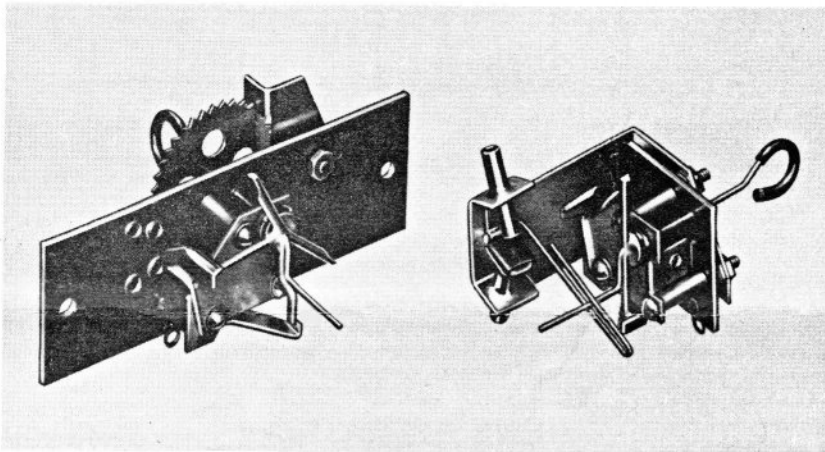


# Installation and Operation

of Bonner "Compound Escapement" and "Motor Control Unit" for Advanced Performance on Single Channel Radio Equipment



**LEFT: Compound Escapement**  
A four-position, self-neutralizing, speed regulated control unit. Designed for operation with single channel radio control while duplicating performance of three channel control. Price.....\$14.95

**RIGHT: Motor Control Unit** A special valving arrangement actuated by standard Bonner SN escapement. Reliable, low current drain; provides engine control and cut-off when used with Compound Escapement.  
Price (Motor Control Unit Comp.) \$9.95  
Bracket and valve assembly only (less escapement) ..... \$2.95

