MASSACHUSETTS INSTITUTE OF TECHNOLOGY
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Movie Memo

Michael Beeler

This is intended as a brief explanation of how to use the Kodak movie camera in sync with a display. Please use care in use of the camera, as it is fairly expensive and more or less irreplaceable. Of the three people who have tried to load it with film so far, all have had trouble with the film jamming in the camera. Although this probably does not damage the camera, it is annoying and time consuming, and it demonstrates that care should be used in operating the camera.

MOVIE MEMO

M BEELER APRIL 1970

THIS IS INTENDED AS A BRIEF EXPLANATION OF HOW TO USE THE KODAK MOVIE CAMERA IN SYNC WITH A DISPLAY. PLEASE USE CARE IN USE OF THE CAMERA, AS IT IS FAIRLY EXPENSIVE AND MORE OR LESS IRREPLACABLE. OF THE THREE PEOPLE WHO HAVE TRIED TO LOAD IT WITH FILM SO FAR, ALL HAVE HAD TROUBLE WITH THE FILM JAMMING IN THE CAMERA. ALTHOUGH THIS PROBABLY DOES NOT DAMAGE THE CAMERA, IT IS ANNOYING AND TIME CONSUMING, AND IT DEMONSTRATES THAT CARE SHOULD BE USED IN OPERATING THE CAMERA.

THERE EXIST COPIES OF THE KODAK INSTRUCTION BOOK FOR THE CAMERA; EDITIONS OFTHE BOOK ITSELF ARE VERY SCARCE. I SUGGEST THESE POINTS TO ESPECIALLY CHECK AS YOU LOAD FILM:

(1) BEFORE TURNING OUT THE LIGHTS OR OPENING THE FILM CAN, ROTATE THE CAMERA'S DRIVE SHAFT (I.E., THAT ON THE MOTOR) SO THE SHUTTER IS CLOSED = THE VIEWFINDER SEES THE SCENE = THE RUBY PULL-DOWN IN THE FILM GATE IS RETRACTED. OTHERWISE, THE FILM CANNOT BE INSERTED IN THE GATE BECAUSE THE PULL-DOWN IS IN THE WAY.

(2) SUPPLY REEL GOES ON FIRST, AND BESIDES PRESSING THE RELEASE IN THE CENTER OF THE SHAFT, YOU MUST ROTATE THE SUPPLY REEL BACK AND FORTH SO ITS SQUARE HOLE GOES OVER THE SQUARE, INNERMOST SECTION OF THE SHAFT.

(3) THE FILM MUST COME OFF THE TOP OF THE SUPPLY REEL AND GO RIGHT; AS FILM IS USED, THE SUPPLY REEL WILL BE PULLED CLOCKWISE.

(4) BE SURE THE FILM PASSES OVER BOTH IDLER ROLLERS BEFORE GOING TO THE MAIN DRIVE CAPSTAN AND ITS ROLLERS.

(5) BE SURE THE EXPOSED FILM GOES UNDER (REPEAT: UNDER) THE CENTER IDLER ROLLER TO THE RIGHT OF THE DRIVE CAPSTAN. IT SHOULD GO BETWEEN THIS ROLLER AND THE SHEET METAL DIVIDER JUST BELOW THE ROLLER.

(6) MAKE SURE A FOOT AND A HALF OR SO OF FILM IS WOUND ON THE TAKE-UP REEL (AND THE STARTING END ANCHORED WITH A SMALL STRIP OF MASKING TAPE OR BY INSERTING IT IN THE REEL HUB'S SLOT).

(7) BE SURE THE TAKE-UP REEL IS PUT ON THE SHAFT WITHOUT (REPEAT: WITHOUT) PUSHING THE RELEASE IN THE CENTER OF THE SHAFT. AS THE INSTRUCTION BOOK SAYS, PUSHING ALLOWS THE REEL TO GO IN TOO FAR.

(8) MAKE SURE THE TAKE-UP REEL HAS THE FILM COMING FROM THE LEFT AND GOING OVER THE TOP OF THE REEL; AS THE FILM IS USED, THE TAKE-UP REEL IS DRIVEN CLOCKWISE.

CURRENTLY, A HELI-COIL THREAD ADAPTER IS BEING USED TO ADAPT THE 3/8-20 THREAD IN THE CAMERA BASE TO THE 1/4-20 THREAD IN THE TRIPOD. THIS MAY BE REMEDIED IN A BETTER WAY IN THE FITURE, BUT FOR NOW USE CARE IN SECURING THE CAMERA TO THE TRIPD. ALSO, A SPECIAL 1/4-20 BOLT IS BEING USED: IT IS 3/2 INCHES LONG SO AS TO PASS THROUGH THE ALUMINUM STEPPING-MOTOR MOUNTING PLATE, AND IT IS THREADED A GREATER THAN NORMAL LENGTH SO AS TO SCREW INTO THE TRIPOD FAR ENOUGH.

THE STEPPING MOTOR IS DRIVEN FROM DEVICE 760, WHICH IS ALSO THE AMF HAND LIGHTS AND THE 110 VOLT CONTACTOR OUTLET BOX UNDER THE FALSE FLOOR. TO USE THE STEPPING MOTOR, UNPLUG (IF CONNECTED) THE RG WIRE STRIPPER MOTOR CABLE FROM THE OCTAL FEMALE PLUG DANGLING OUT OF THE I/O BOX AT THE RIGHT END AND ABOUT HALF WAY UP. THE "MARGIN" SWITCH AT THE LEFT OF THAT SAME BAY WHICH IS MARKED, "RG WIRE DIKE" MUST BE UP (ON). INTO THE OCTAL PLUG INSERT A MINIBOX WITH VENTILATING HOLES LABELED, "MOVIE MOTOR SHUNT BOX." INTO THE 6-PRONG FEMALE SOCKET ON THIS BOX, PLUG THE EXTENSION CABLE. THE MOTOR'S PLUG PLUGS INTO THE END OF THE EXTENSION CABLE. IN THE FUTURE, AN ON/OFF SWITCH MAY BE INSTALLED EITHER ON THE MOTOR SUPPORT OR IN ANOTHER MINIBOX TO BE INSERTED BETWEEN THE EXTENSION CABLE AND MOTOR PLUG.

ONE COMPLETD REVOLUTION OF THE MOTOR'S SHAFT CLOSES THE SHUTTER, ADVANCES THE FILM ONE FRAME, AND OPENS THE SHUTTER. WHEN THE WHITE MARKS ON THE MOTOR KNOB POINT TO THE RED-DOTTED RIVET IN THE MOTOR BACK, THE SHUTTER IS IN THE CENTER OF ITS OPEN OR CLOSED RANGE. NOTE: THE VIEWFINDER "SEES" WHENEVER THE SHUTTER IS CLOSED; I.E., LIGHT GOES EITHER TO VEWFINDER OR TO FILM.

NOTE: PLEASE PUT THINGS AWAY WHEN YOU FINISH!!!

