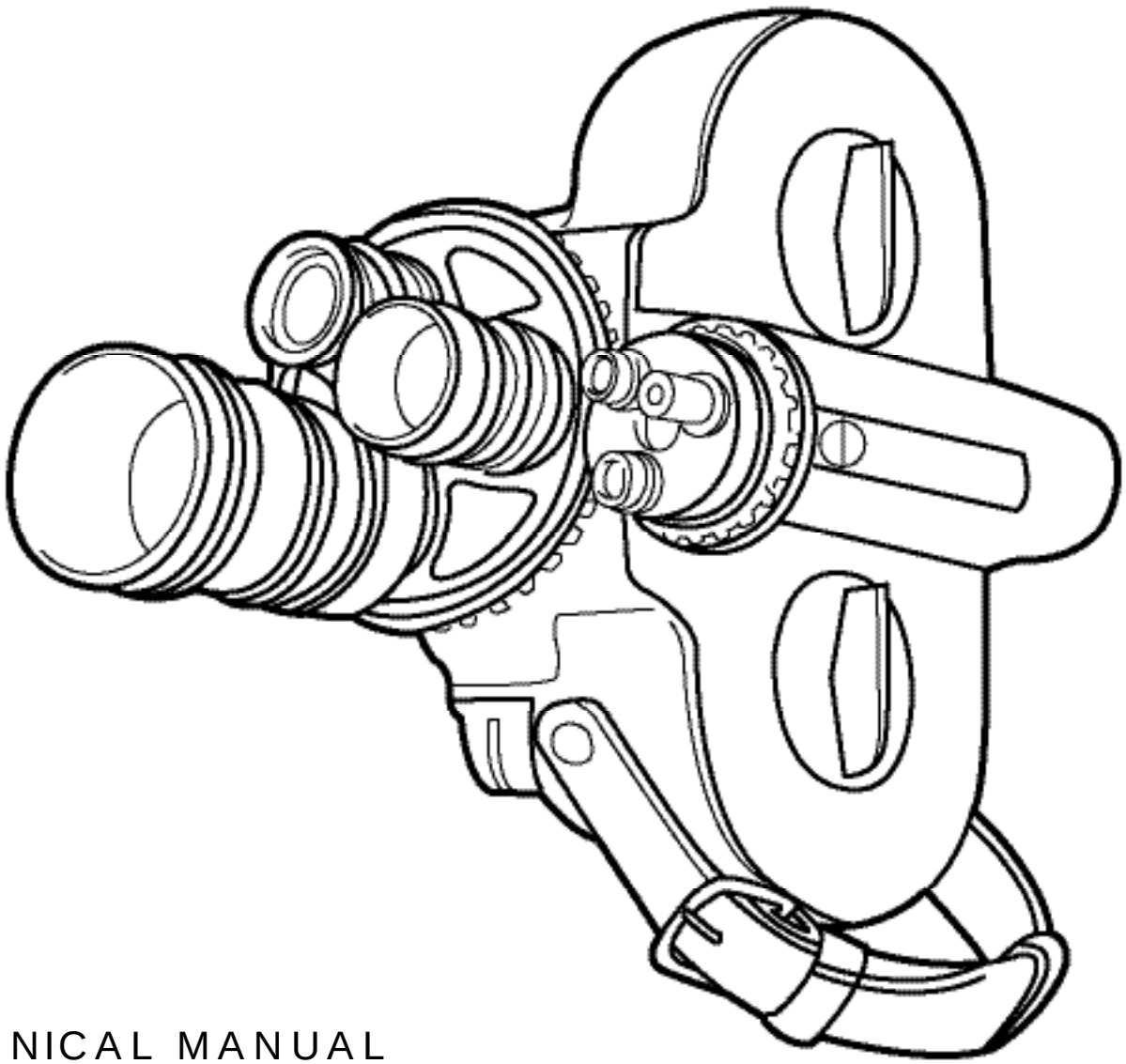
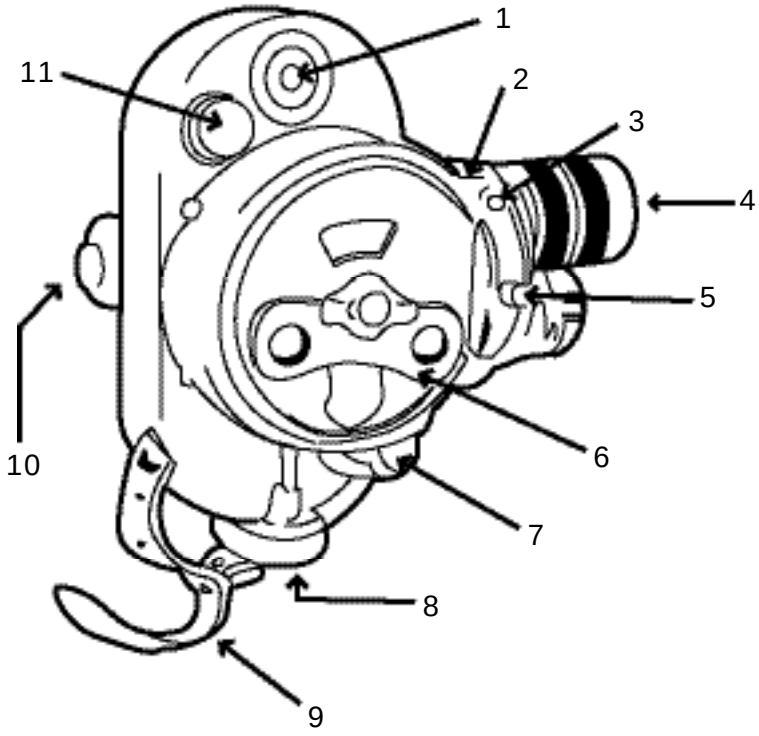
THE FILMO



