• INSTRUCTION MANUAL •

FOR

ANNCO

MULTI-SERVOS

FOR RADIO CONTROL SYSTEMS OF R/C PLANES • BOATS • CARS

MODEL No. 2R For relay operation **$7.95**

MODEL No. 2RL Relayless, with built in 7 transistor amplifier **$19.95**

ANNCO MULTI SERVOS ARE DISTINGUISHED BY BEING THE SMALLEST, LIGHTEST, AND MOST RUGGED MULTI SERVO ON THE AMERICAN MARKET TODAY. NOW SELLING AT REALISTIC PRICES THAT EVERY MODELER IN CLASS I, II, & III CAN AFFORD. THE DOUBLE ENDED PUSH ARM OF ANNCO SERVOS, WTH STRAIGHT LINEAR MOTION, MAKE FOR THE SIMPLEST, MOST RELIABLE HOOKUPS TO THE CONTROL SURFACES OF RADIO CONTROL MODELS.

SPECIFICATIONS

	MODEL NO. **2RL**	MODEL NO. **2R**
WEIGHT	1.7 oz.	1.3 oz.
SIZE	3/4" Wide x 1-9/16" High x 1-3/4" Long	
TRAVEL	5/8 in. Total - Straight line motion	
TRANSIT TIME	1/2 second from neutral	
THRUST	Over 3 pounds	
OUTPUT ARM	Double end - Two adjustment screws	
GEARS	Precision molded from Nylatron GS	
CASE & COVER	Stamped & formed from 1/2 hard Alum.	
SWITCHER BOARD	2 pc. adjustable - Epoxy board	
WIRES	19 Strand - 26 Ga.	
MOTOR	5 ohm arm. - 93% Silver Graphite Brushes	
AMPLIFIER	7 Transistors	

manufactured, guaranteed, and sold direct from factory only by,

ANNCO ENGINEERING CO.

7714 COLFAX AVENUE SOUTH

Minneapolis, Minnesota, 55423

OPERATIONAL INSTRUCTIONS

1. MOUNTING: Either upright or flat, using #2-56 bolts or #2 wood screws, with washers under each head. Pull down snug but not too tight. Also drill 1/4" dia. clearance holes in your plywood tray so cover screw does not touch tray.
2. ADJUSTMENT FOR NEUTRAL: The new Annco servo has a two piece adjustable sliding switcher board to give you close or open centering, on all models relay or relayless. Place servo so you can read the printing on the cover. Notice the two screws which are in the two slots. Loosen both screws and move them to the RIGHT for wider centering, and to the LEFT for closer centering. On close centering (this has already been set at the factory) adjust for one bounce of the output arm on its return to neutral. Do not allow output arm to hunt back and forth, continuously. The adjustable switcher board also allows you to shorten or lengthen the stroke on a trimmable servo as much as 1/16" on each side of the normal 5/8" travel of the output arm.
3. TENSION OF WIPERS: Proper wiper tension is maintained if wipers extend 1/32" above sides of case (with cover removed).
4. DISASSEMBLY OF SERVO: Remove screw in each of the opposite narrow flanges of the cover, remove cover. Remove the single brass screw from the back (this screw is very important as it holds the Yoke assembly firmly inside the case). Now put servo in a flat position, (notice how the motor is placed with the brush terminals at an angle to the base). Gently spring apart sides of case and lift up on motor and Yoke assembly while gently sliding gear shafts out of their respective holes in the case.
5. ASSEMBLY OF SERVO: With gears and output arm properly mounted on Yoke, and with motor inserted in Yoke, (make sure motor pinion gear is not jammed up on the first nylatron gear but is meshing properly), motor must be positioned with one brush terminal uppermost and toward the outside of the case. This is important. Otherwise adjusting screw from switcher board will jam up against motor end cap. Spring apart sides of case and insert motor and Yoke assembly while guiding the two gear shafts into their respective holes. Replace screw from the back that holds Yoke assembly in place, check for no binding operation, replace cover and cover screws. Take up internal slack of wires by pulling gently on each wire, one at a time.
6. INSTALLATION OF AMPLIFIER IN RELAY MODEL SERVOS: Disassemble servo as per paragraph 4. Now, unsolder each wire from the switcher board, and solder the same color SHORT wire from the amplifier in place on the switcher board terminals. Feed the LONG wires from the amplifier out through the grommet. The SHORT green and white wires from the amplifier are now soldered to the motor terminals, (after removing long wires from motor). Be sure to match the color exactly, or remember the green wire goes to the terminal that has the two dimples on each side. Mount amplifier with the two #2 screws provided, making sure insulator piece is in place under amplifier, then reassemble servo as per paragraph 5.