THE FOLLOWING EXAMPLES ARE INTENDED TO DEMONSTRATE HOW A PROGRAM MIGHT USE THE CAMERA. THE FIRST IS AN ENGLISH SUBROUTINE WHICH COULD BE INCLUDED IN A PROGRAM ENGLISH AND ASSEMBLED: THE SECOND IS A (COMMENTED) PATCHING OF TECO.

```
;CCW = FWD = 0, 100, 300, 200, 0, ...
;WHEN LOADED, THINKS SHUTTER IS CLOSED
;CLOBBERS NO ACCUMULATORS

CLOSE:  SKIPN SHUTTR
        POPJ P,
        CLEARM SHUTTR
        JRST OPEN1

FRAME:  PUSHJ P,CLOSE
        SKIPE STOP
        JRST .-1            ;HANG UNTIL STOP NOT = 0
OPEN:   SKIPE SHUTTR
        POPJ P,
        SETOM SHUTTR
OPEN1:  PUSH P,A
        PUSH P,B
        MOVEI A,62          ;25. COMPLETE CYCLES = 1/2 REVOLUTION
OPEN2:  MOVEI B,100
        XORB B,MOTOR
        DATAO 760,B
        MOVEI B,440         ;440 FOR PDP-6 NO TS, 700 FOR PDP-10 IN TS
        SOJG B,.
        MOVEI B,200
        XORB B,MOTOR
        DATAO 760,B
        MOVEI B,440         ;440 FOR PDP-6 NO TS, 700 FOR PDP-10 IN TS
        SOJG B,.
        SOJG A,OPEN2
        AOS NHREVS
        POP P,B
        POP P,A
        POPJ P,

SHUTTR: 0       ;0 = SHUTTER CLOSED, -1 = OPEN
MOTOR:  0       ;LAST DATAO TO MOTOR
NHREVS: 0       ;NUMBER OF HALF REVOLUTIONS SINCE START
STOP:   0       ;NON-ZERO = PAUSE WITH SHUTTER CLOSED
```

```
J$J!
*$L SYS:TS TECO
*

75/     0       MOVSI A,400000  ;STARTING ADDRESS NOW 75
76/     0       .IOTLS A,       ;BEWARE THE POWER THIS GIVES YOU
77/     0       MOVEI A,

PAT/    0       PUSH P,A        ;TECO USES P FOR PUSH-DOWN
PDL+1/  0       PUSH P,B
PDL+2/  0       PUSH P,C
PDL+3/  0       MOVE A,PAT 37   ;NUMBER OF FRAMES TO EXPOSE
PDL+4/  0       PUSHJ P,PAT 20  ;OPEN SHUTTER
PDL+5/  0       MOVE B,PAT 36   ;NUMBER OF DISPLAY CYCLES PER FRAME
PDL+6/  0       .NDIS B,
PDL+7/  0       CONSZ 130,77
PDL+10/ 0       JRST .-1        ;WAIT FOR 340 TO BECOME IDLE
PDL+11/ 0       PUSHJ P,PAT 20  ;CLOSE SHUTTER
PDL+12/ 0       SOJG A,PAT 4
PDL+13/ 0       .NDIS C,        ;RESTARTS DISPLAY SINCE C < 0
PDL+14/ 0       POP P,C
PDL+15/ 0       POP P,B
PDL+16/ 0       POP P,A
PDL+17/ 0       .VALUE

PDL+20/ 0       MOVEI B,62
PDL+21/ 0       MOVEI C,100
PDL+22/ 0       XORB C,PAT 35
PDL+23/ 0       DATAO 760,C
PDL+24/ 0       MOVEI C,700     ;OR 440 FOR PDP-6
PDL+25/ 0       SOJGE C,.
PDL+26/ 0       MOVEI C,200
PDL+27/ 0       XORB C,PAT 35
PAT+30/ 0       DATAO 760,C
PAT+31/ 0       MOVEI C,700     ;OR 440 FOR PDP-6
PAT+32/ 0       SOJGE C,.
PAT+33/ 0       SOJG B,PAT 21
PAT+34/ 0       POPJ P,

PAT+35/ 0       ;DATAO TO MOTOR
PAT+36/ 0       ;NUMBER OF DISPLAY CYCLES PER FRAME
PAT+37/ 0       ;NUMBER OF FRAMES TO EXPOSE

$Y YOU:MOVIE TECO
*75$G
TECO.175
IABCDEF
$$
2↑D$$
↑Z
TYIW)   .IOT P,CH
PAT 36/ 0       3
PAT+37/ 0       100.
PAT$G

PAT+17>>.VALUE 0        $P TYIW $G
IFOO THIS SEEMS TO WORK.$$

AND SO ON.
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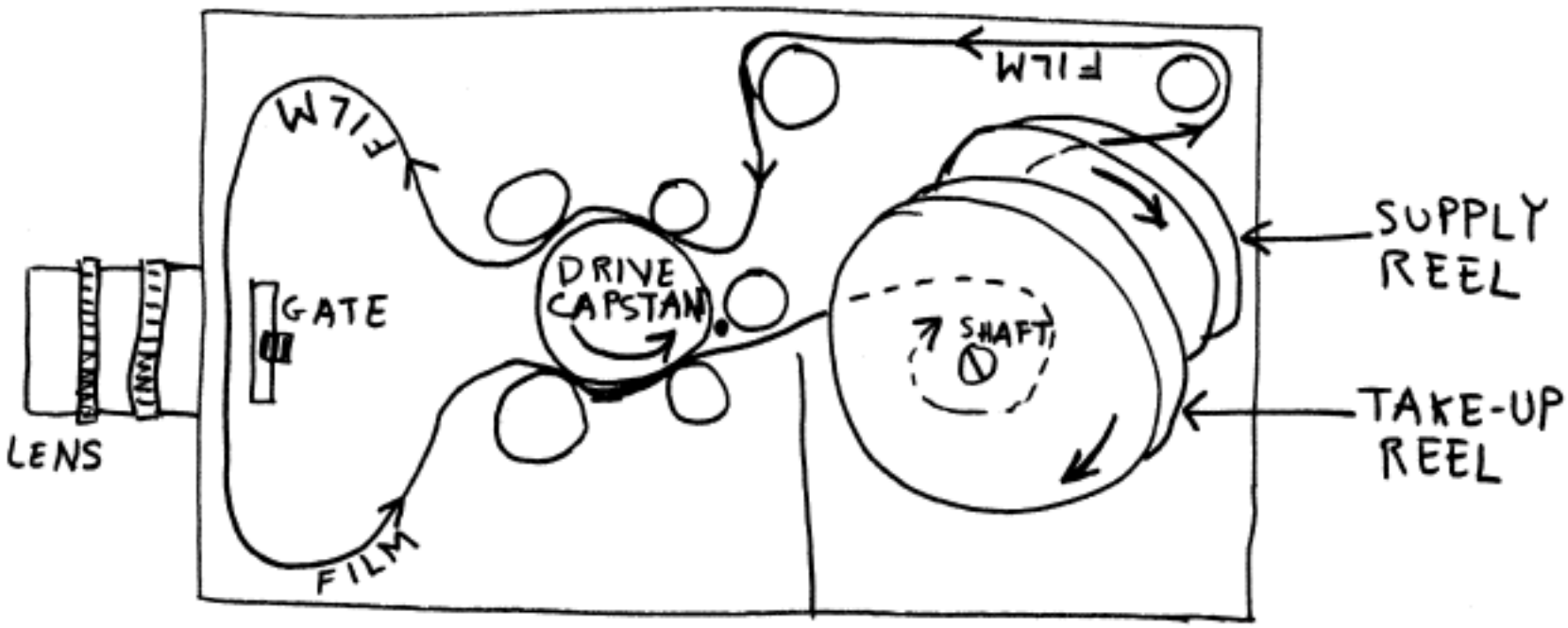
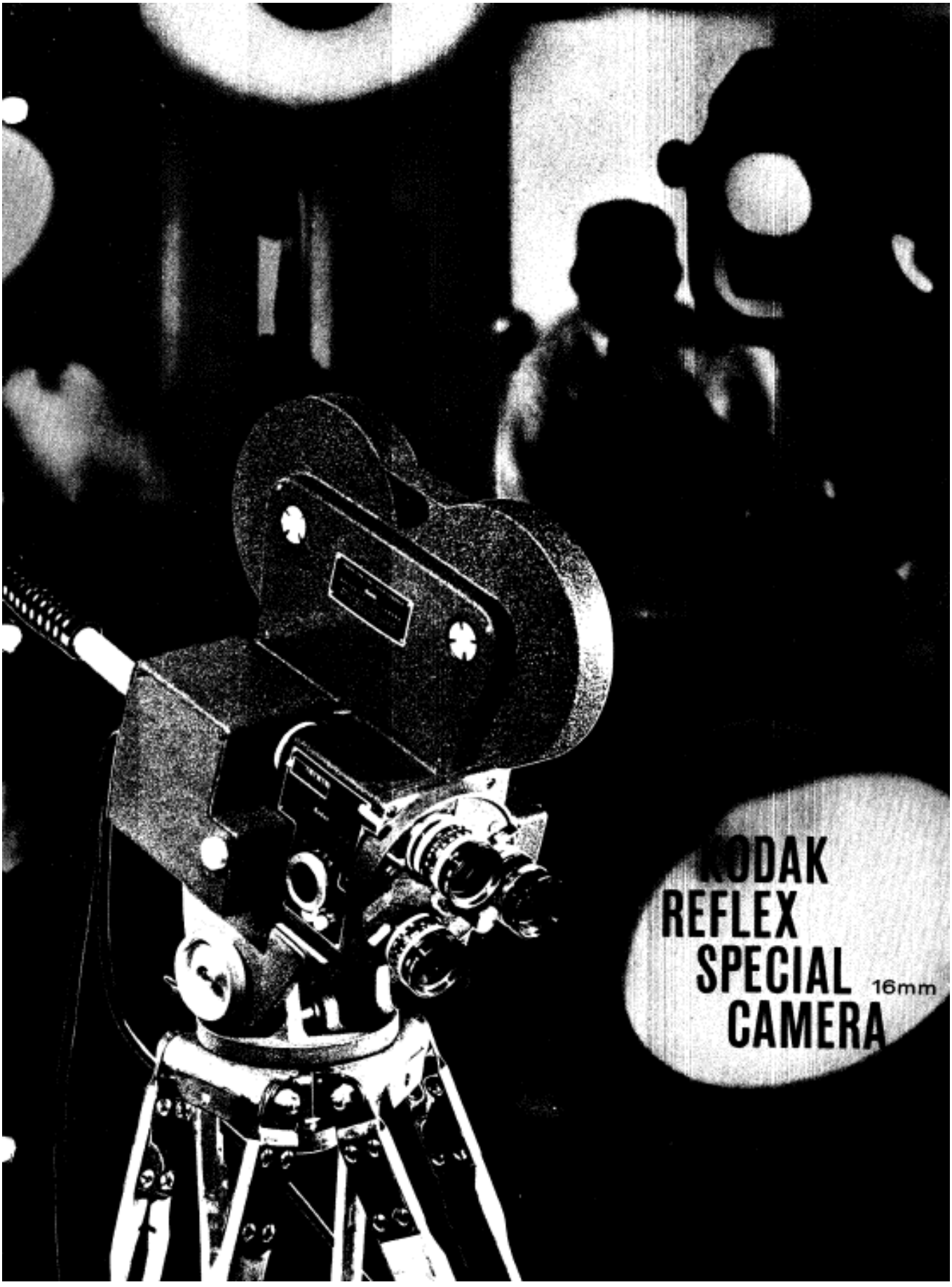


LOADING THE KODAK REFLEX SPECIAL CAMERA


KODAK
REFLEX
SPECIAL 16mm
CAMERA

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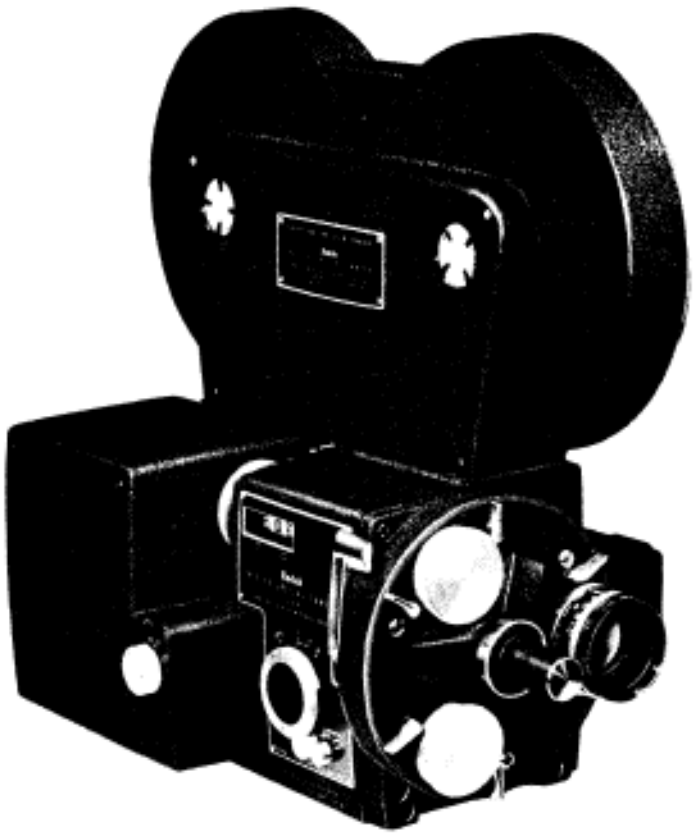


Introduction

KODAK REFLEX SPECIAL CAMERA (16mm)

The Kodak Reflex Special Camera (16mm) with its accessories, provides a complete picturetaking system for both silent and sound motion pictures. The camera is designed for performance of the highest possible quality, and in addition, features ruggedness and extreme versatility. The camera uses films perforated two edges or perforated one edge, Winding B.

The basic camera consists of a 3-lens turret, a film-transport mechanism, a 100-foot film chamber, a buckle-trip mechanism, a finder system, a 400-foot film chamber, and a synchronous motor drive.

The 400-foot chamber and 1200-foot chamber (accessory) are easily interchanged after removal of the camera's carrying handle. The 400-foot film chamber, besides handling 16mm film wound on plastic cores, can also handle 100-foot or 200-foot daylight-loading spools.

The standard camera is supplied with a 115-volt, 60-cycle, ac only, reversible synchronous motor drive. Other motor drives having speeds ranging from 8 to 64 frames per second — or having time-lapse, time-study, and animation controls — are also available.

