ELMO

16mm SOUND PROJECTOR

ELMO

FILMATIC 16-A

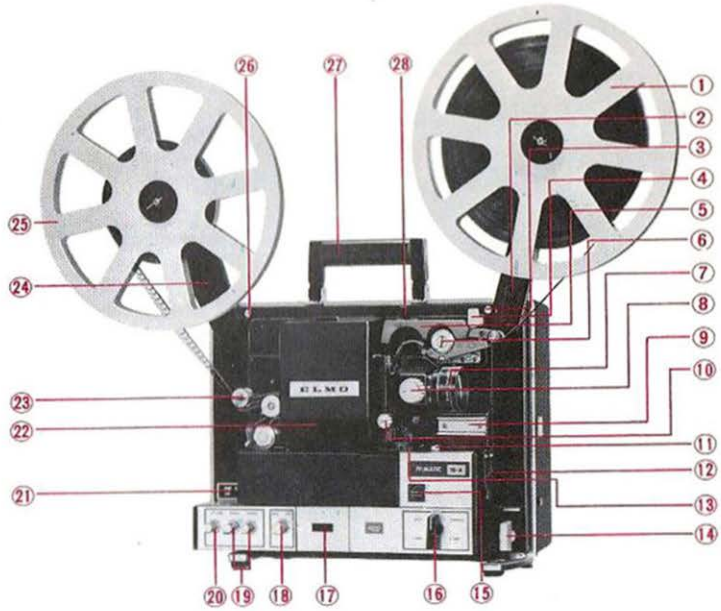
INSTRUCTION MANUAL

SPECIFICATIONS

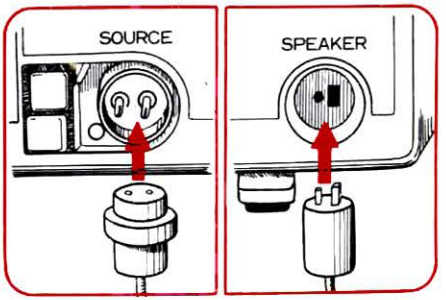
Power supply	:	AC Single phase, 50/60 Hz.
Projection lamp	:	24V-250W quartz halogen lamp with cold mirror.
Projection lens	:	F/1.3 50mm lens is standard. F/1.4 20mm lens, F/1.8 75mm lens, Conversion lens (x0.8 & x1.25), Zoom converter (x0.8 to x1.25) and Elmo scope lens are available as accessories.
Projection speed	:	24 and 16 fps.
Motoe	:	Induction motor.
Reel capacity	:	Max. 600m (2000ft). Projector is equipped with 360m (1200ft) reel.
Film threading	:	Fully automatic.
Loop restorer	:	Automatic.
Still projection	:	Possible.
Reverse projection	:	Possible.
Slow motion projection	:	Possible. 6 and 4 fps. Flickerless system.
Rewinding	:	High speed rewinding.
Remote control	:	Possible.(Depending on countries.)
Sound system	:	Magnetic and optical reproduction.
Photo electric cell	:	Silicon photo-diode.
Amplifier circuit	:	All IC.
Continuous power output (5%)	:	20W (8Ω).
Tone control	:	Treble and bass separate control.
Microphone	:	Usable.
Speaker	:	2 built-in 12.5cm (5") dynamic speakers.

NAME OF PARTS

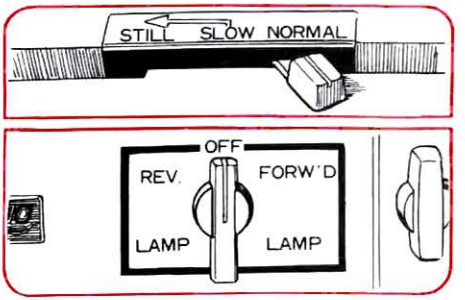
① Front reel
② Front reel arm
③ Folding button for front reel arm
④ High speed rewinding knob
⑤ Self-threading lever
⑥ First sprocket
⑦ Projection lens
⑧ Focusing knob
⑨ Accessory shoe
⑩ Framing knob
⑪ Oil inlet
⑫ Film trimmer
⑬ Speed change lever
⑭ Elevation control knob
⑮ Oil level gauge
⑯ Motor/lamp switch
⑰ Exciter lamp housing
⑱ M-O switch
⑲ Tone control knobs
⑳ Volume control knob
㉑ Amplifier switch
㉒ Lamp housing
㉓ Self-threading release lever
㉔ Rear reel arm
㉕ Rear reel
㉖ Folding button for rear reel arm
㉗ Handle
㉘ Still/Slow Motion lever
㉙ Mic./Phono receptacle
㉚ Speaker cord receptacle
㉛ Inclination adjuster
㉜ Power fuse holder
㉝ Power cord receptacle
㉞ Cover for remote control receptacle



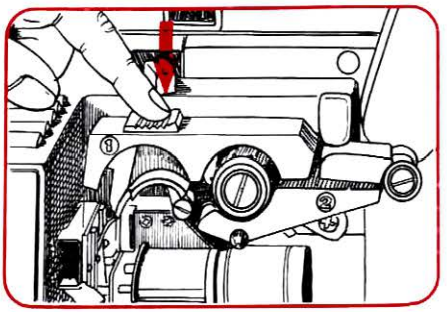
CONDENSED OPERATING INSTRUCTIONS



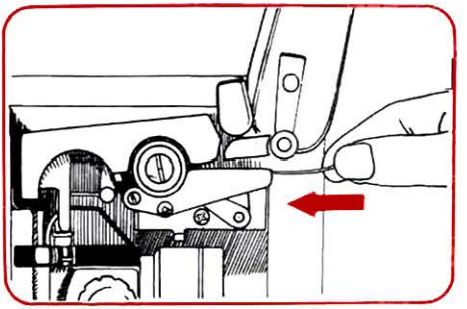
1 Place the projector and speaker in position. Connect the power cord and speaker cord.