Care and Maintenance of Servo Mechanical Parts

A. GEAR TRAIN

1. If gears sound noisy or rattle when servo is operating, gear shafts are dry. Remove gears from fixed shafts on Yoke Frame, (see paragraph 4 of "Operational Instructions" in servo Manual for disassembly) clean gears, Yoke Frame, and Output Arm in any good commercial solvent or dry cleaning fluid.
2. Apply a very thin film of light oil (3 in one) on shafts only. (DO NOT PUT GREASE OR OIL ON GEAR TEETH, THIS CAUSES TOO MUCH FRICTION AND WILL RESULT IN SERVO RUNNING SLOW WITH EXCESSIVE CURRENT DRAIN.)
3. Reassemble gears and output arm in Yoke Frame.

B. MOTOR

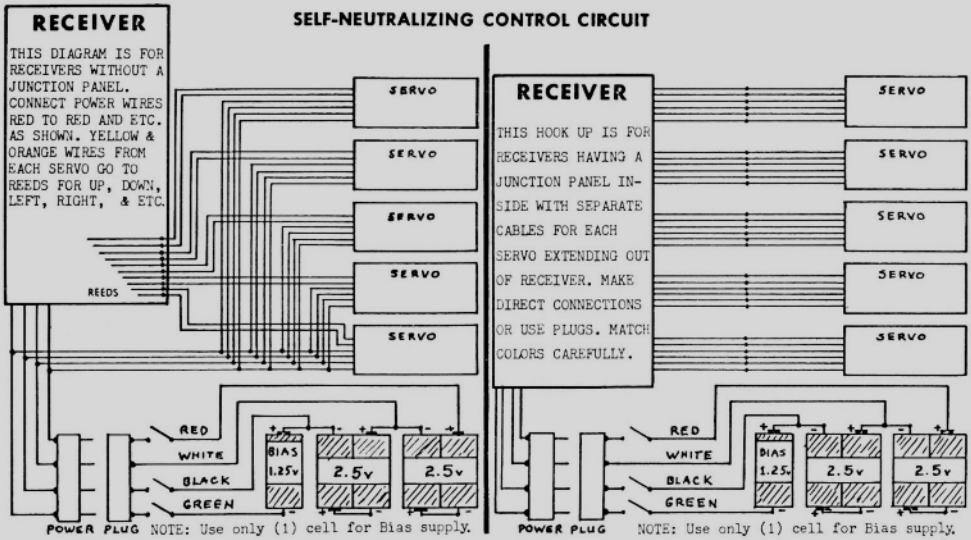
1. Dry motor bearings will cause this small high speed motor to chatter or squeal. Put a tiny drop of very light oil such as 3 in 1, on each motor bearing, noise will stop.
2. If motor runs slow causing sluggish servo operation, and you wish to take it apart for cleaning, remove brush clips first, then remove brush springs, now with the edge of a sharp knife blade carefully lift out the brass brush tubes that hold the silver brushes. (This must be done before you can remove the armature, because of the commutator flanges.) Note that the brushes will probably have a burr at the formed end, remove burrs with a razor blade so brushes will drop freely through tubes at assembly. Now remove the two screws from the front motor cap, (gear end) gently pull from magnet removing armature as well. You do not need to remove magnet from back motor cap, however, if you do, please note metal band around magnet, (this is a keeper to intensify the magnetic field), this band has a joint in it, this joint must line up with notch in magnet which in turn mates with key molded in back motor cap.
3. The commutator will probably have black graphite deposits from the brushes and should be cleaned and polished with Crocus cloth or 600A paper.
4. After polishing commutator, thoroughly clean the armature and all motor parts in a good commercial solvent. (Do not use dope thinner, acetone, or water prepared solvents.)
5. Dry thoroughly, and reassemble motor making sure that the plastic washer is next to the commutator flange and the brass washer next. Some motors may have two plastic washers.

