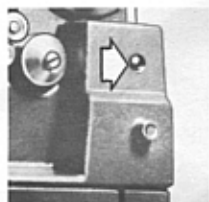
- Place the projector on table or stand at point from which you will project. Be sure projector sits high enough to project over audience.
- Slide **COVER LATCH BUTTON** on top of projector toward handle and cover will slip off easily.
- Plug line cord into 117 volt 60 cycle AC outlet. Use adapter supplied with projector, if necessary.
- Turn **VOLUME** knob clockwise so panel light illuminates.
- Raise **FRONT REEL ARM** to locked position.
- Raise **REAR REEL ARM** to first locked position.
- Mount empty reel on rear arm.
- Mount full reel on front arm.
- Unwind five feet of film from reel and follow instructions on film threading.

Proper Connection of the Ground Wire

If you use the line cord adapter supplied with the projector be certain to attach the ground wire to the outlet as shown in the illustration.



The **EXCITER LAMP** will operate only when the amplifier is on and the projector is running in either forward or reverse. With the projector motor running, the red light (arrow) will go when the amplifier is warm and ready to use.



Model 535

FORWARD—This is the main control knob for the projector. First turn in the up position will run projector. Second position up is **FORWARD** and will turn lamp on.

REVERSE—To reverse the direction of your film anytime during projection turn control knob down to reverse position. (*Note: A momentary stop at the OFF position is necessary when moving from one position to another.*) At first stop reverse mechanism starts and at second stop lamp will go on, projecting a reverse-action picture on the screen. Turn **VOLUME** control as low as possible to eliminate "garbled" sound you will hear as film travels in reverse.

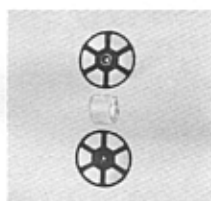
TONE—You can adjust your 3 position **TONE DIAL** for the tonal quality you desire. "HI" is for a large auditorium which does not have the best acoustics; "LO" is for a film which has good music; and "TONE" is the ideal adjustment which meets SMPTE *Projector Room Standards* for 95 per cent of sound prints today.

VOLUME—This controls the ON and OFF, as well as the volume of the amplifier. It also controls the light on the **FINGER SPAN CONTROL PANEL**.

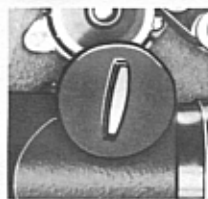
FILMOSOUND FEATURES YOU SHOULD KNOW MORE ABOUT



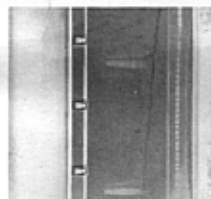
SPEED CONTROL SELECTOR KNOB allows you to show sound or silent films on your Filmosound. While projector is running set the knob for the type of film (sound or silent) you are going to project.



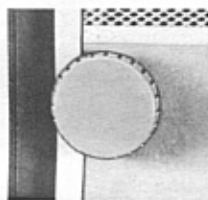
Direct positive gear drive. Steel gears are coated with delrin to provide quiet-operating and self-lubricating advantages of delrin with sturdy reliability of steel.



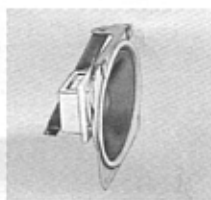
FOCUSING DIAL is a rack-and-pinion concept which means positive lens focusing. To sharpen your image on the screen, use this dial.



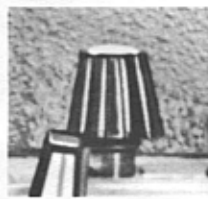
Wear-resistant **SHUTTLE** is made of stellite. Three teeth provide better contact with your film . . . keep film moving safely and properly through the mechanism.



TILT KNOB is used to raise or lower your picture on the screen . . . adjusts easily to ten degrees.



BUILT-IN SPEAKER is acoustically-mounted. Built-into the front of the projector, facing the screen. An additional auxiliary speaker is available.

