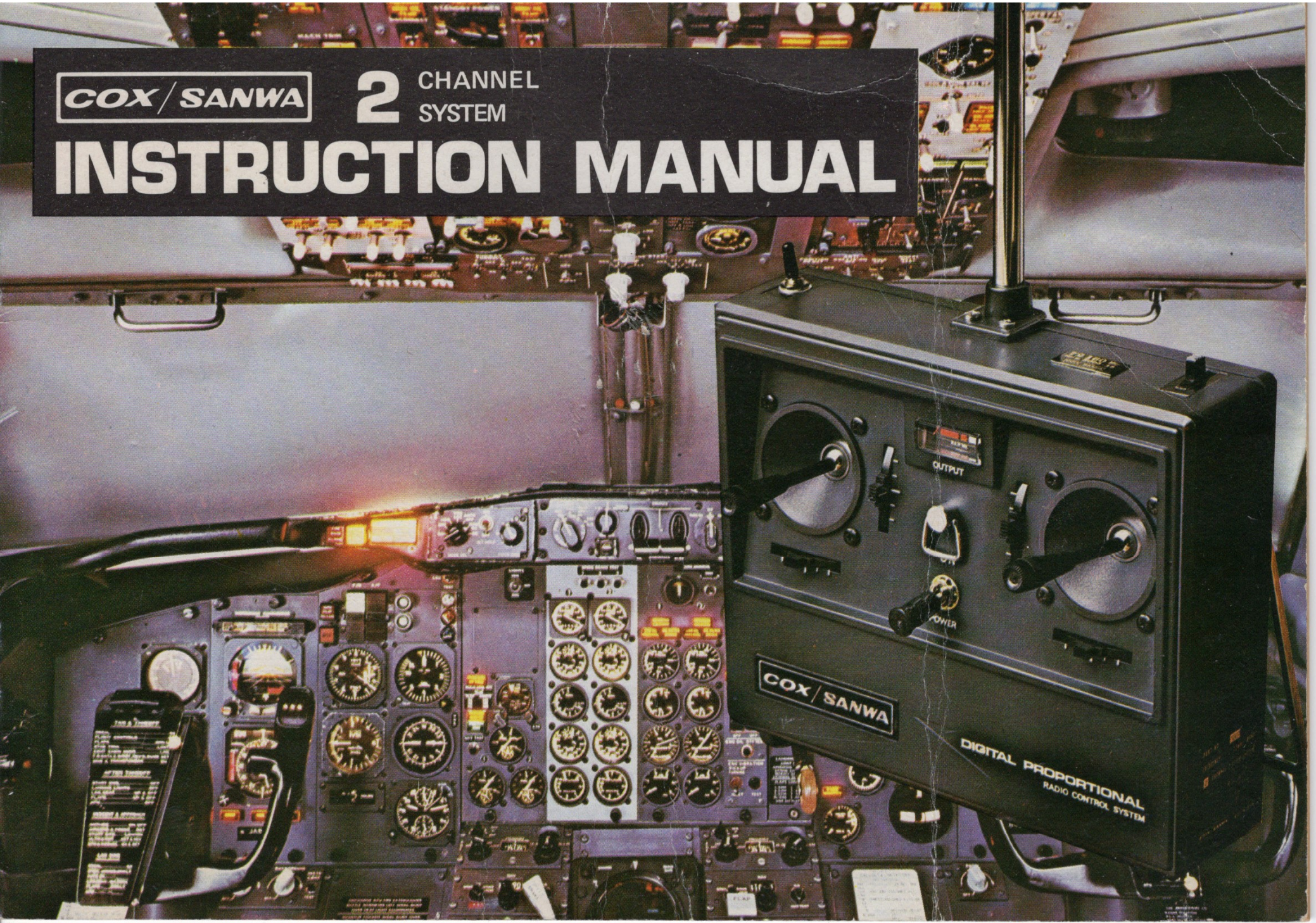
COX/SANWA

2 CHANNEL SYSTEM

INSTRUCTION MANUAL




ON
OFF
COX/SANWA
DIGITAL PROPORTIONAL
RADIO CONTROL SYSTEM
27
MHz RECEIVER
COX/SANWA
BATT
FUSE 1
FUSE 2

CONTENTS

INTRODUCTION

Thank you for selecting a Cox/Sanwa radio system to control your model. We believe this is one of the highest quality and most reliable radio control systems available anywhere in the world. We have dedicated our efforts to design and produce a superior product. Cox/Sanwa systems have unique engineering features which provide precision and convenience of operation unmatched by other equipment.