A Kodak Cine Ekton Lens, 25mm f/1.4, is furnished with the basic camera. The complete series of Kodak Cine Ekton Lenses, from 10mm to 150mm, includes a 17.5mm-to-70mm zoom lens. All lenses are supplied in the Kodak Reflex (Type R) Mount, which allows them to be mounted both quickly and firmly.

The camera can be adapted for single-system magnetic sound by means of additional equipment. The sound system can be used with both the 400-foot and 1200-foot chambers. A blimp, lined with lead and felt, is available for studio-type sound.

The Kodak Reflex Special Camera features a through-the-lens reflex viewing system. This system consists of a rotating mirror (set at 45° to the optical axis behind the lens), a ground glass, a fixed mirror, an erector lens, and an eyepiece. The rotating mirror allows the light from the lens to alternately expose the film and strike the ground glass, forming an image of the subject on both film and glass. With the camera door closed, the ground-glass image is relayed, by means of a fixed mirror set at 45° to the optical axis, through the erector lens to the eyepiece. The erector lens can be positioned for both critical focus and normal viewing.

The Kodak Reflex Special Camera also features a variable shutter system, which consists of a movable shutter blade located behind the rotating mirror. The shutter openings can be varied from OPEN, through 1/2 and 1/4, to 0 — thus controlling the amount of light reaching the film. The shutter can be locked at any of the marked openings.

A finder bracket and matte-box bracket are supplied with the camera.

Description

CAMERA

Variable Shutter Knob

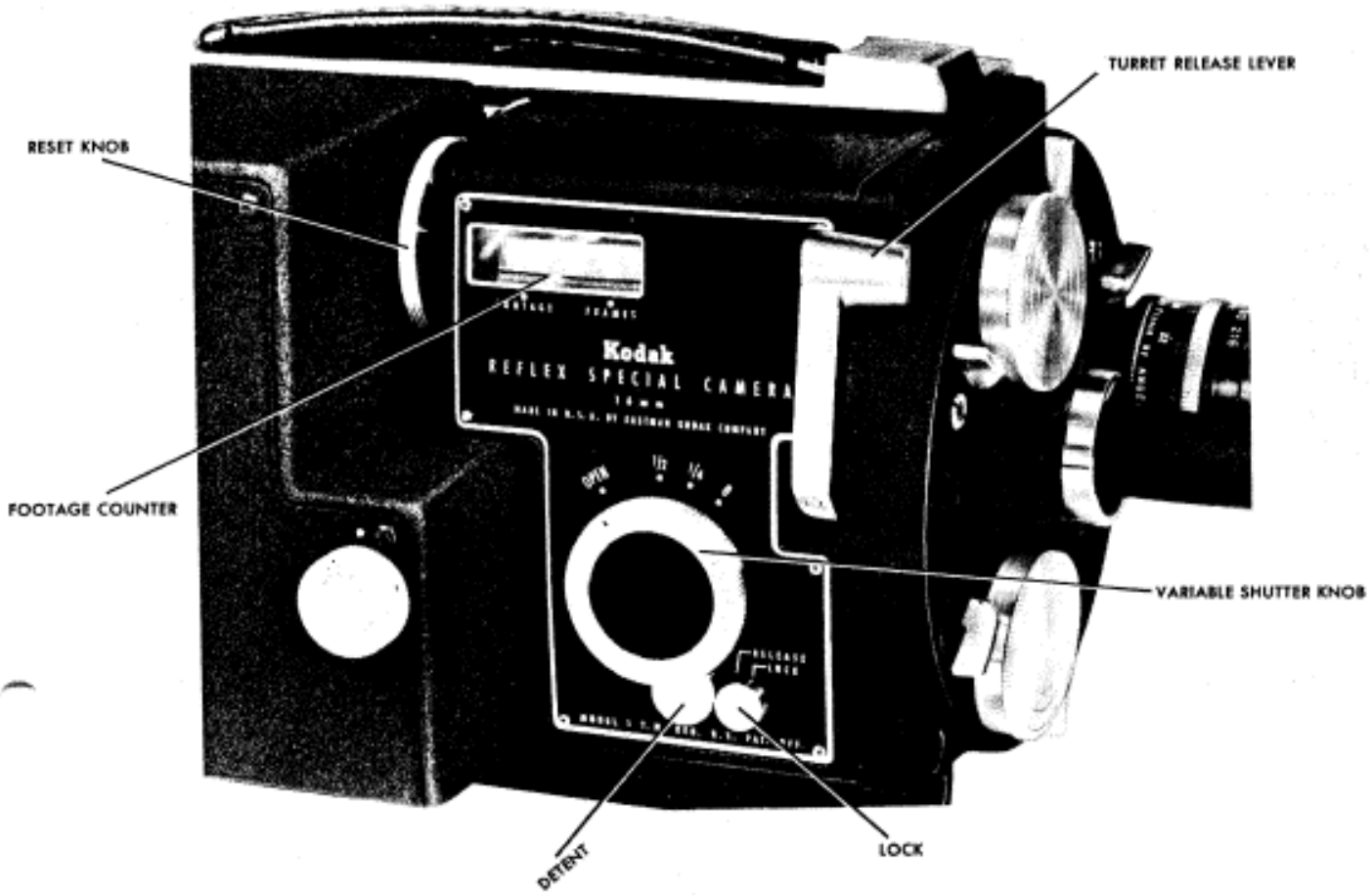
Depressing the variable shutter DETENT and moving the shutter LOCK to RELEASE permits varying the shutter opening from wide-open to closed — OPEN, 1/2, 1/4, and 0. The shutter can be locked at any of the marked openings. The maximum shutter opening is 170°.

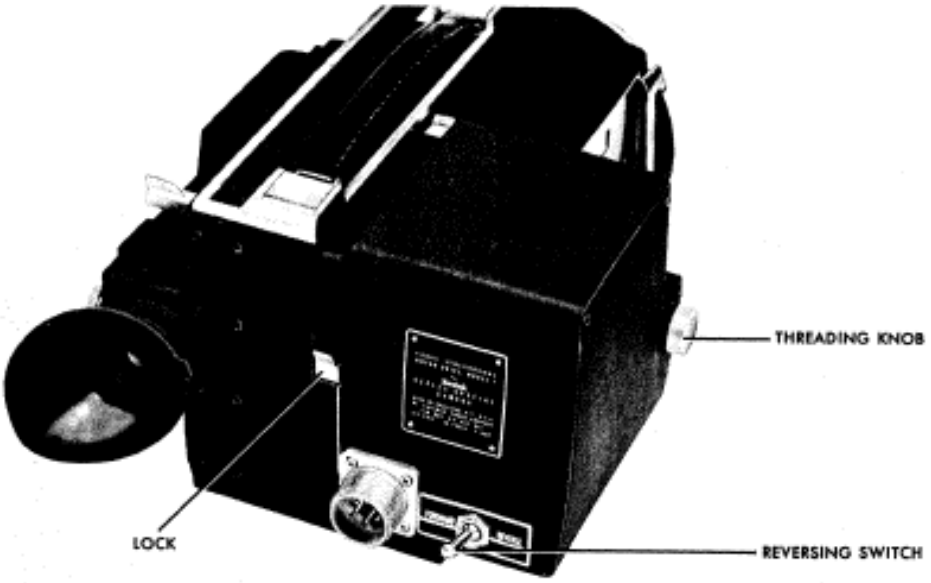
Turret Release Lever

Permits positioning the desired lens for picture-taking. Swinging the TURRET RELEASE LEVER downward and pulling forward on the turret as far as it will go allows the turret to be rotated to the desired lens position. Pushing the turret inward and swinging the turret release lever upward locks the turret in position.

Footage Counter

Indicates amount of film run, in feet and frames. RESET KNOB is for turning counter to 0.





Synchronous Motor

Operates camera at 24 frames per second. For use on 115-volt, 60-cycle, ac only. Motor is held to camera by means of two quick LOCKS. THREADING KNOB is on motor. REVERSING SWITCH must be held toward right to reverse motor and flow of film. Electrical connector is next to reversing switch. Power cord switch has power-to-camera indicator light. Motor is interlocked to prevent its operation when detached from camera.

Reflex Finder

The reflex finder is a telescopic-type finder. Rotating the REAR EYEPIECE provides correction for differences in individual eye characteristics. There is a LOCKING SCREW that permits securing the eyepiece at the proper setting. Once the eyepiece is set, it need not be refocused. The reflex finder lets you see exactly what will be recorded on the film because you look right through the taking lens. The viewed scene is exactly the scene that you will see projected on the screen.

Magnification Change Lever

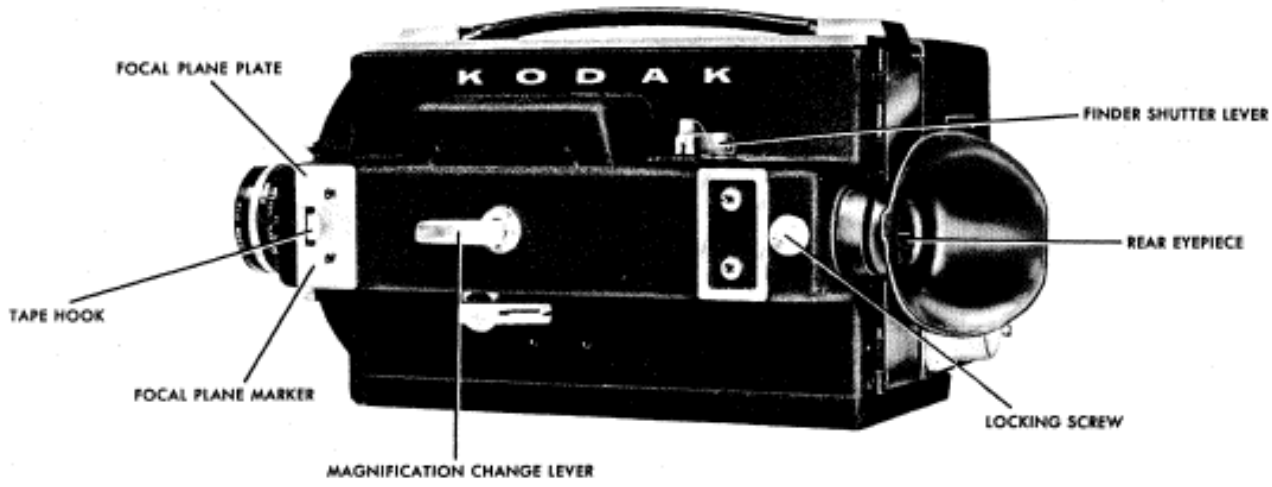
This lever permits changing the magnification of the finder system from 10-to-1 to 20-to-1 for fine focusing.

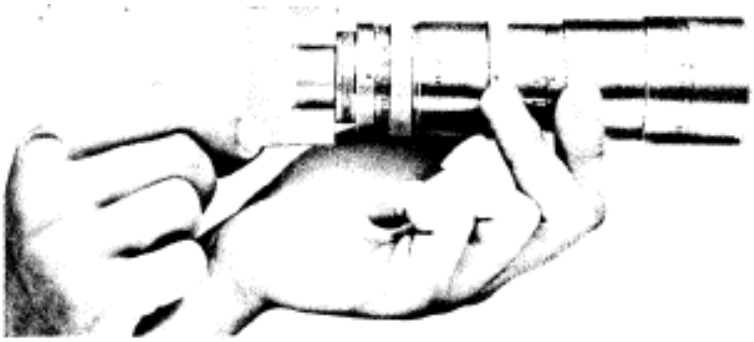
Finder Shutter Lever

Unless the eyepiece is shielded or covered when you are taking pictures, light may enter the eyepiece and fog the film. When you are taking pictures while looking through the finder, the eyepiece is sufficiently shielded to prevent fogging of the film. However, if pictures are being taken when the camera is unattended, or if accessory finders are being used, the finder shutter should be closed. The finder shutter is closed when the FINDER SHUTTER LEVER is turned as far counterclockwise as it will go.

Focal Plane Plate

