g

Graflex® 16 Model 800 and 900 Series Guidebook

graflex®

Your new Graflex 16 Projector is a high quality, precision built audio visual projection unit. It is constructed of the finest optical and electromechanical components and will, with proper care and maintenance, bring you many happy years of trouble-free performance.
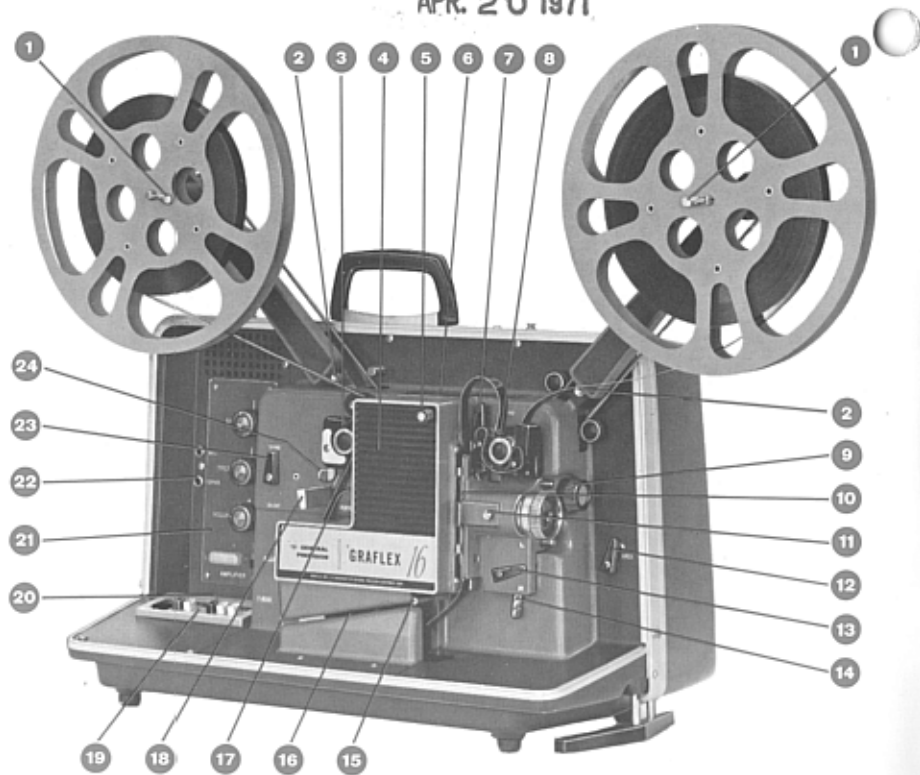
This guidebook includes step-by-step Graflex 16 Projector operating instructions, easy-to-follow lamp replacement and projector maintenance sections, plus a helpful guide to getting more enjoyment out of your film programming. Read this guidebook carefully. It has been prepared to furnish complete information on the Graflex 16 Projector. If you have any further questions regarding your Graflex 16 Projector, please feel free to contact your Graflex dealer or write directly to Graflex, Inc., Rochester, New York.

Table of Contents   APR. 2 0 1971

Reference Guide

1. Reel Spindle Lock Lever
2. Reel Arm Lock
3. Take-Up Sprocket
4. Lamp House Cover
5. Framing Knob
6. Film Path Diagram
7. Rewind Control
8. Feed Sprocket
9. Manual Advance Knob
10. Film Pressure Shoe
11. Lens Lock Screw
12. Elevation Lock Lever
13. Film Pressure Adjustment Lever
14. Film Gate Lever
15. Sound Loop Synchronizer
16. Soundhead (Loading) Slot
17. Lamp House Cover Release
18. Master Control Lever
19. Pushbutton Controls
20. Fuse Reset Button
21. Amplifier Controls*
22. Speaker Jack
23. Speed Control Lever
24. Take-Up Sprocket Shoe Lever

*800 Series Projectors

900 Series Amplifier Control Panel
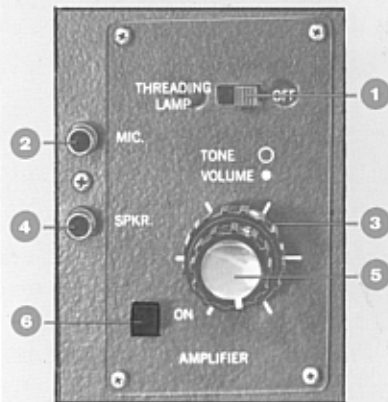
1. Threading Lamp Switch
2. Microphone Jack
3. Tone Control
4. External Speaker Jack
5. "On-Off" Volume Control
6. Amplifier Pilot Light

For familiarity with the projector and the subject matter of the film to be shown, a pre-screening of the film is recommended.

