

Babcock

MARK V HYPER-COMPOUND ESCAPEMENT

INSTALLATION AND OPERATION INSTRUCTIONS

Price 25c

This Mark V "HYPER"-formance Compound Escapement is an adaptation of the famous Babcock Mark II Super Compound Escapement and is another precision piece of Babcock radio control equipment engineered to give long life and trouble-free operation.

The versatile Mark II three-position control has been expanded in the Mark V to give full four-position surface actuation control—left rudder, right rudder, up elevator, down elevator, plus motor speed control, using the Babcock #EM-1 "Motor Minder"—all from a single channel radio. Here is "multi" performance with the simplicity, reliability and low cost that only single channel offers.

MOUNTING AND BATTERY REQUIREMENTS

Use care to see that rudder and elevator torque rods (see Figure 1) are aligned at right angles to the phenolic mounting plate, so that the rods are free to move mechanically, before installation of the brass control arms, to insure freedom of movement. Be sure that the control surface hinges move freely and evenly. Some modelers prefer balsa rods and others use piano wire. If wire is used, $\frac{3}{64}$ " is satisfactory on small models, $\frac{1}{16}$ "

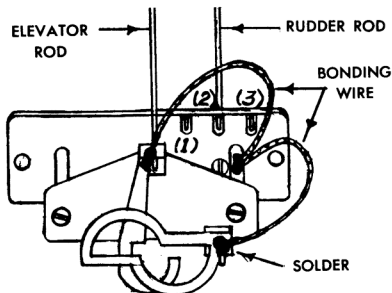


Figure 1

on large ones. The actuating rubber should lead as straight away from the rubber hook as possible. The Mark V is tested to operate on $\frac{3}{16}$ " and $\frac{1}{4}$ " rubber, the $\frac{1}{4}$ " being recommended for best operation. The rubber should be about 20% longer than the spacing between escapement hook and tail hook.

Required voltage for the Mark V is 3 volts. For smaller airplanes, two pencils in series are generally used. For larger airplanes, two "C" or "D" cells will give longer life. Battery connections must be reliable and the best method is to solder the leads directly to the batteries using a little flux and a hot iron.

Bonding of the Mark V escapement must not be omitted. Proper bonding of the unit is not

difficult and it will make the difference between solid, positive operation and intermittent operation. To bond your Mark V, solder a two inch length of light flexible stranded wire or metal braid from each brass actuating arm to the $\frac{3}{16}$ " brass spacer. Solder at both the arm and at the spacer and allow enough flexibility in the bonding wires to allow free movement of the brass actuating arms. See Figure 1.

In relay type receiver operation, one additional step is necessary. A 47 ohm resistor (included) should be soldered between solder terminals (2) and (3). See Figure 1. Insert the resistor close in to the solder terminals. This resistor prevents arcing at the receiver relay contacts, which can cause intermittent operation.

REGULAR FOUR POSITION INSTALLATION

Refer to Figure 1. The Mark V can be mounted horizontally, as shown, or can be mounted vertically. Vertical mounting is used in many of the "midget" planes now so popular. In either mounting, the elevator surface must be held in neutral with a spring. This is easily done with a $\frac{3}{64}$ " spring wire or piece of flat spring stock. Be sure to make a limit stop for the elevator so that it can go only as high as the elevator linkage arm will move it to prevent over travel when stunting and when your model is upside down. The elevator torque rod should be attached to the left-hand side of the elevator, rather

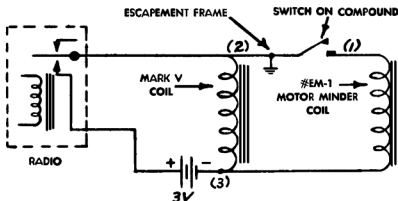


Figure 2

than the right-hand side, as is done in the Mark II. This gives a sequence of control, neutral, right rudder, up elevator, left rudder, down elevator and neutral again, as shown in Figures 4, 5, 6, 7 and 8. The rudder linkage should be mounted centrally, such that in neutral position the crank arm is positioned half way between the sides of the linkage. Very light $\frac{3}{64}$ " wire centering springs can be used on the rudder. Position the elevator linkage carefully so that in neutral, the crank arm is engaged exactly in the right angle corner (point "A") on Figure 4.

USE WITH MOTOR CONTROL

The Mark V Hyper-Compound Escapement works very well with motor control escapements such

as the Babcock #EM-1 "Motor Minder." "Quick blip" motor control operation is possible, and is accomplished by setting the wire whisker contact switch so that it closes and opens while the crank arm is traveling from neutral to position one. This adjustment is made at the factory. Just be sure that the switch is not closed in the position

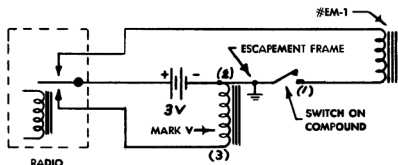


Figure 3

one (right) position. A look at the schematic, Figure 3, will show that the motor control can only work when the receiver relay is de-energized and when the whisker switch is closed. In either case, the sequence of control surface functions is always the same, right, up, left, down and neutral.

RELAYLESS RECEIVER OPERATION

Follow the instructions of the manufacturer of the receiver in regard battery sizes, etc. The 47 ohm resistor is not needed across the coil in relayless operation. In general, no special hook-ups are required for regular operation as in Figure 2. You will not have a "back contact" to use, with a relayless receiver. Some modelers have added an extra set of contacts on the escapement, one on the armature and one on

the phenolic. These contacts are adjusted to be closed when the escapement is unenergized. A hook-up is made to use these extra contacts much like a regular receiver relay back contact in "quick blip" operation.

"STICK BOX" CONTROL

It takes a little practice to hand-key your transmitter and get proper operation from your Mark V, but it is not difficult and the sequence is always the same. The four functions are a "natural" for stick box control, however, and the Mark V will work fine with some of the stick boxes having the proper sequence of operation. It is only necessary to pace the speed of the stick box to the speed of the Mark V, remembering that the Mark V slows down somewhat as the rubber unwinds. The basic speed of the Mark V is set by the brass rocker arm which engages the 6 pointed star gear. You can slow down the Mark V speed by gently bending together the two arms of the rocker.

Ken Willard, famous modeler and author, flew this escapement to the very top, winning First Place in the 1959 Nationals in the Intermediate Class. In a 1962 leading model magazine "Annual" he describes its use and gives construction and operation details. For extra tips read this article, "Poor Man's Multi" by Ken Willard. Good Flying!

"The Ultimate in Radio Control"

BABCOCK MODELS
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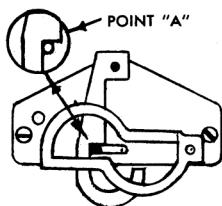


Figure 4 Neutral

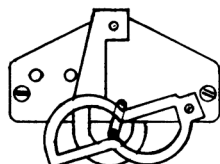


Figure 5 Right

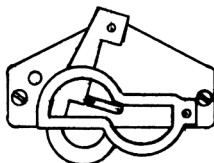


Figure 8 Down

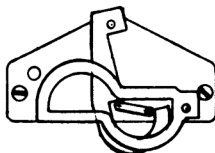


Figure 6 Up

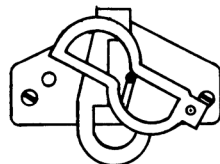


Figure 7 Left