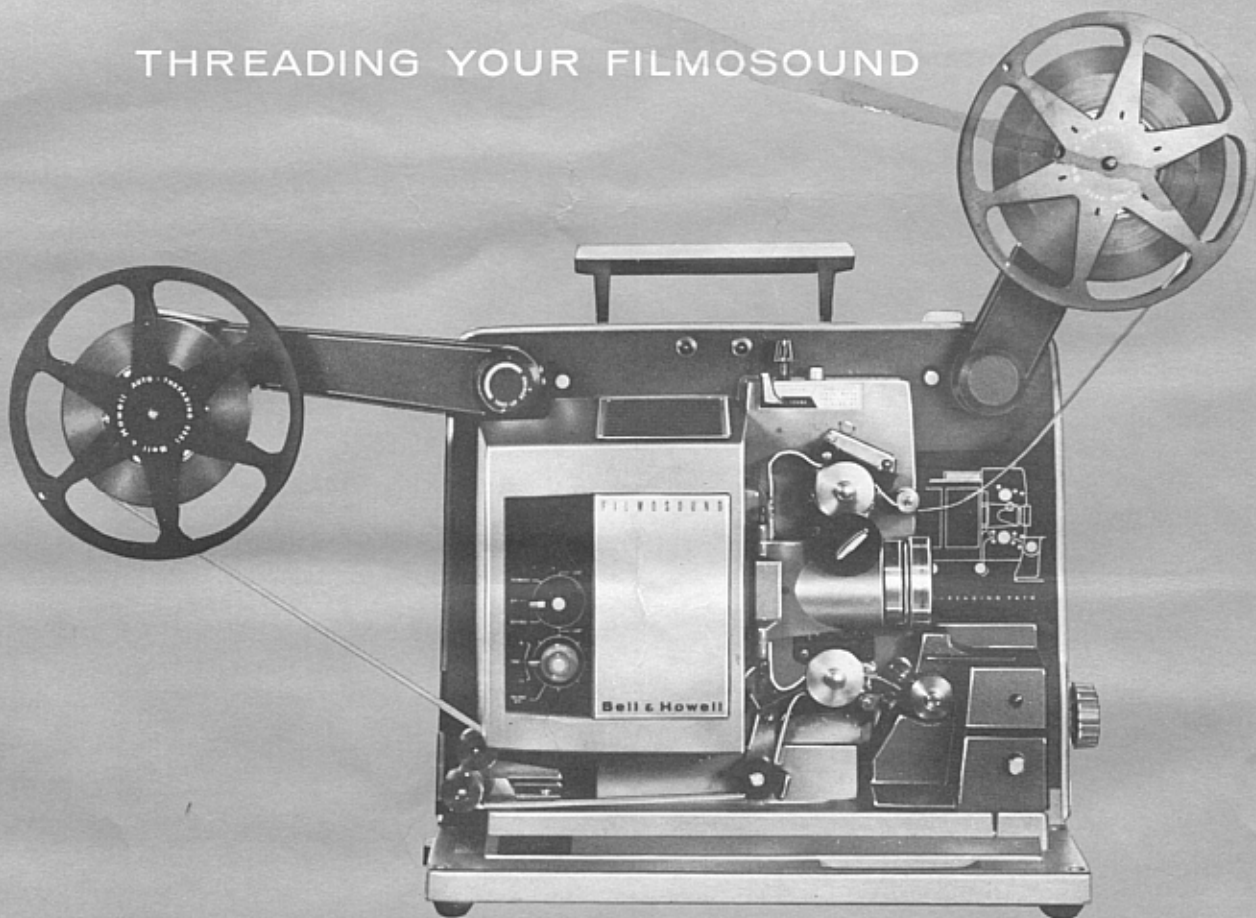


Use this **FRAMING KNOB** to make frame line disappear on the screen. You can adjust either way—top or bottom.