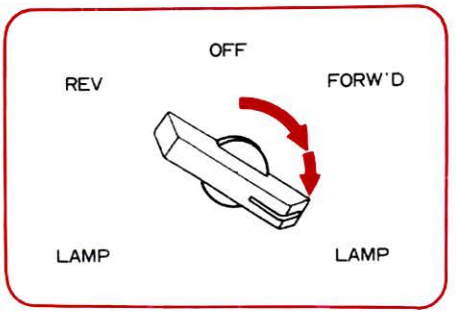
2 Leave the motor/lamp switch ⑯ at "OFF" and the Still/Slow Motion lever ㉘ at "NORMAL".



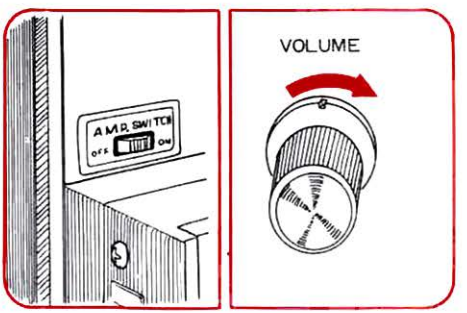
5 Attach the front and rear reels and depress the self-threading lever ⑤ until it sits in position to set the self-threading mechanism.



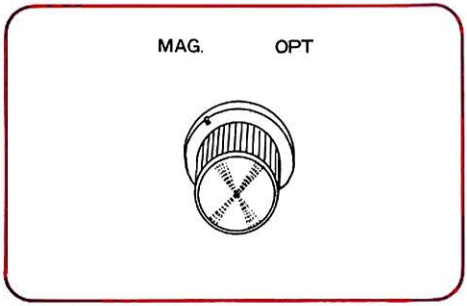
6 Insert the film leader, after trimming, into the threading slot.



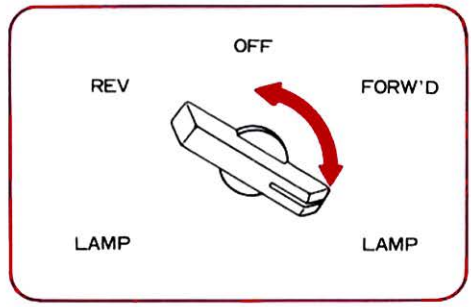
9 Turn the motor/lamp switch ⑯ to "FORW'D" and then to "LAMP".



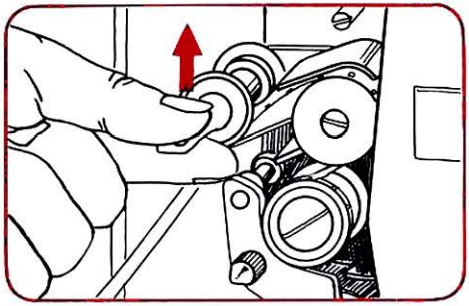
10 Switch on the amplifier switch ㉑. Then turn the volume control knob ⑳ and tone control knobs ⑲ to the desired position.



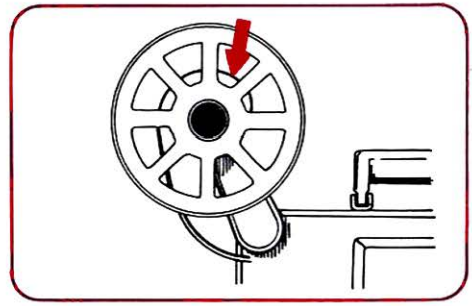
3 Set the M-O switch ⑱ to "M" when using magnetic sound film or "O" when using optical sound film. Leave the volume control knob ⑳ at "OFF".



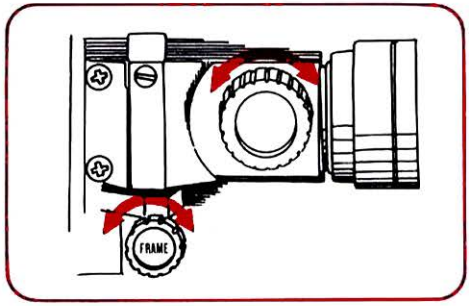
4 Turn the motor/lamp switch ⑯ to "LAMP". Focus on the screen and return it to "OFF" after focusing.



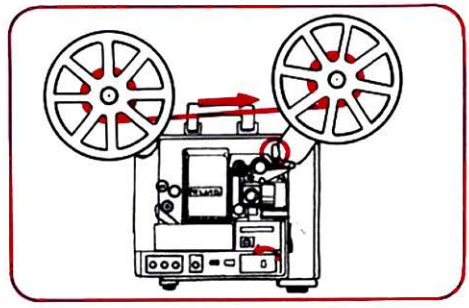
7 After about 50cm (20") of film emerges from the rear end of the projector, lift the self-threading release lever ㉓ to stop the motor.



8 Wind the film on the rear reel ㉕ .



11 Focus the projected image until it is sharp by turning the focusing knob ⑧ and turn the framing knob ⑩ to eliminate the frame line, if necessary.