The projector need not be confined to a projection booth, an auditorium, or a room designated as an "audiovisual center." Most rooms can be used as a projection room: classroom, conference room, living room, family room, etc. The room should be well ventilated and comfortably cool. Complete darkness is unnecessary; excellent viewing is possible in semi-darkness, if the screen is shielded from all direct light.

Position the projector about 5 screen widths from the screen. Place it high enough to allow the image to be centered without having to tilt the projector more than 12 degrees. Pictures projected at greater angles will exhibit "keystone" effects.

Preferably, no seat should be closer to the screen than 3 times the width of the screen, since at closer distances the viewer may not be able to fix his attention on the whole image; viewed at too great a distance from the screen, the image will appear too small.

The Operation of the Graflex 16 Projector
(All models)

Power Supply

Plug power cord into proper power source (as indicated on machine name plate).

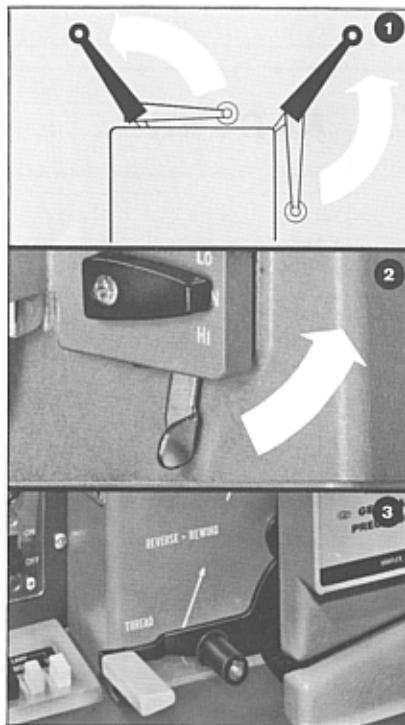### Speaker

If speaker is detachable, place it near screen and plug cable into speaker jack in amplifier control panel. Turn amplifier "on."

Threading

Setting up to load film

1. Swing the Supply and Take-up Reel arms up until locked in place (Fig. 1).

2. Move Film Gate Lever out to open Feed Sprocket and Film Channel (Fig. 2).

3. Set Master Control Lever at thread position (Fig. 3).

4. Open Rear Sprocket Shoe (Fig. 4).

5. Push in rewind lever (Fig. 5).

APR. 2 0 1971

Loading Film

1. Place full reel of film on Supply Arm Spindle and empty reel on Take-up Spindle (Fig. 6).

2. Secure reels by turning back Reel Lock Levers.

3. Unwind approximately five feet of film.

4. Insert film in Feed-Sprocket Channel, engaging film perforations with sprocket teeth (Fig. 7).
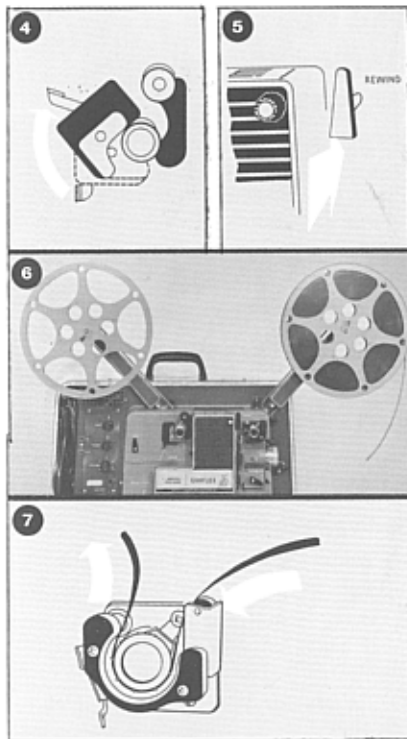
5. The following is the recommended method of inserting film in Film Channel:

