U. S. NAVY

BUREAU OF SHIPS

PERISCOPE MOTION-PICTURE CAMERA

16 mm.

Mark 2, Mod. 0

RESTRICTED

EASTMAN KODAK COMPANY

ROCHESTER, N. Y.

U. S. NAVY

BUREAU OF SHIPS

PERISCOPE MOTION-PICTURE CAMERA

16 mm.

Mark 2, Mod. 0

EASTMAN KODAK COMPANY, ROCHESTER, N. Y.

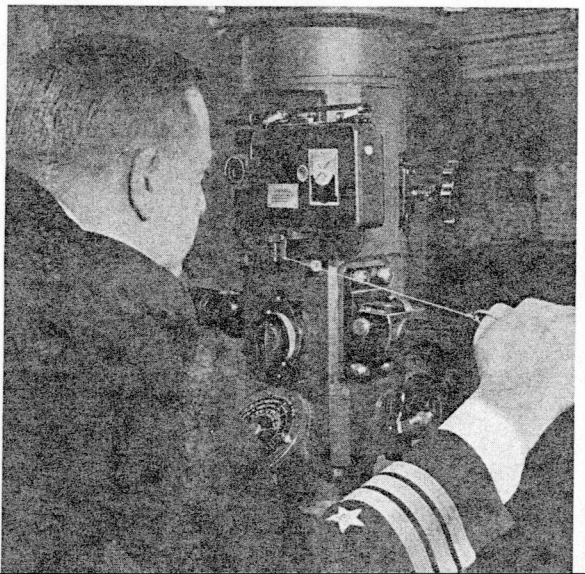
INDEX

PERISCOPE MOTION-PICTURE CAMERA

16 mm.

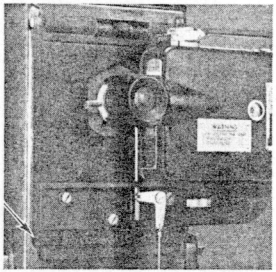
Mark 2, Mod. 0

THE Periscope Motion-Picture Camera, Mark 2, Mod. 0, is a standard 16 mm. Magazine Ciné-Kodak which, by means of a special adapter, can be quickly and easily attached to a submarine periscope. The adapter is designed to permit the periscope to be used for sighting while the camera is in position and in operation.



INSTALLATION

1 Remove the filter plate from the periscope. The periscope camera is completely assembled in the carry case, ready for immediate installation on the periscope. Attach it to the periscope face plate in the same way the filter plate is attached. *Be sure the bottom of the adapter is in contact with the face plate of the periscope; see the arrow in the illustration.*



DIOPTER SETTING MUST BE AT *TRUE* ZERO

2 The diopter setting of the periscope must be adjusted to the "*true*" *zero* point if sharp pictures are to be obtained. Since the zero position on most diopter setting scales is *not* true zero, it will be necessary to determine the true zero position. This can be accomplished in a few moments with the accessory Focusing Finder or it can be determined and marked for future reference by a representative of the base or tender optical shop, using an auxiliary telescope.

See page 12 for instructions for determining the true zero point with the accessory Focusing Finder.

CENTER THE LENS

3 When the periscope camera is attached to a periscope for the first time, the camera lens must be centered in the

aperture of the periscope eyepiece. This adjustment may be considered almost permanent for a given combination of camera and periscope and seldom needs to be changed unless the camera is used on a different periscope. However, it should be checked occasionally.

The accessory Focusing Finder should be used to make this adjustment; see page 12.

EXPOSURE

4 Only three variables need be considered when the periscope camera is adjusted for a given light condition: (1) the type of film to be used, (2) the camera speed setting, and (3) the type of filter. A simple exposure guide, provided with this manual, gives the correct film, filter, and camera speed for each light condition.

Three Films. Three films are provided for use in the periscope camera: Kodak Negative Panchromatic Film, Kodak Super-XX Negative Panchromatic Film, and Kodachrome Film, Type A. In periscope photography, these films are suited for the general uses described below:

> **Kodak Negative[1] Film** is a black-and-white film which is to be used for most pictures made on clear days.
>
> **Kodak Super-XX Negative Film,** about four times as sensitive as Negative Film, is to be used under more difficult light conditions—on cloudy days, or very early or late in the day.
>
> **Kodachrome Film, Type A** (about one-third the speed of Negative Film and one-twelfth as fast as Super-XX), is a color film which, because of its speed, can be used for *periscope* photography only on very bright, clear days. The Type A Kodachrome Filter for Daylight (No. 85) *must be used* when Kodachrome Film, Type A, is exposed by daylight.