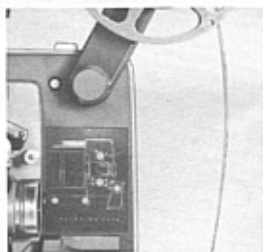


Factory sealed lubrication means the customer will not have to oil the Filmosound. All gears and other moving parts are either self-lubricating or sealed units.

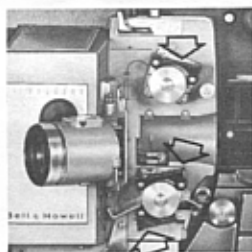
THREADING YOUR FILMOSOUND



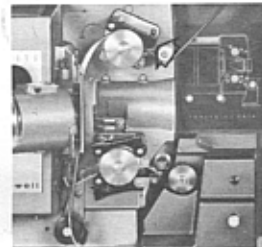
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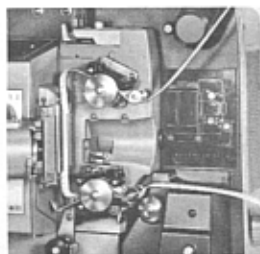
Unwind five feet of film from front reel. You are now ready to thread projector.



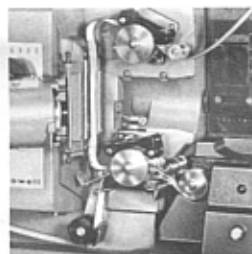
Swing LENS MOUNT open by grasping lens rim and pull out. Open the three guards on the sprockets (arrows) by pushing upward on the top and downward on the bottom.



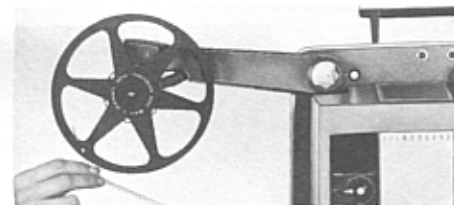
Place film under front roller and on top of sprocket. Be sure film perforations engage sprocket teeth. Close top sprocket guard (arrow).



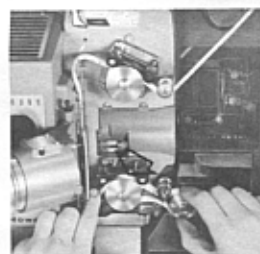
Place film between guide rails in front of aperture opening. Be sure to follow loop size line shown on projector. Thread film over top of lower sprocket and under top stabilizer roller.



Place film around sound drum, over top of lower stabilizer roller, under lower sprocket, and under both rollers. Close lower sprocket guard.



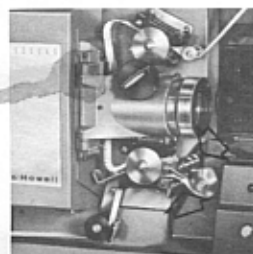
Thread film around snubber rollers as illustrated and attach film to rear reel.



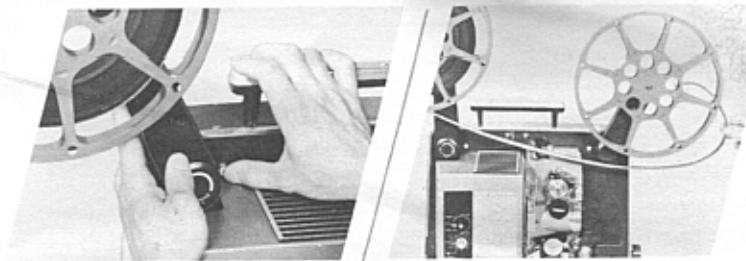
At this point there is no tension around the sound drum. To place tension around this drum, follow these steps.

1. With the thumb and forefinger of the right hand, grasp film around sound drum and rotate counter-clockwise.
2. At the same time, grasp lower loop of film with the left hand and pull down and backward until sprocket teeth on the lower roller (arrow) engage the film perforations.