This plate contains the TAPE HOOK, to which you attach the end of a measuring tape when determining lens-to-subject distance. The FOCAL PLANE MARKER is on the plate, just below the tape hook.





LENSES

A wide variety of lenses are available for use with the Kodak Reflex Special Camera.

The following Kodak Cine Ekton Lenses are available: 10mm f/1.8, 15mm f/1.4, 25mm f/0.95, 25mm f/1.4, 50mm f/1.9, 75mm f/2.5, 100mm f/2.7, 150mm f/2.7, and a zoom lens, 17.5mm to 70mm f/2.2. Since they are in Type R mounts, they can be mounted directly on the camera.

By using a Kodak Cine Lens Adapter, Type SR, the following interchangeable Kodak Cine Ektar Lenses in Type S mounts can be used: 25mm f/1.4, 25mm f/1.9, 63mm f/2.0, 102mm f/2.7, and 152mm f/4.0

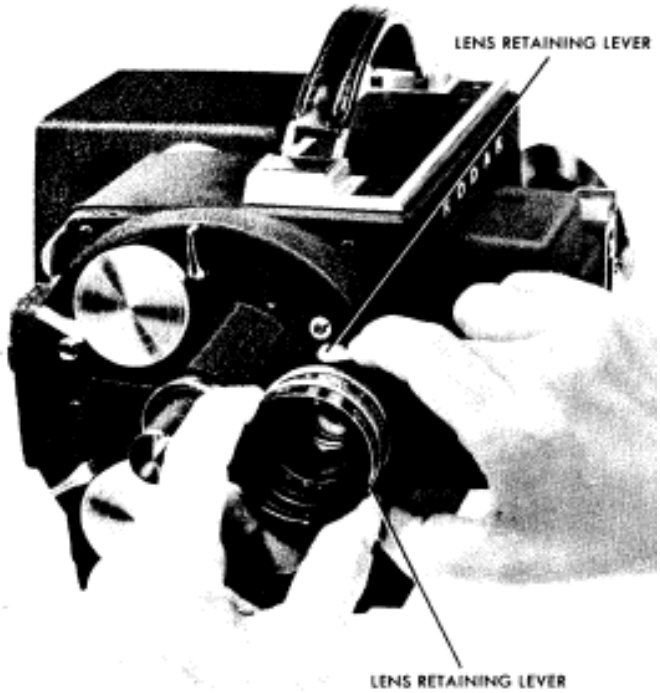
Some lenses in Type S mounts will not fit on the camera. A template is furnished for checking the contour of the rear portion of the lens. To use the template, first set the lens at infinity (∞). Then pass the template over the small end of the lens, making sure that the two surfaces at the open end of the template contact the seating surface of the lens. If there is no interference between the template and the lens, the lens can be used on the camera.

Preparation for Use

Attaching Lens

Squeeze the two LENS RETAINING LEVERS toward each other and insert the lens in the opening on the turret. Rotate the lens until the stud on the lens barrel fits in the slot in the turret. Push in the lens as far as possible and release the retaining levers. The lens is in the picturetaking position when it is nearest the camera door.

NOTE: Because of optical interference, do not use a 10mm wide-angle lens and a 150mm telephoto lens on the turret at the same time. Also, the 150mm telephoto lens should not be in the lower position on the turret when the camera is set on a table.



Attaching Power Cord

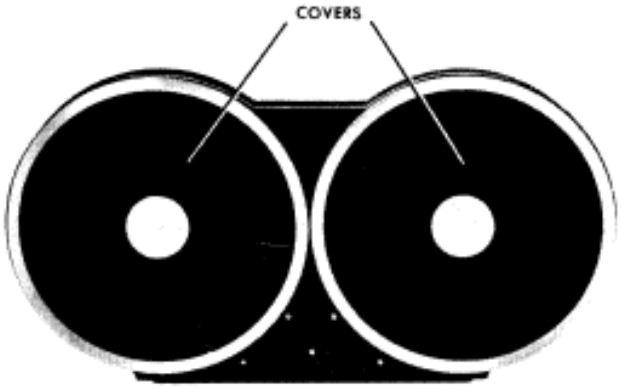
Attach the power cord connector to the plug at the back of the motor.

Kodak 400-Foot Film Chamber

Loading Film Chamber

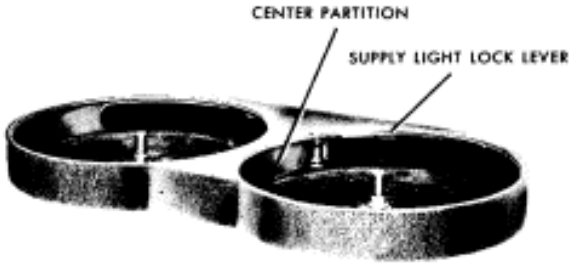
1. Remove both COVERS from the chamber by turning the covers counterclockwise.

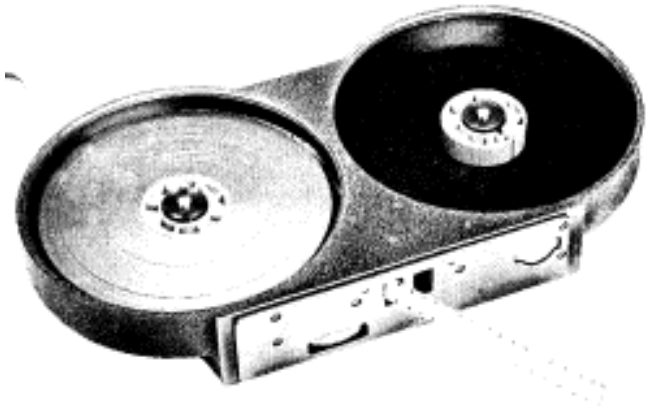
2. In complete darkness, remove a roll of film from its package. (The film chamber may be loaded in daylight if 100- or 200-foot daylight-loading spools are being used.)



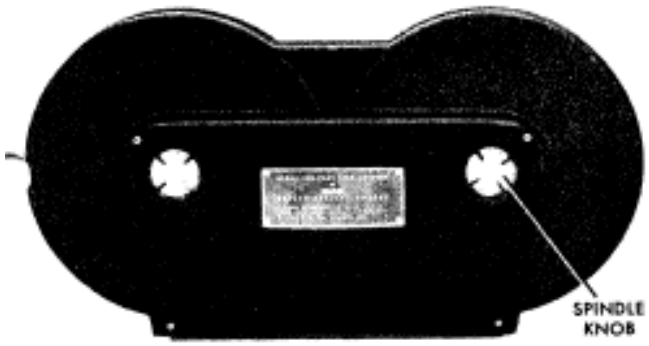
3. With the end of the film coming off the top of the roll, to the right, bend out about 1 inch of the end of the film in order to eliminate the curl introduced by normal storage of film in rolls. The end of the roll should now be approximately flat.

4. Hold the flat end of the film against the CENTER PARTITION of the chamber. Push inward on the SUPPLY LIGHT LOCK LEVER and guide the film along the partition until the end of the film protrudes from the slot in the bottom of the chamber. The chamber has been manufactured to accept film wound on camera spools, but in addition, two adapters for core-wound film have also been provided.





5. Put the roll of film on the spindle, using the core adapters if necessary. Be sure to draw the end of film downward to prevent slack from being caught under the roll.



6. Raise the film chamber. Hold the SPINDLE KNOB on the back of the chamber and rotate the roll of film until the pin on the adapter fits in the slot in the plastic core. Replace the supply compartment cover. The lights may now be turned on.

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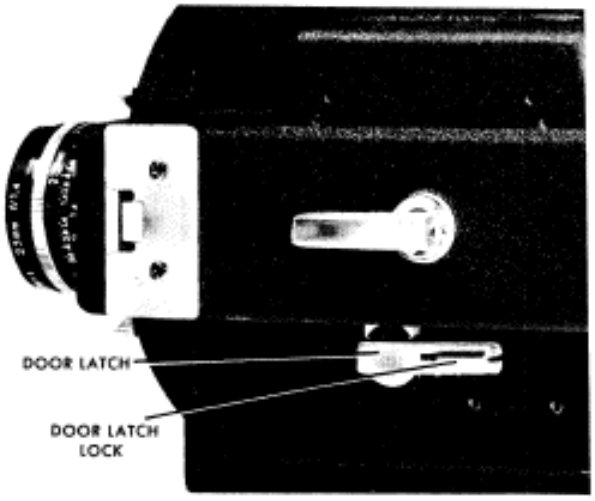
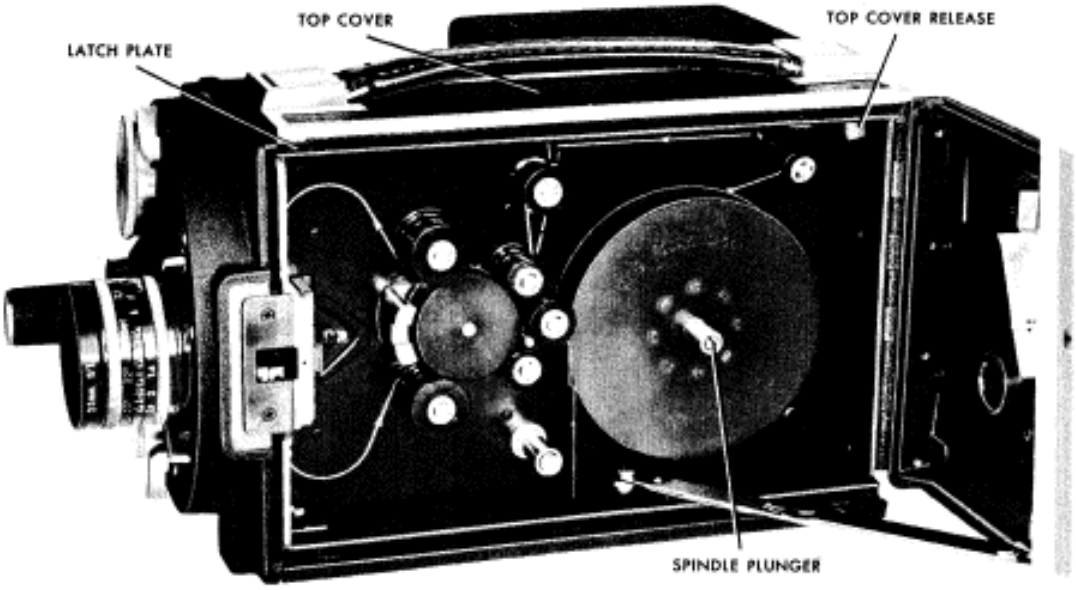
7. Push inward on the take-up light lock lever and insert the end of the film into the slot in the take-up side of the chamber until the end of the film can be put in the slot in the plastic core. Put about 2 loops of film on the core. Replace the take-up compartment cover. Draw out about a 1 1/2-foot loop of film from the supply reel.

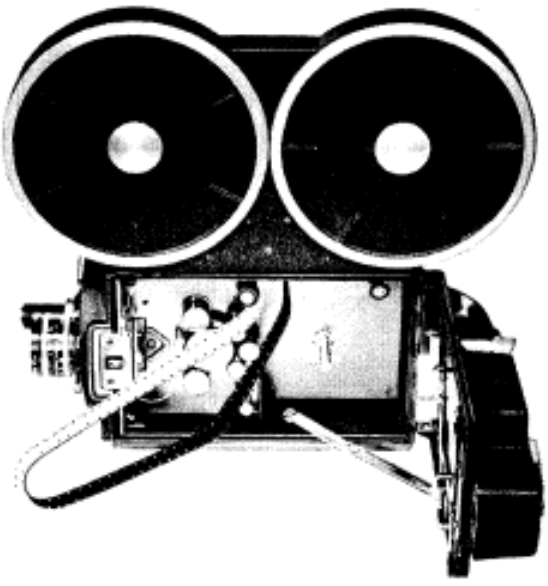
Loading Camera with 400-Foot Film Chamber

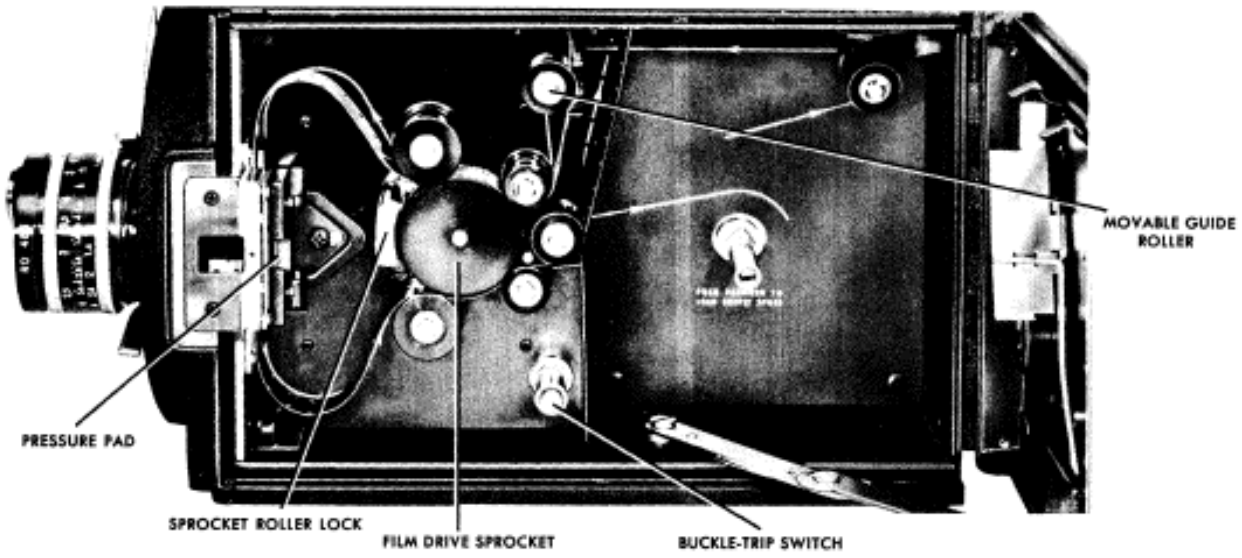
