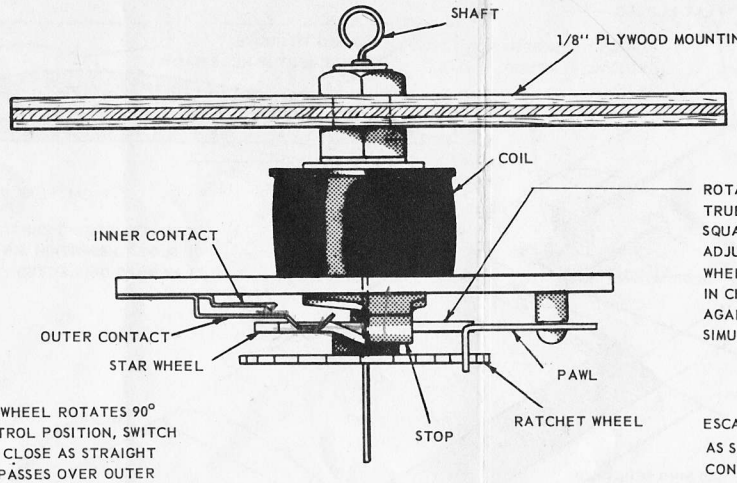
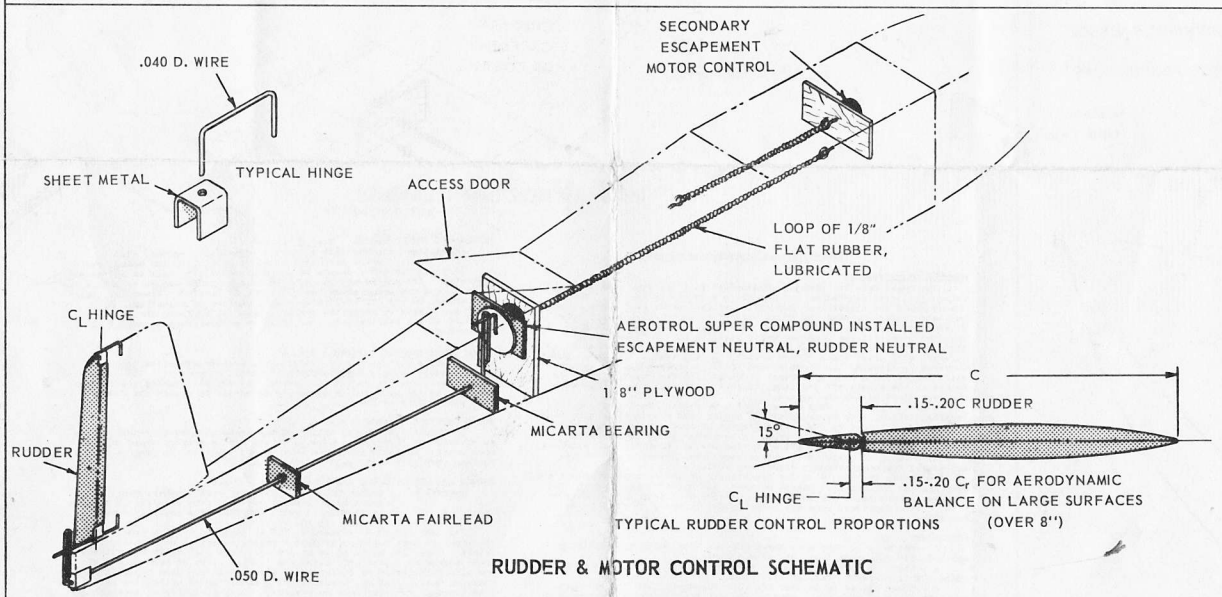


ROTATE STARWHEEL TO BE SURE IT IS TRUE ON SHAFT AND MEETS STOP SQUARELY AT ALL POSITIONS. ADJUST BY PRESSING AGAINST RATCHET WHEEL TO BEND SHAFT SLIGHTLY. IN CHECKING HOLD WHEEL AGAINST BEARING TO SIMULATE TENSION OF RUBBER

