# TECHNIQUE FOR PHOTOGRAPHING SMALL FISH

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A variety of techniques have been developed for photographing small live fish (Cruise and Newman, 1973:22-55; Kinne, 1962:139-159; Thomas, 1978a,b). Photographs of fish have been used for many purposes, including estimating weights (Christensen et al., 1977; Hawkes, 1975) and lengths (Martin, 1967). The recent development of a fiber-optic light-sensing device, the Vivitar MFS-1 Macro Flash Sensor, coupled with the Vivitar 2500 electronic flash, offers an equipment combination that consistently produces high-quality photographs of live fish.

The equipment includes a modified aquarium 41 x 26 x 20 cm, a Pentax $H_3V$ 35-mm single-lens reflex camera, a Vivitar 55-mm 1:2.8 Auto Macro lens, a pistol grip, a Vivitar 2500 electronic flash, and a Vivitar MFS-1 Macro Flash Sensor. The camera and macro lens need not be those specified above. Only Vivitar Corporation, however, produces a commercially available fiber-optic light-sensing device for use with a compatible flash unit and a 35-mm camera.

For taking photographs with this equipment, I modified a 1.6-L O'Dell aquarium so that a piece of single-strength window glass (39 x 24 cm) could be placed behind the front glass of the aquarium. Two grooves were filed in the recessed plastic rim at the top of the aquarium about 5 cm behind the front glass and the piece of single-strength glass was slipped into the grooves. The angle is such that this piece of glass sits on the joint between the bottom and the front glass of the aquarium, creating a chamber that tapers to 5 cm from the front at the top of the aquarium. The temperature and chemistry of the water should be the same in this aquarium and in the tank where fish are held before being photographed. A flat black background (either card stock or plastic) provided the most suitable background for photographing most species; the background material can be taped to the outside of the back of the aquarium. The photo cell described by Goodbred and Occhiogrosso (1979) can be used instead of a modified aquarium.

The phtotographic equipment is assembled as follows:

*Couple the macro lens to the camera body (extension tubes or bellows can be used instead of a macro lens).

*Attach the camera-lens combination to the pistol grip.

*Attach the flash swivel shoe (provided with the MFS-1) to the mounting bracket on the pistol grip.

*Attach Vivitar 2500 flash to the swivel shoe and lock the flash unit to the shoe.

*Using the adjustable swivel shoe, adjust the flash unit so that it points to a spot about 5 cm in front of the lens and the flash unit so that it is at about a 45° angle to the focal plane of the camera (this angle reduces the possibility of flash reflection).

*Pull out the adjustable head on the flash unit until the letter "N" appears in the lower left of the window on top of the flash unit. This head has three positions (W, N, and T) that correspond to wide-angle, normal, and telephoto settings.

*Connect the PC cord (provided with the MFS-1) to the X connection on the camera body and to the receptacle on the lower part of the flash unit.

*Set the mode selector switch on the back of the flash unit to the blue,automatic-exposure mode.

*Turn the "on-off" switch on the back of the flash unit to the "on" position. A red light on the back of the flash will be illuminated when the capacitor is charged.

*Set the white line on the film-speed indicator switch in the window on top of the flash to the proper ASA film speed for the film you are using.

*Set the shutter-speed indicator on the camera to the recommended setting for electronic flash (on many cameras, this is 1/60 s. or is marked with an "x").

MFS-1, the Macro Flash Sensor, is a shielded fiber optic, 30 cm long. The sensor snap couples to the Auto Thyristor Sensor on the front of the flash and the sensor heac clips to the top edge of the macro lens. For optimum results, adjust the sensor head so that it points down at an angle of about 45° The sensor will then read the light at a point about 5 cm in front of the end of the lens with the MFS-1 in place, and the flash will automatically adjust the light output to obtain a satisfactory exposure.

The manufacturer's instructions state that the lens should be stopped down four stops to obtain a proper exposure with the sensor coupled to the flash. I have found that it is also advisable to bracket one full f-stop on both sides of the adjusted f-stop number. For example, if the automatic exposure guide on top of the flash unit calls for a normal exposure of f/2, the lens should be stopped down to f/8, and exposures should also be made at f/5.6 and f/11.

When coupled with the Vivitar 2500 electronic flash, the MFS-1 Macro Flash Sensor enables consistently reliable, high-quality photographs of small and juvenile fish to be taken under a variety of field and laboratory conditions. The equipment is lightweight and portable, and the flash recharges in less than one second. The Vivitar 2500 electronic flash costs about $50; the MFS-1 Macro Flash Sensor, with swivel shoe and PC cord, generally costs about $25, and a pistol grip costs about $25.

## References

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