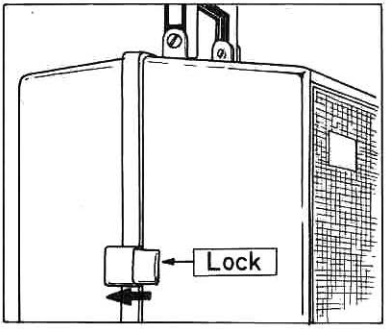


12 For rewinding, turn the motor/lamp switch ⑯ to "REV" and pull the high speed rewinding knob ④ .

PREPARING FOR PROJECTION

Setting up the projector

1. Unlock the locks on both sides of the front cover and remove the front cover.

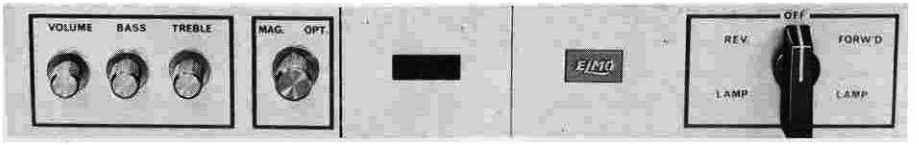


2. The front cover incorporates the speakers so it can be used as a speaker cabinet. Place the front cover beside the screen at a height of 1m to 2m (3ft to 6ft). Remove the speaker cord from the vinyl cover and connect it to the speaker cord receptacles at the back of the projector ㉚ and inside the front cover.

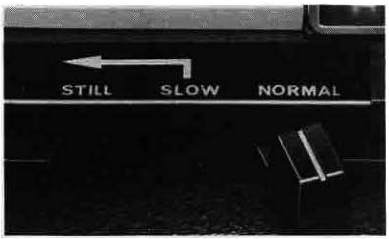
3. Set up the front and rear reel arms ② ㉔.

4. Remove the power cord from the vinyl cover. Connect the power cord to its receptacle ㉝ and plug it into the AC outlet.

5. Make sure that the motor/lamp switch ⑯ , volume control knob ⑳ and tone control knobs ⑲ are set at "OFF" as illustrated below.
   Set the M-O switch ⑱ to either "MAG." when using magnetic sound film or "OPT." when using optical sound film.



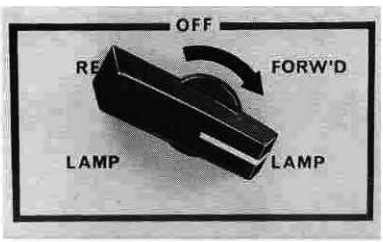
6. Make sure that the Still/Slow Motion lever ㉘ is set at "NORMAL".



7. Attach the reel of film and the empty reel on the front reel arm ② and rear reel arm ㉔ respectively, and lock them into position by turning the reel locks.

8. Adjust sideway inclination of the projector by turning the inclination adjuster ㉛ on the rear leg.

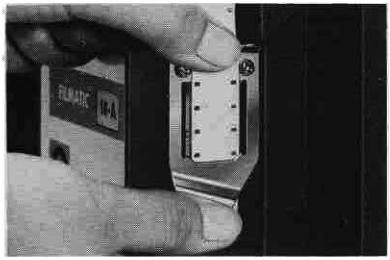
9. Turn the motor/lamp switch ⑯ to "FORW'D" and then to "LAMP". If the projected light is not centered vertically on the screen, loosen the elevation control knob ⑭ and adjust height by raising or lowering the front of the projector. Then tighten the elevation control knob and turn the motor/lamp switch back to "OFF".



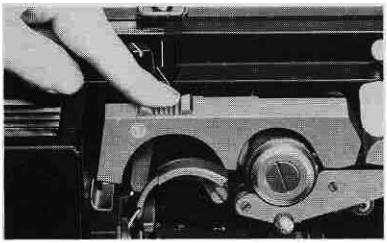
10. Make sure that the projection speed change lever ㉘ is set at desired speed; "SOUND" for 24 fps or "SILENT" for 16 fps. If not, turn the motor/lamp switch ⑯ to "FORW'D" and change accordingly. Do not change the speed unless the motor is running.

THREADING FILM

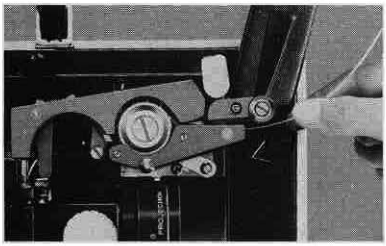
1. Trim the film end with the film trimmer ⑫ to insure smooth, automatic threading. Unless the film end is properly trimmed, the film cannot be threaded. In case the film leader is bent or perforations are damaged, replace or cut off the leader.



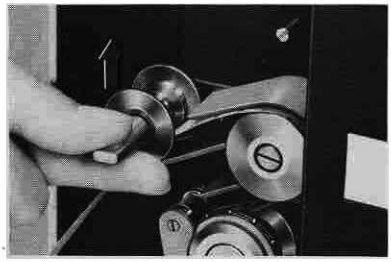
2. Depress the green self-threading lever ⑤ until it sits in position, and the threading mechanism is set for self-threading and the motor starts running.



3. Insert the film end into the threading slot marked by a red arrow until the film is pulled in.

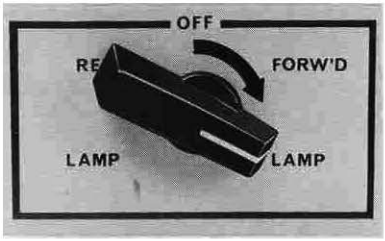


4. When about 50cm (20″) of the film emerges from the rear end of the projector, lift the green self-threading release lever ㉓ , and the self-threading mechanism is released and the motor stops. Wind the film on the rear reel. Film threading is now completed.