1. Depress the DOOR LATCH LOCK and, at the same time, swing the DOOR LATCH clockwise as far as it will go. Open the door as far as it will go. Depress the SPINDLE PLUNGER and remove the empty spool. Pull the TOP COVER RELEASE forward until it is at its stop. Raise the back of the top cover and pull the cover toward the rear of the camera until the front of the cover is free of the cover retaining LATCH PLATE.





2. Take the film loop that extends from the bottom of the film chamber and put it through the rectangular opening in the top of the camera. Slide the front edge of the chamber under the cover retaining latch plate. Latch the top cover release to secure the chamber on the camera top.





3. Push the SPROCKET ROLLER LOCK down as far as it will go. This raises the top guide rollers away from the FILM DRIVE SPROCKET. The MOVABLE GUIDE ROLLER has two positions — make sure it is toward the front of the camera before threading. Open the PRESSURE PAD. Turn the threading knob to OPEN to retract the pulldown.

4. Following the broken guide line, thread the film between the upper sprocket rollers and the drive sprocket. Be sure the perforations on the film engage the drive sprocket teeth. Push the sprocket roller lock upward as far as it will go. Pass the film between the pressure pad and the aperture plate. The film must be properly positioned in the gate so that the film perforations will be engaged by the pulldown. Close the pressure pad.

5. Thread the film between the lower sprocket rollers and the drive sprocket, then under the center guide roller. Center the sprocket roller lock.

6. Check as follows to see if the film has been properly threaded and follows the film-guide line:

a. Turn the threading knob on the motor, or

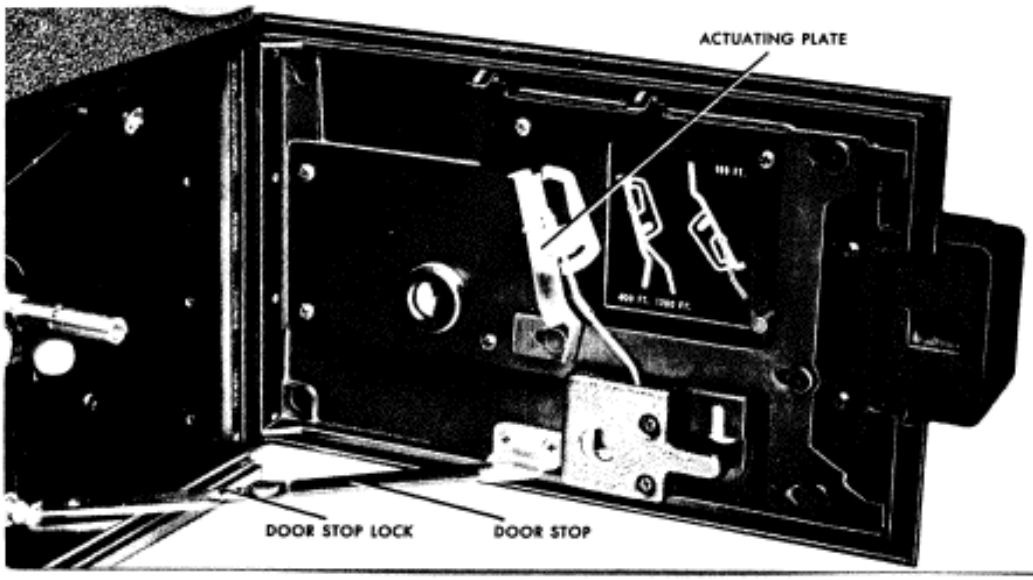
b. Plug the drive motor power cord in a 105- to 125-volt, 60-cycle, a-c electrical outlet. Turn on the starting switch on the power cord. Depress the BUCKLE-TRIP SWITCH for an instant; then release it.

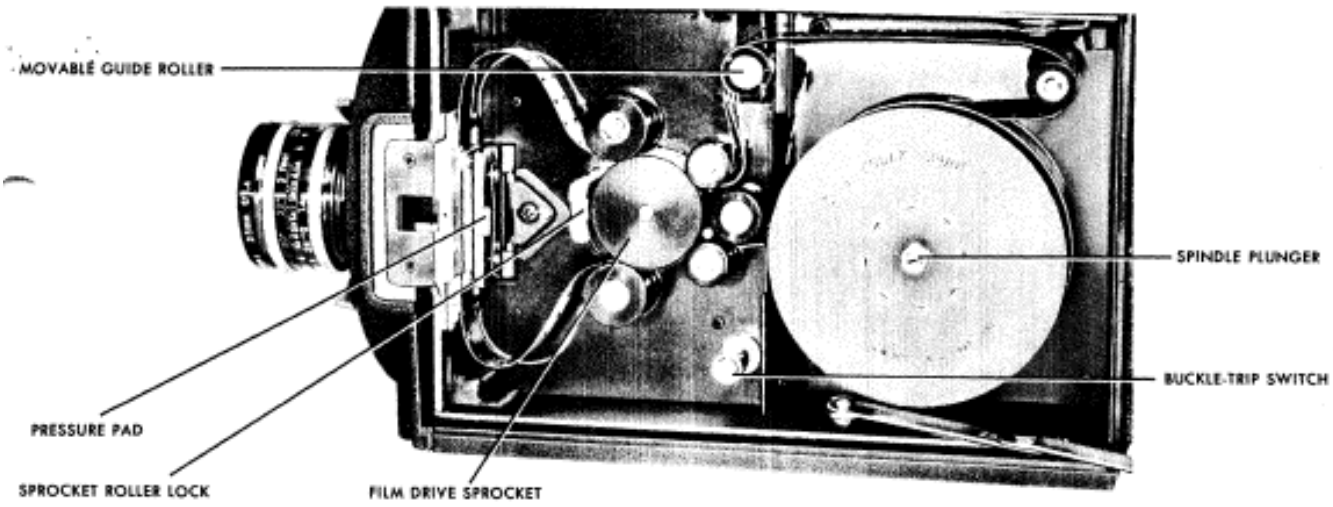
If the film is correctly threaded, the pulldown will draw the film through the film gate. If it is incorrectly threaded, the film will be driven by the sprocket and will pile up without going through the film gate.

7. After the film has been correctly threaded, be sure that the film buckle ACTUATING PLATE is revolved downward (when 400-ft or 1200-ft film chamber is used) as shown in figure 18.

8. Depress the DOOR STOP LOCK and at the same time push in on the DOOR STOP until the door can be closed and latched.

NOTE: Never force the door. If it does not close easily, check to be sure that the gate is closed, that the sprocket roller lock is in the center of its travel, and that the top cover release is pushed as far toward the back of the camera as possible.





Adjusting Finder

Turn the finder shutter lever clockwise until it locks. Set the lens at its largest opening. Look through the finder at the crosshairs on the ground glass. If you cannot see the crosshairs, turn the threading knob until the crosshairs are visible. Then loosen the eyepiece locking screw and adjust the finder to suit your own vision by rotating the rear eyepiece until the crosshairs on the ground glass are in sharp focus. Tighten the locking screw.

Loading Camera

100-Foot Spool

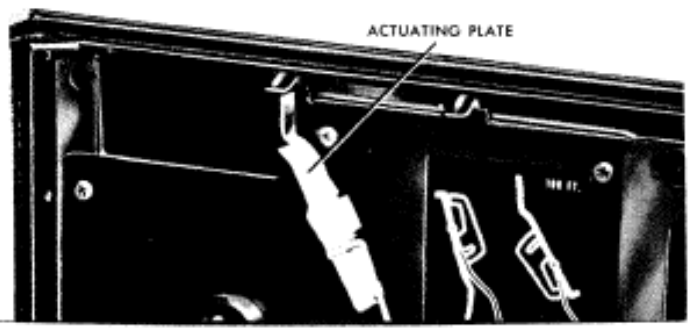
1. Open the camera door (see page 10).
2. Depress the SPINDLE PLUNGER and remove the empty spool. Unroll about 2 feet of film from the new spool and put the spool (square hole first) on the supply spindle. Be especially careful not to let too much film unwind, or the film on the spool will be fogged. Depress the spindle plunger and slide the spool on the spindle until the square hole in the spool fits over the square base on the spindle.

NOTE: The arrowed, solid guide line in the illustration represents the path the film must follow.

3. Push the SPROCKET ROLLER LOCK down as far as it will go. This raises the top guide rollers away from the FILM DRIVE SPROCKET. The MOVABLE GUIDE ROLLER has two positions — make sure it is toward the back of the camera before threading. Open the pressure pad. Rotate the threading knob until the pulldown is retracted.