APR. 2 0 1971

a. Hold film between thumb and index finger of each hand, either hand at top or bottom (Fig. 8).

b. Position film to fit flat in Film Channel (Fig. 9).

c. Allow enough film to form a loop approximately 1½" high (two fingers is a good rule of thumb) (Fig. 10).
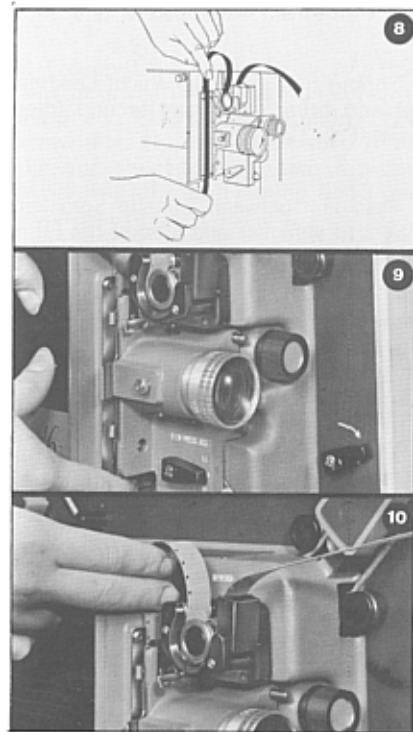
d. Close Film Gate Lever (Fig. 11).

6. Thread film into Soundhead Loading Slot and bring under and around Idler Roller (Fig. 12).
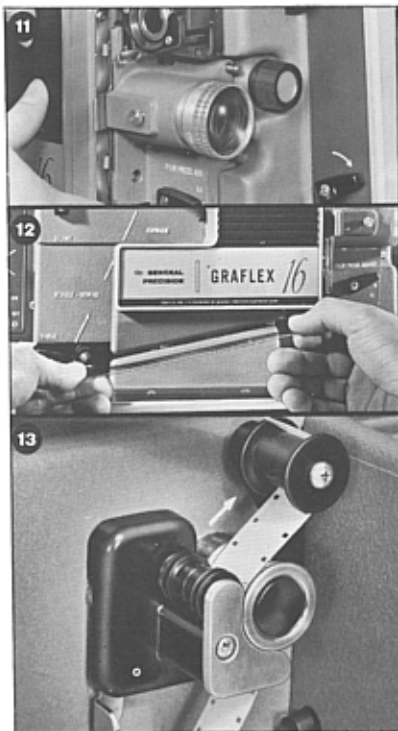
7. Pass film between Take-up Sprocket Shoe and sprocket and around the Film Guide Roller (Fig. 13).

8. Insert end of film in slot of Take-up Reel and turn reel clockwise to take up slack.

9. Test threading by rotating Manual Advance Knob.

APR. 2 0 1971

1. Make sure Amplifier Switch is "On." Let the machine warm up as you thread film.

2. Set the Master Control at "Forward." For longest lamp life, always use the "Norm" (yellow) button when lighting conditions are normal. If extra light power has to be used, push the "HI" (white) button (Fig. 14).

3. To raise or lower picture on screen, turn the Elevation Lock Lever counter-clockwise to unlock. Raise or lower front of projector as required. When picture is "centered," lock projector in position by turning Lock Lever in direction of arrow.

4. Adjust Film Pressure Adjustment Lever to eliminate any distracting sounds made by film as it moves through projector (Fig. 15).

5. Loosen Lens Lock Screw and turn Lens in or out until image on screen is sharp and clear; then retighten Lock Screw (Fig. 16). If a black strip (frame line) appears at top or bottom of picture on screen, turn the Framing Knob until picture is properly framed.

6. When picture has been properly aimed, framed and focused, set Master Control at "Reverse," and run film back to beginning. Push "Off" (red) button as soon as blank film ahead of opening title appears.