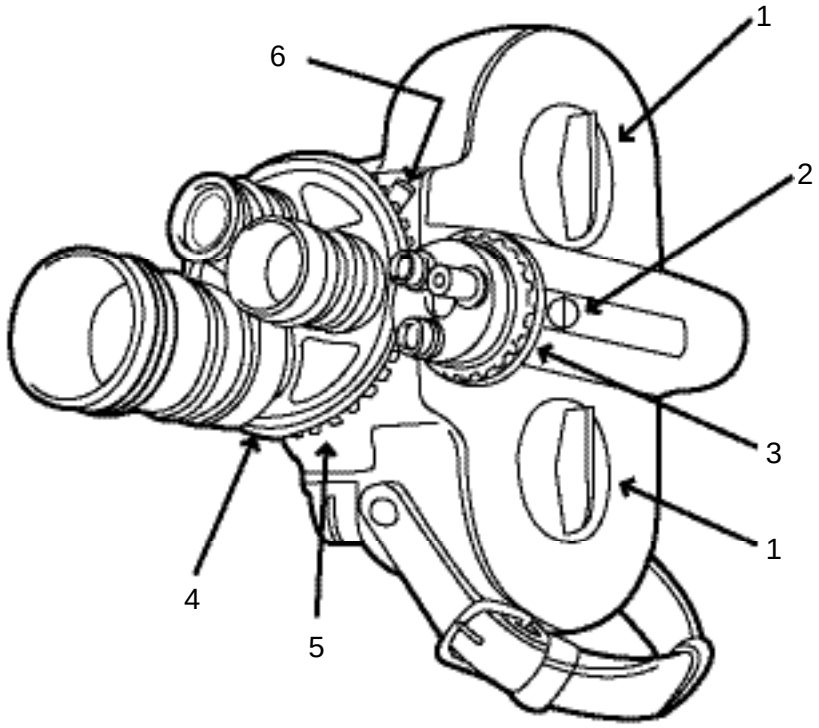
A TECHNICAL MANUAL

COMPILED & WRITTEN BY RENATO TONELLI

THE FILMO



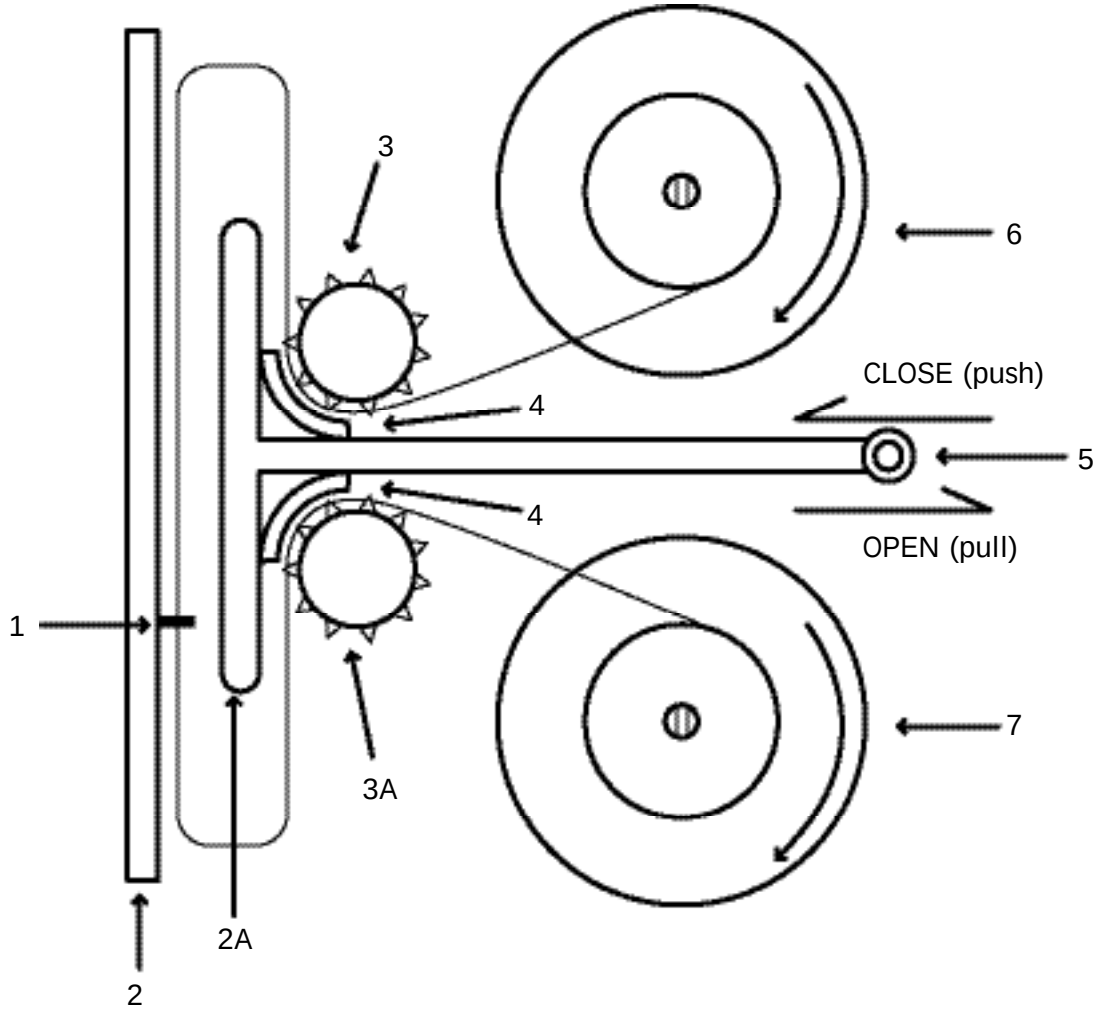
1– FOOTAGE COUNTER
2– STARTING BUTTON ("on")
3– LOCK PIN
4– LENS
5– CRITICAL FOCUSER
6– RATCHET WINDING KEY
7– BACK WIND SLOT
8– TRIPOD MOUNTING HOLE
(1/4 - 20 size only)
9– LEATHER STRAP
(not on all cameras)
10– VIEWFINDER
11– SPEED ADJUSTMENT (f.p.s) Dial