4. Following the solid guide line, thread the film around the upper guide rollers and then between the upper sprocket rollers and the drive sprocket. Be sure the perforations on the film engage the drive sprocket teeth. Push the sprocket roller lock upward as far as it will go. Pass the film between the pressure pad and the aperture plate. The film must be all the way in the gate so that the film perforations can be engaged by the pulldown. Close the pressure pad.
5. Observe the film in the film gate; turn the thread knob on the motor to see that the pulldown will draw the film through the film gate.
6. Thread the film between the lower sprocket rollers and the drive sprocket, then under the center guide roller. Center the sprocket roller lock.
7. Attach the end of the film to the slot in the empty take-up spool; then wind the film a few turns around the core to take up the slack and to make certain that the film is securely attached. The film must be attached so that the square hole in the spool will go on the spindle first. Push the spool on the spindle until it is held by the ball bearings on the spindle. Do not push the spindle plunger. If the plunger is depressed, the spool can be slid far enough on the spindle so that it will not take up. If the plunger has been depressed, remove and reinsert the spool on the spindle.
8. Check as follows to see if the film has been properly threaded and follows the film-guide lines:
   a. Turn the threading knob on the motor, or
   b. Plug the drive motor power cord in a 105- to 125-volt, 60-cycle, a-c electrical outlet. Turn on the starting switch on the power cord. Depress the BUCKLE-TRIP SWITCH for an instant; then release it.

If the film is correctly threaded, the pulldown will draw the film through the film channel. If it is incorrectly threaded, the film will be driven by the sprocket and will pile up without going through the film channel.

9. After the film has been correctly threaded, be sure that the film buckle ACTUATING PLATE is revolved upward (100-foot), as shown in figure 20.
10. Close the camera door (see page 10).



Operation

1. Plug the drive motor power cord in a 105- to 125-volt, 60-cycle, a-c electrical outlet. Make sure that the light in the switch housing is on. This indicates that there is power available to the motor.

2. Press the starting switch and run about 4 feet of film through the camera. Reset the counter to 0 by turning the reset knob.

3. Check to see that the variable shutter is set on OPEN.

4. Turn the finder shutter lever clockwise until it locks. If the field is dark, turn the threading knob until the field is light.

5. Compose the picture in the finder.

6. Focus the picture by either measuring from the focal-plane mark on the door to the subject, setting this distance on the lens, or by focusing the subject on the ground glass by turning the focusing ring on the lens.

7. Set the lens opening.

8. Take pictures by pressing the starting switch.

Variable-Shutter Opening	OPEN	1/2	1/4
24 Frames per Second	1/50	1/100	1/200

Turret

The lens turret on the Kodak Reflex Special Camera accommodates three Kodak Cine Lenses. A lens is in picturetaking position when it is nearest the camera door. To locate a lens, swing the turret release lever downward and pull forward on the turret as far as it will go. Then rotate the turret to position the lens. Lock the turret by pushing inward on the turret and then raising the turret release lever.

Because of optical interference, do not use a 10mm wide-angle lens and a 150mm telephoto lens on the turret at the same time. Also, the 150mm telephoto lens should not be in the lower position on the turret when the camera is placed on a table.

Variable Shutter

A wide number of effects can be obtained by using the variable shutter. The principle of the shutter is as follows:

When the film is being exposed at 24 frames per second with the shutter at OPEN, the exposure for each individual frame is 1/50 second; at 1/2, the exposure is about 1/100 second, or half the exposure of OPEN. Lens opening, another factor affecting exposure, also changes in multiples of 2—f/8 admits twice as much light as f/11. For this reason, it is simple to keep the exposure at the correct value while changing one or more of the factors governing exposure.

