

How to use  
your

Bell & Howell  
Diplomat

16MM PROJECTOR

IMPORTANT

The Bell & Howell Guarantee is VOID unless you register the serial number of your equipment with Bell & Howell. Use the 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 Guarantee.
2. Free correspondence counsel from our Personal Service Department.

# 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.

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.

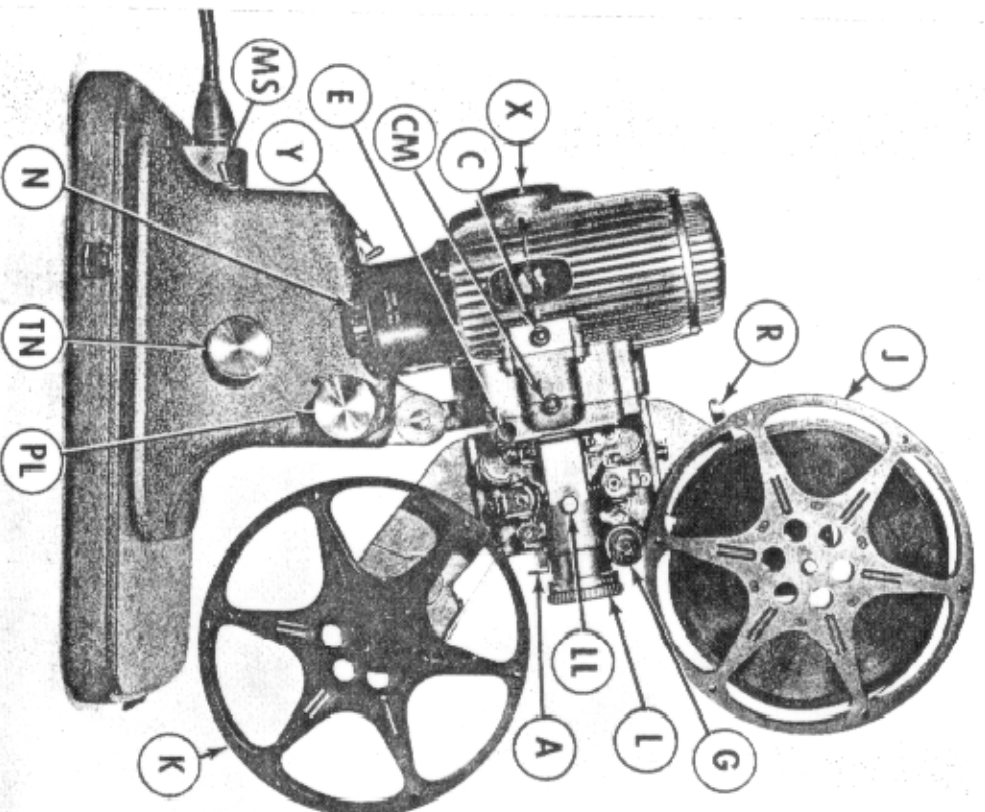
Should you desire additional help in your movie-making, please feel free to call on your Bell & Howell dealer or write directly to us.

Bell & Howell

7100 McCormick Road

Chicago 45, Illinois

Use the registration card on the 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.



- |                         |                           |
|-------------------------|---------------------------|
| A. Film gate lever      | IL. Lens locking screw    |
| C. Condenser            | MS. Line switch           |
| CM. Magnilite condenser | N. Cap                    |
| E. Framer               | PL. Pilot light           |
| G. Clutch               | R. Run-Rewind lever       |
| J. Feed reel            | TN. Tilt knob             |
| K. Take-up reel         | X. Reflector              |
| L. Lens                 | Y. Forward-Reverse switch |

# 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. Rotate clutch C clockwise 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

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

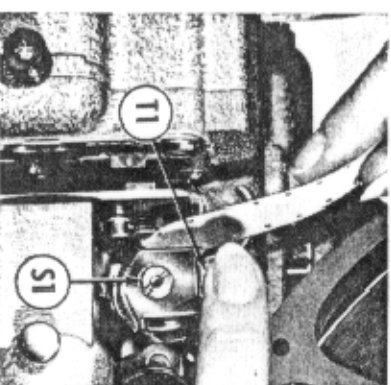
**Pilot Light.** The pilot light PL provides light while threading projector in a darkened room. To operate, pull cap forward; to turn it off, push back. *The pilot light should always be off when the projector is in operation.*

**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

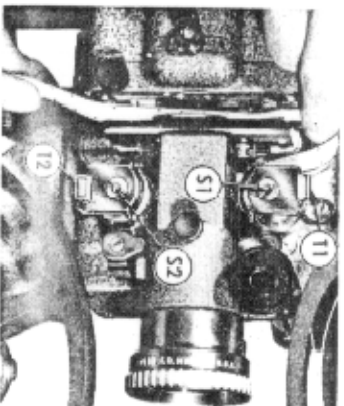


below sprocket S1. Slide the film as far toward the machine as it will go. Holding the film snugly around the sprocket with the right thumb and index finger, press on tab T1 to open the guard. Pull gently on the film until the perforations seat on the sprocket teeth.