Three Camera Speeds. Three camera speeds are provided on the periscope camera: 8, 16, and 24. When camera speed 8 is used, the shutter remains open for a longer time than when either of the other speeds is used, thus passing more light to the film. Camera speed 16 permits half as much light to pass as camera speed 8, and camera speed 24 passes one-third as much light as speed 8.

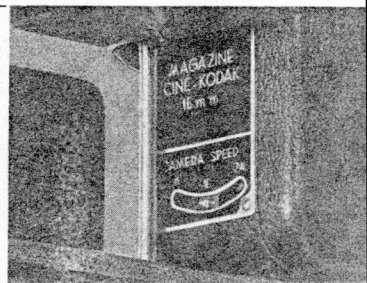
See the exposure guide.

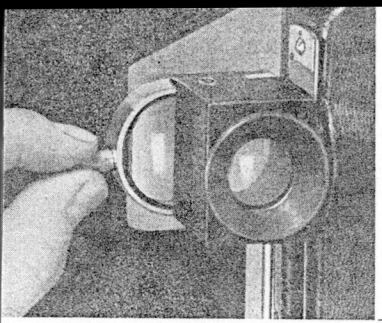
Two Filters. Two filters, the Type A Kodachrome Filter for Daylight (No. 85) and the Kodak Wratten G Filter, are provided in slip-in mounts. *Be sure one or the other is in posi-*

[1] The black-and-white negative films will be developed at a tender or base to provide negatives for making paper prints. When positives are desired for projection, the developed negative film must be printed at an agency or Naval activity provided with proper facilities.
Kodachrome Film must be processed by the Eastman Kodak Company.

SETTING THE CAMERA SPEED

To set the camera speed, slide the button on the front of the camera to the figure indicating the speed required.





ATTACHING THE FILTERS

To attach a filter to the periscope camera, grasp the projecting pin on the filter mount and slip the filter into the slot provided for it in the prism mount.

tion on the camera when pictures are made, otherwise the field will be greatly reduced.

The Type A Kodachrome Filter must *always* be used when Kodachrome, Type A, is exposed by daylight. It is also used with the black-and-white films under some light conditions; see the exposure guide.

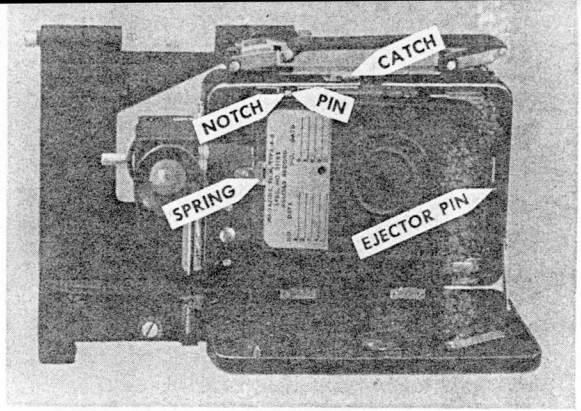
WINDING

5 To wind the periscope camera, raise the winding handle, fit it over the shaft and turn the handle clockwise until the spring is wound.

LOADING

6 Raise the catch on the top of the camera and slide it to the left as far as it will go. This unlocks the door. Open the door by pulling its top edge away from the case.

Slip the magazine of film into the camera, sliding the end with the label under the spring and bringing the pin on the edge into the notch. The right-hand end of the magazine will be slanting outward because it is resting on the ejector pin. Close the door of the camera and slide the



catch to the right *as far as it will go*. This locks the cover and opens the aperture in the magazine.[1]

The magazines of film are interchangeable. If the situation requires a type of film other than that already in the camera, the partially exposed film can be immediately removed and replaced with the desired type.

FILM METER

7 Each magazine of film has a film meter which automatically registers the number of feet of *unexposed* film in the magazine. The meter is visible through the window in the side of the camera.

The motor can be operated after film has been expended, therefore the meter should be checked occasionally while exposures are being made.

[1] If the catch is left at the intermediate "LOCK" position, both the cover *and* exposure lever are locked. Never leave the catch in the "LOCK" position when the camera is mounted on the periscope.

OPERATION

8 Before taking pictures, be sure these steps have been taken:

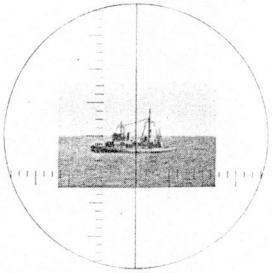
1. The periscope diopter setting is at *true zero*. See section 2, page 3.
2. The camera is fully wound.
3. The camera is adjusted for the correct camera speed and the proper film is loaded in it, as indicated by the exposure guide.
4. The correct filter is in position.