The variable shutter is used for many things — among them: a) closing the shutter when it is necessary to reverse or advance the film without exposing it; b) exposure control; c) fades and dissolves; d) sharpening images of moving objects; and e) control of depth of field.

1. Closing the Shutter

If it is necessary to advance or reverse the film without exposing it, depress the variable shutter detent and move the shutter lock to RELEASE. Close the variable shutter down to 0. Turn the shutter knob back and forth a little to make sure that the knob has locked in position. Be sure to return the shutter knob to an open position when taking pictures.

2. Exposure Control

If the light is so intense that even the smallest lens opening will give overexposure, move the shutter knob to 1/2 (same exposure effect as 1-lens-opening smaller) or to 1/4 (same exposure effect as 2-lens-openings smaller).

When taking pictures outside with high-speed films, proper exposure with an open shutter may call for a lens opening so small that the image on

the ground glass will appear too dim. In this case, the image can be brightened by closing the shutter to 1/2 or 1/4 and opening the lens aperture a corresponding amount.

3. Fades and Dissolves

A "fade-out" is a gradual darkening of the end of a scene until it is completely blacked out. A fade-in starts as a black-out and gradually lightens until the scene is properly exposed. A dissolve is the fading-out of one scene with the simultaneous fading-in of the next scene.

The speed with which the shutter knob is turned determines the length of the fade or dissolve. The shutter knob may be opened and closed uniformly or regulated to match the tempo of the subject being filmed.

When making fades or dissolves, be sure that the shutter lock is in the RELEASE position, so that the shutter knob will not catch at the 1/2 and 1/4 settings.

To fade out

Start the camera motor. When the action in a scene reaches the point for the fade-out, slowly turn the the shutter knob to 0. Then stop the camera motor.

To fade in

Set the shutter knob at 0. Start the camera motor, and at the same time, start to move the shutter knob toward OPEN. Allow the same number of frames for the fade-in as were allowed for the fade-out.

To dissolve

Fade out; run back the film by pushing the FORWARD-REVERSE switch to REVERSE; then fade in. Standard dissolves contain either 40 or 60 frames. Watch the number of frames exposed on the counter.

If a lap dissolve is made in the camera without any editing, observe the following conditions:

a. Every time the camera is stopped, turn the shutter knob to CLOSED.

b. When the camera is stopped, keep the lens capped as much as possible.

c. When the camera is stopped, do not open up the lens aperture. Do not leave the camera stopped for more than 5 minutes while the lens is open to the correct aperture for the lighting of a scene.

4. Sharpening Images of Moving Objects

To sharpen the image of each frame showing rapidly moving objects (in pictures of sports events, industrial processes, waterfalls, etc), move the shutter knob to 1/2 or 1/4. This shortens the exposure time for each frame and results in sharper pictures. Compensate by opening the lens 1 or 2 stops to maintain correct exposure. Do not use the shutter at 1/4 while taking pictures of moving objects that are close to the camera.

5. Out-of-Focus Background

It may be desirable at times to emphasize an object in the foreground by throwing the background out of focus. Use a large lens opening to decrease the depth of field; set the shutter knob at 1/4 to avoid overexposure.

Frame and Footage Counters

The frame counter rotates whenever the exposure button is pressed. One foot of film, or 40 frames, passes through the film gate each time the frame counter travels from 0 to 40. One complete revolution of the frame counter records 1 foot on the footage counter.

Because the frame counter is matched to the footage counter, any one of thousands of frames in a roll of film can be relocated exactly.

The counters have a range of 40,000 frames (or 1,000 feet) before repeating.

Unloading Film

Film Chambers