3. With the right hand, close the second sprocket guard. The stabilizer rollers (arrows) should now be spread, assuring tension around sound drum.
4. Align the film properly in between the guide rail and the side tension bar.
5. Close lens mount and be certain pressure shoe lies flat between guide rails.

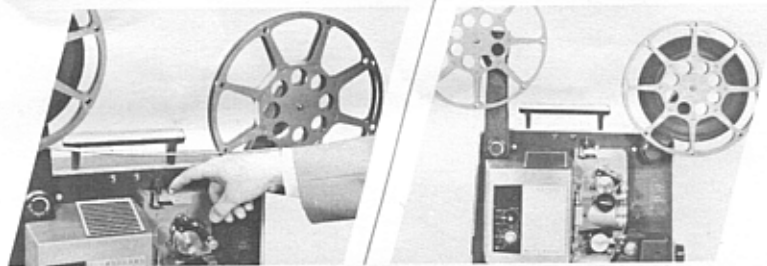


4 SIMPLE STEPS AND THE FILM IS READY TO SHOW AGAIN



After the film showing is completed and all the film is on the rear reel arm, turn control switch to OFF position.

- 1 Support full reel with left hand and lift up slightly, hold reel up and then press rear reel arm release button and swing reel arm to vertical **REWIND** position.
- 2 Strip film from back reel and thread it on *underside* of front reel so it will rewind counter-clockwise as shown. Take two or three turns of film on the front reel manually to begin rewind operations.
- 3 Rotate control switch to **REVERSE**. Press and hold down momentarily high speed **REWIND BUTTON**.
- 4 Turn the projector off as soon as film is fully rewound.



PUTTING THE PROJECTOR AWAY

- Make certain **VOLUME** and operating controls are off.
- Remove reels from front and back reel arms.
- Press **REEL ARM RELEASE BUTTONS** and swing reel arms down into place.
- Completely lower projector by means of **TILT KNOB**.
- Unplug line cord, wind it around 400-ft. reel, place reel into reel slot.
- Place projector cover into position and snap shut.

CARE AND MAINTENANCE

Your Bell & Howell Filmosound features unitized construction, that is, certain elements have been constructed as one unit and have been placed in the projector to make it a compact—snug—design. It is a precision-built and quality-tested projector.

If any part of your projector is damaged, units are available for replacement at the Bell & Howell Approved Service Station. This insures the cost of repair will be minimum and time-saving.

The parts in the Filmosound are built of the finest materials and are designed by experts to provide professional performance with simplicity of operation and maintenance.

Parts and units can be adjusted at Bell & Howell Approved Service Stations to insure the finest trouble-free life of your projector. These establishments offer you factory-trained technicians and genuine Bell & Howell parts.


Your projector has been lubricated at the factory and requires no oiling by you. In addition, all bearings are sealed in a permanent lubricant to provide extended service and longer life.

Instructions on simple cleaning and parts replacement are given in this book. These are all maintenance operations you should perform yourself, with a minimum amount of expense and effort.

However, many owners follow our suggestion that their projectors be cleaned and adjusted periodically even though it seems to be in first-class condition. Such protective maintenance assures that your machine is thoroughly cleaned, lubricated, and inspected, then tested before being returned to you. The cost of this periodic checkup is nominal and is worth much in terms of worn parts, adjustment for top performance and worry-free operation.

CLEANING LENS CHAMBER

TO CLEAN THE LENS—Turn FOCUSING DIAL counter-clockwise until lens is threaded out as far as it will go. Grasp lens barrel and remove it from mount. Use a lens tissue or cloth moistened with Opti-Kleen or other lens cleaner to wipe dust and fingerprints off front and rear lens elements.

TO CLEAN GATE SHOE AND APERTURE—Swing lens mount open by grasping lens rim and pull out. Gently wipe gate shoe with cloth moistened with Opti-Kleen to remove dirt or emulsion that may accumulate. While lens mount is open, wipe APERTURE PLATE clean. Also, clean aperture side guide rails and aperture opening. Swing lens mount back into position and snap it closed. Insert  into mount and turn FOCUSING DIAL clock-wise to engage lens.

