CONTROLAIRE SERVOS

INFORMATION AND INSTRUCTIONS

ASSEMBLY AND DISASSEMBLY

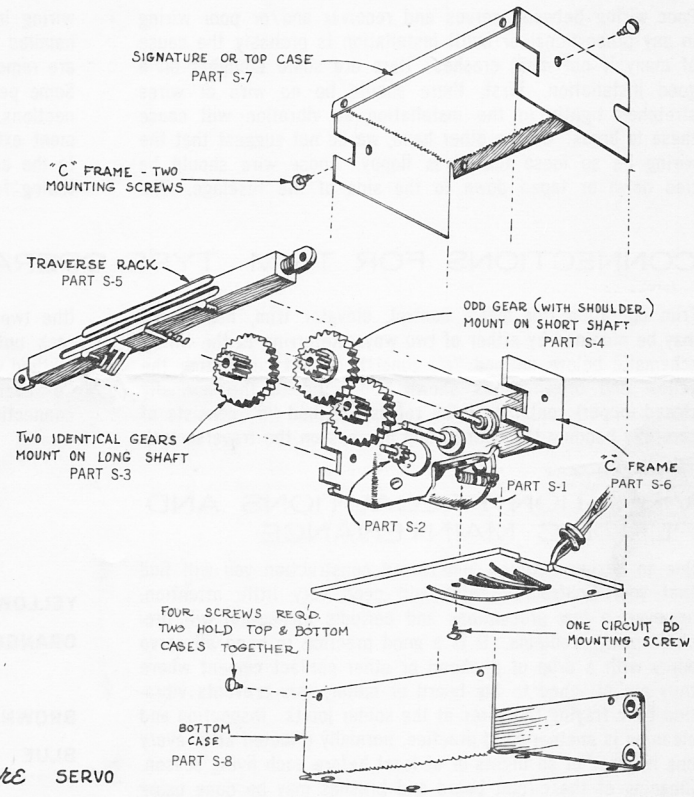
We do not recommend disassembly of your factory adjusted servo. If you are curious, here are a few pictures.

To disassemble the servo remove the 6 case screws and very carefully slide out the bottom case. The rack is then removed very carefully at which time the top case can be removed from the "C" frame. At this point the three pinion gears can very easily be removed. See our schematic exploded drawing for the correct position of the Printed Circuit Board

assembly which is fastened to the "C" frame with one sheet metal screw. Reverse the above order for reassembly. Note angle of brush springs when rack is disassembled. When reassembling the rack it is advisable to compress the brush springs with a light piece of cardboard (name card typical) before sliding the rack into the "C" frame. If this is not done, the brush assembly can be damaged if it is pushed up against the circuit board.

MODEL CS-R3 RELAY TYPE SERVO PARTS LIST

Servo Motor w/mtg. screws (Part S-1)	$ 4.95
Gear — Pinion (Part S-2)	.25
Servo Motor w/Pinion installed	5.45
Nylon Gear — 1st and 3rd (Part S-3) ea.	.25
Nylon Gear — 2nd (Part S-4)	.25
Nylon Rack w/brushes and adj. screws specify Proportional or Reed/Relay (Part S-5)	1.50
"C" Frame w/tool steel idler shafts (Part S-6)	1.95
Case Top (Part S-7)	1.95
Case Bottom — heat treated (Part S-8)	1.95
Adjustment Screws (Nylon) ea.	.10
Grommets (5)	.15
#2 x 3/16" S.M. Screws (7)	.10
Printed Circuit Board	1.75



Controlaire SERVO

BRUSH ADJUSTMENT FOR RACK TRAVEL

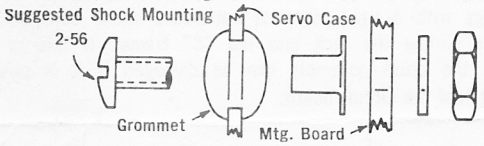
Almost all reed servos have had some brush adjustment to provide a slight area of trim in the center of the rack travel. In the early days of multi flying this was the way flyers attained trim. With the advent of 10 channel and the advent of the elevator trim servo this type of servo adjustment took on a much less important role in flying. Most flyers do not depend on this adjustment at all these days. Because of this Controlaire servos are adjusted for little or no trimmable travel at the center of the stroke. This feature, however, is designed into the servo. Notice the pictorial or examine the rack if you have your servo disassembled. Notice that the two outer brushes have hemispherical kinks bent into them. If you desire to increase the amount of trim at the center of your stroke on neutralizing servo you can flatten out these crimped sections the greater the distance between the contact points on the two outer brush blades will be. By increasing the distance you increase the amount of trim at the neutralizing servo center. We might add one interesting point here. Actually, when we set these servos up, we set them so that they would just **slightly** oscillate (springs crimped too much) and then assemble them into the case. Generally, when they are set up so that they will just slightly oscillate without the case on, we find that the addition of the case causes the servo to be set just right — no oscillation — and with almost no dead band or trim in the center of the servo travel. The case offers just a little friction to the rack. This friction dampens the reversing motor velocity and makes the oscillation stop.