7. Set Master Control at "Forward" (Fig. 17). Film is now ready for showing . . . push the "Run" (green) button and set the Speed Control on "Sound." Press desired "Lamp" brightness button (yellow or white) and begin film projection. Your show is under way. Adjust Volume and Tone Controls for best sound quality.

8. When the "The End" appears on screen, turn lamp off by pushing lamp "Off" (black) button and turn down volume control to avoid distracting markings and noises at tail end of film. Push the master "Off" (red) button, when film has completely passed through projector.

Picture Size: To adjust size of picture, vary distance between projector and screen, or use lens of a different focal length (see page 16).

9. If lower loop is lost during projection, swing the Sound Loop Synchronizer down fully and release (Fig. 18).
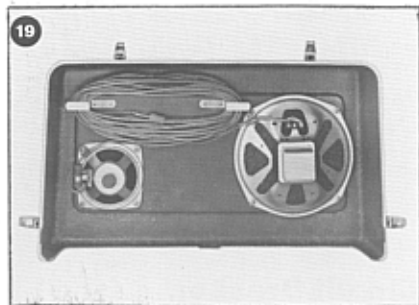
APR. 2 0 1971
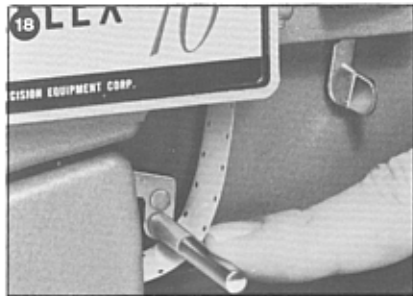
External Speaker

Insert speaker plug into SPKR jack. Speaker output is 8 ohm impedance and will operate with 6 ohm to 16 ohm speaker systems. The built-in twin 5" oval speakers (900 series only) are automatically bypassed when an external speaker is used (Fig. 19).

Projecting Silent Film

To project silent film, follow the same instructions given on pages 11 and 12 for projecting sound film, with the following exceptions:

1. Turn amplifier off, unless a microphone or phonograph is plugged into the Microphone Jack.

2. Place Sound-Silent lever on "Silent." Move this lever only when projector is operating in "Forward."

Projecting Still Pictures

(Applies to models with "still" control)

While film is being shown, push the "still" (blue) button to stop the film and project a single frame as a still picture.

If no picture (or only part of a picture) appears on the screen, rotate the Manual Advance Knob until a full picture appears.

Picture brightness will be reduced, because the safety shutter holds back some light. It may be necessary to focus on the still picture to regain maximum sharpness.

To continue the film, push the "Run" (green) button and refocus.

Rewinding

(All models)

1. When the film has completely passed through the projector, push the "Off" (red) button. Set the Master Control Lever in the "Reverse Rewind" position.

2. Attach loose end of film to the empty reel. Do not change the position of the reels. This is another Graflex convenience.

3. Pull the Rewind Control out. Push the "Run" (green) button. Keep hands away from the revolving reels.

4. When film is rewound, push the "Off" button and push in the Rewind Control. Put the Master Control Lever into the "Thread" position ready for the next reel of film.

Microphone

Insertion of a Microphone plug into the "MIC" jack located on the Amplifier Control Panel automatically interrupts sound from the soundhead (see panel illustration on page 5).

800 series. Use medium impedance (3000 ohm) microphone. To use as public address system, press red "Off" button and use Amplifier Controls normally.

900 series. Use medium impedance (3000 ohm) directional type microphone. To use as public address system press black "Off" button, set Master Control in "Forward" and use Amplifier Controls normally.
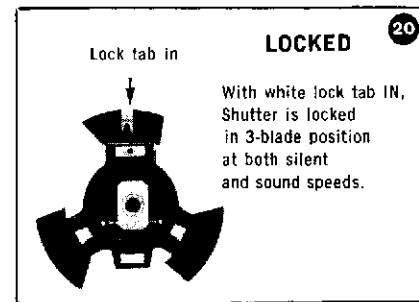
Circuit Breaker

Your new Graflex 16 is equipped with an Amplifier Circuit Breaker (Reset Fuse). If the amplifier pilot light fails to light when the amplifier switch is turned on, the Circuit Breaker may have opened. To reset, turn the amplifier off and press the "Reset Fuse" button.

