

- a) lid
- b) fastening catch
- c) filming button
- d) footage counter window
- e) side handles
- f) motor winding crank
- g) shooting porthole with neutral filter
- h) iconometer viewfinder
- i) diaphragm control
- j) motor winding gear
- k) toothed collar for setting diaphragm
- l) special camera baseplate
- m) scale of f-stops
- n) spanners for watertight gaskets

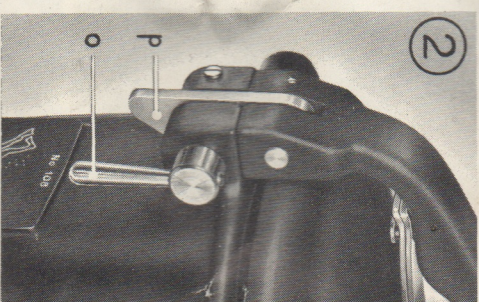
Foreword

The Bolex Underwater Housing has been specially designed to allow movie-makers to shoot films under water with the utmost safety and ease. It is equally suitable for use with the Bolex H16 Standard and Reflex 16mm cameras and with the Bolex H8 8mm camera. The Underwater Housing is absolutely watertight and is proof against water pressures encountered down to a depth of 300 ft. and beyond. It is simple to use, and the camera can be inserted and withdrawn in a few seconds, without using any tools. Furthermore, when in the water, its weight is just right to ensure utmost stability, whilst allowing the diver to enjoy complete freedom of movement.

I. To Prepare Housing for Use

1. Open housing. To do so :

- a) Raise locking lever (o) (fig. 2).
- b) Press on catch and withdraw fastening hook (p).
- c) Remove lid. If lid adheres tightly to housing (owing to an internal vacuum, due for instance to housing having been shipped by air), dislodge it by inserting the shank of one of the spanners (supplied with the equipment) between housing and lid and levering it off.



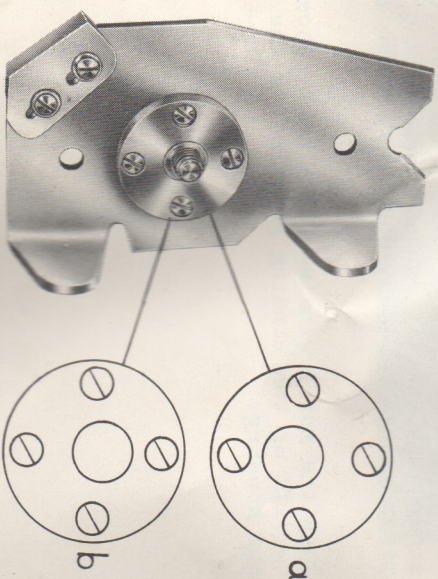
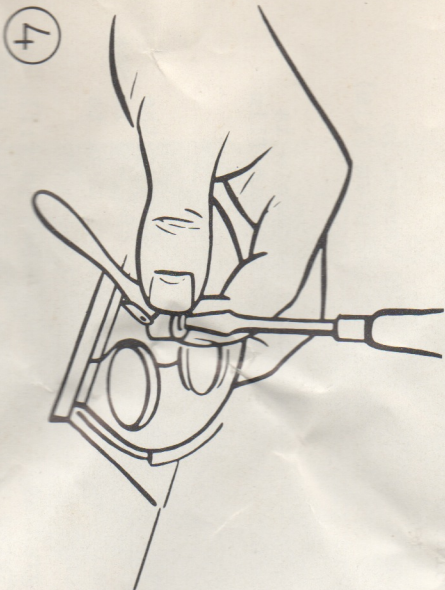
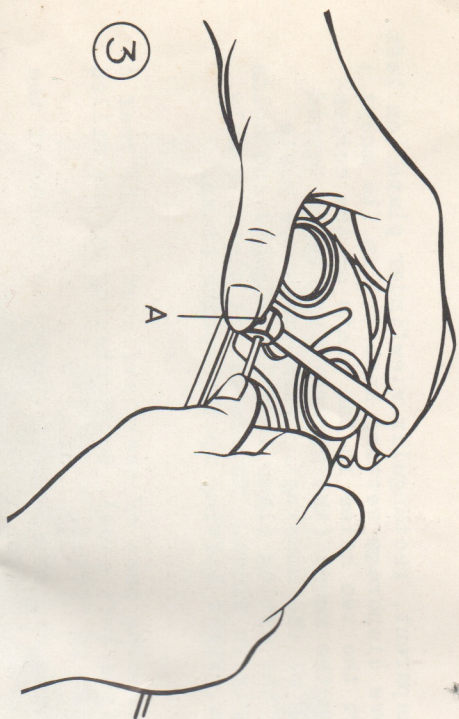
2. Remove accessories from inside housing.