A. Gate lever  
B. Hand setting knob

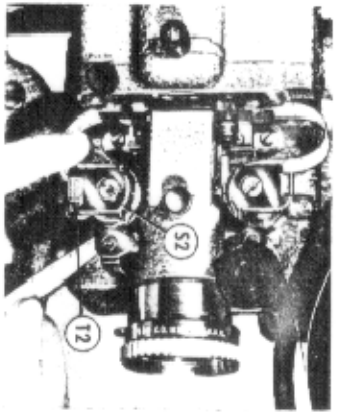


Then release tab T1 locking the film on the sprocket. Swing lever A upward to open the film gate. Place the film in the channel and form the first loop, following the loop outline on the



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



**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 hub of take-up reel

## 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.

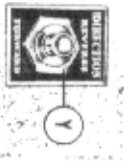
**Still Picture Projection.** To project a still picture, rotate clutch G counter-clockwise to the STOP position. If the picture does not then appear on the screen, press and turn clockwise the

K. The B&H "touch threading" reel will hold the film in place. 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.

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

### Y. Reverse switch



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.

**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.

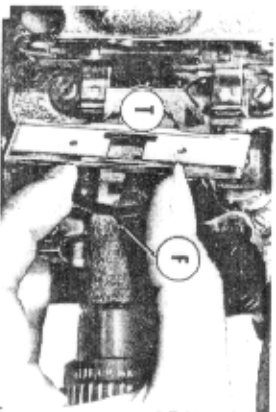
**Cleaning Optical Parts.** At any time that seems necessary, the projection lens, condensers, reflector and aperture should be cleaned.

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.

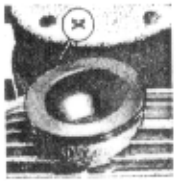
If only a slight amount of dust has accumulated on these lenses, use lens cleaning tissue to remove the dust. If, however, finger prints, oil, grease, or dirt are present, wipe B&H Opti-Kleen Lens Cleaning Fluid on lens surfaces and follow with a thorough cleaning with lens cleaning tissue.

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

**F. Metal frame**  
**T. Guides**



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.

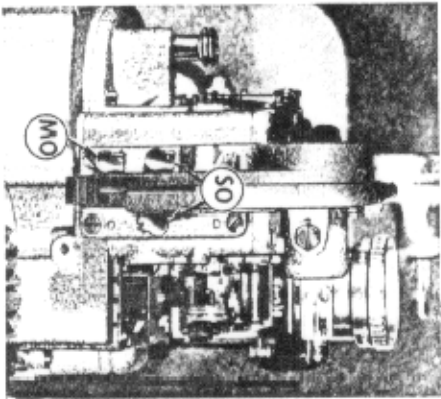
**Cleaning Film Handling Parts.** Before returning the lens to position, clean the removable gate shoe, aperture, and film channel. To remove the gate shoe, open the film gate by raising lever A, grasp the metal frame F at top and bottom, and withdraw. *Use no tools!* Clean and polish with a soft cloth. 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 cups MO and SO should receive one drop of oil after each 50 hours of operation.