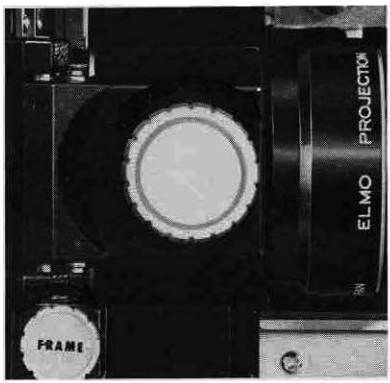


PROJECTION

Projection is started by turning the motor/lamp switch ⑯ to "FORW'D" and then to "LAMP". (Unless the self-threading mechanism is released, the motor/lamp switch cannot be turned.)



When the projected image appears on the screen, check the following points:

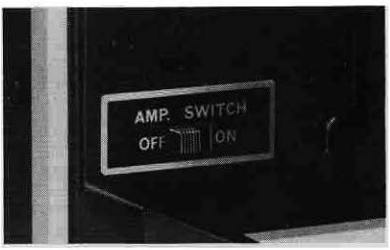


1. Focus

Turn the focusing knob ⑧ to bring the image into focus.

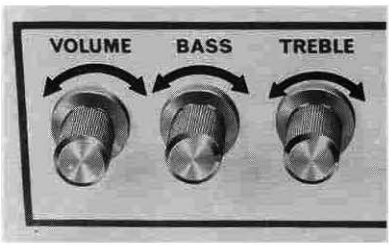
2. Framing

If the frame line appears on the screen, turn the framing knob ⑩ to eliminate it.



3. Volume and tone

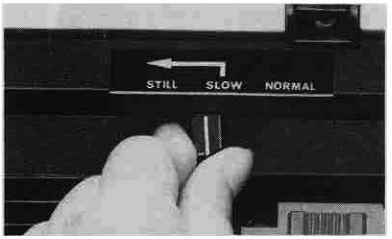
Switch on the amplifier switch ㉑ .



Then adjust volume and tone by turning the volume control knob ⑳ and tone control knobs ⑲ respectively.

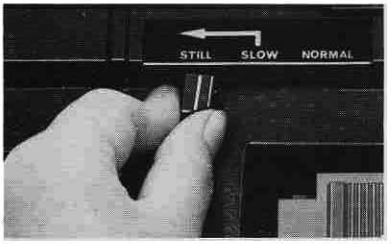
VARIOUS PROJECTION

1. Slow motion projection



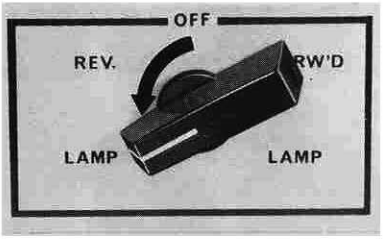
For slow motion projection, move the still/slow motion lever ㉘ from "NORMAL" to "SLOW", and the projection speed is slowed down to a quarter of the normal speed.

2. Still projection



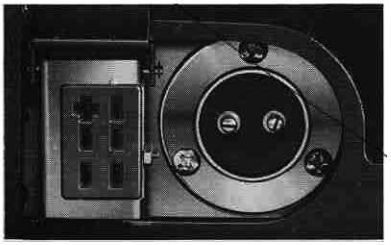
Still projection during operation can be done by moving the still/slow motion lever ㉘ to "SLOW" and then further to "STILL" while depressing the lever at the position of "SLOW" and holding it.

3. Reverse projection

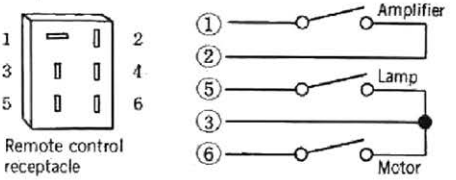


When the motor/lamp switch ⑯ is turned to "REV", the film moves in reverse. When it is turned further to "LAMP", the film is projected in reverse.

4. Remote control projection



Remote control projection can be done by connecting an optional remote control device to the remote control receptacle inside its cover ㉞ . Be sure to operate a remote control switch by setting the motor/lamp switch ⑯ to "FORW'D". (Do not turn it to "LAMP".) The wiring for remote control is illustrated below.

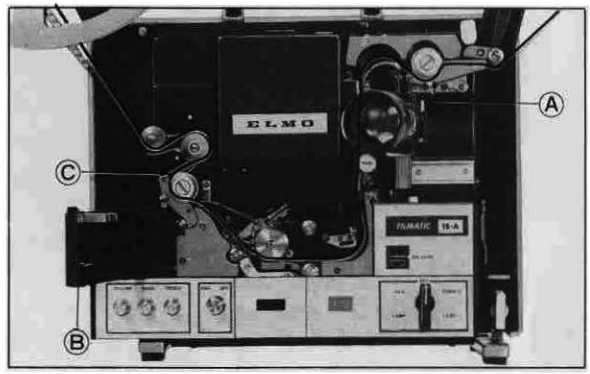


Note:
For certain countries, the projector is delivered without the remote control receptacle, and in this case, this instruction is not applicable.

UNLOADING FILM MANUALLY

When removing the film manually from the film path:

1. Push down the button Ⓐ shown in the picture to open the sprocket shoe.
2. Swing open the hinged lens holder toward you.
3. Open the cover Ⓑ and push down the sprocket shoe Ⓒ as illustrated in the picture.
4. Now the film can easily be taken out manually.