- 3. Place the filter in front of the porthole. Insert the three round holes in the filter on the corresponding studs on the porthole (the clamping spring towards the front), then turn the filter until the clamping spring is well home and retains the filter securely in place.

In order to prevent reflections and increase picture contrast, the filter is entirely immersed while shooting under water. To remove the filter : turn it in reverse after having left the clamping spring.



4. Fasten the transparent, rectangular viewfinder plate (on left of housing, above diaphragm setting knob (1) on its mount; to do so, insert the two holes in the plate on the corresponding studs on the mount (the spring clamp being turned towards the back of the housing). Then press the plate downwards until the spring clamp is fully engaged and holds the plate properly in place. To remove the plate, simply press it upwards, first lifting up the spring clamp.
5. Fasten the rear aiming post of the viewfinder to the rear of the housing (on the left side), by tightening up the milled knob with which it is fitted.
The aiming post can be set either in front or behind of the milled knob :
 - a) The forward position must be used when the camera is fitted with a lens of focal length 10mm (for 16mm film) or 5.5 or 6.5mm (for 8mm film).
 - b) The rearward position must be used when the camera is fitted with a lens of focal length 16mm (for 16mm film only).
6. Make certain that the scale of f-stops mounted facing the diaphragm control knob corresponds to the type of lens in use. There are several different models of this scale, made to match the lenses listed on page 12.
Each of these plates is graduated in f-stops down to f:11. In actual practice, apertures smaller than f:8 are only used very rarely.
Turn the diaphragm control knob until the groove engraved around it is exactly opposite the mark on the scale corresponding to the widest aperture of the lens used.
7. Turn the motor winding crank in a clockwise direction, so as to lift up the winding gear before the camera is inserted in the housing.



II. To Prepare Camera for Underwater Use

1. Remove the Octameter Viewfinder and the turret lever from the camera.

See H Camera Instruction Manual, page 14, for instructions on how to remove viewfinder.

To remove turret lever :

- fold it back onto the turret,
- withdraw lever spindle by pushing it upwards with a pin.

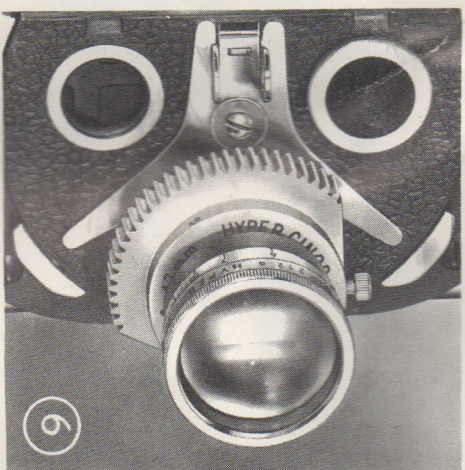
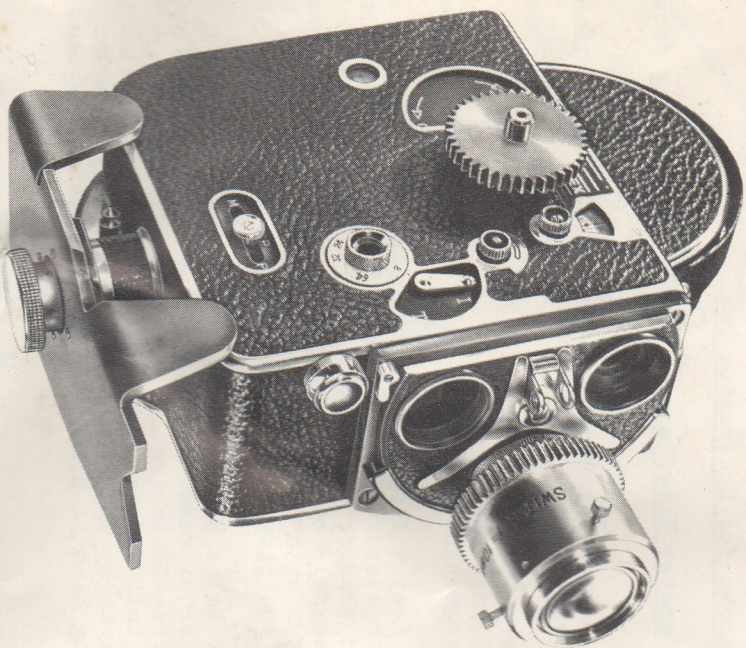
Important : Keep a finger pressed against hole (A) in the lever during this operation, in order to avoid losing the spring-mounted plunger inside the lever. When the lever is off, put the spindle back on it, easing insertion by pressing the plunger down with a pin through hole (A). To mount the lever back on the camera, use the same procedure (fig. 3).