LAMP EJECTION

- Turn off projector.
- To open lamp house door, apply pressure on button under lamp house door. Button located over film exit track. Pull door open. (Note: For lamp size replacement look on top of FINGER SPAN CONTROL PANEL).
- Lift up gently on LAMP EJECTOR LEVER to force lamp from socket.
- Remove lamp from socket by hand. (Use glove or cloth if lamp is still hot.)



REPLACE LAMP

- Set new lamp into socket and rotate it slowly until lamp drops into position and cannot be rotated further. It will fit only one way.
- Press down gently on lamp until it is seated firmly.

REPLACING EXCITER LAMP

1. Volume control dial should be in OFF position.
2. Unthread THUMB SCREW holding exciter lamp cover in place until screw is loose.
3. Pull cover straight out without tilting.
4. Swing lamp lock lever counter-clockwise to release lamp. Rotate lamp until it easily slips off guide pins.



REPLACE LAMP

1. Place new lamp over guide pins. (It will fit only one way.) Rotate clockwise until pins reach narrow end of slots.
2. Rotate lock lever clockwise to lock lamp into position.
3. Replace outside cover. Be certain cover is firmly seated then push toward machine and thread THUMB SCREW.

FINGER SPAN CONTROL PANEL LIGHT REPLACEMENT

- Put RETRACTABLE REAR REEL ARM in rewind position.
- Open lamp house door.
- If your machine has a lamp shield, pull lamp shield off by pulling up and towards rear of the machine.
- Push down on lamp and rotate counter-clockwise 1/4 turn and lift out. To replace lamp, put finger in behind socket and guide edges of shield over and around edges of the socket.
- Straddle open end of shield on the plastic nose and push down.
- Close lamp house door.

CLEANING CONDENSING LENSES

- Condensing lenses in the Filmosound projector should never be removed from their holder. To clean the condensers, grasp the carriage at the top and rotate it down out of the housing.
- Clean glass elements with tissue or cloth.
- Replace the carriage. Hook bottom arm over lower support lug and snap top carriage arm into place over the upper support lug.
- If the area between the two condensers has to be cleaned, it is suggested that your local Bell & Howell Approved Service Station *do the job* when you take it in for a check-up.



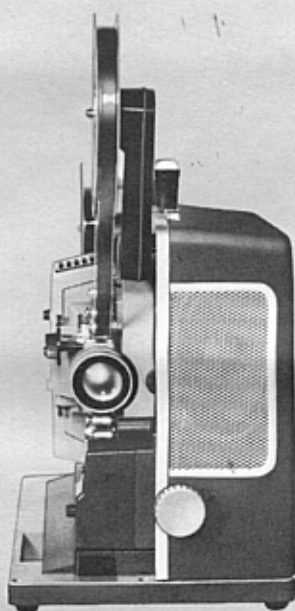
The manufacturer of this projector suggests that you do not remove the back cover on the Filmosound projector. It is recommended that the customer should not replace or clean the amplifier tubes or the two diodes used in the projector.

Another important note for the customer is that there is no fuse in the Filmosound. The amplifier circuit is protected with a resistor that will burn out only in case of component failure. This resistor will protect the amplifier from fire, etc. If the resistor burns out, this is an indication that the amplifier should be checked thoroughly.

It is recommended that the customer take the projector to the nearest Bell & Howell Approved Service Station to check any of the above operations.

ACCESSORY SPEAKER

New type of auxiliary speaker which is housed in a separate case is available for your projector.



STANDARD SPEAKER

The Filmosound has an acoustically-mounted oval speaker built into projector case. This speaker faces the screen and is located in the front of the projector.



2-IN-1 SPEAKER

This extended range system has two speakers in one unit with an 8" woofer and a 4" tweeter. It's a balance system designed especially for the Filmosound. No maintenance is required on this 2-in-1 Speaker.