MO, Main oil cup  
SO, Oil cups

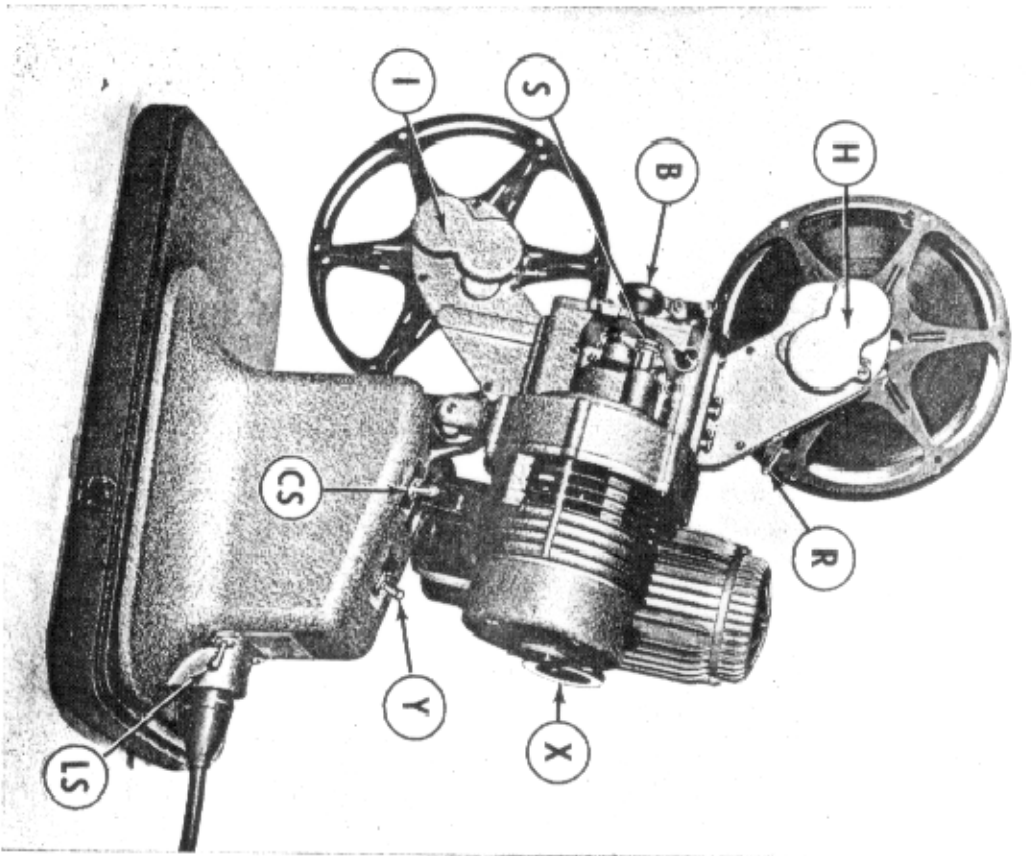


**Pilot Lamp Replacement.** To replace the pilot lamp, turn the metal cover PL in a counter-clockwise direction until it may be removed. Unscrew the lamp and replace it with another. Position metal cap and tighten securely.

## PROJECTED PICTURE SIZES OBTAINED WITH B&H PROJECTION LENSES

DISTANCE IN FEET FROM SCREEN TO FILM

LENS FOCAL LENGTH	WIDTH AND HEIGHT OF PICTURE																
	8'	10'	12'	15'	20'	25'	30'	35'	40'	45'	50'	60'	75'	100'	125'	150'	
16mm	WIDTH AND HEIGHT OF PICTURE																
Pro-lector	Upper Dimension is Width of Picture Lower Dimension is Height of Picture																
3/4"	4.9"	5.11"	7.2"	9.0"	12.0"												
1"	2.11"	3.8"	4.5"	5.7"	7.5"	9.4"	11.3"	13.1"									
1 1/4"	1.5"	1.10"	2.2"	2.9"	3.8"	4.7"	5.7"	6.6"	7.5"	8.5"	9.4"	11.3"	14.0"	18.9"	23.5"	28.2"	
2"	1.10"	1.10"	2.2"	2.9"	3.8"	4.7"	5.7"	6.6"	7.5"	8.5"	9.4"	11.3"	14.0"	18.9"	23.5"	28.2"	
2 1/2"	1.5"	1.5"	1.9"	2.2"	2.9"	3.5"	4.2"	4.10"	5.7"	6.3"	6.11"	7.5"	9.0"	11.3"	15.0"	18.9"	22.6"
3"	1.4"	1.4"	1.8"	2.1"	2.9"	3.5"	4.2"	4.10"	5.7"	6.3"	6.11"	7.5"	9.0"	11.3"	15.0"	18.9"	22.6"
3 1/2"	1.8"	1.8"	2.3"	2.9"	3.8"	4.5"	5.2"	5.11"	6.8"	7.5"	7.5"	9.4"	11.3"	14.0"	18.9"	23.5"	28.2"
4"	1.8"	1.8"	2.3"	2.9"	3.8"	4.5"	5.2"	5.11"	6.8"	7.5"	7.5"	9.4"	11.3"	14.0"	18.9"	23.5"	28.2"



- B. Hand setting knob
- CS. AC-DC switch
- H. Feed reel arm
- I. Take-up reel arm
- LS. Lamp switch
- R. Run-Rewind lever
- S. Speed control
- X. Reflector
- Y. Forward-Reverse switch

### 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.

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:

- a) If equipment has not been registered with Bell & Howell (please use card supplied);
- b) If equipment has been damaged by accident or mishandling;
- c) If equipment has been serviced by other than Bell & Howell approved service stations\*;
- d) If 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.

\*Location of nearest approved service station will be furnished on request.

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