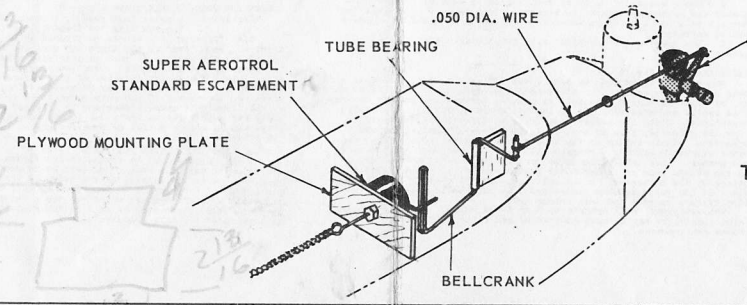
AS STARWHEEL ROTATES 90° TO CONTROL POSITION, SWITCH SHOULD CLOSE AS STRAIGHT TOOTH PASSES OVER OUTER CONTACT. SWITCH MUST REOPEN WHEN TOOTH HAS COME TO REST AGAINST STOP.

ESCAPEMENT SHOWN IN NEUTRAL POSITION. AS STAR WHEEL ROTATES 90° FROM CONTROL POSITION SWITCH MUST REMAIN OPEN AS OFFSET TOOTH PASSES OVER OUTER CONTACT.