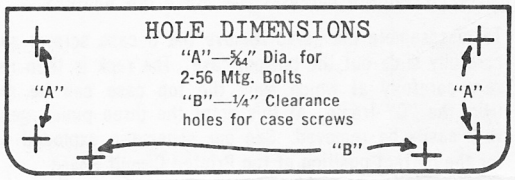
RACK BRUSH SPRING TENSION

On reed or relay servos the brushes should compress about .050" to .060" when the rack is installed. The circuit board is .045" thick. You can use the board as a reference if you choose to readjust the brushes.

SERVO MOUNTING

We suggest that the servo be mounted in a near vibration free manner. We supply a small Servo Mounting Kit, CS-MK1, which is also available extra at 25¢. See sketch below for recommended assembly. Apply a drop of cement to the screw threads to prevent loosening.





FULL SIZE DWG. - SERVO BASE PLATE

WIRE CONNECTIONS TO THE SERVO

Poor wiring between servos and receiver and/or poor wiring in any proportional or multi installation is probably the cause of many if not most crashes. Here are some thoughts on a good installation. First, there should be no wire or wires stretched tightly in the installation as vibration will cause these to break. On the other hand, we do not suggest that the wiring be so loose that it is floppy. Loose wire should be tied down or taped down to the side of the fuselage. The wiring in the airplane should be planned so that it will not handled or frayed every time the receiver or the batteries are removed for battery charging, etc. Wiring should be neat. Some people prefer to pot or incapsulate their terminal connections. This incapsulation can make service on the equipment extremely difficult when you send your equipment back to the equipment manufacturer — we recommend heat shrink tubing for strain relief.

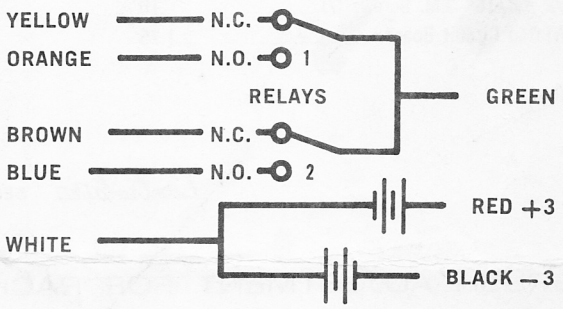
CONNECTIONS FOR TRIM TYPE OPERATION

Trim operation (for motor control, elevator trim, flaps, etc.) may be obtained by either of two ways. Referring to the wiring schematic below, method "a" consists of not connecting the yellow and brown wires shown connected to the normally closed (upper) contacts of the relays. Method "b" consists of carefully bending the neutralizing brushes on the traverse rack (the two outer brushes with hemispherical kinks) toward the rack until they no longer contact the circuit board. Either method works equally well, however, many users prefer method "b" even on relayless type servos due to uniformity of wiring connections & for interchangeability of servos.

VIBRATION PRECAUTIONS AND PERIODIC MAINTENANCE

Due to design features and closed construction you will find that your Controlaire servo will need very little attention; however, a few precautions and periodic inspection will preclude many problems. It is a good practice to bond all servo wires with a drop of pliobond or other contact cement where they are attached to the board or motor; this prevents vibration from fraying the wires at the solder joints. Inspection and cleaning is another good practice, normally effected after every one hundred or so flights or at least before each flying season. Cleaning of the circuit board and brushes may be done using lighter fluid or alcohol on a clean tissue. Gears and shafts may be lubricated lightly with any thin machine oil such as 3-and-1. Keep in mind that one of the physical properties of the gear and rack material is that of self-lubrication; avoid over-lubrication as this attracts dirt.

MODEL CS-R3
For Relay Type RX



GUARANTEE AND SERVICE

We guarantee the servo to be free from faulty parts and workmanship thirty days after purchase. The servo may suffer from crash damage or may wear out from long extended use. In such an event send your servo back to Controlaire for service. In doing so make sure your name and address is on the package so we will know where to return it. Secondly, please tell us why you are sending the servo in for repair. Sometimes rather substantial repair bills are passed back to customers when very little is wrong with the servo. The reason for this is time consumed in trying to locate the source of the trouble by the repairman. Please make his job easier by advising why you are returning the servo.

CONTROLAIRE DIVISION of WORLD ENGINES, INC.
8206 Blue Ash Road Cincinnati, Ohio 45236