Slip the ring on the release cable over the thumb of the right hand. Grip the periscope handles in the normal manner. Pull the release cable to expose film.

Form the habit of rewinding the motor after each shot whenever possible. If an occasion then arises when an exposure of some length is necessary, the camera will be wound and ready for use without delay.

COMPOSITION

9 The camera photographs only the center of the field viewed in the eyepiece, therefore it is necessary to *keep important objects centered in the field of view.*



SCENE LENGTH

10 Whenever possible, expose each scene for from 5 to 10 seconds, at camera speed 16. At speed 8, expose the scene for from 10 to 20 seconds; at speed 24, 3 to 6 seconds.

The spring, when fully wound, will run the motor for about 25 seconds at camera speed 16 (enough for from two to five average scenes).

PANORAMING

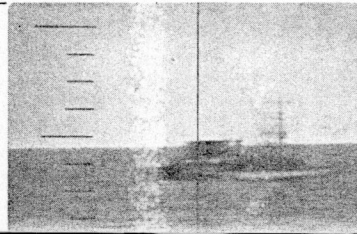
11 Panoraming—swinging the periscope through azimuth while an exposure is being made—should be avoided if a satisfactory record can be obtained by a *series* of separate, steady shots.

Never panoram at camera speed 8.

Panoraming is permissible when it is necessary to obtain a continuous record of a given scene; in this case, panoraming should be handled as outlined below:

1. Start the exposure before moving the periscope.
2. Then move the periscope *s-l-o-w-l-y* to the first point of interest and halt for another steady exposure. The rate of movement of the peri-

The picture at right illustrates the result of panoraming too rapidly. Move the periscope *slowly.*



scope should not exceed about one degree per second at camera speed 16.

3. Stop the periscope as each succeeding point of interest becomes centered in the field of view.

4. When the panoram is ended, continue to photograph the last scene for a few moments after the movement of the periscope is halted.

UNLOADING

12 When the film meter reads "0," open the camera and remove the magazine. Do not move the pin on the top edge of the magazine or some of the film will be fogged. Do not open the magazine. Replace the magazine in its container but *do not retape the container*. Place the magazine and container in the carton.

CARE OF FILM

13 The keeping properties of unexposed and exposed films are affected adversely by high humidity and high temperature. Of the two conditions, high humidity is the more serious.

Before Exposure. All film supplied for use in the periscope camera is "tropically packed," that is, sealed in containers under controlled factory conditions.

1. Store the bulk of the supply of tropically packed film in the chill room.

2. Remove film from the chill room several hours *before opening the sealed container*, to avoid excessive condensation of water vapor.

3. Several magazines of each type of film, in their sealed containers, should be kept in the carry case. This film will then be ready for use at any time.

Important: Keep the carry case in a dry place, away from warm pipes, heating units, electric lights, etc.

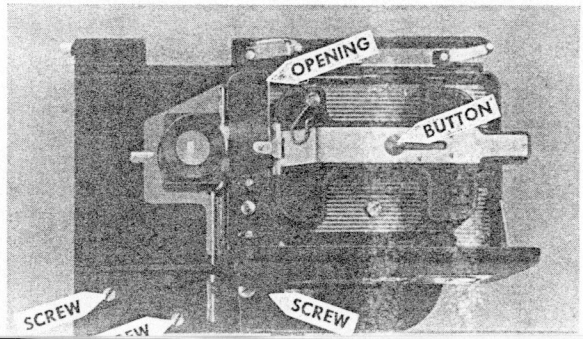
After Exposure. As soon as possible after exposure, place the exposed film in its container and cardboard carton (*do not seal the container with the tape*). Store the film in a dry place, away from warm pipes, heating units, electric lights, etc.

In general, regardless of the conditions of storage, all film should be developed as soon as possible after exposure.

USING THE FOCUSING FINDER

14 Slip the Focusing Finder into the camera in the same manner as a magazine of film, bringing the end with rectangular opening toward the front of the camera. Seat it evenly in the camera.

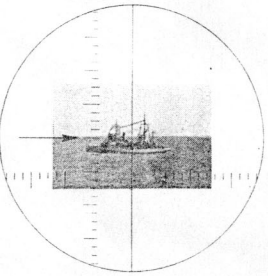
Unscrew the plug which is attached to the finder with a



chain. Insert the plug into the opening in the camera and use it as a lever to push the spring, which can be seen in the opening, toward the bottom of the camera. Do this by pushing up on the end of the plug; at the same time, draw back the catch as far as it will go toward the rear of the camera. Now replace the plug in the opening provided for it in the Focusing Finder.