In the case of Bolex H8 or H16 cameras fitted with an old-type lever (without removable spindle), proceed as follows : Unscrew the screw fastening lever to turret, taking care to hold down the bell and lever, so as to prevent their being projected upwards by the spring. Remove bell and lever. Put bell and spring back in place and tighten down screw again (fig. 4).

2. Screw the gear supplied with the equipment on the camera instead of the rewinding crank. To do so, set crank in rewinding position and turn it clockwise. Then screw on the gear in the opposite direction.

3. Fasten the camera on the special baseplate, turning latter so that the two lugs are resting against right side of camera. Before doing so, the baseplate must first be adjusted once and for all to suit the camera with which it is to be used. The fixing knob is provided for this purpose with an eccentric mount fastened by four screws and having two positions :

- a) rear position : for cameras up to No. 100.400,
- b) forward position : for cameras from No. 100.401 upwards (fig. 5).



Position of toothed sector when lens diaphragm is set wide open

4. Screw lens fully in camera, focus it on one of the distances listed on page 12 and open the diaphragm up fully.

Note : Only Kern-Paillard wide-angle lenses are suitable for underwater movie-making. The use of wide-angle lenses is mandatory on account of the short filming distances and of the reduced depth of field due to refraction phenomena.

The Switar 10mm f:1.6 (as well as the Switar 5.5mm f:1.8 for the Bolex H8) is a particularly good choice for this purpose on account of its very high speed. See the lists of appropriate Kern-Paillard lenses and recommended settings on p.12.

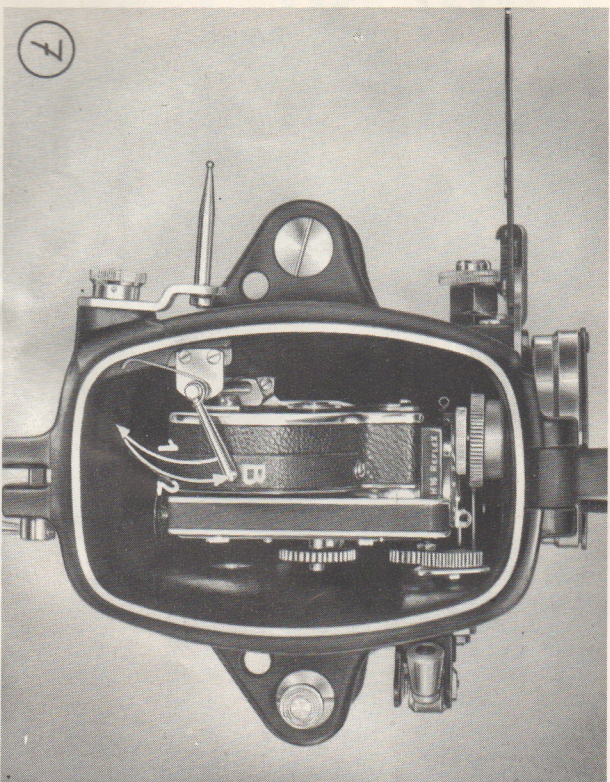
5. Fit the toothed diaphragm setting collar onto the lens, with the teeth nearest the camera.