ESCAPEMENT ADJUSTMENT

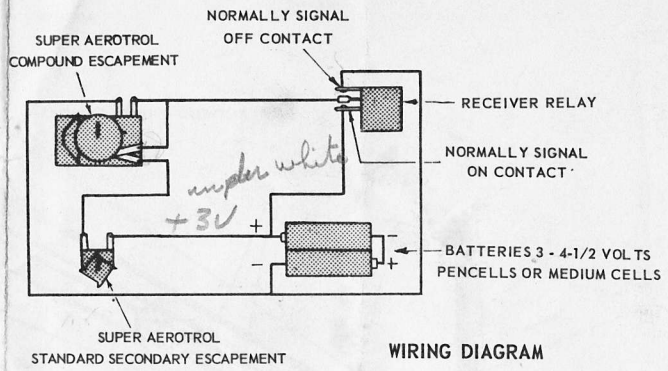


RUDDER & MOTOR CONTROL SCHEMATIC

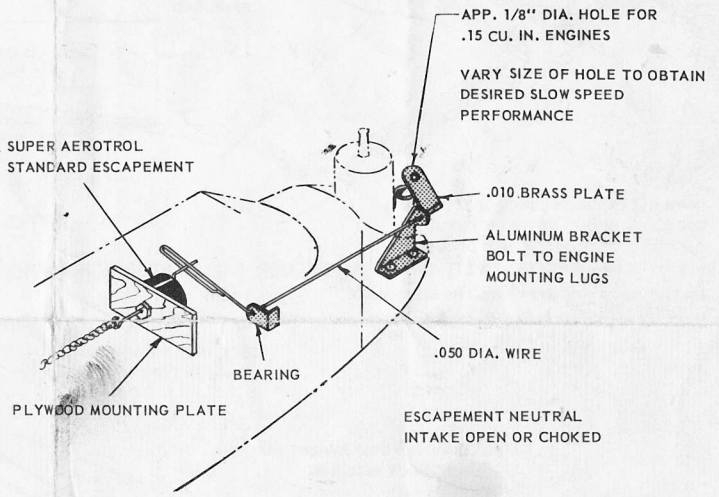


THROTTLE SCHEMATIC

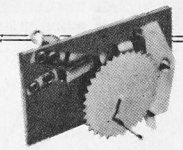
ESCAPEMENT NEUTRAL, THROTTLE HIGH SPEED OR LOW SPEED POSITION



WIRING DIAGRAM



MOTOR CHOKE SCHEMATIC



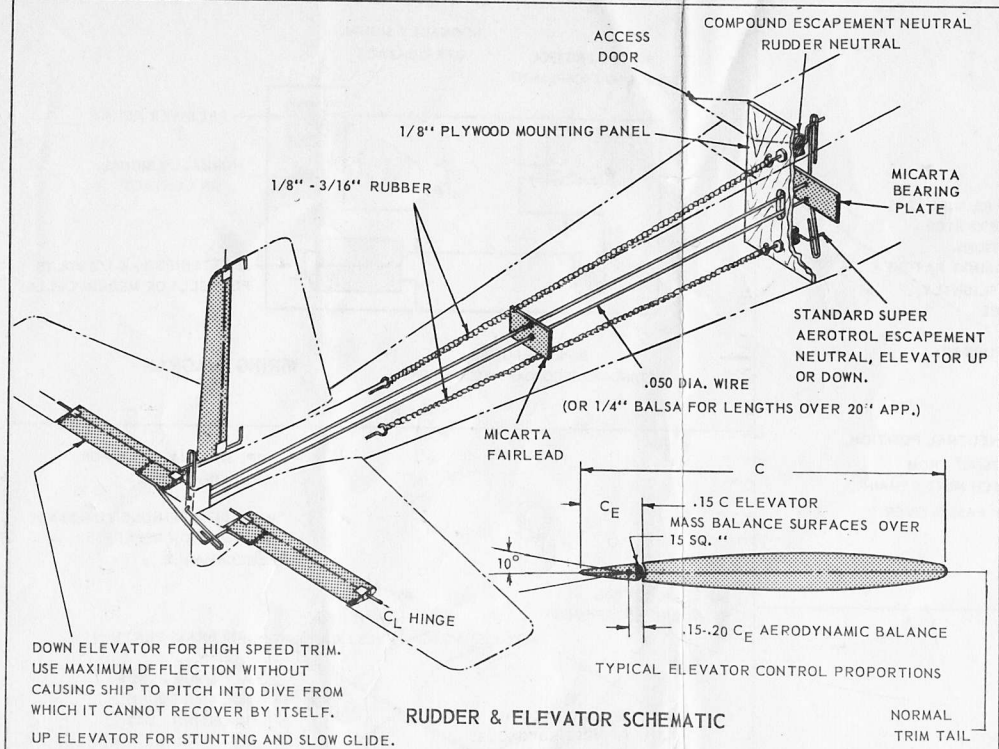
For Multiple Control Radio Control Flying . . . with Single Channel Equipment!

SUPER AEROTROL "COMPOUND ESCAPEMENT"