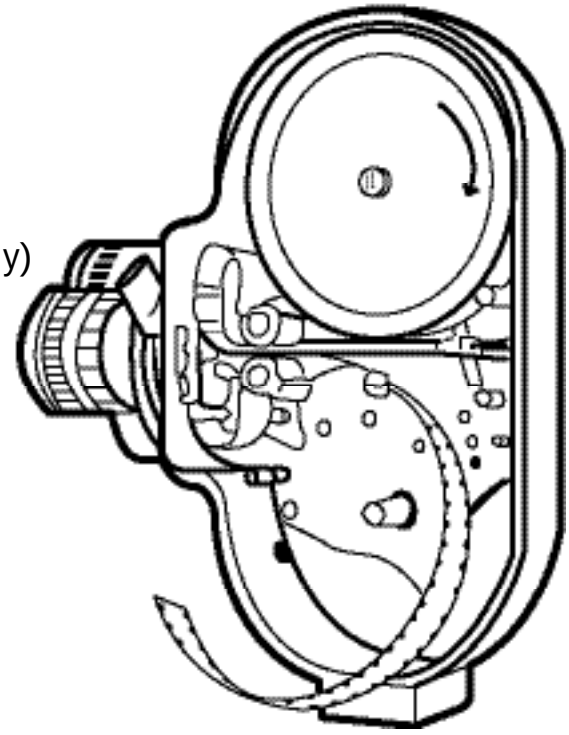
1– COVER LATCHES
2– FILM PLANE REFERENCE MARKER
3– VIEWFINDER TURRET WITH THREE VIEWFINDING OBJECTIVE
4– TURRET WITH 3 LENSES
5– TURRET GEARS
6– FILTER HOLDER

THE FILMO

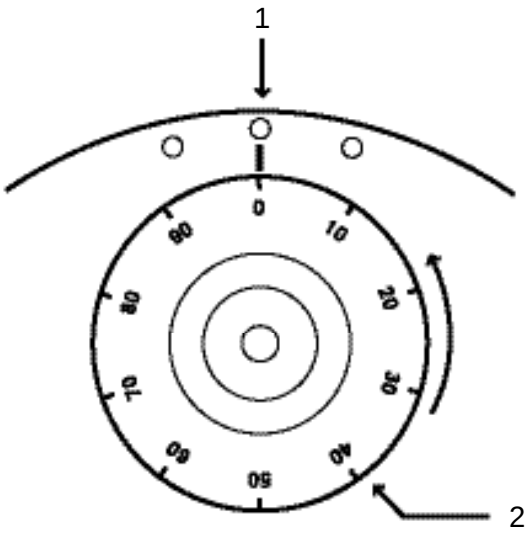
FILMO TREADING PATH



1– PULL-DOWN CLAW
2– APERTURE PLATE
2A– PRESSURE PLATE
3– SPROCKET DRIVE (feed/supply)
3A– SPROCKET DRIVE (take-up)
4– FILM GUIDE/SHOE
5– PRESSURE PLATE ARM
6– SUPPLY-SIDE SPOOL
7– TAKE-UP SPOOL

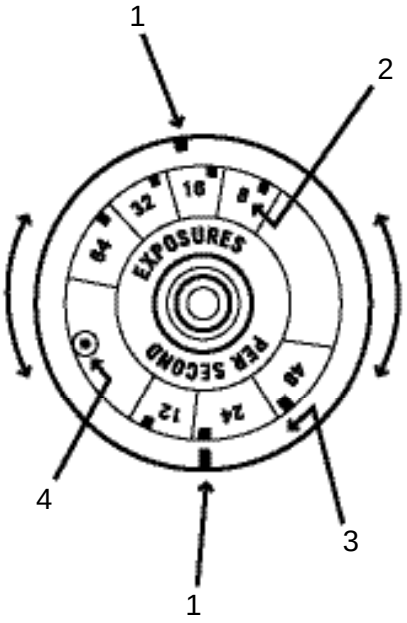


THE FILMO



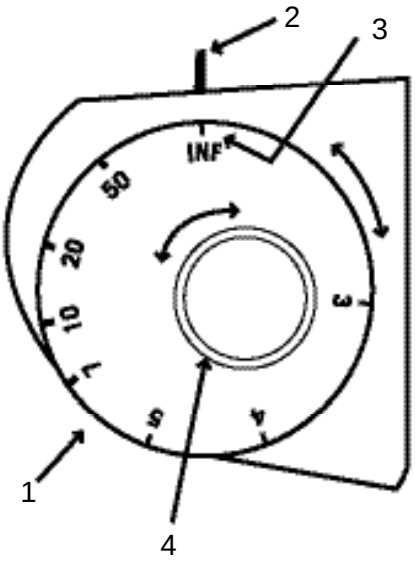
FOOTAGE COUNTER

1– CENTER DOT (WITNESS MARK)
2– FOOTAGE COUNTER DIAL
(marked in feet only)