Note : Collars of different sizes are available to fit each of the lenses listed on page 12. The method of mounting depends on the model :

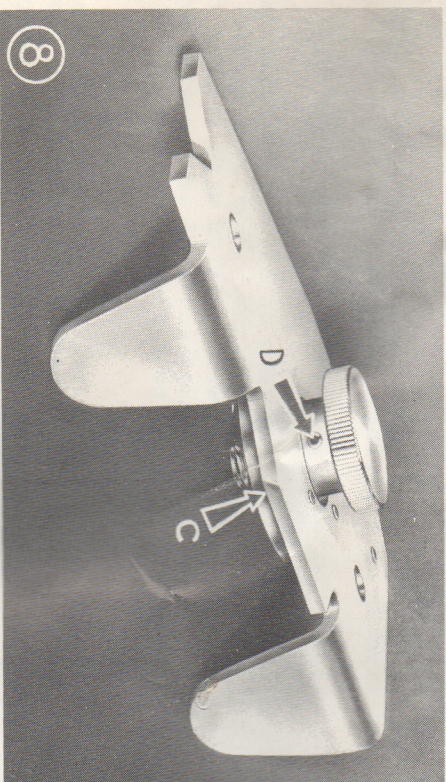
- a) Collars for Switar 10mm, Switar 10mm H16 RX, Switar 5.5mm and Pizar 5.5mm :
Loosen the 3 clamping screws on the collar, insert latter over lens as far as it will go, hold in that position and fasten to diaphragm ring by gently tightening up the 3 screws.
- b) Collars for Switar 16mm f:1.8, Switar 16mm f:1.8 H16 RX and Yvar 16mm f:2.8 :
Loosen the clamping screw, screw collar gently onto lens and tighten up clamping screw gently.
- c) Collar for Switar 12.5mm f:1.5 and Yvar 13mm f:1.9 fitted with Hyper-Cinor :
Loosen the 2 clamping screws on the collar, slip latter on lens, then screw on Hyper-Cinor. Take care to set toothed sector of collar in correct position with respect to worm gear (fig. 6). Pull collar until it is pressing against Hyper-Cinor and tighten both clamping screws.

Warning : The clamping screws are provided with plastic tips to avoid marring the lens diaphragm ring. Do not tighten screws when not necessary, or tips may come off.

Important : When fitting on diaphragm collar, always make certain that lens is set to its widest aperture.



7



8

III. To Insert Camera In Housing

1. Turn lever (B) towards rear of housing and keep it there (fig. 7).
2. Insert the camera, ready fitted with its accessories, gently into the housing until baseplate is resting on slides. Then push camera forwards until a stop is felt. Turn lever (B) fully towards front of housing.
3. Check that diaphragm control knob functions properly. Looking through the lens porthole, watch position of toothed collar with respect to worm gear. The collar and worm must mesh accurately, without jamming or excessive play. If meshing seems too loose or too tight, adjust height of camera on its baseplate by removing one or more of the washer which will be found inserted between the baseplate and the disk holding the fixing knob (C). The washer can be reached by removing pin from knob (D) and unscrewing the 4 screws retaining the disk (fig. 8).
4. Check operation of motor winding crank. When crank is turned in anti-clockwise direction, gears inside housing must mesh with winding gear fitted on camera. When camera has been wound up, always take care to turn winding crank back at least half a turn in the opposite direction to that used for winding, before folding it flat in its stirrup. If this precaution is omitted, the camera motor may jam.
5. Put lid back on housing (first checking that rubber gasket is clean and in its proper place) and close the catch.
6. Now raise the locking lever (o).
7. Press on the catch. Insert the fastening hook (p) in its recess and turn locking lever (o) downwards. The housing is now ready for use, and you may safely dive with it down to a depth of 300 ft.

