A RADIO-CONTROLLED TRAP FOR BLUEBIRDS AND OTHER HOLE-NESTING BIRDS

By Dr. Lewis F. Kibler

For the past four years I have conducted a Bluebird nest-box project of approximately forty boxes. During this period I have tried to carry on the routine activities of making pertinent observations, keeping records and banding both young and adult birds with a fair degree of faithfulness. But finding time to do this has been a problem. Improving the efficiency of my activities therefore has been of interest to me.

The most time-consuming effort has been the capturing of the male Bluebird. The young almost always can be banded without difficulty. The females, in the past, also have been banded without much difficulty because they usually can be caught by hand on the nest. I would like to mention, however, that this year I have discontinued hand-trapping females on their nests. I have been able to associate three desertions with hand-trapping. Although I had suspected that hand-trapping on the nest during the incubation could cause desertion I have never followed the nest closely enough to be certain of the relationship between the trapping and the desertion. In these three cases approximately 36 hours after banding, the clutches (each at about mid incubation) were cold and the birds were gone from the vicinity. The nests and eggs were intact. All three were protected by cone-type predator guards so that the adults probably had not been disturbed. No catastrophic weather factors such as snow or sharp temperature drop had occurred which might have caused desertion. Until found otherwise, then, it would appear that the desertions were caused by my hand-trapping.

There is the possibility that the birds of my latitude (42 degrees) with relatively inclement spring weather may have a lower threshold of desertion. From the south Laskey (1939) reported that the brief handling necessary for banding her hand trapped birds caused no desertions in 104 nesting Bluebirds. The next year (1940) she reported that, "In three or four instances, desertions may have been caused by the trapping of the brooding bird..." in a series of 133 nestings in Tennessee. My three desertions out of eight hand-trappings this season reflect a considerably higher desertion rate than is reflected in her figures. As a result of my no longer hand-trapping one might expect that the time needed to band would be greater and that the proportion of birds banded would be less, but this has not been the case. More of this later.

The male Bluebird has been the most difficult for me to trap. A review of trapping results of other banders suggests that they too have had difficulty. There are several reasons for this. The male does not participate in incubation. His custom is to feed the young from outside the nest box as soon as they can reach the hole rather than regularly entering the box as does the female. He is generally more cautious near the box.

Laskey (1952) reported trapping 432 Bluebirds from 1938 through 1950, almost every one of which was a female. Schreiber (1938) banded 16 birds out of 103 nestings, all females. Krug from 1936 through 1939 banded only one male and 65 females out of 125 successful nestings. Low (1934) obtained adult male Bluebirds with traps and nets but implied that he had difficulty. He did not give figures. In Ruth Thomas' (1946) three year sutdy of three Bluebird territories in Arkansas she banded 23 adult females and 16 adult males. She lured the males to traps with chopped raw peanuts. The females were caught on their nests.

If these reports had included the ratio of birds trapped to the total number of birds which might have been trapped, they would have been more meaningful. In effect, the number of males which might have been trapped is the same as the number of pairs which establish nests in the nest-boxes of a given time period. Such a figure would indicate the completeness and/or intensity of the banding program and thus give perspective to any conclusions derived from the data. With this in mind a retrograde glance at my records reveals that in the first year 11 males were banded representing 46% of the males possible to band. For the second, third and fourth years the results were 50, 6.7 and 25 percent of the males possible to band representing, respectively, 23, 3 and 14 birds.

Trapping during the first nesting season of this year has resulted in the capture of 18 (100%) of the females and 13 (72%) of the males. The five males not banded deserted before an attempt was made to capture them. Three of them were paired with the deserting hand-trapped females mentioned earlier; two abandoned their nests, one after the young died and the other after predation of the eggs. If I had not precipitated the three desertions my results would have been 16 males banded or 89%. These figures represent a considerable improvement in the percent trapped this year but they do not show the improvement in trapping time which has come about. I have no data to demonstrate it but I would estimate that it has taken only about one-quarter the time to trap this greater proportion of males and females that it has taken in prior years.

This brings us to the main purpose of this paper which is to present an effective system for trapping adult Bluebirds with almost no risk of causing desertion and with a good potential for banding all of the birds concerned. The basis of the system is a shutter which closes the nest-box hole when its release mechanism is activated by a radio signal transmitted by the bander. The system may be further enhanced by several refinements in technique which will be described later.

