Bell & Howell

Guarantee

1. This product is guaranteed against faulty materials and workmanship. During its lifetime, any servicing necessary because of imperfections in materials or workmanship will be done without charge (except for transportation of equipment) by Bell & Howell Company or any company-approved service station.

2. Equipment which has been damaged or abused, or worn from extended use will be repaired at factory established rates.

3. Bell & Howell lenses purchased with this equipment are covered by this guarantee. Lenses of other makes, projection lamps, and film are not covered by this guarantee.

4. No liability is assumed for film which is damaged or is unsatisfactory for any reason (due to equipment malfunction or otherwise) nor is Bell & Howell obligated to replace such film.

5. No liability is assumed for expenses or damages resulting from interruptions in operation of equipment.

6. This guarantee is void: (a) if adaptations or accessories of other than Bell & Howell recommendations have been made or attached; (b) if equipment has not been registered with Bell & Howell (use card supplied with equipment); (c) if equipment has been serviced by other than a Bell & Howell approved service station.

7. This guarantee is made in lieu of any other guarantee, warranty or liability, express or implied. It is valid only as to the initial purchaser of this new equipment, his donees or his bona fide vendees, upon receipt by Bell & Howell of a registration card or letter giving the name and address of the present owner of the equipment.

Bell & Howell Company

Form 1861E Feb. 1951 Printed in U.S.A.

How to use your BELL & HOWELL Diplomat 16MM PROJECTOR

IMPORTANT

The Bell & Howell Lifetime Guarantee is VOID unless you register the serial number of your equipment with Bell & Howell. Use the stamped self-addressed reply card over this cover. Registration of your equipment brings you the following advantages:

1. **Obtaining the full benefits of the B&H Lifetime Guarantee.**
2. **Assistance in finding your equipment in case of loss or theft.**
3. **Free correspondence counsel from our Personal Service Department.**
4. **Receipt of bulletins about movie equipment and its use.**

Congratulations!

You have made a wise decision in selecting B&H motion picture equipment, precision-made to give you professional results with amateur ease.

The name Bell & Howell is your guarantee of satisfactory, long-lasting performance. Since 1907 Bell & Howell Company has manufactured the professional equipment preferred by the motion picture industry. Experience gained in the designing and production of this equipment has been applied to supplying the needs of the amateur and semi-professional with the ultimate in performance, convenience, appearance.

Precision operations in every phase of manufacture assure perfection in the finished product. Matched registration mechanisms in B&H cameras and projectors result in steady pictures in full, natural color or sparkling black-and-white on your movie screen.

The far-sighted basic design of your projector provides for a built-in capacity to keep pace with the latest developments. Your original investment is never lost because you can have the newest improvements developed by the Bell & Howell Engineering Laboratory added to your sturdy projector.

With such a capable instrument in your possession you will naturally want to get the fullest enjoyment from it by achieving the best results. To become properly acquainted with this new servant of yours, study the following pages carefully with your projector in front of you before putting it to work.

Should you desire additional help in your movie-making, please feel free to call on your Bell & Howell dealer or write directly to us.

BELL & HOWELL COMPANY
7100 McCormick Road
Chicago 45, Illinois

Use the stamped registration card over this booklet cover to register your equipment with Bell & Howell—mail it *today!* The serial number of your projector will be found on the rear of the motor housing.

There's a B&H for every purpose


127-A
8mm camera


220
8mm camera


134
8mm camera


134-TA
8mm camera


ZXI
8mm projector


Progent
8mm projector


202 16mm
magnetic-recording projector


Diplomat
16mm silent projector


220-T
16mm camera

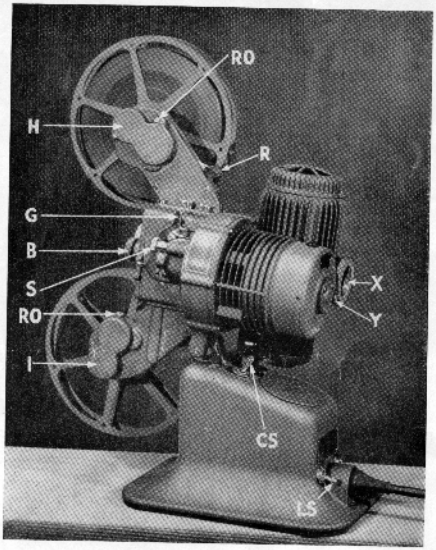

285 16mm
sound-on-film projector


70-DL
16mm camera

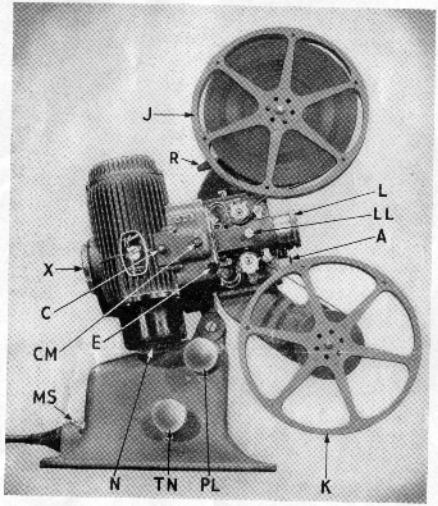

Radiant
projection
screens
—
for
movies
or slides

Bell & Howell Company

Since 1907 the World's Largest Manufacturer of Precision Equipment for Hollywood and the World



