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Radio Controlled Bow-net for American Kestrels

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American Kestrels (*Falco sparverius*) are, in general, a relatively easy raptor to trap. But, there are certain individuals that do not respond to some types of traps. If one type of trap does not elicit a response another may be effective.

During a color banding study conducted on American Kestrels I found that it was imperative to trap each individual on every territory in the study area. Normally a bal-chatri trap with domestic house mice (*Mus musculus*) is effective (Berger and Mueller 1959), but some individuals are extremely wary of some types of traps. These wary individuals must be trapped in other ways. I have used a Great-horned Owl (*Bubo virginianus*) with a mist net (Hamerstrom 1963), a bal-chatri trap with House Sparrows (*Passer domesticus*) instead of mice, House Sparrow with a harness (Toland 1985) and an automatic bow-net with house mice (Tordoff 1954). There are some individuals that simply do not respond to any of these traps. They seem to prefer sparrows but the bal-chatri with sparrows still seems suspicious to some individuals. Kestrels respond well to a harnessed sparrow but my success rate of ensnaring them is very low. A sparrow with an automatic bow-net might work well but the sparrow would set off the trap as it was attempting to escape.

To circumvent the problem of a sparrow setting off the bow-net trap, the release device can be radio controlled (Meng 1963). There is still a problem, however, in that the sparrow is extremely active for a few minutes then rapidly becomes exhausted. It may be quite some time before the kestrel returns to its nest vicinity and this very still sparrow provides no attraction for the kestrel. The solution is to put a box over the sparrow so it remains quiescent until the kestrel is near and then remove the box so the sparrow is exposed and still fresh. To do this, the box removal must be radio controlled.

The basic design of the bow-net is from Tordoff (1954) and should be built to his specifications. The trap has measurements that are approximately 3 feet long and 2 feet wide. The bow that pulls the net over the kestrel is approximately 17 inches tall. The net can be of any suitable material. I use a fishing net with 1 inch squares from an army surplus store. Part of a mist net

can be used but the mist net can become easily entangled in anything protruding from or near the trap; stay away from a mist net if at all possible.

The mechanisms for the release of the box that houses the sparrow and the release of the bow are as follows:

1. Following the diagram, servo motor #1 pulls steel piano wire #1 in the direction indicated on diagram labeled TOP VIEW.
2. Steel wire #1 pulls out through the tubular brass which releases swivel #1. Swivel #1 is quickly pulled away from tubular brass by rubber band #1.
3. String #1 is also attached to swivel #1 and is quickly pulled toward right side of trap which in turn quickly pulls piano wire #2 out of the second set of tubular brass.
4. This releases swivel #2 and rubber band #2 which pulls swivel #2 and string #2 and the box off the end of the trap.
5. This exposes the sparrow and it will try wildly to fly away. When the kestrel sees a sparrow that looks as if it is in trouble, the response is often very quick.
6. Once the kestrel is on the trap, servo motor #2 is activated which pulls steel wire #3 out of the tubular brass. This releases the bar that holds the net.
7. The net is released and you have a very upset kestrel in the trap.

There are some things to remember when using this trap. First, a piece of paper must be put on top of each servo motor; the net folds on top of the servos and will become entangled in the servo arm which will prevent full release of the bow and net. The paper I use is from a grocery bag. Next, the box should be painted a drab green or brown; then glue a thin layer of dirt on it. The tubular brass that fits under the box should give a relatively tight fit so the sparrow cannot escape. The sparrow should be tied by one of its legs with about 3 inches of movement with fishing line. The sparrow is rarely killed but after being grabbed once by a kestrel they are reluctant to fly on succeeding attempts to trap kestrels. They just sit still when the box is released; have fresh sparrows on hand!

Paint the whole trap with drab green and brown paint to camouflage it and cover the trap lightly with dirt and weeds once it is set up to trap. Be sure to attach a

2"x2" piece of wood under each end of the trap to elevate the trap because the servo motors project below the trap. A sheet of plywood is stapled to the underside of the welded wire. Cut two square holes, in the plywood, slightly larger than the servo motors and screw the servos in place. The receiver and its battery should be put in a small box and the box painted. The wires go through a hole in the box and attach to the servo motors. The box is set on the ground near the release bar and covered with vegetation. The brass tubing should be 3/16" in diameter and soldered to the welded wire. The swivels are the swivel part of a snap-swivel used for fishing gear.

There are two sets of wires coming from the receiver box that plug into the sets of wires coming from the two servo motors. Plug these wires into the servos. Turn on the transmitter and push the lever for channel one. This will move one of the servos. This servo will operate either the release of the box or the release of the net. Attach a piece of tape to the set of wires coming from the receiver and from the servo and mark the tape either "box" or "net", whichever is appropriate. Now, label the transmitter (on the transmitter box) either "net" or "box", whichever is appropriate. Do the same with the second channel. In this way, you can always plug the correct servo into the correct receiver channel. This is important. You do not want to release the net when you intended to release the box.

