

INSTRUCTION SHEET

RAND LR3 actuator for single channel pulse proportional or so-called "Galloping Ghost" provides two proportional outputs for push rod operation of rudder and elevator and one trim output for throttle control.

SPECIFICATIONS

SIZE: 1 x 1 1/4 x 2

WEIGHT: 1 1/4 oz.

POWER SUPPLY: Plus or minus 2.5 V. (5 V. center-tapped)

SIGNAL REQUIREMENTS: Elevator: 4-12 P.P.S. 6 P.P.S. Neutral

Rudder: 70%-30% Width Change

Unwanted motor control will occur if these signal requirements are exceeded.

RECOMMENDED UNITS: Min-X Pulsemite, Controaire GG, Citizenship NPT, Jansson GG, F & M GG-1, or transmitter with add-on pulser like Phelps.

Understanding How It Works:

The three variables transmitted by the pulse coder and received by the airplane receiver are decoded mechanically by the actuator. The actuator moves control surfaces to give effective proportional control to the rudder, elevator and motor.

The *rate* information controls the position of the elevator cam plate in relation to how fast the actuator motor oscillates. At high pulse rates, the crank does not have time to move very far. Therefore, the effect is for full down elevator. At low pulse rates the crank has time to move about 270° with the effect of up elevator. At neutral pulse rates the crank swings back and forth approximately 100° (5/16") motion causing the elevator to move up and down for effective neutral elevator. The *width* variable causes the motor to turn more in one direction than the other which means the crank (rudder) assumes an average position to the right or left.

Steady-on tone or steady-off tone causes the crank to turn 360°, five times for full throttle control. Signal off is used for low motor to provide fail-safe operation. The controls are moved rapidly through their extreme positions, for effective neutral control action.

The result is the control surfaces wiggle, which is necessary for the mechanical separation of the signals. But, because of the high rate, the effect on the airplane is minimal.

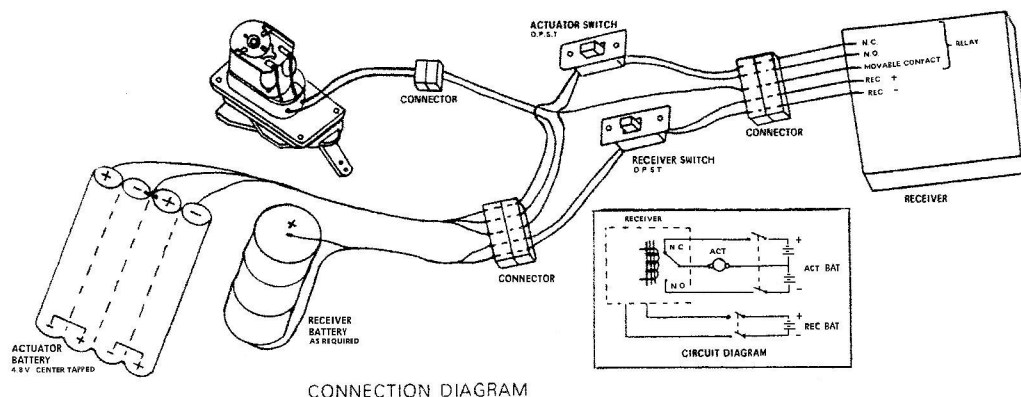
Flight Trim:

The trim lever setting (on transmitters incorporating trim systems) selects the neutral pulse rate and therefore the amount of control surface motion. As in ordinary multi-airplanes, the push rod adjustment is used for flight trim. The trim lever is used for in-flight trim.

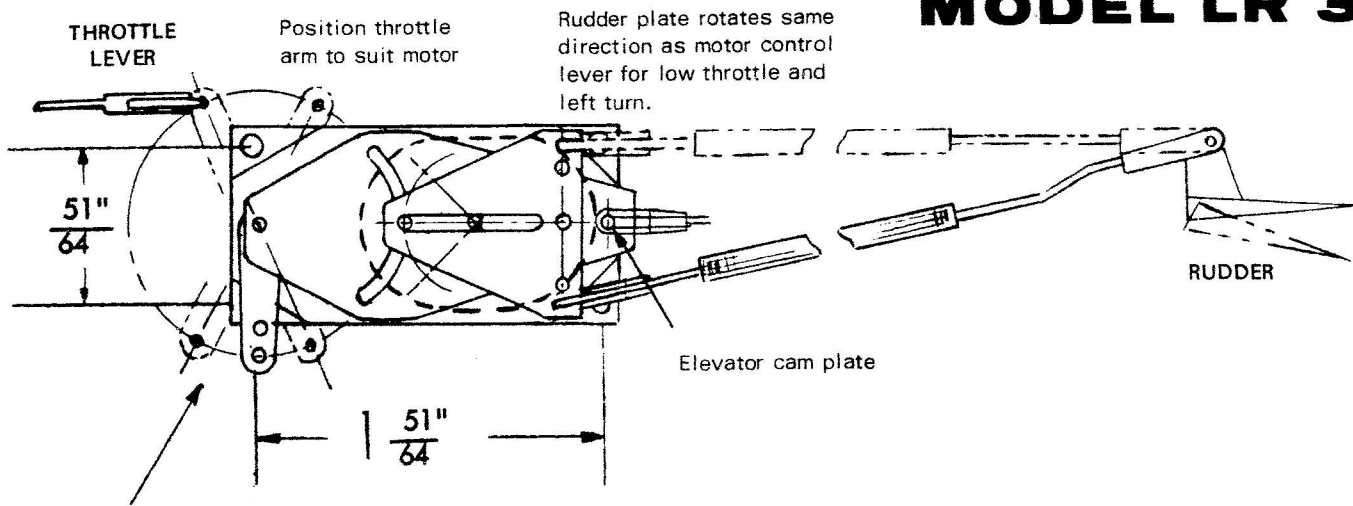
Note position of control stick or trim lever to maintain level flight.