Automatic Shutter

(All Models with Still Control)
Your projector has a variable 2-3 blade shutter to give you a projected picture with maximum brilliance and minimum flicker (Fig. 20).

Lock tab in   **LOCKED** ㉒

With white lock tab IN,
Shutter is locked
in 3-blade position
at both silent
and sound speeds.

At sound speed, the shutter will operate as a 2-blade shutter to get the fullest output of the projection lamp. If, however, the intensity of the light projected is considered too great (on "Norm" or "High"), it can be easily reduced. Simply lock the shutter in the 3-blade position as follows:

1. Press "Off" button to stop the projector; remove the Lamp House Cover (see page 18).

2. Turn Manual Advance Knob to locate shutter blade with white lock tab. Hold knob to prevent shutter from rotating, and with the tip of the finger, slide the white tab in fully, towards the hub of the shutter. Replace the Lamp House Cover.

NOTE:

a. To restore shutter to automatic 2-3 blade operation, merely unlock shutter by pulling white lock tab out fully toward end of shutter blade.

b. At silent speed, the shutter automatically changes to a 3-blade shutter.

Picture Size Chart

UPPER DIMENSION IS HEIGHT OF PICTURE
LOWER DIMENSION IS WIDTH OF PICTURE

Entries shown as height / width.

Proj. Lens Focal Length	2'	3'	4'	6'	8'	10'	15'	20'	25'	30'	35'	40'	50'	75'	100'	125'
¾"	0'9" / 1'0"	1'2" / 1'6"	1'6" / 2'0"	2'3" / 3'0"	3'0" / 4'0"	3'9" / 5'0"	5'7" / 7'6"	7'6" / 10'0"	9'4" / 12'6"							
1"	0'7" / 0'9"	0'10" / 1'2"	1'1" / 1'6"	1'8" / 2'3"	2'3" / 3'0"	2'10" / 3'9"	4'3" / 5'8"	5'7" / 7'6"	7'0" / 9'4"	8'6" / 11'4"	9'9" / 13'1"					
1½"		0'7" / 0'9"	0'9" / 1'0"	1'1" / 1'6"	1'6" / 2'0"	1'10" / 2'6"	2'10" / 3'9"	3'9" / 5'0"	4'8" / 6'3"	5'7" / 7'6"	6'7" / 8'9"	7'6" / 10'0"	9'4" / 12'6"			
2"						1'4" / 1'10"	2'1" / 2'10"	2'10" / 3'9"	3'6" / 4'8"	4'1" / 5'6"	4'10" / 6'6"	5'6" / 7'5"	7'0" / 9'4"	10'5" / 14'0"	14'0" / 18'9"	17'10" / 23'5"
2½"						1'2" / 1'6"	1'7" / 2'1"	2'3" / 3'0"	2'10" / 3'9"	3'4" / 4'6"	3'11" / 5'3"	4'6" / 6'0"	5'7" / 7'6"	8'5" / 11'3"	11'2" / 15'0"	14'8" / 19'8"
3"									2'4" / 3'1"	2'10" / 3'9"	3'3" / 4'4"	3'9" / 5'0"	4'8" / 6'3"	7'0" / 9'4"	9'4" / 12'6"	11'7" / 15'7"
3½"									2'0" / 2'8"	2'4" / 3'2"	2'10" / 3'9"	3'2" / 4'3"	4'0" / 5'4"	6'0" / 8'0"	7'11" / 10'8"	9'11" / 13'4"
4"									1'9" / 2'4"	2'1" / 2'10"	2'2" / 3'3"	2'10" / 3'9"	3'6" / 4'8"	5'3" / 7'0"	7'0" / 9'4"	8'8" / 11'8"

16

Projection Time Table

SOUND SPEED: 24 frames per second (36' per minute)   SILENT SPEED: 18 frames per second (27' per minute)