B. Hand setting knob
CS. AC-DC switch
G. Clutch
H. Feed reel arm
I. Take-up reel arm
LS. Lamp switch
R. Run-rewind lever
RO. Reel arm oil holes
S. Speed control
X. Reflector
Y. Reverse switch



A. Film gate lever
C. Condenser
CM. Magnilite condenser
E. Framer
J. Feed reel
K. Take-up reel
L. Lens
LL. Lens locking screw
MS. Line switch
N. Cap
PL. Pilot light
R. Run-rewind lever
TN. Tilt knob
X. Reflector holder

How to use your BELL & HOWELL Diplomat 16mm Silent Projector

Setting Up

Electrical Connections. Be sure that line and lamp switches, MS and LS, are in the OFF position; plug the line cord into the receptacle at the back of the projector, and connect to wall or extension cord receptacle supplying 115- to 120-volt alternating or direct current.

On the projector base, below the motor housing, is switch CS which adjusts the projector for use with AC or DC current. Set the switch for the type of current in your locality. No damage will result if the motor is set for AC when the current is DC, but the speed of the motor will be too great to be controlled by speed control screw S. If set for DC when the line current is AC, sufficient speed cannot be attained even though the speed control screw is fully released.

The projection lamp supplied with your projector is of the voltage common to most communities. Before projecting, remove the lamp as instructed in the paragraph on "Projection Lamp Replacement" and check the voltage. If it does not match the voltage of the line current to be used, replace the lamp with another of the correct voltage.

Adjusting the Projector to the Screen. Turn on line switch MS and lamp switch LS. The projection lamp will not operate unless the motor is running. Press clutch G forward to the RUN position.

If the electrical connections are correctly made and clutch G is in the RUN position, the projector mechanism should now operate and a beam of light be projected on the screen.

Move the projector on its stand or table to such a position that the projected beam coincides with the screen.

Tilt the projector to the required angle by turning tilt adjustment knob TN.

If the projected image is larger than the screen, move the projector closer.

If the image is too small, move the projector farther from the screen.

If room size limits the throw, select the correct lens as indicated in the table on page 7.

With the projector operating and the lamp turned on, loosen lens locking screw LL, by turning to the left, and slide the lens L forward or backward in the carrier until the outlines of the aperture or frame are sharply defined.

To further sharpen the focus, revolve the lens first in one direction and then in the other until the point of maximum sharpness is found. Lock lens in

PROJECTED PICTURE SIZES OBTAINED WITH B&H PROJECTION LENSES

LENS FOCAL LENGTH	DISTANCE IN FEET FROM SCREEN TO FILM												
16mm Projector	8'	12'	12'	15'	20'	25'	30'	35'	40'	45'	50'	60'	75'
	WIDTH AND HEIGHT OF PICTURE												
1"	4'8" 3'11" 2'6" 2'5"	7'2" 5'4"	7'2" 5'4"	9'0" 6'8"	12'0" 8'11"								
2"	3'11" 2'11"	4'11" 3'8"	5'11" 4'5"	7'6" 5'7"	10'0" 7'5"	12'6" 9'3"							
3"	2'11" 2'2"	3'8" 2'9"	4'5" 3'4"	5'7" 4'2"	7'5" 5'7"	9'3" 6'11"	11'1" 8'4"	13'0" 9'8"					
3½"	2'11" 1'5"	3'8" 2'2"	4'11" 3'0"	6'2" 3'8"	8'3" 4'11"	10'3" 6'2"	12'5" 7'5"	14'6" 8'8"	16'8" 10'0"	18'9" 11'3"	12'6"		
5"	....	2'2" 1'7"	2'8" 2'0"	3'4" 2'6"	4'5" 3'3"	5'7" 4'2"	6'8" 5'0"	7'9" 5'9"	8'9" 6'6"	10'0" 7'5"	11'2" 8'4"	12'3" 9'1"	14'0" 10'5"	16'8" 12'11"	19'5" 14'5"	22'2" 16'5"
7½"	....	1'5" 1'1"	1'9" 1'4"	2'2" 1'8"	2'11" 2'2"	3'8" 2'9"	4'5" 3'4"	5'2" 3'10"	5'11" 4'5"	6'8" 5'0"	7'5" 5'7"	8'3" 6'2"	11'2" 8'4"	13'0" 9'8"	14'9" 11'0"	16'8" 12'5"	18'6" 13'11"
9"	....	....	....	....	....	3'11" 2'11"	3'0" 2'3"	4'4" 3'3"	4'11" 3'8"	5'7" 4'2"	6'3" 4'8"	7'5" 5'7"	9'4" 6'11"	12'5" 9'3"	15'7" 11'7"	18'9" 13'11"
3½"	....	....	....	....	....	2'7" 2'1"	3'2" 2'6"	3'8" 2'9"	4'3" 3'2"	4'8" 3'7"	5'4" 4'0"	6'5" 4'9"	8'0" 6'0"	10'8" 7'11"	13'4" 9'11"	16'1" 11'11"
4"	....	....	....	....	....	2'3" 1'8"	2'9" 2'1"	3'3" 2'5"	3'8" 2'9"	4'2" 3'1"	4'6" 3'4"	5'7" 4'2"	7'0" 5'2"	8'4" 6'2"	11'8" 8'8"	14'0" 10'3"