IMPORTANT

Do not move the projector when the lamp is on or before the lamp is adequately cool as this may damage the lamp.

WHEN PROJECTION IS COMPLETED

When the film has been projected, first turn off the lamp by turning the motor/lamp switch ⑯ to "FORW'D", and then turn the volume control knob ⑳ to "OFF" and switch off the amplifier switch ㉑ . After the film has been wound completely on the rear reel, move the still/slow motion lever ㉘ to "STILL" and leave the motor running to ensure that the lamp is adequately cooled.

Rewinding the film:

1. Insert the film end into the slot of the front reel hub.

2. Turn the motor/lamp switch ⑯ to "REV".

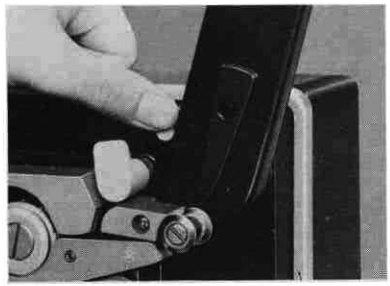
3. Pull the high speed rewinding knob ④ toward you, and the film is rewound at high speed. (The high speed rewinding knob is released automatically when the projector operates for forward projection. So you may leave it in this position until the next projection.)

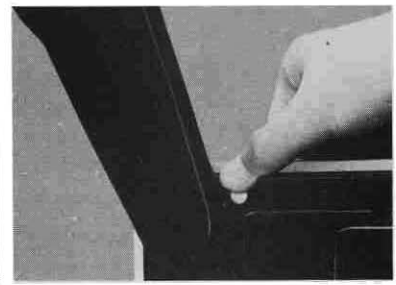
4. After making sure that the lamp is adequately cool, turn the motor/lamp switch ⑯ to "OFF".

STORING

1. Disconnect the power cord first. Return the take-up reel, power cord and speaker cord to their storing places. Handle the cords with care so as not to damage them.

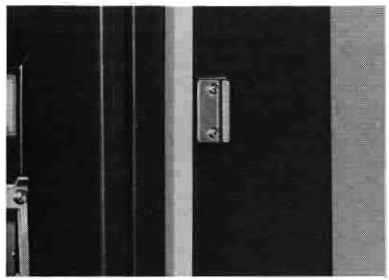
2. Lower the front and rear reel arms by depressing the folding buttons ③ and ㉖ at the base of the reel arms.





3. Loosen the elevation control knob ⑭ , return the elevation leg to its retracted position, and retighten the knob. Never transport the projector with the elevation leg extended.

4. Replace the front cover on the projector and put on the vinyl cover.



CLEANING

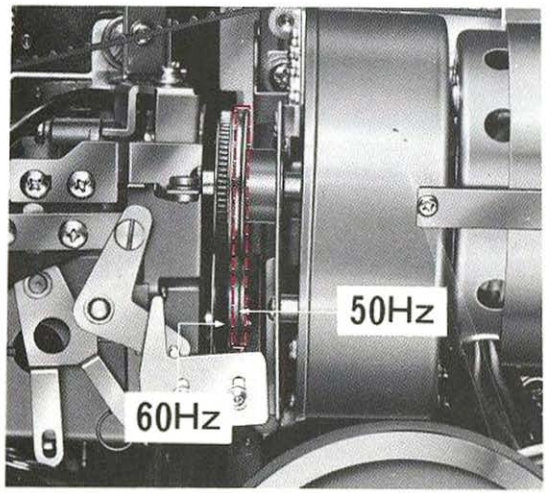
Open the hinged lens holder toward you to clean the film gate and lens surfaces.

1. **Film gate**
   The film gate, which is in continuous contact with the film, is precisely machined to prevent damage to the film. When dust or other matter adheres to the gate, it may scratch or damage the film. From time to time, therefore, especially after heavy use, the film gate and surrounding area should be cleaned with the small brush provided or a soft cloth. Never attempt to clean the film gate with anything made of metal or touch the film sending claw during cleaning.

2. **Projection lens**
   Remove the lens by pulling straight out. Clean both the front and rear surfaces gently with a soft hair brush or soft cloth. Never blow on the lens surfaces or touch with bare fingers.

CHANGING FREQUENCY (CYCLE)

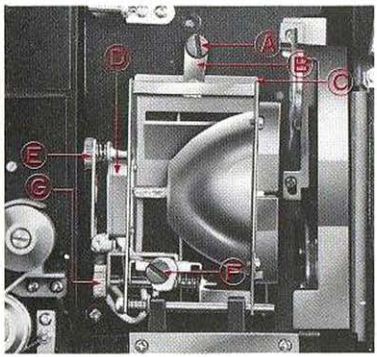
When changing frequency from 50Hz to 60Hz and vice versa, disconnect the power cord first, remove the back cover and then shift the frequency changing belt as shown in the picture.

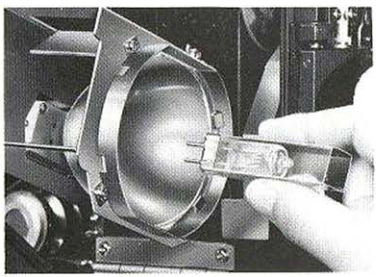


MAINTENANCE

Be sure to disconnect the power cord before replacing the lamps and fuses. When replacing the projection lamp, make sure that it has cooled sufficiently to handle.