PROTECTIVE COVERS

Form-fitting covers will keep your projector free from dust and damage while in storage or transit. Also available for the 2-in-1 Speaker and 12" Power Speaker.

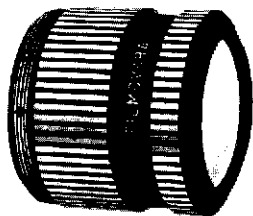
STORAGE CANS

Your 16mm film can be protected with Bell & Howell storage cans. Available in 400, 800, 1200, 1600 and 2000 sizes.

16mm REELS

The 400-foot reels are rust proof, spring steel and have the exclusive "touch-threading" feature. Other size reels come in 800, 1200, 1600 and 2000.

ATTACHMENT
EQUALS
CONVENIENCE



A wide range of projected image sizes can be obtained with your Filmovara attachment. The Filmovara can be used on the 1.5" f/1.6, 2" f/1.6 and the 3" f/1.6 lenses. See the projection table below for the span of focal lengths you can achieve with this special device. This attachment lets you change the size of your picture without moving the projector or screen.

For example, using the Filmovara on a 2" lens, you can place the projector and screen anywhere from 22 to 28 feet apart and a twist of the Filmovara attachment will enlarge or shrink the picture to fill a 56" x 41" screen.

HOW TO USE
YOUR FILMOVARA
ATTACHMENT

- Place the Filmovara attachment on the front of the lens. It screws on clockwise.
- Revolve the rear black knurled collar of the lens until your picture fills the width of your screen. Revolve the lens collar counter clockwise to increase picture size. Revolve it clockwise to decrease it.
- If your picture is out of focus, use the FOCUSING DIAL on the projector to sharpen the image.

PROJECTION
LENSES

Bell & Howell projection lenses offer you the last word in sharp brilliant movies. It is best to have a lens of the proper focal length in order to project the right picture size on your screen. This focal length will vary according to the distance from film to screen and size of screen. It is always best to have the projector as far in the rear of the room as possible, to avoid obstructing the view of anybody in your audience. The projected picture size table shows the various lenses available for your Filmovara, and the picture sizes they will produce at certain distances.