Length of Film	At Sound Speed Film Will Run: Minutes	Seconds	At Silent Speed Film Will Run: Minutes	Seconds	Length of Film	At Sound Speed Film Will Run: Minutes	Seconds	At Silent Speed Film Will Run: Minutes	Seconds
50'	1	24	1	51	600'	16	40	22	13
100'	2	47	3	42	700'	19	26	25	55
200'	5	34	7	24	800'	22	14	29	37
300'	8	20	11	6	900'	25	0	33	20
400'	11	7	14	49	1000'	27	46	37	2
500'	13	54	18	31	1600'	44	44	59	15
					2000'	55	34	74	4

The above chart will help you plan more effective use of time by determining in advance how long a film will require for showing. For example, a 400' sound film takes 11 minutes, 7 seconds to run, while a silent film of the same length requires 14 minutes and 49 seconds.

17

Lamp And Belt Replacement APR. 2 0 1971

Removing Lamp House Cover

1. Disconnect power cord.

2. Press Lamp House Release Button with thumb of right hand while grasping cover between thumb and fingers, and pull straight away from projector (Fig. 21).

3. To replace, push cover straight in until release catch engages. (**NOTE:** It may be necessary to rotate the Framing Knob to align knob groove with the shaft.)
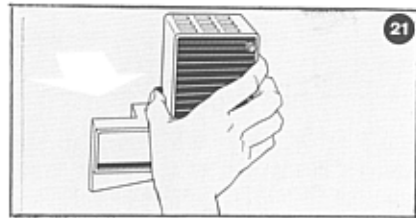

Replacing Projection Lamp

Remove Lamp House Cover.

Remove chimney by lifting straight up. Remove lamp in same manner.

To replace lamp, align ridge on center pin of lamp with groove in socket. Push down firmly until it seats with a click. Wipe lamp free of fingerprints and dust (Fig. 22).

Replace lamp chimney by aligning the notch on chimney with guide pin, and press in firmly (Fig. 23). Replace Lamp House Cover. (Use replacement lamp designated by ASA ordering code DLR or DKM only.) DKM should be used for **maximum** life at normal line voltages or maximum light output at **high line voltages.** DLR should be used for maximum light output at **normal line voltages.**
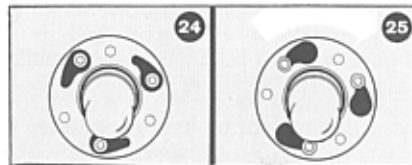

SOUND EXITER
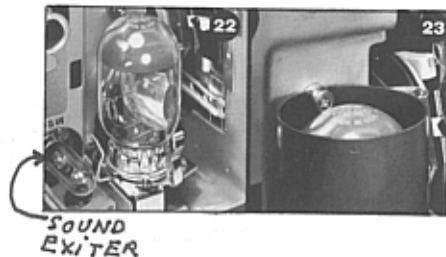
### Replacing Exciter Lamp APR. 2 0 1971

Remove Lamp House Cover (see page 18). To remove exciter lamp correctly, turn lamp counterclockwise as you pull it out.

Align the three slots in new lamp with pins in the socket and turn clockwise (Figs. 24, 25). Replace Lamp House Cover. (Replacement lamp: 800 Series—BRK; 900 Series—BSW).

Replacing Threading Lamp

Unscrew two retaining screws and remove soundhead cover (Fig.26).
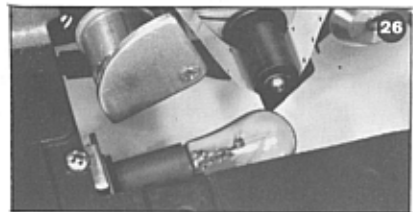
a. 800 Series: remove lamp by pressing in and turning it counterclockwise. To replace, align pins on new lamp with slots in socket, press in and turn clockwise. Replacement lamp: No. 44.

b. 900 Series: remove or replace screw base lamp by threading into or out of base. Replacement lamps: 117 volt models use No. 6S6; 220 volt models use No. 1056/10.

Reel Belt Replacement

(All models)

Open one end loop of old belt, disconnect hooked ends, and remove belt from projector.