If up trim is required, lengthen push rod. If down trim is required, shorten push rod. After trimming airplane, note whether neutral elevator is occurring at up or down position. Trim model C.G. or incidence so neutral flight trim position will be with neutral elevator. (Refer to Connection for Elevator Push Rod).

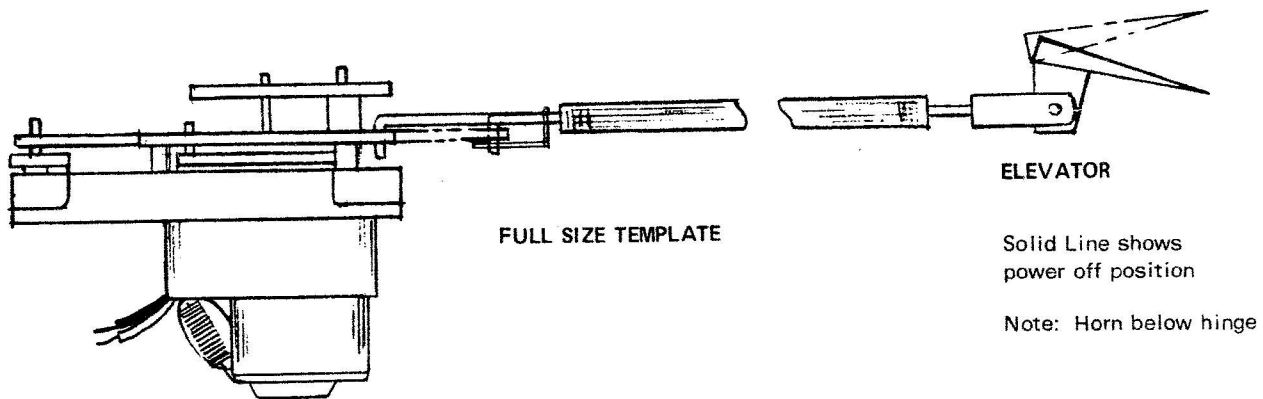
This is the challenge and fun for the modeler...to be able to trim his airplane for the most control and smoothest flight.



MODEL LR 3



Slip clutch permits movement to any position.



INSTALLATION STEPS

1 Connection to actuator motor.

Connect leads to actuator so the throttle control moves to low throttle on low motor signal. (Signal Off)

2 Connection for rudder.

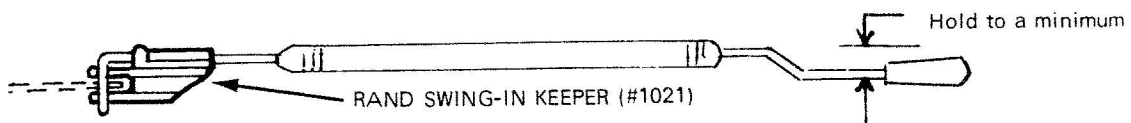
With transmitter signaling left turn, note position of rudder plate. Connect rudder push rod to appropriate side to give "left" rudder. Adjust push rod length for neutral.

3 Connection for elevator.

Connect as illustrated. Observe motion of elevator with stick and trim in neutral position, (6 P.P.S.). Adjust length of push rod so elevator is moving approximately same amount above and below center line. Connect push rod on furthest "out" position on elevator horn for initial flights. The trailing edge of elevator should move about 1/8" to 1/4" from neutral.

Note: Elevator horn must project below surface or add crank to convert the motion.

NOTE: Arrange push rod installation to minimize off-set required.



MOUNTING: Use RAND #7011 (includes mounting plate) or RAND #1014. Both these kits have the items needed for proper mounting. Otherwise, we recommend mounting the actuator on 3/32" plywood plate with #2-56 blind mounting nuts. Attach the plate with rubber grommets to rails glued to sides of fuselage. Must be mounted on rubber mounts for vibration protection.

FOR MOTOR CONTROL: Be sure all control linkages are free. Watch for binding of quick links on control horns caused by too much tension, keepers that are too tight and misalignment. Be sure voltage at actuator is at least 2.2V. Check the voltage while actuating motor control.