Open the camera shutter by pulling the release cable. When the button is in the forward position, a circular field, showing a magnified image of the middle of the area included by the camera, is visible. When the button is in the rear position, the exact area which will be included in the picture will be shown in the finder.

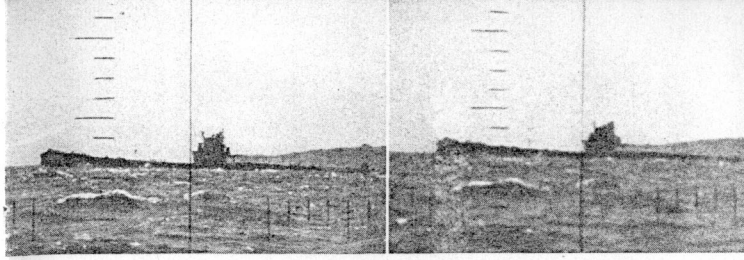
To Center the Lens. Push the button on the Focusing Finder back as far as it will go. With a screw driver, loosen the three screws shown in the illustration on page 11.



Look through the focusing finder and move the camera until the rectangular picture area is centered in the field of view. The picture area should be bisected by the vertical reticle line; the reticle line indicated by the arrow in the illustration should bisect the picture horizontally.

Tighten the screws securely.

To Determine True Zero. Push the button on the Focusing Finder forward as far as it will go and look through its eyepiece.



The picture on the left was made with the periscope diopter setting at *true* zero. The picture at right illustrates the result obtained with the diopter setting off true zero.

With the periscope adjusted for high power, turn the diopter setting until a distant object in the field of the Focusing Finder is critically sharp. The diopter setting is then at true zero. *Note or mark this setting for future reference.*

True zero may or may not be the same setting that yields the sharpest visual image in the camera eyepiece, but *it must be used when pictures are made through the periscope.*

To Remove the Focusing Finder. To remove the finder, slide the catch on the top of the camera to the left as far as it will go; then lift out the finder.

KEEP GLASS SURFACES CLEAN

15 Keep the outer prism surface, the inner lens surface, and the filter surfaces clean. *Avoid touching them with the fingers.* If the surfaces require cleaning, wipe them *gently* with lens cleaning tissue.

USING THE CAMERA TOPSIDE

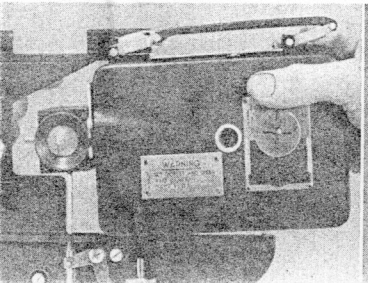
THE periscope camera is packed in its carry case completely assembled and ready for use on the periscope. However, it can be dismounted, fitted with its normal lens, and used as a standard 16 mm. motion picture camera.

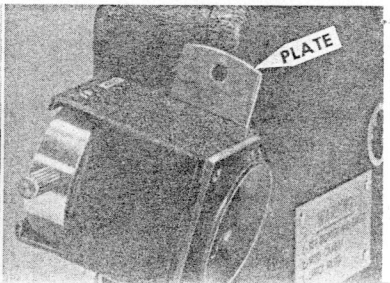
DISASSEMBLY

16 Remove the periscope camera from the periscope. Unthread the screw from the base of the camera; then lift and *slide* the camera off the adapter.

Remove the prism mount from the camera by depressing the lock pin and swinging the plate to the right. Place the adapter and prism mount in the carry case.

Attach the 25 mm. *f*/1.9 Kodak Anastigmat Lens to the camera. Insert the two pins on the mount of the lens into the slots in the camera, press the lens firmly against the front of the camera, and move the metal plate to the left until it is locked. The camera is now ready for operation.





OPERATION

17 There are several ways in which the operation of the camera topside differs from its operation on the periscope. These are outlined below:

Focus. The camera no longer has a fixed focus, but must be adjusted for objects at varying distances. Most scenes, however, will be shot with the lens set at infinity.