Push new belt through opening indicated by arrow. Interlock both end loops. Open one end loop of new belt if necessary and close (Fig. 27).
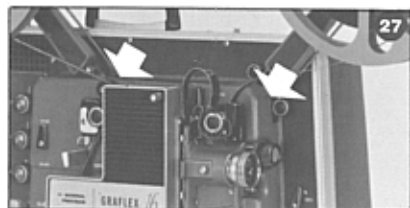
APR. 2 0 1971

Projector Care

Before each showing, swing Film Gate Lever forward to open film channel. Loosen Lens Lock Screw and turn lens forward. Remove Film Pressure Shoe by pulling straight out. Clean the Pressure Shoe and Aperture Plate with aperture brush or soft, lint-free cloth. If neces-sary, dampen cloth with solvent to re-move any hardened substance (Fig. 28).

Periodically, wipe dirt and dust from projector mechanism with a soft, lint-free clean cloth.

Film Care

Never pull film tight on its reel, because the emulsion may become scratched with "cinch marks." Your Graflex 16 re-winds film with just the right amount of snugness. For storage, secure loose end of film with a length of masking tape. Fold it under and stick masking tape against itself about ½" from end. This forms a tab for easier removal. Protect film from dust by replacing in storage can promptly after showing. Store cans away from heat.
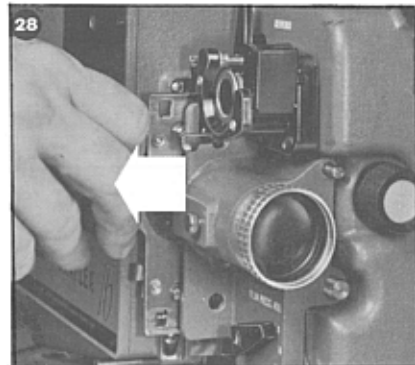

Cleaning the Lens

Loosen Lens Lock Screw and remove lens. Remove dust from front and rear exposed lens surfaces by brushing gently with a soft brush; then wipe gently with a clean lens tissue (slightly moistened with lens cleaner if necessary). **CAU-TION:** Never pour lens cleaner or other solvents on the lens elements.

Lubrication

Your Graflex 16 is permanently lubri-cated and should not be oiled except as noted here. To insure optimum perform-ance apply 16 drops of Graflex Instru-ment Oil (p/n 39479P8) to the felt oiler pad after each 500 hours of operation or once every 12 months. It is available in convenient applicator tubes from your Graflex AV Dealer or Service Station (Fig. 29).
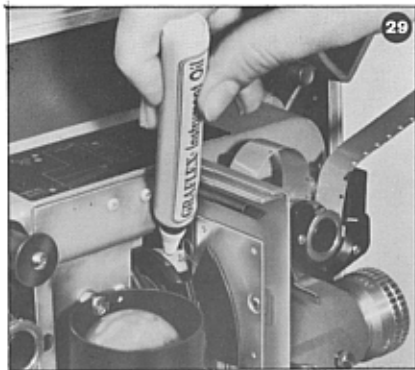
Accessories

Genuine Graflex Accessories
custom designed for greater
service from your projector

12" Accessory Speaker

A high quality permanent-magnet
speaker, baffle-mounted in properly de-
signed case for optimum acoustic bal-
ance. Impedance-matched to output of
projector amplifier. Attractive styling
complements projector case.
. . . . **Cat. No. 3723**

Speaker Extension Cable

Allows an additional 50' separation be-
tween projector and speaker. Complete
with fittings . . . . **Cat. No. 3646**

Slip Cover

Padded, heavy duty, with zipper pocket
for 1600' reel . . . . . **Cat. No. 3739**

Aperture Cleaning Brush

(white nylon) . . . . **Cat. No. 3694**

Graflex Instrument Oil . . **Cat. No. 3741**

Projection Lenses

Finest quality lenses with a wide
range of focal lengths to adapt the
Graflex 16 to every projection dis-
tance and screen size. (See "Pic-
ture Size Chart," page 16.)

Focal Length	f No.	Catalog No.
⅝"	f/2.0	3610
1"	f/1.9	3602
1½"	f/1.6	3603
2"	f/1.6	3609*
2"	f/1.6	3604
2½"	f/1.8	3605
3"	f/2.0	3606
3½"	f/2.5	3607
4"	f/2.8	3608

*Field Flattener Lens