C. REASSEMBLE SERVO AS PER PARAGRAPH 5 OF SERVO OPERATIONAL INSTRUCTIONS

WIRING INSTRUCTIONS

RELAYLESS MODEL NUMBER 2RL

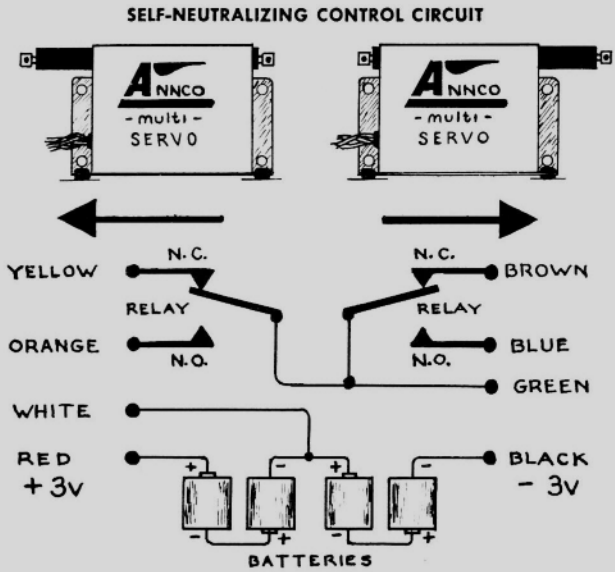
Operation directly from a standard reed bank (not a split insulated reed bank) of any relayless reed receiver. Check instructions with your receiver, then connect servo wires to reeds and batteries as shown below.



FOR TRIMMABLE CONTROL, bend the 2 outermost contact wipers down against wiper holder so they do not make contact with switcher board

RELAY — MODEL NUMBER 2R

Check your radio receiver instructions to determine which receiver socket terminals are connected to the N.C. (normally closed) and N.O. (normally open) relay contacts, then connect wires from servo to relays and batteries as shown below.



FOR TRIMMABLE CONTROL
eliminate Brown & Yellow wires

• PARTS PRICE LIST •

PUSH PULL ARM	.75 ea.
YOKE FRAME	1.00 ea.
GEARS, set of 3	.50 set
CASE, w/grommets	.75 ea.
COVER, less switcher board	.75 ea.
DRIVE GEAR, long pinion	.40 ea.
SWITCHER BOARD, less wires	.60 ea.
SWITCHER BOARD, w/ wires	1.00 ea.
MOTOR	3.95 ea.
PINION GEAR, for motor	.25 ea.
ADJUSTMENT SCREWS, for push arm	.15 ea.
MOTOR BRUSHES, (2 brushes & 2 springs)	.50 set
ANNCO GROMMETS	.25 doz.
ANNCO HOOK UP WIRE, 8ft. ea of, 4 colors (Red, White, Black, Green)	.45 pkg.
ANNCO HOOK UP WIRE, 3ft. ea of 8 colors	.45 pkg
#2-56 x 1/8 long pan head screws	.25 doz.
#2-56 x 3/32 long rnd. head screws	.25 doz.
SELF TAPPING SCREWS, #2 x 3/16 long	.25 doz.
AMPLIFIER, w/insulator and screws	11.95 ea.

Add 25c for postage *no C.O.D.s please*

FACTORY REPAIR SERVICE
Important, Please Read Carefully

All Annco Multi Servos are guaranteed against defects in materials and workmanship. All servos have been tested and adjusted at the factory before shipping to make sure they are in top working condition.

If you are going to send a servo back to the factory, for any reason, there will be a minimum charge of $1.50 per servo. This charge will include replacement of broken gears, stripped or broken push arm, and or cleaning of motor if necessary. Enclose check, or M.O. in the amount of $1.50 for each servo plus $.25 ea. for return by regular mail, or $.50 ea. for return by Air Mail. (Under this minimum charge, no returns by C.O.D.)

Add the following amounts to the above minimum charge for:

Damaged Case	$.75
Damaged Cover	.75
Burned out power transistors (2)	@1.50
New Long wires to amplifier	per amplifier 1.50
New switcher board in cover	.60
New wipers on push arm	.25