

# Don Steeb Incorporated

PRECISION MODEL EQUIPMENT

70 Holworthy St.      Rochester 6, N. Y.

Idlewood 6-0058  
ATLAS EMD-1

## INTRODUCTION:

The ATLAS EMD-1 proportional actuator is the result of over a year of testing different designs and principles in the proportional actuator field. It has long been the desire of modelers, using pulse type control, to have actuators with complete electrical centering. Thus eliminating all rubber bands and springs normally used for a neutral reference. We have accomplished this with a very unusual circuit which has never before been used. In operation this circuit acts as an ELECTRO-MECHANICAL DISCRIMINATOR. Working on a "Feed Back" type circuit, the EMD-1 actuator will always sense neutral when a control is not being given. This neutral will always be exact because of a balance system used between the fifty-fifty pulse width and equal resistance of the two variable resistors. If these resistors are on the final output shaft of the actuator they will vary the resistance with each increment of rudder movement in either direction. If we change the pulsed signal in width, the relay in the radio receiver pulses become uneven. This condition can be classified as an unbalanced resistance because more current is flowing thru one relay contact than the other. Our variable resistors move to again balance the resistance at the relay. Since they are on the output shaft of the actuator a rudder movement occurs. By varying the width of the signal in either direction and any degree we find the actuator will follow. This gives us proportional control of our surfaces.

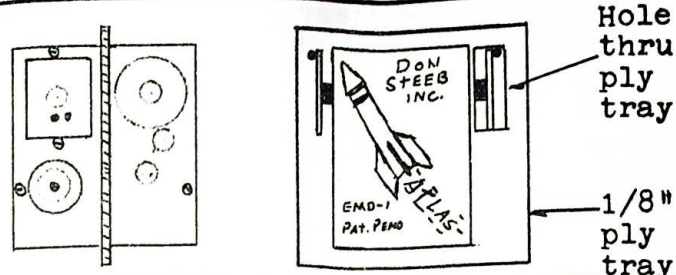
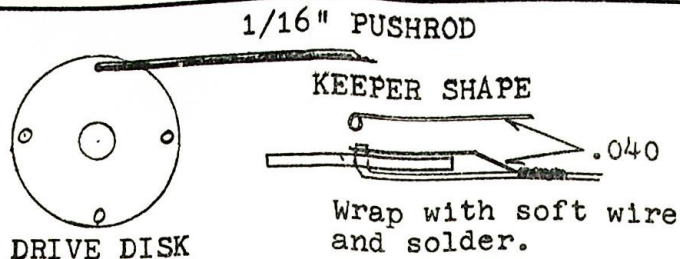
## OUTSTANDING FEATURES:

- Precision fitted, MACHINED, brass gear train.
- MOTOR--Ball bearing (in metal race), twin alnico magnets, copper graphite brushes (with spring loaded holder), spring centered armature with machined thrust washer.
- 24 St chassis for maximum protection.
- Mounts in any position without alteration.
- Positive limit pin (never any over-travel).
- Oilite bearings on main drive shaft.
- Very compact size (only 1" high, 1-5/8" wide, 2-1/2" long).
- Weight -- only 3oz.
- Low current drain.
- Can be pulsed at a very slow rate with no wobble in plane.
- Very powerful.
- Draws no current in extreme positions.
- Uses our own ELECTRO-MECHANICAL DISCRIMINATOR circuit.
- Reliable printed circuit switching.
- UNMATCHED QUALITY through-out.

## MAINTENANCE:

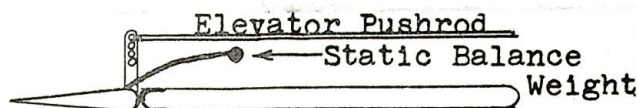
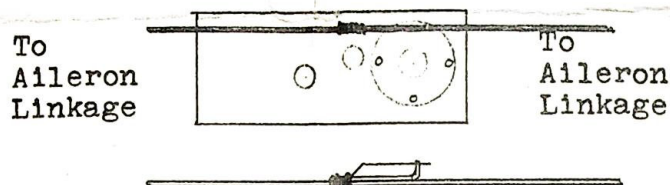
The actuator as received is ready for use. Just hook up as shown on reverse side. Always keep equipment clean. Radio and actuators should have the care of a fine tool or watch to get the most from them. If after removing the dust cover, the actuator looks dirty, clean and oil. DO NOT DISASSEMBLE to do this work and DO NOT oil motor bearings as they are factory lubricated and should require no attention.