The shutter (A - see figures 1 and 2) may be any flat weather-resistant material about 3/16 inch thick, and long enough so that when in position on the box, one end will be able to drop down across the nest-box hole while the other end will project laterally beyond the side far enough to receive the release rod (J). The shutter is rectangular in

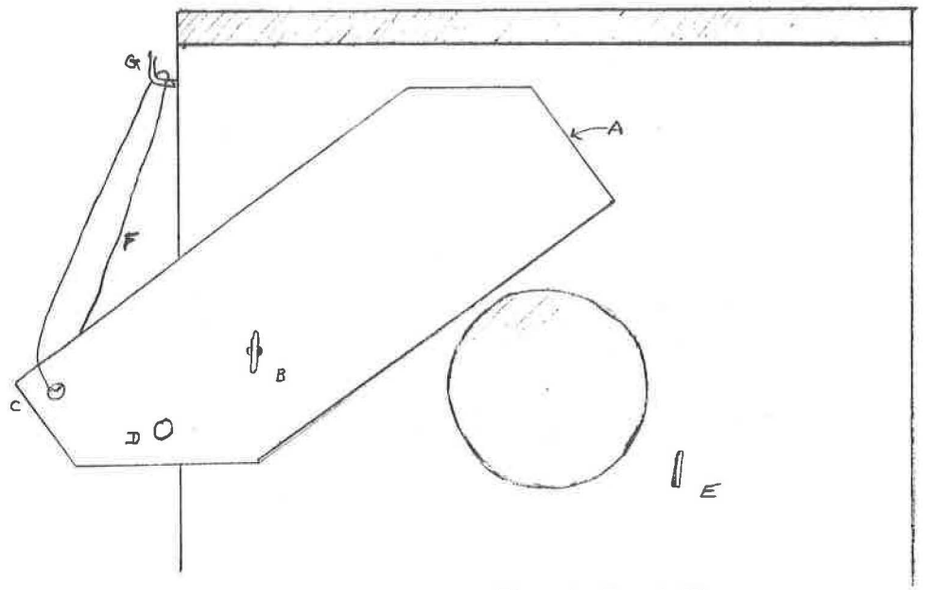

Fig. 1: Front View

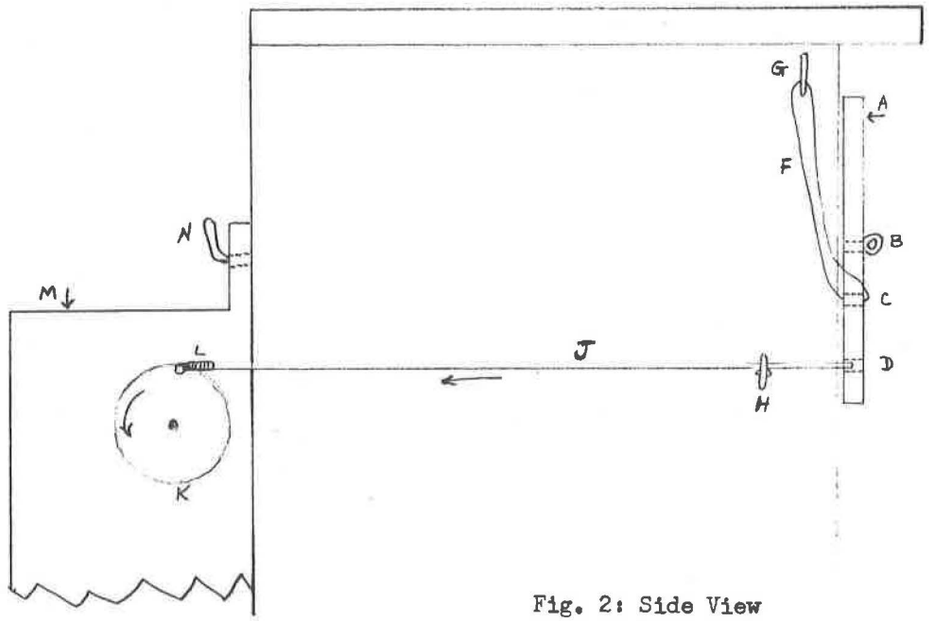

Fig. 2: Side View

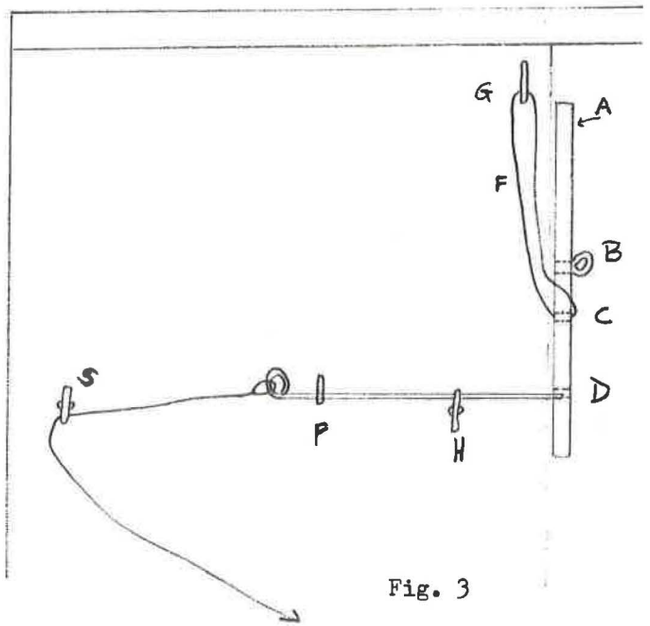

Fig. 3

shape with two opposite corners removed. The upper corner on the hole end is removed so that the shutter, in the set position, will neither impinge against the overhang of the roof nor cover part of the nest-box hole. The lower corner of the laterial end is removed so that it will clear the release rod faster. Three holes approximately 3/16 inch are drilled in the shutter. Through the most central hole (B) passes an eye-screw which acts as a pivot for the shutter. One lateral hole (D) received the release rod; the other (C) receives a rubber band (F) which serves as the activating mechanism for the shutter. An angle-screw (E) is placed just beyond the nest-box hole at about five o'clock to stop the shutter in front of the hole and hold it against the hole should the bird try to push it away from inside. Another angle-screw (G) is mounted on the side of the box above the hole in the shutter receiving the rubber band. The free end of the rubber band is slipped over this angle-screw to set the trap.

The release mechanism is mounted on the back and side of the nest-box. It consists of a small battery-powered motor which, upon activation by a radio signal, withdraws the release rod from hole (D) allowing the rubber band to pull the laterial end of the shutter upwards pivoting the center end down across the nest-box hole. The release rod is held in the set position by an eye-screw at point (H). One end of the rod is mounted on