Most of the radio controlled equipment will transmit at least one mile, line of sight. This is much more than is needed since you need to be able to see the trap clearly (at least through a scope) to know when to trap the kestrel. The transmitter should be off until you need to use it, to save batteries and also to avoid any radio interference setting off your trap prematurely. Make sure that if you are sitting in a car that it is not running when you have the transmitter turned "on". Many car ignition systems will cause your transmitter to send a signal and the box and net will release. Any radio controlled airplanes or RC cars in the area may set off your trap. The sequence of events is as follows:

When the kestrel flies into the area and lands, turn the transmitter to "on" and press channel 1 (or channel 2) to release the box. Immediately turn the transmitter switch to "off" because it might take a few minutes for the kestrel to respond and you do not want any stray signals to set off channel 2. When the kestrel starts to go down for the sparrow, turn the transmitter to "on". When the kestrel grabs the sparrow, push the lever for channel 2 and the bow pulls the net over the kestrel.

Most of the parts to convert the bow-net to radio control can be purchased at a hobby store. The radio control and servos are standard for radio controlled airplanes. The swivels can be purchased at a store that sells fishing supplies. The list of parts sizes is in Table 1. The trap may seem complicated to make, but if the

Table 1. Parts Needed to Make Radio-Controlled Bow-Net.

steel piano wire - .030 inch diameter round tubular brass - 3/16 inch diameter plywood - 16"x9"x1/4" snap swivel - #10 Plymouth rubber band - #84 box covering sparrow - 4"x4"x4"
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directions are followed it can be assembled in 8-10 hours. It has one big advantage in that it is the most fun to use of any trap I have tried!

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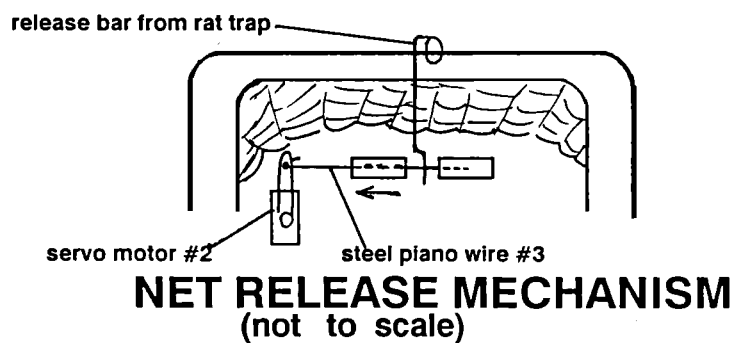
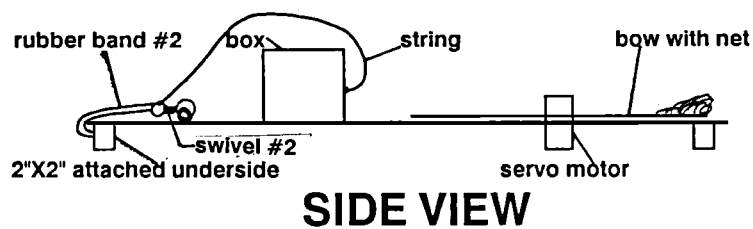
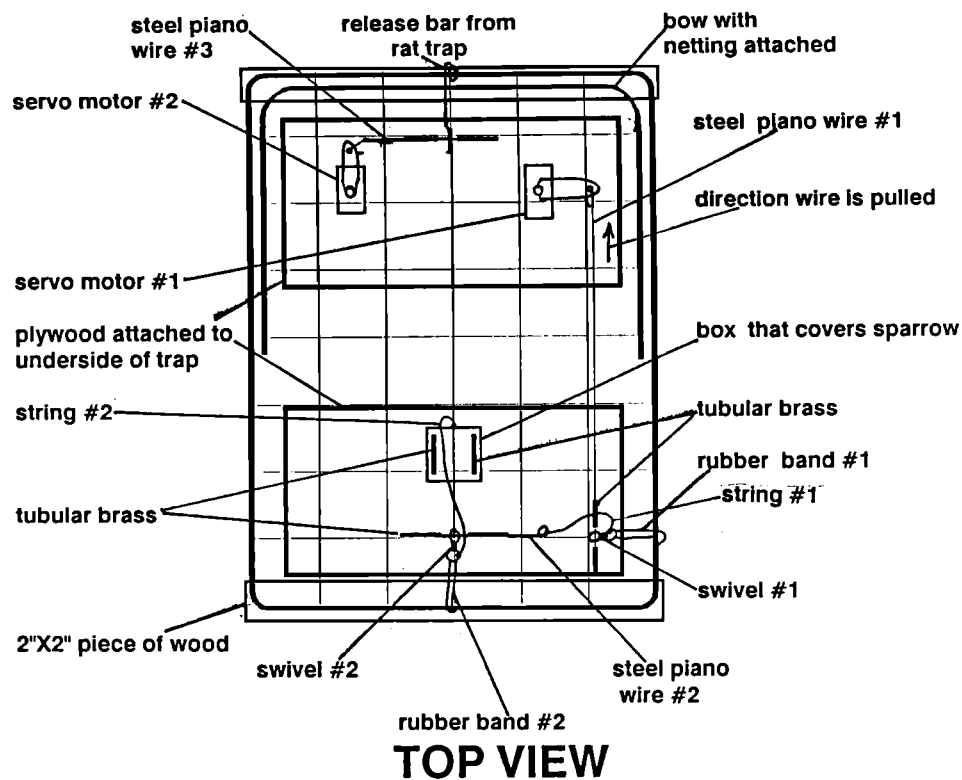


Figure 1. Radio controlled bow-net mechanism. (Drawings not same scale.)