In total darkness, unscrew the film-chamber covers and remove the roll of exposed film. Remove the adapter from the film core. Re-wrap the film in the black envelope and place it in the light-proof film can. Tape the can to prevent light-leak.

100-Foot Film Spool

Depress the spindle plunger and remove the exposed spool of film. Replace the film in the film can and tape the can to prevent light-leak.

Care of the Camera

Proper care of the Kodak Reflex Special Camera is essential to satisfactory performance. The film gate must be kept clean at all times; the front and rear outside surfaces of the lens must be kept free of finger marks and dirt; the film chambers must be kept free of dirt and film particles; and the reflex finder should be cleaned whenever necessary.

Clean the Lens

It is impossible to obtain sharp pictures of good contrast unless the lens is kept clean.

To clean the lens, carefully brush off any dust or grit with wadded Kodak Lens Cleaning Paper or a fine camel's-hair brush. If necessary, wipe the surfaces gently with a wad of one or several sheets of lens-cleaning paper or a clean, soft, lint-free cloth. Always wipe with a circular motion. Fingerprints, oil spots, or other scum deposits can be removed with a drop of Kodak Lens Cleaner on the cloth.

Clean the Film Gate

Swing open the pressure pad.

With the ball of the thumb, rub off any accumulation of dirt on the polished tracks of the plate. With a match covered with a clean cloth that has been dipped in Stoddard's Solvent, or its equivalent, remove any accumulation on the tracks of the aperture plate. (Do not use alcohol as a cleaning agent.)

With a camel's-hair brush, remove any dust or lint on the edges of the rectangular aperture. Do not use anything that might chip or remove the paint from the aperture plate.

Be extremely careful not to scratch the polished surfaces over which the film travels. Never scrape the tracks with a metallic tool.

Be sure that the pulldown tip is clean.

Clean the Reflex Finder

Keep the glass of the finder window (in the finder door) and the eyepiece free of dust and fingerprints.

Fingerprints can be removed with a drop of Kodak Lens Cleaner on a clean, soft, lint-free cloth. If dust collects on the ground glass, remove the taking lens from the lens turret; with a rubber pinch bulb or similar device, blow air into the lens opening in the turret, into the turret, and into the ground-glass opening in back of the lens.

Oil the Camera

A bottle of Kodak Reflex Special Camera Lubricating Oil is furnished with the camera. Never use any other lubricant, or the camera may be damaged.

If at any time the film guide rollers do not turn freely, put a drop of oil on the ends of the roller shaft.

Trouble Chart

Film will not enter film channel.

Retract the pulldown.

Camera door will not close.

Center the sprocket roller lock.

Push the top cover release as far toward the back of the camera as possible.

Put the door latch lock in the open position and then close and lock the door.

Revolve the film buckle actuating plate upward if the 100-foot film chamber is being used. Revolve the plate downward if the 400-foot or 1200-foot film chamber is being used.

No image in finder.

Turn the threading knob to CLOSE.

Turn the finder shutter lever clockwise until it locks.

Motor will not run.

Check the power input line and the power source. Check electrical connection. Check to see if light in power cord switch is lit.

Check camera for take-up failure. Wind up any loose film on the take-up spool. Check the camera threading by turning on the starting switch on the power cord. Depress the buckle-trip switch for an instant; then release it. If film builds up after leaving the sprocket, the 400-foot chamber take-up or the 100-foot chamber take-up is not operating properly.

Film scratched.

Check for emulsion build-up or scratches on aperture plate and pressure pad. Clean aperture plate and pressure pad.

Film torn.

Check threading.

No image on film.

Open shutter.

Pictures fuzzy or blurred.

Check focus of lenses and finder eyepiece.

Clean lenses and filters.

Check lens seat in turret and lens mount surface for dirt or nicks.

Pictures flicker.

Check variations in line voltage with a voltmeter.

Check electrical connections.