Projection lamp





(1) Replacing the projection lamp:

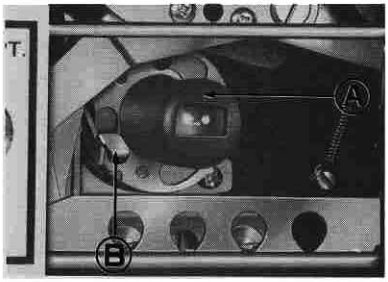
1. Open the lamp housing ㉒.
2. Loosen the screw Ⓐ and turn the locking lever Ⓑ to release the mirror holder Ⓒ.
3. Pull the mirror holder Ⓒ toward you and pull the lamp straight out.
4. When inserting a new lamp, leave the paper sleeve or cardboard cover on the lamp. Never touch the glass portion of the lamp and mirror directly with bare fingers.
5. Align the two pins of the lamp with the holes in the socket Ⓓ and push the lamp into the socket as far as it will go.
6. Push the mirror holder Ⓒ back to its place and fix it.

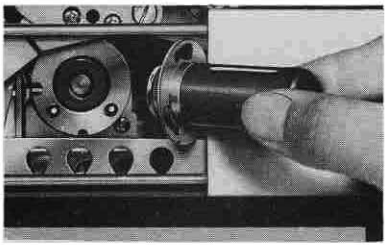
(2) Adjusting the position of the projection lamp:

If the projected image is too dark or uneven after replacing the lamp, adjust the lamp position by turning the adjusting screws Ⓔ, Ⓕ and Ⓖ.

1. To adjust brightness on the upper or lower side of the image, turn the adjusting screw Ⓔ.
2. To adjust brightness on the right or left side of the image, turn the adjusting screw Ⓕ.
4. After adjustment with the adjusting screws Ⓔ and Ⓕ, make fine adjustment by turning the adjusting screw Ⓖ.

Exciter lamp





The quality of optical sound reproduction will deteriorate if the exciter lamp is used for a long time.

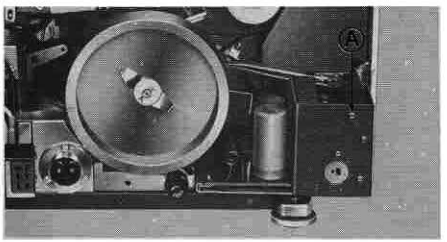
To replace the exciter lamp:

1. Remove the exciter lamp housing ⑰ by pulling from underneath toward you.
2. Pull out the metal shielding cylinder Ⓐ, push up the ejector Ⓑ and turn the lamp counterclockwise to remove it.
3. To install a new lamp, align the three guide pins with the holes of the lamp base flange, with the notch of the lamp base flange facing downward. Then push the lamp and turn it clockwise as far as it will go.
4. Push down the ejector to fix the lamp in position and attach the shielding cylinder with its open side facing upward.

Power fuse

When replacing the power fuse (5A), turn the power fuse holder ㉜ counterclockwise, and the fuse can be taken out.

Amplifier fuse



1. Pull out the volume and tone control knobs ⑲ ⑳ .
2. Remove the back cover.
3. Remove the chassis retaining screw Ⓐ of the amplifier and pull out the amplifier unit.
4. There are two fuses; the right one (2A) is for the exciter lamp and the other (3A) is for the amplifier.

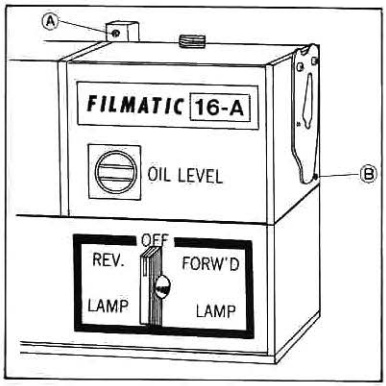
LUBRICATION

Oiling for intermittent feeding mechanism

The intermittent feeding mechanism is lubricated by the oil circulation system. The oil level should be kept between the two lines on the oil level gauge ⑮ . If the oil is insufficient after frequent use, add exclusive Elmo Special Oil through the oil inlet ⑪ while observing the oil level gauge, until the oil level is close to the upper limit on the oil level gauge.

Changing oil

It is recommended to change the oil after a few years of use, though it depends on the frequency of using the projector.



To change the oil:

1. Remove the oil inlet screw and the screws Ⓐ and Ⓑ of the oil tank housing shown in the picture, and the oil tank housing can be detached.
2. Place a suitable receptacle beneath the oil outlet on the lower, right side of the oil tank.
3. Remove the oil outlet screw and drain the oil.
4. Operate the projector and drain all the oil in the oil feed pipe. Never operate the projector over one minute after the oil has been fully drained.
5. Tighten the oil outlet screw.
6. Pour Elmo Special Oil into the oil inlet while observing the oil level gauge.

Oiling for bearings

All the bearings are ball bearings or special oilless types. Although frequent oiling of the bearings is not necessary, it is recommended to apply one or two drops of oil to the rotating parts other than the ball bearings packed with grease, after about a year of use. Be sure to disconnect the power cord before removing the back cover. Never put the oil on the rubber rollers and belts.

TROUBLE SHOOTING

1. Film will not thread

- ○ when the film end is bent as shown in Fig. 1.
- ○ when perforations are damaged as shown in Fig. 2.
- ○ when the film end is jagged as shown in Fig. 3.
- ○ when the film end is twisted or curved as shown in Fig. 4.
- ○ when the film end is extremely curled as shown in Fig. 5.
- ○ when the film end is reversely curled as shown in Fig. 6.