Clean the reflector with the same materials as for the lens. To expose reflector for cleaning, grasp holder and pull out from the projector.

X. Reflector holder

Clean the reflector in the same manner as the projection lens and return holder to position. A snap spring permits quick removal and insertion. The reflector is factory-adjusted.

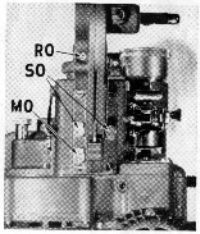
Cleaning Film Handling Parts. Before returning the lens to position, clean the removable gate shoe, aperture, and film channel. To remove the gate shoe, open the film gate by raising lever A, grasp the metal frame F at top and bottom, and withdraw. *Use no tools!* Clean and polish with a soft cloth. If dirt or emulsion has gathered and hardened on the shoe, remove by rubbing with a soft dampened cloth. To avoid scratching polished surface, *use no sharp tools.*

Clean the aperture and film channel by opening the gate and inserting the brush into the channel in a vertical position. With the gate partially closed, move the brush up and down to remove all dirt and emulsion. *The machine must not be running.*

Replace the gate shoe, being sure that guides T at top and bottom are placed over the metal plate attached to the back of the lens carrier casting. An audible click will be heard when the frame F is correctly positioned. Return the lens to position, and tighten lens locking screw LL securely.

Projector Lubrication. The main oil cup MO should receive one drop of oil after each 8 hours of operation. Cups SO should receive one drop of oil after every 32 hours of operation.

MO. Main oil cup
RO. Reel arm oil hole
SO. Oil cups



The sprocket felts should be saturated with oil every six months. To saturate these felts, disconnect the projector from the current supply and lay it on its side. Insert the tip of the B&H oil can into the holes D, and squeeze the sides of the oil can about three times. The feed and take-up reel arm spindle oil holes RO should receive oil after every 32 hours of operation. Push spring-ball down with oil can spout and apply two drops.

Pilot Lamp Replacement. To replace the pilot lamp, turn the metal cover PL in a counter-clockwise direction until it may be removed. Unscrew the lamp and replace it with another. Position metal cap and tighten securely.

position by turning lens locking screw LL in a clockwise direction.

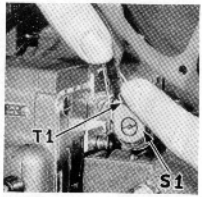
Pilot Light. The pilot light PL provides light while threading projector in a darkened room. To operate, pull cap forward; to turn it off, push back. *The pilot light should always be off when the projector is in operation.*

Threading the Film. Place the loaded reel on the spindle of the feed reel arm H and an empty reel on the spindle of take-up reel arm I. Press each reel firmly on the spindle until the small retaining spring-ball locks the reel on the spindle. Pull off about 18 inches of leader film for threading.

The film, if correctly wound, should feed from the front of the reel with the emulsion, or dull, side out. (Exception: Duplicates from original reversal or Kodachrome films and prints from 16mm negatives are wound and projected with the emulsion side in.) The film should come off the bottom of the reel and the objects on the film should be upside down as they pass through projector mechanism.

Lead the film above the roller and

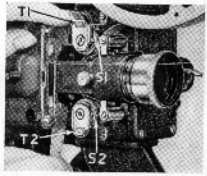
S1. First sprocket
T1. First sprocket tab



below sprocket S1. Slide the film as far toward the machine as it will go. Holding the film snugly around the sprocket with the right thumb and index finger, press on tab T1 to open the guard. Pull gently on the film until the perforations seat on the sprocket teeth.