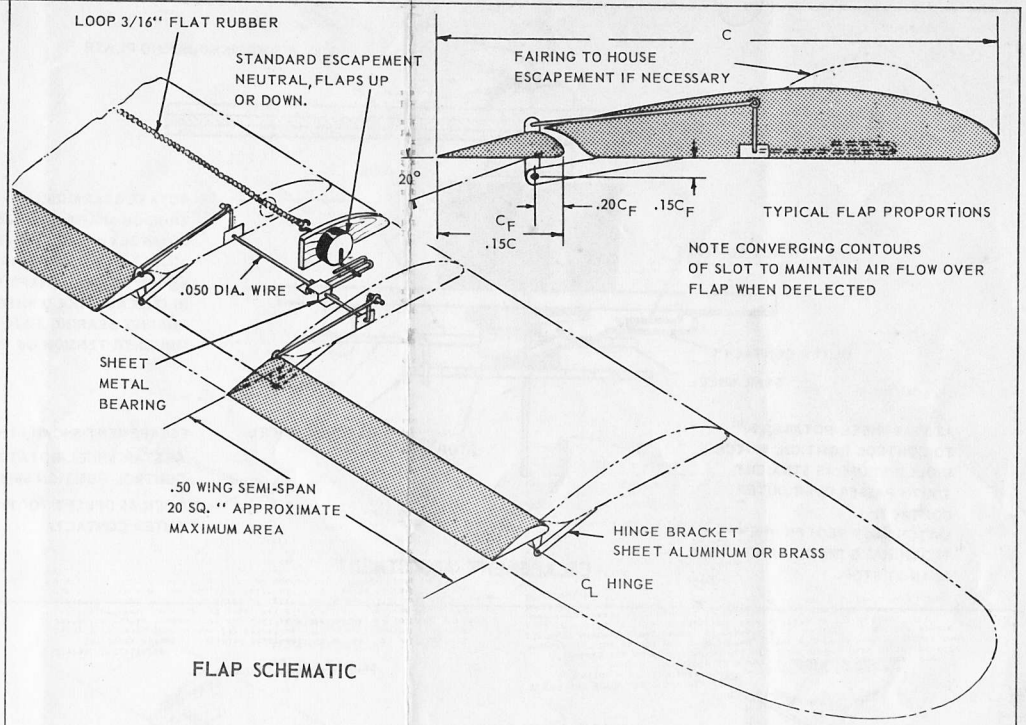
DESIGNED BY: HENRY STRUCK

DRAWN BY: HENRY STRUCK ENGINEERED BY: BILL EFFINGER

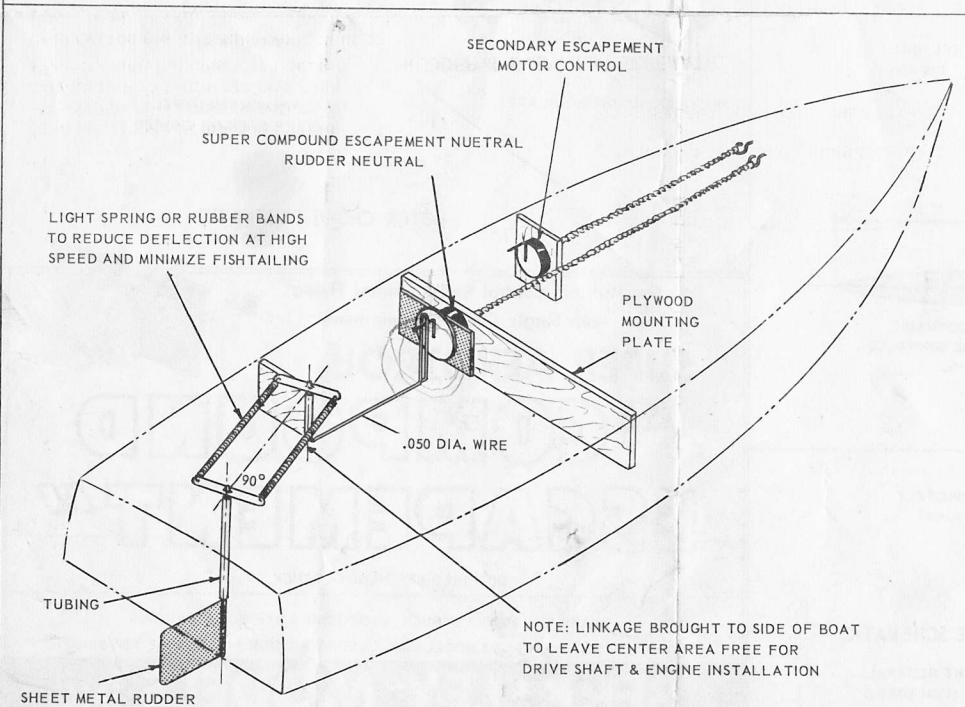
BERKELEY MODELS INC.
WEST HEMPSTEAD, NEW YORK, U. S. A.



RUDDER & ELEVATOR SCHEMATIC



FLAP SCHEMATIC



BOAT RUDDER & MOTOR CONTROL SCHEMATIC

INSTALLATION INSTRUCTIONS:

SUPER AEROTROL COMPOUND ESCAPEMENT

GENERAL DESCRIPTION:-

The Super Aerotrol Compound Escapement is a two arm, self neutralizing type, with provisions for actuating a secondary control. Normal operation of the transmitter key will move the rudder as follows, press key-left rudder, release and press key-right rudder, release and press key-left rudder, etc. The speed of operation is dependent only upon the condition that the receiver relay still be in the "signal on" position, to keep the circuit to the secondary control broken as the straight star wheel tooth closes switch. At any time a very short pulse, obtained by flicking the thumb across the key, or by a similar method, will actuate the secondary control by permitting the receiver relay to return to the signal off position, thereby completing the circuit when the star wheel closes the switch.

A bit of practice will reveal that a very quick series of control reversals can be made by conventional keying, and a definitely very short pulse, only obtained by a different method of keying will actuate the secondary control. This will prove to be advantageous to the flier, since in normal maneuvering all attention may be focused on the aircraft, as only a definite action will obtain secondary control, eliminating accidental operation through signalling error.

To become familiar with the functioning of the escapement, study the sketches for adjustment, control systems, and battery requirement. The control systems shown are intended to provide a variety of suggestions with details dependent upon the actual model in which they are to be installed.

ADJUSTMENT - Fig. 1 -

1 - Check to be sure star wheel rotates true, with teeth seating against, and releasing from, the stop cleanly.

2 - Check to be certain points are always open unless closed by contact with straight tooth of star wheel.