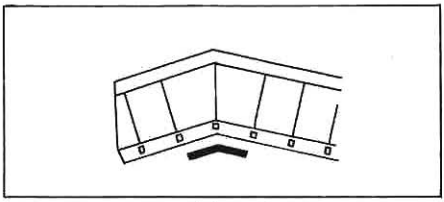


Fig. 1

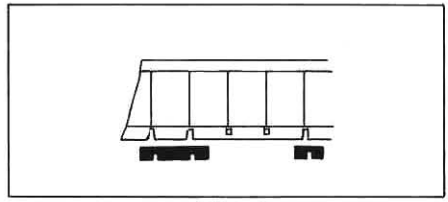


Fig. 2

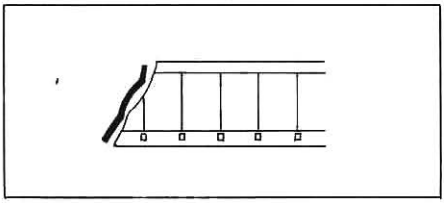


Fig. 3

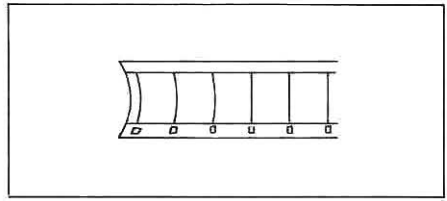


Fig. 4

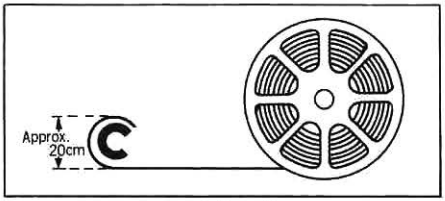


Fig. 5

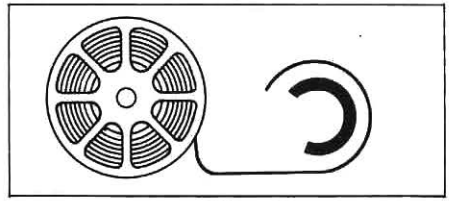
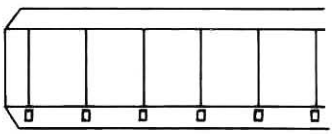


Fig. 6

Properly trimmed film end



Trim the film end with the film trimmer ⑫ . Straighten the film leader if it is extremely curled or replace the film leader if it is reversely curled.

2. **Motor will not run**

- when the power cord is not properly plugged in.
- when the power fuse is broken.

3. **Self-threading will not be done**

- when the threading lever is not depressed.
- when the motor/lamp switch is not positioned at "OFF".
- when the sprocket shoes are open.
- when the film gate is open.
- when the film end is not properly trimmed.

4. **Projection lamp will not light**

- when the lamp is broken.

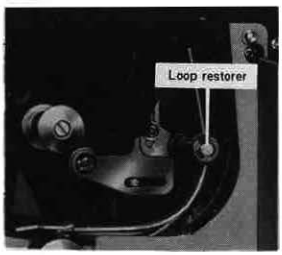
5. **Sound will not be reproduced**

- when the M-O switch is not properly positioned.
- when the exciter lamp or its fuse is broken (in case of optical reproduction).
- when the amplifier is not switched on.
- when the volume is turned down to the lowest limit.
- when the amplifier fuse is broken.
- when the speaker cord is not properly connected.
- when sound is not recorded on the film.

6. **Sound will be out of tune**

- when the speed change lever is positioned at "SILENT".

7. **Automatic loop restorer will work irregularly**

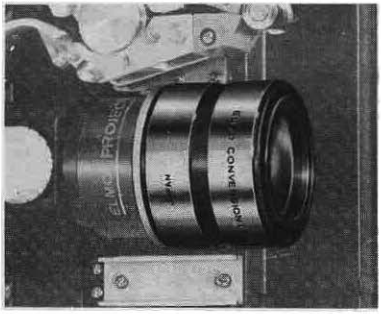


- when the proper film length between the two sprockets is lost because the perforations of a few frames are damaged. In this case, stop the projector, open either sprocket shoe, and reset the film loop.

ACCESSORIES

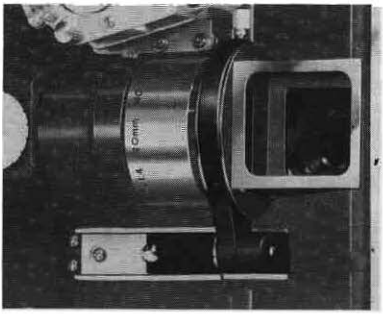
Elmo Scope Lens

This lens is used for projecting Cinemascope movies. It can be put in front of the projection lens simply by mounting it on the accessory shoe of the projector. The projected image is horizontally magnified twice.



Conversion Lens

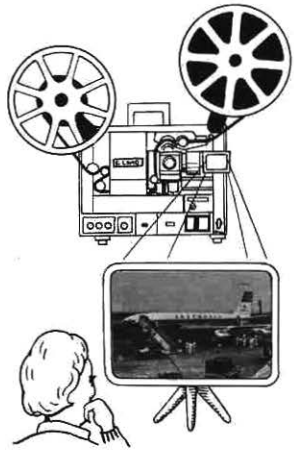
This attachment lens converts the focal length of the projection lens to either x0.8 or x1.25, i.e., the standard 50mm lens plus this accessory serves as a 40mm wide-angle lens or by reversing it a 63mm telephoto lens. You can make use of it when the projected image is too small or large.