SPEED ADJUSTMENT (f.p.s) DIAL

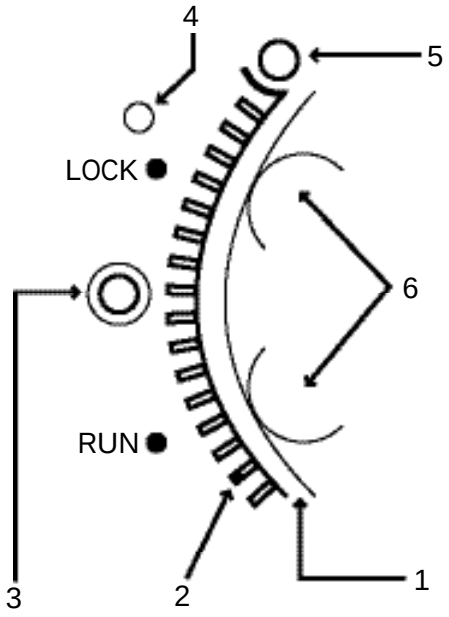
1– FPS WITNESS MARKS
2– FPS INDIVIDUAL CALIBRATIONS
3– FPS DIAL – ROTATES
(diagram shows fps dial set at 24fps)
4– FPS DIAL LOCKING KNOB
(not on all cameras)



VIEW FINDER

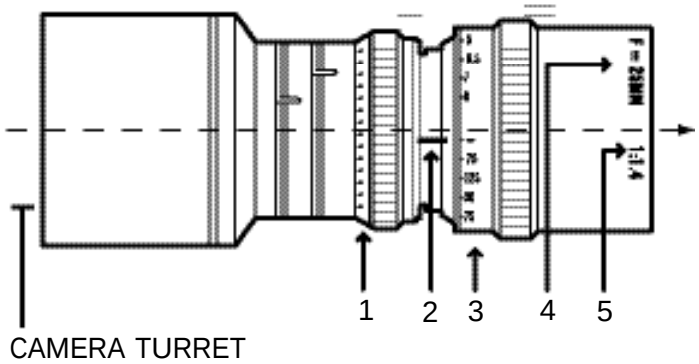
1– PARALLAX ADJUSTMENT DIAL – ROTATES
2– WITNESS MARK (on camera cover)
3– INDIVIDUAL FOCUS DISTANCE
CALIBRATIONS (marked in feet only)
– diagram shows dial set at infinity
4– VIEWFINDER/DIOPTER – ROTATES

THE FILMO



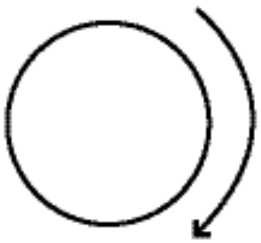
FILMO TURRET SIDE-VIEW (right side)

1– TURRET RING
2– INDEX MARK - SHOWN AT "RUN"/FILMING POSITION
3– CRITICAL FOCUSER
4– LOCK PIN (not all cameras)
5– STARTING BUTTON
6– LENSES

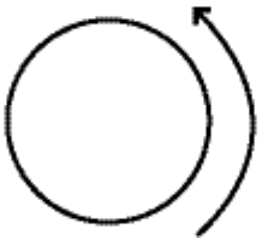


LENS

1– IRIS (f/stop) RING
2– WITNESS MARK (line up f/stop & distance against this mark)
3– FOCUS (distance) RING (marked in feet or meters or both)
4– FOCAL LENGTH OF LENS
5– MAXIMUM IRIS (f/stop)