the edge of a small wheel (K) driven by the motor so that as the wheel revolves it draws the rod backward and downward pulling it out of hole (D). This allows the rubber band to contract, pivoting the shutter. The wheel continues to turn completing the revolution thrusting the rod forward again. This explains why the lower lateral corner of the shutter has been remove to improve clearance. The motor is designed so that it revolves only once and then stops until reactivated by the radio signal. The radio signal which activates the motor is transmitted from a small portable box with a collapsible aerial on it, an off and on switch, and a button for sending the signal at the proper moment.

The unit containing the motor, the radio signal receiver and the batteries to power both is a 2"x2"x8" box fashioned from masonite. It is suspended from the rear of the nest-box by an angle-screw (N). Five AA batteries are required, two for the receiver and three for the motor. I have found that by adding one more battery in the series with the other two receiver batteries the radio signal transmission is considerably improved. The release rod length can be varied by screwing it in or out of the connector (L) which holds it to the motor wheel (K). This gives some adjustment in case the dimensions of the various nest-boxes are different.

When first applied the trap must be tailor-fit to each box to get the eye-screw and angle-screws in the right positions but after the initial mounting it is just a matter of a minute to set the trap. On boxes where there is not enough clearance between the hole and roof to place the shutter, the mounting can be reversed so that the shutter swings up from below. However, this is less desireable because the time it takes for the Bluebirds to become accustomed to it is longer. They normally cling to the lower part of the hole and prop their feet and tail against the place where the shutter would rest if mounted this way.

The radio components for this trap may be purchased or ordered from most hobby shops carrying model airplane supplies. The transmitter, receiver and motor are used by model enthusiasts for controlling their airplanes in flight. A list of the components used in my unit is appended below. The total cost comes to approximately $65 but it is possible to reduce this to approximately $35 by using other components. One possibility is the substitution of an inexpensive solenoid unit for the motor unit. The hobby shop proprietor can offer advice on this matter.