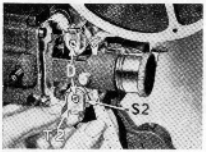
A. Gate lever
B. Hand setting knob

Then release tab T1 locking the film on the sprocket. Swing lever A upward to open the film gate. Place the film in the channel and form the first loop, following the loop outline on the



S1. First sprocket
S2. Second sprocket
T1. First sprocket tab
T2. Second sprocket tab

side of the gear case. Be certain that film is fully seated in channel and close film gate by pressing lever A downward. Form the second loop, according to the outline on the gear case, and slip the film over the second sprocket S2. Again press the film as far toward the projector as it will go



D. Sprocket oil holes
S2. Second sprocket
T2. Second sprocket tab

and, while maintaining correct loop size, lock the film on the sprocket as for sprocket S1.

Pass the film over take-up reel K and engage with edge clips. Remove the film slack, before starting the projector, by revolving the take-up reel clockwise. Place clutch G in the STOP position; turn hand setting knob B several clockwise revolutions to test the threading. If the lower loop slides upward, open film gate and reset the loop to the outline on the gear case. Close the gate and test the threading again.

Operation

Controls. Turn on line switch MS, place clutch G in the RUN position, and turn on lamp switch LS.

Focusing. As the first title or picture appears on the screen, loosen lens locking screw LL, and revolve the lens first in one direction and then in the other until the point of maximum sharpness is found. Tighten lens locking screw LL securely.

Framing. If the picture frame line shows on screen, turn framer knob E until frame line disappears.

Speed Control. If the light on the screen flickers, turn speed control screw S counter-clockwise to increase the speed. The proper projection speed for silent films is just above the point of noticeable flicker.

Still Picture Projection. To project a still picture, place clutch G in the STOP position. If the picture does not then appear on the screen, press and turn clockwise the hand setting knob to lift the shutter from behind the lens. It will be necessary to adjust the lens to focus a still picture. Re-focus when motion is resumed.

Reversing. To change the direction of film movement in order to repeat any portion of the picture, place clutch G in the STOP position and push reverse switch Y up to the REVERSE position. Place clutch G in the RUN position and allow the projector to run until the desired starting point is reached; then place clutch G in the STOP position and push reverse switch Y down to the FORWARD position. Place clutch G in the RUN position and the showing will proceed as before.

Y. Reverse switch

Rewinding. With clutch G in the STOP position, lead the film directly from take-up reel K over the front of feed reel J. Push run-rewind lever R up to the REWIND position. If it does not move easily, turn hand setting knob B slightly to disengage the gear. Turn on line switch MS and place clutch G in the RUN position. When the film has been re-wound, place clutch G in the STOP position and set run-rewind lever R at RUN.

Care and Maintenance

Projection Lamp Replacement. To replace the projection lamp, make sure that the current is off, and tilt the projector to its lowest position by turning the tilt adjustment knob R; then, unscrew cap N at the bottom of the lamphouse and allow the lamp to slide out into the hands. If a projection lamp is being replaced during a show, be careful as the lamp slides down to grasp it by the relatively cool prealignment gauge ring. This operation should be performed quickly, since a moment or two after the lamp is disengaged from the socket, the prealignment gauge ring, acting as a cooling flange, becomes quite warm. If the lamp does not readily drop out, insert the eraser end of a pencil through the top of the lamphouse and rock the lamp until it is dislodged.

Insert the new lamp with the vertical tongue on the prealignment gauge ring toward the front of the projector and revolve it slightly one way or the other until the tongue settles into the prealignment gauge slot in the bottom of the lamphouse.

Replace the screw cap, making sure that it screws in squarely and tightly to lock the lamp in the proper position. *Never attempt to change a lamp with the current on.*

Since the lamps are designed to burn base down, the machine must not be turned upside down or laid on its side while the lamp is burning.

Cleaning Optical Parts. At any time that seems necessary, the projection lens, condensers, reflector and aperture should be cleaned. Use the B&H lens cleaning kit.

Remove projection lens L by loosening lens locking screw LL and pulling forward on the lens barrel. The front and rear elements are then accessible.

If only a slight amount of dust has accumulated on these lenses, use lens cleaning tissue to remove the dust. If, however, finger prints, oil, grease, or dirt are present, wipe B&H Lens Cleaning Fluid on lens surfaces and follow with a thorough cleaning with lens cleaning tissue.

The same treatment should be given the condenser C and the Magnilite condenser CM, which are removed from the projector by pulling on the holder handles.

C. Condenser
CM. Magnilite condenser
F. Metal frame
T. Guides