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A CAMERA FOR PHOTOGRAPHING BATHYTERMOMAPH SLIDES

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The instrument described here is a simple portable device that quickly produces accurate and permanent 2½” x 3½” photographic prints of bathythermograph data, both smoked slide and calibration grid being photographed simultaneously. It gives uniformly satisfactory results and has been used with considerable success at the U. S. Navy Electronics Laboratory. Both the instrument and technique are modifications of those used at present at the Woods Hole Oceanographic Institution and elsewhere.

The instrument (Fig. 1), which consists of a rectangular cabinet and camera back whose dimensions are 25 x 9½ x 7 inches, weighs only 12 pounds. In this unit both the light source and focus are fixed, and the lens opening and shutter speed can be set for optimum results. To obtain a BT slide reproduction, the slide and grid are placed in their holder, the light is turned on, a self-cocking lens is tripped, and the exposed polaroid film is removed after 60 seconds. For permanency, the print can be coated with the chemical dauber and waxing cloth supplied with the film. The prints obtained from the unit are remarkably sharp and clear with a 2.4 times enlargement (Fig. 3).

The cutaway drawing in Fig. 2 shows the composition of the instrument. It consists of: (1) a rectangular box and (2) a Polaroid Land Camera back adapted for a 4 x 5 graphic camera. The Land Camera back attaches and locks by means of sliding brackets to a Graflok back plate for a 4 x 5 graphic camera. A Wollensak “Alphax” lens (4 x 5 series IIIA, Extra Wide Angle, f/12.5, 3½ inch focus) is mounted 10½” from the back plate in a light-tight partition. This particular lens was selected because of its availability and not because it was considered optimal for the job. The self-cocking lens eliminates the need of opening the box and cocking the shutter before each picture; thus it saves both the user’s time and good nature. For this application, a shutter speed of 1/10 second and a lens opening between f/12.5 and f/17 are used.

1 Sonar Research conducted during the Period 1 July 1951–30 September 1951, Woods Hole Oceanographic Institution, References 51–90: 14.
Figure 1 (top). Photograph of BT Copy Camera Unit. Figure 2 (middle). Simplified cutaway drawing of BT Copy Camera Unit. Figure 3 (bottom). Slide reproduction obtained from BT Copy Camera.
The track for the slide and grid holder is mounted on a second partition 6\(\frac{1}{4}\) inches from the lens partition. Directly in back of this partition is a light diffusion system which consists of a piece of glass with opal coating on both sides. Behind this light diffusion system a No. 1 photoflood lamp is mounted with a switch and a cord for connection to an ordinary 110 volt A.C. socket. The top of the case contains a small door which permits insertion of the BT slide and grid holder and which allows access to the lens and the photoflood lamp. Two different slide and grid holders are necessary to accommodate the grids for all BT instruments in use at the Laboratory. Where BT data are corrected for absolute temperature and zero depth, a special slide and grid holder can be constructed to permit shifting of the calibration grid for these corrections.

Use of the BT Copy Camera has markedly increased the accuracy of interpreting raw bathythermograph data and has permitted better analysis through simultaneous examination of many different slides. It guards against loss of data by providing a method for the immediate copying of the slide while at sea, thus avoiding smudging or other damage to the fragile BT slides.

The development of the BT Copy Camera was initiated by Dr. D. A. Wilson and the actual evolution of the finished product was due to the combined efforts of F. D. Parker, E. H. Boldrick, S. N. Jara, and C. W. Stuart.