CLOCKWISE MOTION

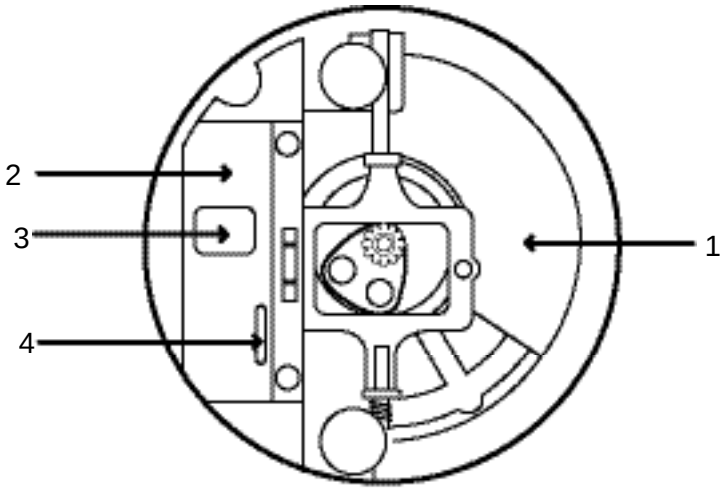


COUNTER CLOCKWISE MOTION

THE FILMO

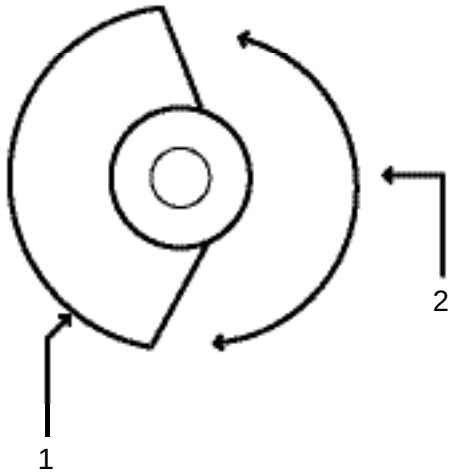
FILMO ONLY:
FPS TO SHUTTER SPEED CHART

CAMERA SPEED fps	*SHUTTER SPEED*
8	1/4 second
12	1/21 second
16	1/28 second
24	1/42 second
32	1/56 second
48	1/84 second
64	1/112 second
SINGLE FRAME	1/15 second



INTERMITTENT MECHANISM

1– SHUTTER (rotating)
2– APERTURE PLATE
3– APERTURE
4– PULL-DOWN CLAW SLOT



SHUTTER

1– SHUTTER
2– SHUTTER OPENING: 204˚

THE FILMO

EQUIPMENT DESCRIPTION

FILMO:
The Bell & Howell 16mm FILMO is one of the most durable professional cameras ever made and a perfect camera on which to learn the basics of cinematography. Its spring-wound motor enables it to operate without a battery anywhere, at any time and in almost any climate. Its 204˚ shutter is especially useful for shooting in low light situations. Its low-profile enables access to most locations.

MOVEMENT:
Camera operated single claw pull-down.

SHUTTER:
204˚ fixed shutter (close down 1/3 f-stop or set exposure meter to next higher rating. For example, if your film's exposure index is 50, set meter's ASA dial at 64).

FOCUSING:
Measure distance with a tape measure from subject to camera's film plane reference mark (engraved on viewfinder). On some models a critical focuser provides an inverted and greatly magnified circular image of central portion of frame. Turret must be turned (counter-clockwise) 180 degrees to check focus and then rotated back to –un/taking/filming position.

LENSES:
Three C–mount lenses (10mm or 12.5mm; 25mm – 1 inch; 50mm or 75mm – 2 inch or 3 inch) with matching viewfinder lenses mounted on turrets. Turn lenses by the edge of the turret – not by holding the lenses – always counter-clockwise to the left when you are behind the camera.

MOTOR:
Spring driven governor controlled mechanism exposes 22 feet/6.7m or 35 seconds per winding at 24 fps. Seven speeds: 8, 12, 16, 24, 32, 48 and 64 are individually calibrated. Intermediate speeds may be used (see diagram). Further exposure adjustments are necessary when filming at any speed other than 24 fps (i.e., if exposure for 24 fps is f8, at 48 fps it will be 1 full stop more, or f5.6; the Sekonic Studio Deluxe L398 meter with its cine-scale matching the FILMO's speeds takes a glance to figure out the exposure compensations). Spring motor is wound by turning the ratchet winding key (or a doorknob handle in an emergency) to the left (counter-clockwise) until it stops – do not force it or it will break. Gear driven footage meter indicates amount of exposed film in feet. Footage counter must be manually set after loading (see diagram).