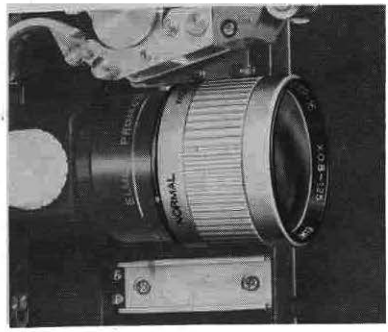


Daylight Rear Projection Device

This accessory prism, which can be put on the accessory shoe of the projector, provides a clear projection image in a bright place when used with a special translucent screen.

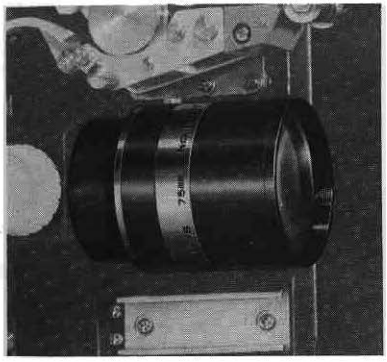
Translucent screen
60cm x 80cm
(23.6" x 31.5")
39cm x 52cm
(15.4" x 20.5")





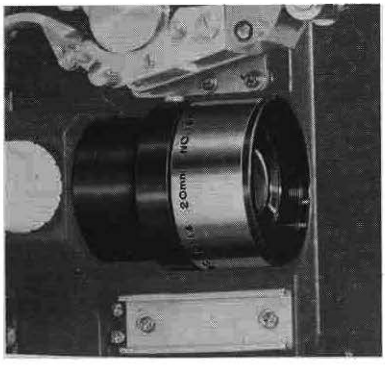
Zoom Converter

When this converter is used with the projection lens, the focal length is converted continuously from x0.8 to x1.25, i.e., the standard 50mm lens plus this accessory serves as a 40mm - 63mm zoom lens. Using it, you can vary the size of the projected image without changing the projector-to-screen distance.



Telephoto Projection lens (F/1.8, 75mm)

This telephoto lens is for projection in a large auditorium.



Wide-angle Projection Lens (F/1.4, 20mm)

This wide-angle lens is for projection in a small room.

PROJECTION DISTANCE AND IMAGE SIZE

The projection distance refers to the distance between the film plane and the screen.

In meter.

		3	5	7	10	15	20	25	30	40	50	60
Standard lens (F/1.3, 50 mm)	Length	0.4	0.7	1.0	1.4	2.1	2.9	3.6	4.3	5.8		
	Width	0.6	0.9	1.3	1.9	2.9	3.8	4.8	5.8	7.7		
Standard lens with Conversion lens (x 0.8)	Length	0.5	0.9	1.2	1.8	2.7	3.6	4.5	5.4			
	Width	0.7	1.2	1.7	2.4	3.6	4.8	6.0	7.2			
Standard lens with Conversion lens (x 1.25)	Length	0.3	0.6	0.8	1.1	1.7	2.3	2.9	3.4	4.6	5.6	
	Width	0.4	0.8	1.1	1.5	2.3	3.1	3.8	4.6	6.2	7.5	
Standard lens with Elmo scope lens	Length	0.4	0.7	9.9	1.4	2.1	2.9	3.6	4.3	5.8		
	Width	1.1	1.9	2.7	3.8	5.8	7.7	9.6	11.5	15.4		
Telephoto lens (F/1.8, 75 mm)	Length	0.3	0.5	0.7	0.9	1.4	1.9	2.4	2.9	3.8	4.8	5.8
	Width	0.4	0.6	0.9	1.3	1.9	2.6	3.2	3.8	5.1	6.4	7.7
Wide-angle lens (F/1.4, 20 mm)	Length	1.1	1.8	2.5	3.6	5.4						
	Width	1.5	2.4	3.4	4.8	7.2						

In feet.

		10	15	20	30	50	70	90	110	130	160	190
Standard lens (F/1.3, 50 mm)	Length	1.4	2.1	2.9	4.3	7.2	10.1	13.0	15.8	18.7		
	Width	1.9	2.9	3.8	5.8	9.6	13.5	17.4	21.2	25.1		
Standard lens with Conversional lens (x 0.8)	Length	1.8	2.7	3.6	5.4	9.0	12.6	16.2	19.8			
	Width	2.4	3.6	4.8	7.2	12.0	16.9	21.7	26.5			
Standard lens with Conversion lens (x 1.25)	Length	1.1	1.7	2.3	3.4	5.8	8.1	10.4	12.7	15.0	18.4	
	Width	1.5	2.3	3.1	4.6	7.7	10.8	13.9	17.0	20.1	24.7	
Standard lens with Elmo scope lens	Length	1.4	2.1	2.9	4.3	7.2	10.0	13.0	15.8	18.7		
	Width	3.8	5.8	7.7	11.5	19.3	27.0	34.7	42.4	50.1		
Telephoto lens (F/1.8, 75 mm)	Length	0.9	1.4	1.9	2.9	4.8	6.7	8.6	10.6	12.5	15.4	18.3
	Width	1.3	1.9	2.6	3.8	6.4	9.0	11.6	14.1	16.7	20.6	24.4
Wide-angle lens (F/1.4, 20 mm)	Length	3.6	5.4	7.2	10.8	18.0						
	Width	4.8	7.2	19.3	14.5	24.1						