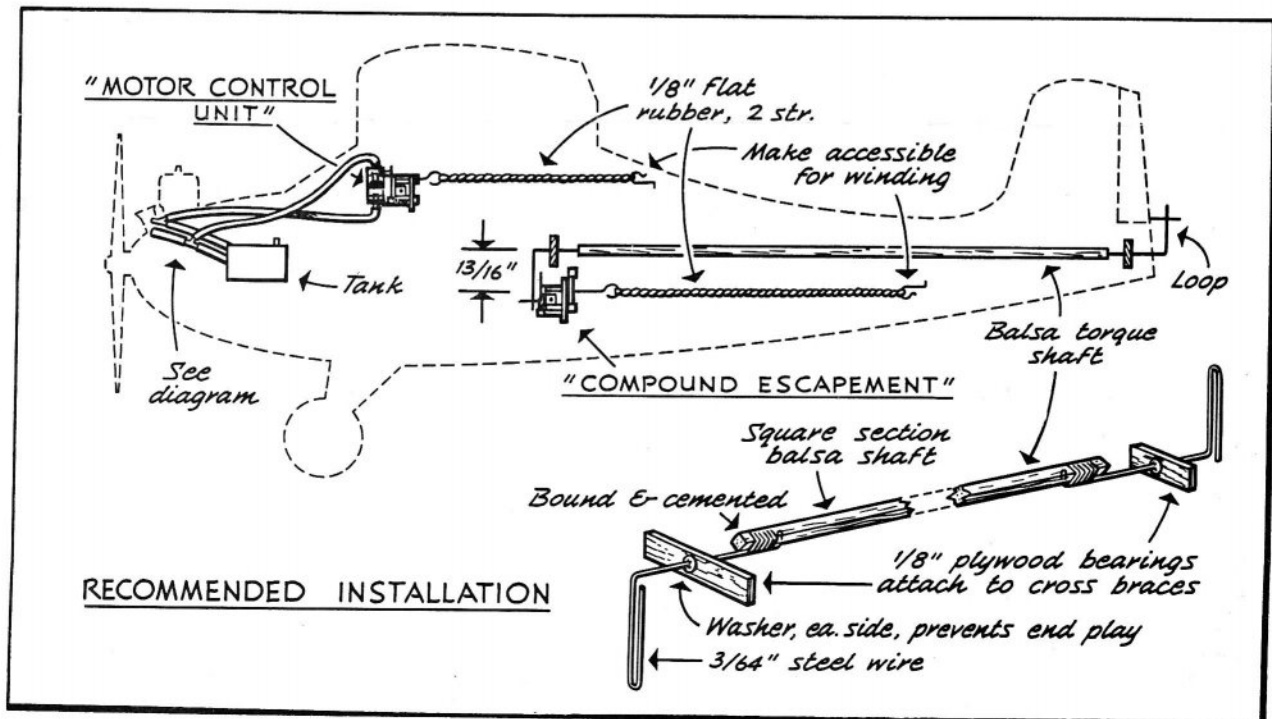
## Installation

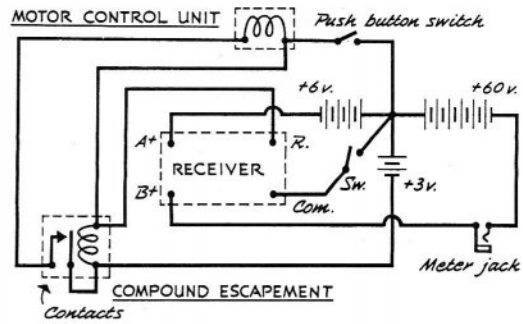
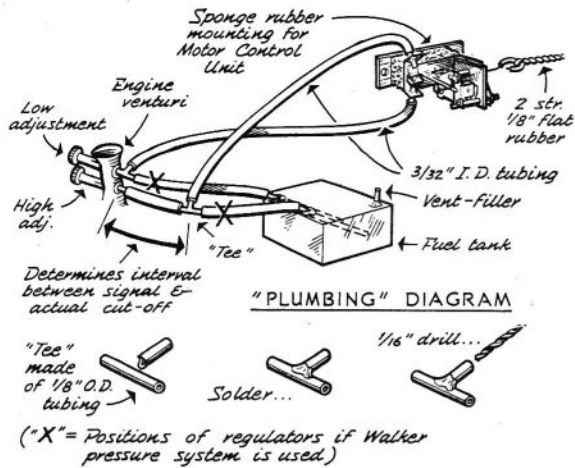
**COMPOUND ESCAPEMENT:** It is recommended that the Compound Escapement be mounted with two, #4-40 machine screws to plywood tabs glued to the vertical struts of the fuselage sides in the position shown. Note that oversize holes have been provided in the back plate to allow slight lateral movement for equal throw adjustment.

The electrical contact points on the Compound Escapement may be used to operate other auxiliary controls. In the wiring diagram shown, the contacts are used to actuate a motor control unit as described below. If the modeler wishes, the contacts may be used for flaps, bomb drop, brakes, elevator etc.

The linkage indicated has been found the simplest and most trouble-free arrangement. The balsa extension is used to reduce inertia forces in the torque rod assembly, providing rigidity without excessive weight. The wire loops may be bent from 3/64" piano wire. Be sure that the escapement crank pin and rudder pin moves freely in wire loops. It is important that the entire linkage be free with no binding or tight positions. These can cause the rudder to "hang up" in hard rudder position thus causing a spiral dive.

Use 3 volts to the escapement lugs and drive it with 1 loop (2 strands) of 1/8" flat rubber. Always wind rubber to at least one full row but less than a double row of knots. In making connections to contacts, be sure connecting wire is soldered to contact material as well as to contact eyelet.





