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**ECONOMICAL FLASH BRACKET FOR MACROPHOTOGRAPHY—**  
 (Note). When the macrophotographer moves into the real-life experience of outdoor photography, he finds that a portable light source is essential. Very often the subject of a potential photograph is growing in one of the darkest crevices possible, or charging about over forest floor litter without the slightest possible regard for ASA ratings, depth of focus or the photographer's sanity. Although the ringflash partially cured these problems, it is expensive, and produces a flat field effect. The mini strobe mount described below is cheaply and easily produced; it also allows a modeling effect which portrays depth, roundness and natural lighting conditions. It has proven itself admirably for everything from quick, backyard shooting to infield documentation of insects in the jungles of Costa Rica.

The cost is ca. \$6.00 and usually enough materials are left over for more than 1 mount. The mount is constructed of a piece of aluminum metal bar, screen brace, flash shoe, assorted nuts, bolts and washers (Fig. 1). All supplies should be available at a local hardware store except the flash shoe, which may be purchased at a camera store or ordered from a photo supply house. If the exact parts cannot be located, close substitutes may be used, for the general design is the important aspect.

The heart of the rig is the adjustable arm, made from a piece of 9¼" x 1/8" x 3/4" aluminum (Fig. 1). Aluminum is light weight and easy to bend and drill. Cut the aluminum bar to size and smooth rough edges. Drill one 1/4" hole in the bar at end A, centered, and 3/8" from the end. Drill a 1/8" hole in end B, 3/16" from the end and offset 1/2" from 1 side to allow proper arm articulation with the screen brace. A 90° bend is then made 5" from end B, followed by a 120° downward bend 1½" from end A (Fig. 1). This will give a slight, downward tilt to the strobe, approximating the direction of natural light. An outward 55° twist to the upright portion of the mount finishes the arm. A flash shoe with opposite screw and nut then may be anchored through the hole in end A. The shoe may be swiveled and tightened as needed. The 2½" screen brace may be prepared by drilling a ¼" hole at its apex and hammering out any ridge along the edge within 1" of the drill hole; this allows the screen brace to lie flat between the camera and pistol grip. End B of the arm may then be attached to the brace with the

6/32- $\frac{1}{2}$ " bolt, lockwasher, washer and wingnut. The brace is then placed between the camera body and a suitable pistol grip; next, a mini strobe is slipped into the shoe and the components are adjusted to throw light on the subject. Mini strobes are now available for under \$20 and may be operated on rechargeable AA size batteries.

Correct exposure with this flash bracket is best determined by calibration. After shooting a test roll of ASA 64 daylight film at a variety of carefully recorded f-stops, I know exactly which one to set it on using my particular lens and strobe. For example, using a 55mm lens plus 79mm of extension tube for magnification, and a mini strobe with a guide number of 49 (feet, ASA 50 film), I can shoot at f/16. Changes in either lens, type or length of extension tubes or bellows may necessitate changes in the f-stop, and is best determined by calibration. The differences are generally minimal and easily remembered. Once the calibration process is completed, continue to shoot with the same ASA rated films to get consistent results. Bracketing, that is, shooting  $\frac{1}{2}$  stop above and below the setting, is recommended in all situations for best results. This variation in exposure allows compensation for fluctuations in ambient light levels.—Dwight Bennett, Department of Entomology and Nematology, University of Florida, Gainesville, Florida 32611.

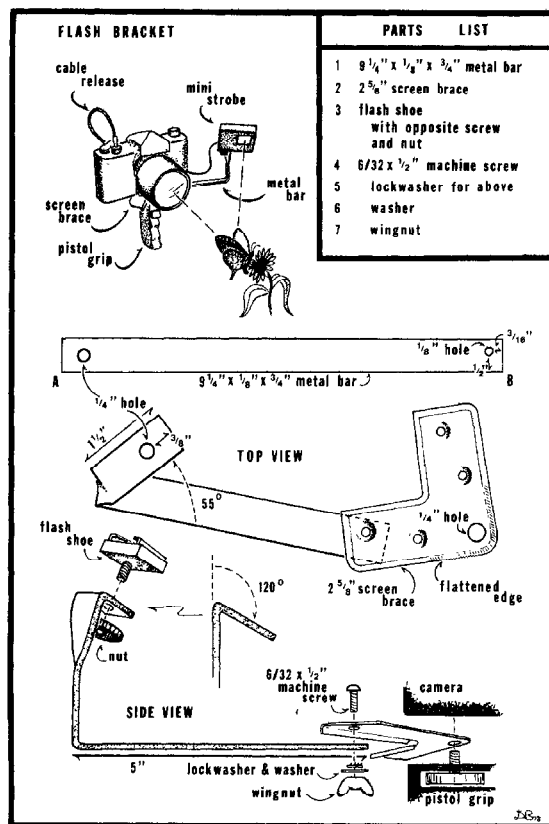


Fig. 1. Diagram and construction details for constructing a flash bracket for macrophotography.