To start camera, press starting button and maintain pressure on the button until you wish to stop. To keep the camera running with the finger removed from the starting button, press the lock pin in when the starting button is depressed. To stop, pull the lock pin. (Not available on all FILMOs.) Revolve the turret counter-clockwise so that any of the three index marks on the edge of the turret head falls opposite the word "LOCK" on the camera proper. To release, turn the turret until the desired lens is at the aperture (filming position), when an index mark will fall opposite the word "RUN." Some FILMOs are also provided with a thumb start lever at the bottom rear of the camera. Maintain pressure on the lever until you wish to stop.

THE FILMO

EQUIPMENT DESCRIPTION CONT'D

VIEWFINDER:
Positive–type turret viewfinder accommodates three viewfinding objectives. Matching objectives show full size image without masking. Matched gearing on lens turret and viewfinder turret automatically positions correct viewfinder when lens is swung into filming position. **Before locking camera door, be sure viewfinder lenses are synched (matched) with camera lenses.** Viewfinder has parallax compensation at rear adjustable from 3 ft. to infinity. Focus set on viewfinder must match focus set on lens you're filming with (i.e., if the camera to subject distance is 10 ft. you must set the lens at 10 ft. and the parallax compensator at 10ft.). Failure to do so will result in an exposed image not matching with the composed image in the viewfinder. Diopter adjustment is in the center of parallax compensator.

MAGAZINES:
Internal 100 ft./30m daylight spool only. No external magazine.

FILTERS:
A behind–the–lens gel holder (not available on all FILMOs) can be removed and replaced only when turret is in "lock" position, i.e., the lens is not in filming position. The holder need not be in position when filming. Filters must be Kodak Wratten gelatin filters or equivalent.

LOADING: (see diagram)
Avoid direct sunlight. Before opening the camera make sure that a lens is in the filming position and that the speed adjustment dial is set at 24 fps. Open the camera by turning together the two cover latches. Open the film gate by pushing the pressure plate arm toward the back of the camera as far as it will go.

Unreel approx. 18 inches/45 cm of leader film from spool (the first 6ft. of the film itself serves as threading and as a light-proof protective leader). Place the spool on the supply side of the camera. Film feeds in clock–wise, emulsion in. Insert the film between the pressure plate arm and the feed sprocket, passing it also between the supply sprocket and the upper film guide shoe. Place the film in the film gate channel, leaving enough slack above to form the upper loop, the extreme top of which should be about 1/4 inch/7mm from the metal camera shell. Leave a lower loop of the same size and insert the film between the take–up sprocket and the lower film guide shoe.

Make certain that the film perforation is engaged with the sprocket. Check upper and lower loop and adjust if necessary. Engage a perforation with the pull–down claw at the bottom of the aperture plate (if the pull–down claw is retracted, wind the spring motor one turn and pull–down claw will emerge – you will hear a "click.:) Make sure that the firm perforations are still engaged with both supply, take–up sprockets and pull–down claw and that the loops are still the correct size.

Close the gate by pushing the pressure plate arm towards the film gate channel as far as it will go (note: the camera will not close unless the gate is closed). Make a final check of the loop size. Seven perforations should be visible in the upper loop, six in the lower loop when gate is closed. Insert film end in take–up spool hub slot (never use tape) and place the take–up spool on the take-up side (make sure it is not bent or damaged in any way – if it is, the camera will eventually jam.

THE FILMO

EQUIPMENT DESCRIPTION CONT'D

Run the camera by pressing the "on" button momentarily a few times to verify proper loop and proper take–up. Correct any errors discovered by this test. Replace the camera cover. Tape all around to ensure against light leaks. Check proper alignment between the viewfinder lenses and the filming lenses. Correct if necessary. Set the footage dial (see diagram) by turning it with thumb and finger until the zero is opposite the right hand dot. Cover filming lens with your hand and run camera until the zero is opposite the center dot. The moment of truth has arrived. The camera is now ready for filming – are you?