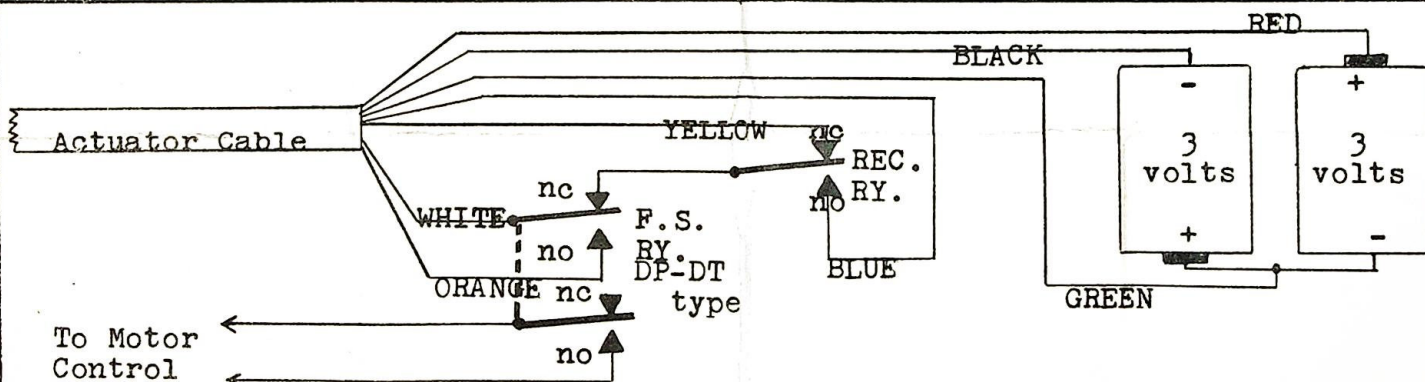
Use at least .040 piano wire keepers. Be sure linkage is free. Other methods of operating surfaces may be used. This is most trouble free.

Vertical tray mounting (most crash proof). Mark all screw points on bottom of servo and drill relief holes in tray. Use # 2-56 nuts & bolts to mount.



1/16" piano wire pushrod, one piece. This eliminates one wear point in the linkage. Put a slight "V" in rod to correspond with dihedral angle. Make keeper as shown. Wire wrap and solder.

A static balance weight on a large surface such as elevators helps actuator action. Weight should hold elevator in neutral with pushrod disconnected.



The circuit above shows a typical actuator hook up with a motor control circuit added. When using two actuators, as in a Dual Proportional outfit, a triple pole-double throw relay will have to be used. One for each fail safe circuit and one for the throttle control circuit. Each actuator fail safe circuit has to be completely separate from each other because of inter-action. This is caused, because of the electrical centering employed. If a throttle control is desired, it's control contacts also have to be separate from the other circuits. A pulse rate of 3 to 5 pulses per second will work fine.

Always use a good grade of solder (60% tin 40% lead) when making installations. Do not use too big a soldering iron for small jobs such as wiring. A small 35 watt Ungar type works fine. Spend a little more time on the radio and actuator installation and it will pay off in hours of trouble free flying.

#### SERVICE:

If for any reason the actuator has to be sent back for adjustment, a Minimum of \$1.00 plus \$.25 for postage will be charged. If the actuator is sent back for repairs and is found to be beyond economical repair, it will be replaced for one half the list price. This actuator is of the finest quality and with a little care it will give many many hours of trouble free service.

" QUALITY WILL BE REMEMBERED LONG AFTER PRICE IS FORGOTTEN "