3 - Check points to be sure they are reopened after contact with straight tooth of star wheel when escapement has rotated 90 degrees from neutral to control position.

4 - Check action of relay in receiver to be sure it is operating quickly and returning crisply to signal off position in order that the contacts will be closed when escapement switch is closed for secondary control operation.

5 - Use loop of 1/8" or 3/16" flat lubricated rubber for control surface power.

WIRING DIAGRAM - Fig. 2

Use good stranded hook up wire about #20, and solder all joints with rosin core solder only. Make all connections mechanically before soldering, by twisting around terminal, or passing through eyelet. If desired, wires may be soldered directly to the batteries by taking a few simple precautions. Clean the battery terminals by scraping or sandpapering. Allow the soldering iron to heat up fully before attempting to make a connection. Apply solder to tip of iron and withdraw iron as soon as solder sticks to battery. Prepare all terminals and ends of wire in this manner. Then join wires to batteries adding a bit more solder at the tip of the iron to induce quick heat transfer, to avoid excessive heating of the batteries. A low melting point solder will be a further help. If the joint appears unsuccessful do not continue heating, but allow battery to cool and then remake joint.

The escapement will operate on 3 or 4-1/2 volts. For larger ships medium size cells may be used instead of pen cells to increase time between replacements.

RUDDER AND MOTOR CONTROL - Fig. 3

Operation - 1 pulse left rudder, 1 pulse right rudder, etc.
1 quick blip high speed, 1 quick blip low speed, etc.

Although the motor cannot be cut off completely, this is not at all necessary. The engine may be adjusted to run slowly enough to permit the plane to descend under power, to a landing if desired. Since the engine also cannot be cut off accidentally by a mistake in signalling, full power can always be reapplied during landing if the ship should appear to be short of the landing strip, or if it be necessary to go around again if too high.

MOTOR CHOKE CONTROL LINKAGE - Fig. 4

A simple linkage may be installed to provide effective two speed motor control using a Super Aerotrol standard escapement. The choke plate should seat squarely on the air intake, but without binding the linkage. The size of the hole in the plate may be varied to obtain the desired slow speed motor performance.

MOTOR THROTTLE LINKAGE - Fig. 5

To convert the rotary action of the escapement to push-pull action to operate the throttle, a wire bellcrank may be mounted ahead of the escapement. Adequate clearance must be provided for the passage of the pushrod through the firewall to avoid binding.

RUDDER AND POSITIONABLE ELEVATOR CONTROL - Fig 6

Operation - 1 pulse left rudder, 1 pulse right rudder, etc.
1 quick blip to shift elevator from normally up to down.
1 quick blip to shift elevator from normally down to up, etc.

The ship should be trimmed to fly as flat and fast as possible with elevators in down position without entering an actual dive in straight flight. Then upon shifting to up position ship will climb right into stunt maneuvers. Take off, climb and final portion of landing pattern are also facilitated by flying in up elevator trim. When applying up elevator during landing, excess speed that may cause ballooning can be dissipated by entering into an immediate turn, gradually straightening out as speed drops down.

RUDDER AND POSITIONABLE FLAPS - Fig. 7

Operation - 1 pulse left rudder, 1 pulse right rudder, etc.
1 quick blip "up flaps", 1 quick blip "down flaps", etc.

With flaps up ship should be trimmed to fly fast for good wind penetration. Upon lowering the flaps the ship can be slowed down for landing and tight maneuvering, as well as providing a steeper glide path with little chance of ballooning. Upon lowering the flaps the ship may rise momentarily, due to the increase of lift before the increased drag slows the ship down. This action may be employed for landing flare out with practice. Inversely if the ship seems to be short of the field, pulling up the flaps will cause a decrease in lift and greater sink until airspeed has been built up again due to the decreased drag. Therefore, flaps should not be pulled up near the ground in an effort to stretch the glide.

RUDDER AND MOTOR CONTROL FOR BOATS - Fig. 8

The escapement may be rigged as for planes to obtain two speed operation to enable a boat to be brought to shore at low speed to avoid damage. Due to the density of the water in which the rudder operates the effect of the control is much more abrupt, causing the boat to 'fishtail'. Light springs or rubber bands incorporated in the linkage serve to delay the action as well as reducing the rudder effectiveness at high speed for safe maneuvering.