• Diagram shown for "Citizen's" radio receiver. If other type is used, connect the contacts on Compound Escapement in series with recvr. relay points. Otherwise, Motor Control Unit will operate each revolution of Compound Escapement - As viewed from gear side of Compound Escapement, connect jumper wire from upper contact to right solder lug -

**MOTOR CONTROL UNIT:** The motor control unit should be mounted on  $\frac{1}{8}$ " thick sponge rubber in approximate location shown. Cement the sponge rubber between back of bracket assy. and sub-mounting plate. Locate above fuel level to prevent siphoning when tank is filled. Connect vent lines as shown.

**ENGINE:** For two speed operation, a glow engine must be used which is equipped with 2 needle valves. At this printing, the K & B Torpedo .19 is available at hobby shops, complete with factory built dual carburetion. Some engines may require an extension on the venturi while others must have a plug in the venturi tube with a smaller intake air opening. It is important to place the low speed vent tee as near as possible to the venturi of engine. Best results are obtained when the low speed vent tee is soldered directly into needle

valve body. Usually, the original needle valve is used for high speed operation, while the other needle valve operates for low speed.

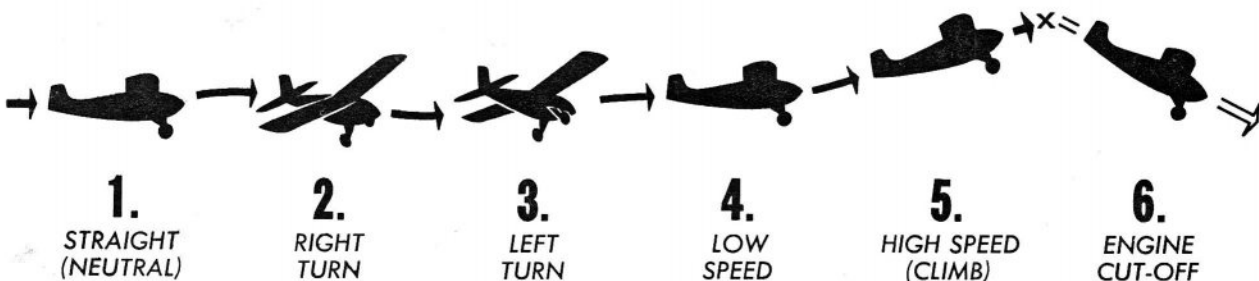
**ENGINE OPERATION:** It is recommended that the engine be started in low speed (low speed vent line closed) and allowed to warm-up before switching to high speed. With engine running in high speed (high speed vent closed), adjust H. S. needle valve for slightly rich operation. Now index to low speed with manual push button switch and adjust L. S. needle valve for desired low speed R. P. M. Experiment with various fuels and glow plugs to obtain greatest speed change. Usually, best results are obtained with a low nitrate, sport type of fuel. The most satisfactory fuel and plug combination is determined by the make of engine and atmospheric conditions.

## Operation

The Compound Escapement is a four position, speed regulated, self neutralizing device. It enables the operator to obtain selective rudder position and auxiliary control and still have an automatic return to neutral upon absence of signal. When used with the motor control unit below, one may obtain at will, left, right, neutral, in either high or low speed plus motor cut-off from either speed range. All this is done without having to remember what control comes next. You merely signal for the control you want!

When installed with the linkage shown and the motor control unit, the signalling is as follows:

- NEUTRAL — No signal
- RIGHT — Press transmitter button and hold as long as this control is desired. Release for neutral.
- LEFT — Press, release, and press again quickly, holding as long as left is required.
- MOTOR CHANGE — Press, release and press, holding for approx. 1 second and release.
- MOTOR CUT-OFF — Same as motor change except the third pulse is held long enough for engine to consume fuel between vent tee and engine.



**NOTE:** The only way a mechanical device can distinguish a series of single pulses from a pulse sequence is by the spacing (off-time) between the pulses. Hence, the pulses may be as long as desired but the spacing between pulses must be kept short. The escapement returns from right rudder to neutral in approx. 0.5 seconds, hence, the rudder may be "beeped" as often as one repeat rudder position per second for gentle turns.

**BONNER SPECIALTIES**

2900 Tilden Ave.

Los Angeles 64, California