ACCESSORY LENSES

.625" f/2.1 • 1" f/1.9 • 1.5" f/1.6
• 2" f/1.6 • 3" f/1.6 • 4" f/1.6

PROJECTION TABLE

LENS FOCAL LENGTH*	DISTANCE IN FEET FROM SCREEN TO FILM														
	8'	10'	12'	15'	20'	25'	30'	35'	40'	45'	50'	60'	75'	100'	
Upper Dimension is Width of Picture															
Lower Dimension is Height of Picture															
1.5" LENS WITH FILMOVARA ATTACHMENT	.625	4'9"	5'11"	7'2"	9'0"	12'0"									
		3'6"	4'5"	5'4"	6'8"	8'11"									
	1"	2'11"	3'8"	4'5"	5'7"	7'5"	9'4"	11'3"	13'1"						
		2'2"	2'9"	3'4"	4'2"	5'7"	6'11"	8'4"	9'9"						
	1.3"	2'4"	2'11"	3'6"	4'5"	5'11"	7'5"	8'10"	10'5"						
	1'9"	2'2"	2'8"	3'4"	4'5"	5'6"	6'8"	7'10"							
1.5"	1'11"	2'5"	2'11"	3'8"	4'11"	6'2"	7'6"	8'9"	10'0"	11'3"	12'5"				
	1'5"	1'10"	2'2"	2'9"	3'8"	4'7"	5'7"	6'6"	7'5"	8'4"	9'4"				
1.75"	1'5"	2'2"	2'6"	3'2"	4'3"	5'5"	6'6"	7'7"	8'8"	9'10"	10'9"	12'5"	15'5"		
	1'1"	1'7"	1'11"	2'5"	3'2"	4'0"	5'0"	5'8"	6'6"	7'3"	8'1"	9'2"	11'5"		
2.0" LENS WITH FILMOVARA ATTACHMENT	1.75"	1'5"	2'2"	2'6"	3'2"	4'3"	5'5"	6'6"	7'7"	8'8"	9'10"	10'9"	12'5"	15'5"	
		1'1"	1'7"	1'11"	2'5"	3'2"	4'0"	5'0"	5'8"	6'6"	7'3"	8'1"	9'2"	11'5"	
	2.0"		1'10"	2'2"	2'9"	3'8"	4'8"	5'7"	6'6"	7'5"	8'5"	9'4"	11'3"	14'0"	18'9"
		1'4"	1'8"	2'1"	2'9"	3'5"	4'2"	4'10"	5'7"	6'3"	6'11"	8'4"	10'5"	13'11"	
2.25"		1'7"	1'11"	2'6"	3'4"	4'0"	5'0"	5'10"	6'8"	7'7"	8'4"	10'1"	13'7"	16'11"	
		1'2"	1'5"	1'10"	2'6"	3'1"	3'9"	4'4"	5'0"	5'8"	6'3"	7'7"	10'2"	12'8"	
3.0" LENS WITH FILMOVARA ATTACHMENT	2.6"		1'4"	1'8"	2'1"	2'9"	3'7"	4'3"	5'0"	5'9"	6'5"	7'2"	8'9"	10'8"	14'6"
			1'1"	1'3"	1'7"	2'1"	2'8"	3'3"	3'9"	4'3"	4'8"	5'5"	6'6"	8'1"	10'9"
	3.0"						3'1"	3'8"	4'4"	4'11"	5'7"	6'2"	7'5"	9'4"	12'6"
							2'3"	2'9"	3'3"	3'8"	4'2"	4'7"	5'7"	6'11"	9'3"
3.4"						2'6"	3'1"	3'6"	4'1"	4'7"	5'2"	6'3"	7'7"	10'4"	
						1'10"	2'3"	2'8"	3'1"	3'6"	3'9"	4'7"	5'9"	7'8"	
4.0"						2'3"	2'9"	3'3"	3'8"	4'2"	4'8"	5'7"	7'0"	9'4"	
						1'8"	2'1"	2'5"	2'9"	3'1"	3'5"	4'2"	5'2"	6'11"	

*1.5" lens with Filmovara = 1.3" to 1.75" focal length range.
2.0" lens with Filmovara = 1.75" to 2.25" focal length range.
3.0" lens with Filmovara = 2.6" to 3.4" focal length range.

Gold band = standard focal length lenses.
Brackets indicate focal length range with Filmovara attachment.

PROJECTIONIST'S TROUBLE-SHOOTING LIST

CHECK LIST

- Is line cord properly connected to receptacle?
- Test current outlet with ordinary lamp or other device known to be in working order, to see if current is reaching outlet.

- Is projector amplifier switch in the ON position?
- Is projector in forward or reverse operating position?
- Is exciter lamp burned out? If so, replace lamp.

- Does advancing volume control help?
- Is film threaded properly?
- Has film got an adequate soundtrack? To check this, proceed as follows: Remove film and turn on amplifier. Turn volume control to maximum position. Pass a card swiftly back and forth between sound lens and sound drum. If thumping noise is heard from speaker, the Filmosound is operating properly—the sound is missing from the film itself.

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- Have you advanced volume control to maximum position?
- Is line voltage between 105—129 volts A.C.?
- Is film clean? Dirty or imperfect film will not produce full sound volume.
- Is exciter lamp defective? If so, replace.

- Is film tight around sound drum?
- Have you tried the remedies previously suggested for inadequate sound volume?

- Is rotary control switch in FORWARD position?
- Is projection lamp burned out? If so, replace with another of correct voltage, and wattage.

- Is line voltage adequate?
- Can room be darkened further, so as to make picture seem brighter?
- Are projection lens and condensers clean and properly in place?
- Effective lamp life sometimes may end before lamp actually burns out. Replace lamp if necessary.
- Is lamp pushed down in the socket?