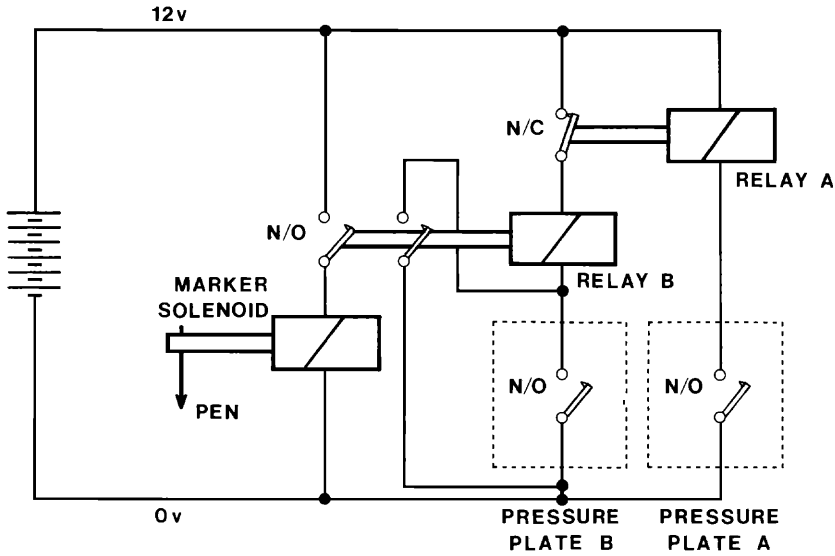

FIGURE 3. Circuit diagram of apparatus for monitoring the nest visits of burrow-nesting birds (N/O = switches normally open; N/C = switches normally closed).

powered by a 12-volt battery which lasted about 10 days without recharge. A dissecting needle attached to the marker-solenoid was used as a pen on the pressure sensitive paper. A light spring kept the pen depressed so that it made a continuous trace across the paper on the drum. As a bird entered the burrow and walked over both pressure plates, the pen made a mark on the chart and only returned to its original position once the sensor had been reactivated as the bird left the nest.

This automatic monitoring system proved reliable and occasional cleaning of the contacts on the sensor was the only maintenance required. The clockwork chart-drum was very satisfactory and kept the total cost of the recorder and sensor to under $200 (1982 prices). The system obviously has wider application than just tunnel-nesting birds and could be used for recording the passage of any animal which uses a regular pathway.

I wish to thank K. Achleitner for his technical advice. Financial and logistic support was provided by the South African Department of Transport, Antarctic Division.—MICHAEL SCHRAMM, *FitzPatrick Institute, University of Cape Town, Rondebosch, 7700, South Africa.* Present Address: *Zoology Department, University of Transkei, Private Bag X5092, Umtata, Transkei.* Received 16 Apr. 1981; accepted 13 Sept. 1982.

A Radio-Control Method for Trapping Birds in Nest Boxes.—Perhaps the most exasperating part of any study of box-nesting species is capturing a specific individual for marking. We found conventional methods unsatisfactory in trapping specific individual Starlings (*Sturnus vulgaris*) and Tree Swallows (*Iridoprocne bicolor*). Here we describe a radio-controlled trap designed in response to this problem.

This design is a modification of trap designs developed by Kibler (EBBA News 31: 167–173, 1968) and Dhondt and VanOutryve (Bird-Banding 42:119–120, 1971). A hinged door is attached to a modified nest-box lid (see Fig. 1). The door is held against the lid by a servomechanism. When the servomechanism is activated by a radio signal, it moves downward, releasing the door, which swings into place blocking the entrance. The captured bird is removed by blocking the hole from the exterior and removing the lid. The

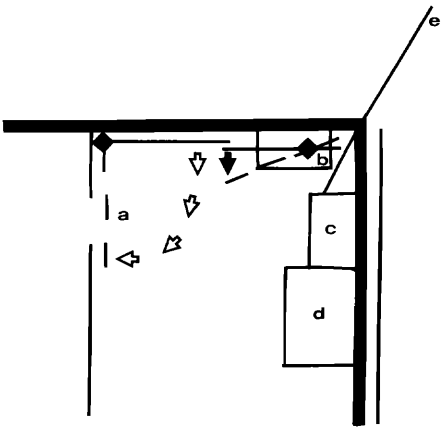

FIGURE 1. Nest box with radio-control trap: (a) hinged door, (b) servomechanism, (c) radio receiver, (d) power source (4 AA, 1.5 V batteries), (e) radio antenna. Open arrows indicate direction of door movement. Solid arrows indicate direction of servomechanism movement.

radio signal emanates from a transmitter normally used to operate model airplanes. The radio receiver, its power source (4 AA, 1.5 V. batteries), and antenna are attached to an extension of the lid that projects into the cavity of the box (Fig. 1). The trap can be activated from as far away as 300 m.

Initial cost of construction was about $120 in 1981. Previous to our use of this trap it was very difficult to capture breeding males—and many studies suffer this inadequacy. The ease with which breeding male Starlings and Tree Swallows were captured in 1981 and 1982 justified the cost.

In 2 years of operation the only parts that have required replacement have been the transmitter and receiver batteries. While the transmitter's batteries are used only during trap release, the receiver's are in continuous operation during a trapping attempt. We found battery life to be over 10 h in receivers. Most birds have been caught in less than 15 min.

The advantages of this system are (1) unlike that of Dhondt and VanOutryve (1971), this system does not require wires running to and from the box, thus decreasing set up time and the camouflage of trap components; (2) unlike Kibler's (1968), this system is entirely portable, e.g., when a bird is to be captured, the lid of its nest-box is replaced by the modified lid; (3) it allows some individuals unlimited access to a box until the targeted bird enters the box; (4) its design is easily modified for any shape or size box (we have used 5 different designs); and (5) it is easily constructed, operated, and maintained.

We used the MRC Guidance System 2000 manufactured by the Model Rectifier Corporation, 2500 Woodbridge Avenue, Edison, New Jersey 08817. This system contains enough parts for constructing two traps. Any comparable system will work equally as well.

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