The chief advantage of this trap is that the bander can withdraw far enough from the nest-box so that the adult birds waste no time in reentering the box yet a minimum of time-consuming preparation is needed to do this. No tangled balls of string, thorn bushes, etc. to worry about.

There are a number of secondary procedures and devices which help to make this a relatively efficient system for trapping, and these are enumerated on the following page.

1. To begin with, my nest-boxes are constructed so that the hole is at least eight inches above the floor. With deeper boxes it takes longer for the young to mature sufficiently to reach the hole to receive food. The male is thus forced for perhaps a week longer to enter the box, and the bander has more chance to trap him inside the box.

2. The boxes are placed so that some part of the entering bird may be seen from a car parked 200 to 400 feet away although the operating range can be over 1,000 feet. At this distance binoculars are a help in distinguishing sexes. Birds nesting near human habitations may enter a box with the bander just 30 feet away. The birds are usually less suspicious of an automobile than an exposed person and return to the box much sooner. The aerial of the transmitter should project out the car window but must not touch the metal of the car or it will not transmit.

3. The shutter is mounted some time before attempting to trap in order to permit the Bluebird to become accustomed to it. I have a number of identical shutters so that one may be mounted on several boxes at a time. The shutter is held in position during this period by turning the eye-screw pivot tight. This is important because weather conditions can cause the materials to contract allowing the shutter to loosen and drop down across the entrance hole, isolating the young from the parents. This accidental closure may further be prevented by stretching a rubber band to an angle screw mounted below the shutter.

4. After setting the trap and before withdrawing to a distance the trap should be set off once to test whether it is working. It is easy to forget to turn the radio receiver on or the switch may be only partially on or the tension of the rubber band may be too tight so that the motor cannot release the rod.

5. In the afternoon most Bluebirds slow down the feeding of their young. They may go off for an hour at a time. For this reason I plan to trap in the morning, later afternoon or early evening when they are feeding more actively.

For those who prefer not to become involved with the intricacies of radio transmitters, batteries and receivers, etc., this trap may be activated by a pull string with slight modification (see figure 3). In place of the release rod a three to four inch straight piece of coat-hanger wire is used. One end of the wire is placed into the shutter hole (D) to set the trap; the other end is bent so that a piece of string may be tied to it. The string is passed through an eye-screw (S) mounted an inch or so behind the loop and then goes to the bander's hand. The tension of the rubber band on the shutter will tend to lift the end of the wire as it projects into its hole in the shutter. To counteract this an angle-screw (P) is mounted in line with the wire and just under it. With this setup a pull on the string will cause the wire to withdraw from the hole (D) and

the shutter will snap down over the hole. Since there is always a chance for mechanical failure, I carry with me a ball of string and the small piece of wire described above. So far I've not had to use them.

I would like to thank Mr. Earl Smith of Groton, Conn., for his helpful suggestions in the design of this trap.

COMPONENTS

Transmitter: Mark II Mule (all transistorized 9 volt one channel tone transmitter)

Receiver: Controlaire 4. Receiver and transmitter from:

Controlaire Electronics Division
World Engines, Inc.
8206 Blue Ash Road
Cincinnati, Ohio 45235

Motor: S-103 rudder servo. From:

Ogawa Model Mfg. Co. Ltd.
83 Hiranobaba, Higashisumiyoski
Osaka, Japan

Release Rod: Du-Bro Dura-V-Link (at hobby shops)

LITERATURE CITED

Krug, H.H. 1941. Bluebird Banding at Chesley, Ontario. Bird-Banding, 12: 23-26.

Laskey, A.R. 1939. A study of nesting Eastern Bluebirds. Bird-Banding, 10: 23-32.

Laskey, A.R. 1940. The 1939 nesting season of Bluebirds at Nashville, Tennessee. Wilson Bulletin, 52 (3) 183-190.

Low, S.H. 1933. Notes on the nesting of Bluebirds. Bird-Banding, 4: 109-11.

Schreiber, E.D. 1938. Bluebird 'Better Housing' project. Migrant Mar. 1938.

Thomas, R.H. 1946. A study of Eastern Bluebirds in Arkansas. Wilson Bulletin, 58 (3) 143-183.

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