Lens type	Diaphragm stop	Focus to	Available depth of field (ft.)
<u>LENSES FOR 16mm FILM</u>			
Switar 10mm f:1.6	f:1.6 f:2.8 f: 4	6' 6' 6'	3' - ∞ 2.28' - ∞ 1.79' - ∞
Switar 16mm f:1.8	f:1.8 f:1.8 f:2.8	6' 15'	4.29' - 11.08' 7.28' - ∞
Yvar 16mm f:2.8	f:2.8	6'	3.67' - 20'
	f:2.8	15'	5.64' - ∞
	f: 4	6'	3.11' - ∞
	f: 4	15'	4.44' - ∞
Yvar 16mm f:2.8	f:2.8	6'	3.67' - 20'
	f:2.8	15'	5.64' - ∞
	f: 4	6'	3.11' - ∞
	f: 4	15'	4.44' - ∞
<u>LENSES FOR 8mm FILM</u>			
Switar 5,5mm f:1.8	f:1.8 f:2.8 f: 4	3' 3' 3'	1.45' - ∞ 1' - ∞ 0.89' - ∞
Plazar 5,5mm f: 2	f: 2 f:2,8 f: 4	- - -	1.54' - ∞ 1.23' - ∞ 1' - ∞
Switar 12,5mm f:1.5 + Hyper-Cinor	f:1.5 f:2,8 f: 4	6' 6' 6'	2.43' - ∞ 1.55' - ∞ 1.17' - ∞
Yvar 13 mm f:1.9 + Hyper-Cinor	f:1.9 f:2.8 f: 4	6' 6' 6'	2' - ∞ 1.55' - ∞ 1.17' - ∞

IV. Use of Underwater Housing

You will find that there is little difference between filming technique underwater and on dry land, aside from the fact that the camera is operated by means of the controls on the housing. Focusing is set once for all, prior to diving, on one of the distances listed in the table on page 12, since there is adequate depth of field available, even at wide apertures. The filming speed is also set before diving (usually at 16 or 24 frames per second). The diaphragm, on the other hand, may be adjusted according to the amount of light available under water. The following points, however, are of importance :

1. Filming Button : This has two positions :
 - a) locked position : to lock button, turn so groove in shank is perpendicular to groove in handle ;
 - b) filming position : when both grooves are in line, button can be pressed.
2. Iconometer Viewfinder : To allow for parallax effect, the viewfinder plate is provided with two holes of different sizes. The small hole is used for centering subjects about 16 ft. away, whilst nearer subjects (about 4 - 5 ft. away) are centered, with the large hole. To make sure that the viewfinder field corresponds to that covered by the lens, your eye should be as close to the aiming post as your goggles will allow.
3. Quick-aim Viewfinder : To permit of even faster aiming, a sports-type viewfinder, consisting of a simple front and rear sight, is mounted on the left side of the fastening catch. Thus you can aim the camera quickly at your subject by simply lining latter up with both sights to catch those fleeting, spur-of-the-moment shots. Parallax is corrected down to a distance of 15 - 16 ft.
4. A Safety Strap (not supplied) may be used to attach camera housing firmly to diver. Two holes are pierced for this purpose in the upper side ribs.
5. Various Attachments (such as spot-lamps, etc., not supplied by Bolex) can be attached to the housing by using the slide mount at bottom.

V. To Remove Camera From Housing

This is done by reversing operations for insertion. Take care that drops of water do not enter housing. If necessary, wipe groove in lid dry before opening housing.

VI. Care and Upkeep

The Bolex Underwater Housing needs little maintenance, since all parts are protected against corrosion by salt water. It should however be washed from time to time in fresh water to remove residual salt deposits. Before diving, always check that the controls (filming release and f-stops) operate correctly. When on your way to the site, lie the housing on its right side on the bottom of the boat. This will help to protect the delicate viewfinder plate against jolts. For added safety, the viewfinder plate can be removed until just before the dive.



Watertight Gaskets : The Bolex Underwater Housing is fitted with 3 watertight gaskets (one for each external control). When the housing has been in use for some time, these gaskets may require retightening. Two spanners are supplied with the housing for this purpose. Use both spanners at once on the respective nut and counter-nut of the gasket requiring attention, as follows :

1. Loosen counter-nut.
2. Tighten nut.
3. Tighten counter-nut down hard. (fig. 9).