

F. Sax

# fish feeder

The care of aquaria during holidays can be something of a problem. However the device described here will overcome this problem by automatically dispensing the required quantity of feed each day. The system consists of a light-operated circuit which controls the actual feed dispenser. This senses the change from darkness to light at daybreak each morning, and activates the feed dispenser.

The store of dried feed is held in a trough with V-shaped sides (figure 1). At the bottom of the trough is a cylindrical container which runs the length of the trough, and which has one side cut away. This cylinder is driven, via a reduction gear, from a small model motor. As the container rotates it will fill when the open side is uppermost, and empty into the aquarium as it rotates. The number of revolutions made at each feeding session, and hence the amount of food delivered, is controlled by the electronic circuitry. A cowl at the bottom of the dispenser prevents splashing caused by the fish or the aerator from making the feed sticky and thus clogging the dispenser.

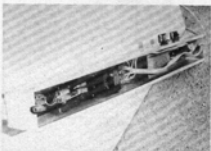
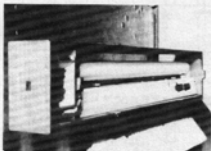
## The circuit

In figure 2, T1 is an emitter-follower whose base potential is controlled by a light dependent resistor R1 and a potentiometer P1. This is followed by a Schmitt trigger, T2 and T3, which has a large degree of hysteresis. This drives T4 via R9 and zener diode D2. During dark-

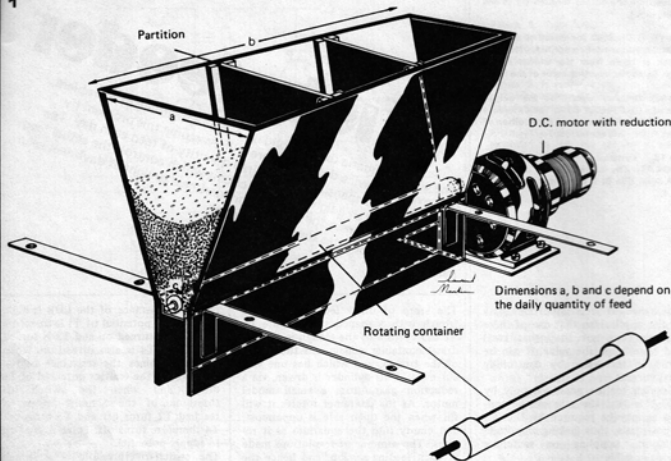
ness the resistance of the LDR is high. The emitter potential of T1 is therefore high, T2 is turned on and T3 is turned off. Hence T4 is also turned on. When daybreak comes the resistance of the LDR drops, the emitter potential of T1 drops, and when the switch off threshold of the Schmitt trigger is reached T2 turns off and T3 turns on. T4 therefore turns off. Point A goes up to supply potential.

The switch-on threshold at daybreak can be adjusted with P1. The hysteresis of the Schmitt trigger is so great that even large brightness variations during the day will not cause spurious triggering. However, care must be taken to ensure that the LDR is screened from room lighting so that spurious triggering does not occur in the evening. The motor control circuit is shown in figure 3. When T4 switches off at daybreak, T5 turns on. This shorts out the base of T6 through C2, and T6 turns off until C2 has charged sufficiently through R15 and P2 for T6 to turn on again. During this time T7 and T8 are turned on and the motor runs. The charging rate of C2, and hence the motor running time, can be adjusted by P2. In the evening when T4 turns on, T5 turns off but this does not affect the state of the following stage, so no feeding occurs.

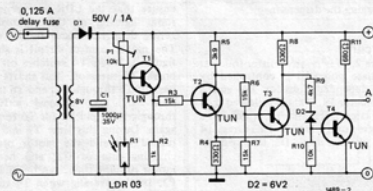
If the fish feeder is to be used other than at holiday times the triac switch of figure 4 may be used to control the aquarium lighting. It is important to include C3 across the choke of the fluorescent tube to avoid high voltages being applied to the triac. If the lighting circuit is connected to the automatic feeder it is imperative to ensure that the finished construction is adequately insulated as the ground connection of the fish feeder is connected to the mains neutral. No part of the circuit should be accessible, and in particular the motor should be insulated, including the drive shaft. Potentiometer P2 should have a plastic shaft, and the whole assembly should be mounted in a plastic box, with no metal protrusions.



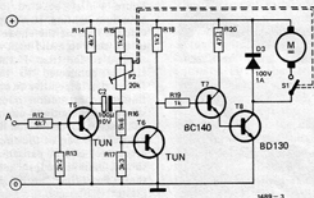
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### Construction of the dispenser

The dispenser is probably best constructed of clear acrylic sheet, so that the level of food may easily be seen. This may be glued together with acrylic cement. Motors with suitable reduction gearboxes can be obtained from most model shops.

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