UNLOADING:
When the zero is opposite the right hand dot once again, there are 5 ft./1.5 m of film left on the supply spool. Place your hand in front of filming lens and run the remaining film through before removing the camera cover. Run it until the zero is opposite the left hand side dot. This ensures that the leader film has enclosed the exposed film, protecting it from the light admitted when the cover is removed. Avoid direct sunlight. Take the exposed film out and place it in its container. Note: if you exposed to the last available foot of film, unload in total darkness to avoid spoiling your last shot(s).

Remember:
Rewind motor after each shot.

Set focusing distance on both lens and parallax on rear viewfinder.

For handheld shots it is best to steady the camera by pressing it firmly against the forehead, bringing the left eye even with the viewfinder to avoid squinting. Keep the arms close to the body, forming as rigid a rest or support for the camera as possible.

Tripod Mounting:
Has 1/4 – 20 mounting hole only.

Recommended Tripod: Bogen 3020

THE FILMO

IMAGE PROBLEMS

Wrong Size image e.g., close up instead of long shot
Viewfinder objective lens not matched with filming lenses – remove cover and adjust

Shot out of focus
Camera–to–subject distance improperly measured or improperly set on lenses

Image cut off
Parallax dial not set properly against witness mark

No Image
Turret on "lock" position
F/stop ring completely closed

Image totally exposed
Wrong f/stop reading
F/stop iris not properly set on lens
Wrong camera speed and f/stop combination – set/read meter correctly

STANDARD CUTTING LINES FOR FRAMING THE HUMAN FIGURE

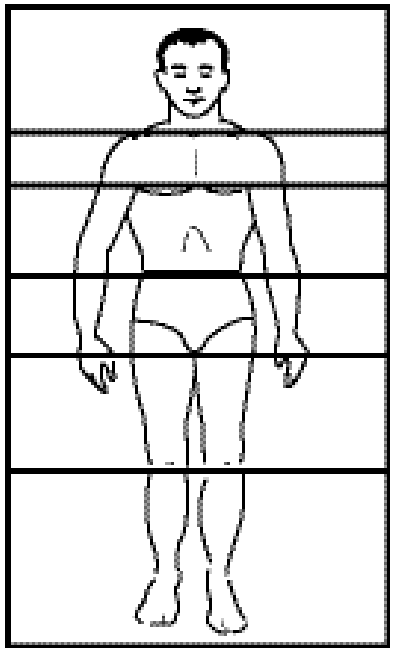
ECU Extreme close–up

MCU Medium close–up

Waist shot

MS Medium shot

Knee shot



THE FILMO

CAMERA TROUBLESHOOTING

Camera Door Will Not Close
Film gate not properly closed

Camera will not run, runs only slowly or intermittently
Turret on “lock” position
Spring motor not fully would
Film threaded improperly

Film cannot be threaded through camera gate
Pull–down claw is retracted – crank spring motor one full–turn

Film does not take up or jams
Bent film
Film end has become detached from take–up spool
Film in either side became loose during transportation
Incorrect loop sizes, faulty film lacing
Take–up tension set incorrectly – return to equipment room

Film fogged
Camera door lid not completely closed or faulty or not taped
Faulty filmstock (extremely unlikely)
Faulty handling, processing or printing at laboratory
Film loaded in extremely bright light conditions
Spool loaded film has bent flanges
Film threaded with base facing lens

Film loses loop
Damaged sprocket or pull–down claw
Film incorrectly threaded
Film not over sprocket teeth correctly
Loops incorrect size
Sprocket guides not engaged
Film perf. pitch wrong size

Film scratched
Abrasive or scratched gate and pressure plates
Careless handling at laboratory
Careless rewinding
Dirt in the camera wherever the film may touch
Faulty camera loading
Faulty filmstock (extremely unlikely)
Loops too large or too small

THE FILMO

Image unsteadiness
Bad print
Bent camera pull–down claw caused by starting camera at too high a speed
Camera running faster than designed to do so by manufacturer
Emulsion build up in gate or chip of film stuck in film path
Loop size incorrect, faulty camera threading
Unsteady projector
Vertical straking of highlights – lost lower loop. After threading, run camera a short burst to check proper take-up and loops holding before closing.

No Image
Turret set on “lock” position

Spring motor will not wind and camera will not run in “run” position
Congratulations! You’ve done the near–impossible: you’ve broken the camera. Bring the camera back with $600 for repair parts.