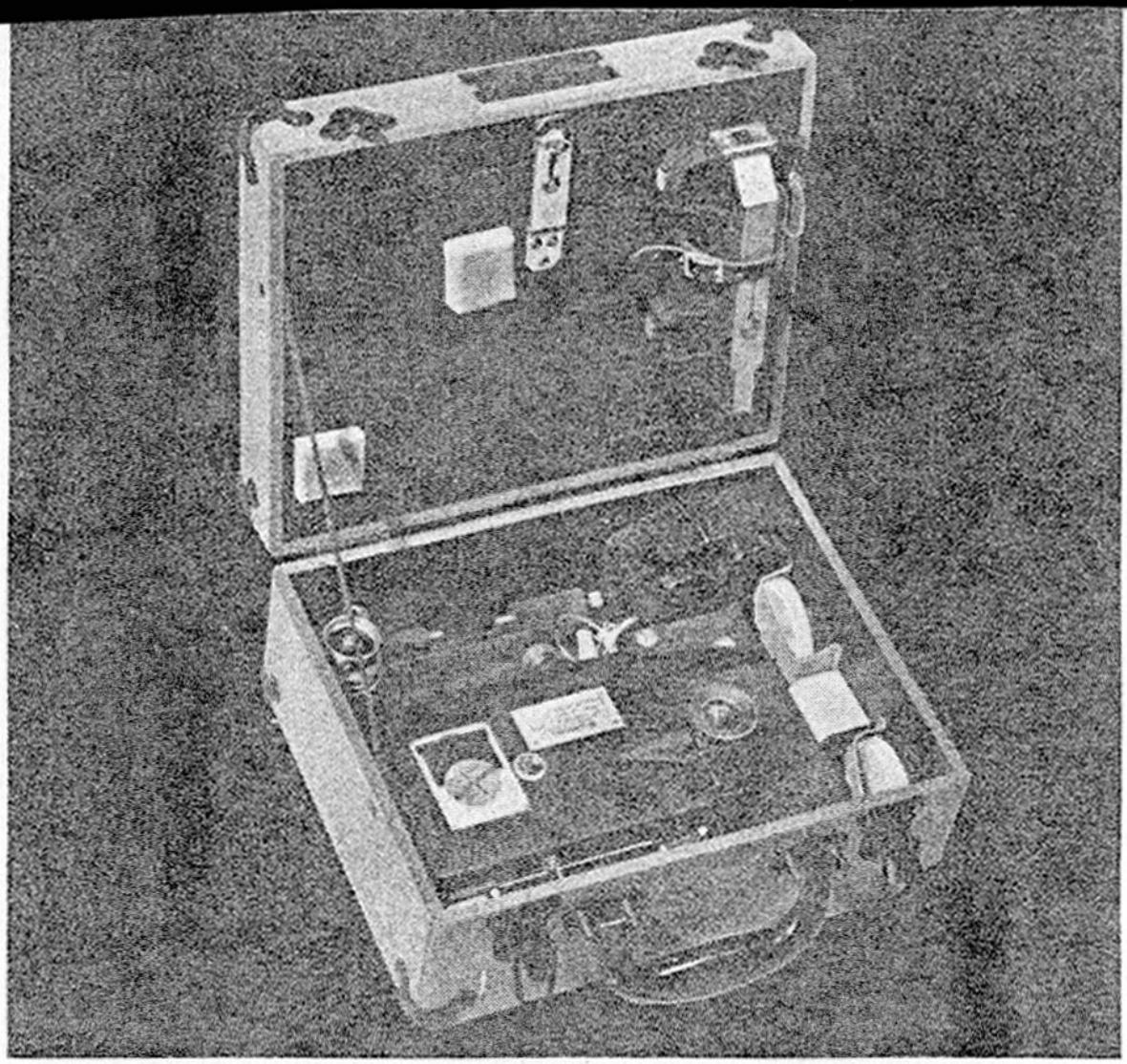
Lens Opening. The lens opening through which light passes to the film is no longer fixed, and must be adjusted for different light conditions.

Camera Speeds. Since a variable lens opening is provided in the lens, the camera speeds need no longer be used for exposure control. Camera speed 16 is usually used for normal picture making. Under conditions of unusual vibration or rolling of the ship, use speed 24.

Film. The standard lens, used at its wider apertures, passes much more light to the film and thus Kodak Negative Film can be used for most black-and-white pictures. Kodachrome, Type A (with the Type A Kodachrome Filter for Daylight, in the special W mount, on the lens), can be used under all reasonably good light conditions.

Hold Camera Steady. The camera is no longer locked in position and thus extra care must be taken to hold it as steady as possible while film is being exposed.

Complete instructions for the use of the camera off the periscope are contained in "How to Use Your Magazine Ciné-Kodak," a manual packed in the carry case.



ASSEMBLY

18 Remove the lens from the camera and replace the prism mount.

Slide the camera onto the periscope adapter, making sure the exposure lever of the camera slides under the release arm of the adapter, and tighten the screw into the base of the camera.

Always assemble the periscope camera before returning it to the carry case. It will then be ready for immediate use on the periscope.

EASTMAN KODAK COMPANY, ROCHESTER, N.Y.

4-43-A Printed in the United States of America