We are proud of this equipment, and feel confident you will enjoy many hours of trouble-free operation. Moreover, we are totally committed to provide whatever service or assistance you may require to derive maximum performance from your system. Study this instruction booklet carefully. Make sure you are familiar with the many features of your set before attempting to use it.

COX AIRTRONICS
William H. Selzer
President

THE COX/SANWA MODEL 8020

The Cox/Sanwa model 8020 is a true digital proportional system offering two independent simultaneous control functions. These two controls are generally used for rudder and elevator in the case of airplanes and gliders. In boats they are used for rudder and throttle or sail control. For cars they are used for steering and throttle.

The transmitter is a dual stick configuration featuring high RF output. The dual LED indicators continuously monitor the battery voltage and output power. It uses alkaline pencells batteries which are readily available. The 27 mhz units feature a plug in crystal which allows you to change frequency at will. The receiver also uses alkaline pencells for power.

The receiver is a super heterodyne type which features high selectivity and sensitivity for long range and a high degree of interference rejection. It also has the plug in crystal capability on the 27 mhz band. The servos and power source plug directly into the receiver.

The servos are the smallest of their type in the world and offer plenty of power for even larger models.

To legally use this radio you must file an FCC Form 505. These are available from your nearest FCC office which are listed at the right.

Your requests should be addressed as follows:

FEDERAL COMMUNICATIONS COMMISSION
ENGINEER IN CHARGE
(applicable street and city for your area)

FCC LIST

District	Address
1	1600 Customhouse, BOSTON, MASSACHUSETTS 02109
2	748 Federal Building, 641 Washington Street, NEW YORK, N.Y. 10014
3	1005 U. S. Customhouse, PHILADELPHIA, PENNSYLVANIA 19106
4	819 George M. Fallon Federal Building, BALTIMORE, MARYLAND 21201
5	870 North Military Highway, NORFOLK, VIRGINIA 23502
6	1602 Gas Light Tower, 235 Peachtree Street, N.E., ATLANTA, GEORGIA 30303
6S	238 Federal Office Bldg. and Courthouse, P.O.Box 8004, SAVANNAH, GEORGIA 31402
7	919 Federal Building, 51 S. W. First Avenue, MIAMI, FLORIDA 33130
7T	738 Federal Building, 500 Zack Street, TAMPA, FLORIDA 33606
8	829 Federal Building South, 600 South Street, NEW ORLEANS, LOUISIANA 70130
8M	439 U.S. Courthouse and Customhouse, 113 St. Joseph Street, MOBILE, ALABAMA 36602
9	5636 Federal Building, 515 Rusk Avenue, HOUSTON, TEXAS 77002
9B	323 Federal Building, 300 Willow Street, BEAUMONT, TEXAS 77701
10	Room 13E7, 1100 Commerce St., Federal Building, DALLAS, TEXAS 75202
11	312 North Spring St., U. S. Courthouse, Room 1754, LOS ANGELES, CALIFORNIA 90012
11SD	1245 Seventh Avenue, Fox Theatre Building, SAN DIEGO, CALIFORNIA 92101
11SP	300 South Ferry Street, Terminal Island, SAN PEDRO, CALIFORNIA 90731
12	323A Customhouse, 555 Battery Street, SAN FRANCISCO, CALIFORNIA 94111
13	314 Multnamah Building, 319 S.W. Pine Street, PORTLAND, OREGON 97204
14	8012 Federal Office Building, 909 First Avenue, SEATTLE, WASHINGTON 98104
15	504 New Customhouse, 19th St. between California & Stout Sts. DENVER, COLORADO 80202
16	691 Federal Building, 4th & Roberts Streets, ST. PAUL, MINNESOTA 55101
17	1703 Federal Building, 601 East 12th St., KANSAS CITY, MISSOURI 64106
18	1872 U. S. Courthouse, 219 South Dearborn Street, CHICAGO, ILLINOIS 60604
19	1054 Federal Building, Washington Blvd. & LaFayette Street, DETROIT, MICHIGAN 48226
20	905 Federal Building, 111 W. Huron St. at Delaware Avenue, BUFFALO, NEW YORK 14202
21	502 Federal Building, P. O. Box 1021, HONOLULU, HAWAII 96808
22	U. S. Post Office and Courthouse, Room 322, 323, P. O. Box 2987, SAN JUAN, PUERTO RICO 00903
23	U.S.Post Office Building, Room G63, 4th & G St.,P.O.Box 644, ANCHORAGE, ALASKA 99510
24	Room 216, 1919 M. Street, N. W., WASHINGTON, D. C. 20554

FREQUENCY and PROPER FLAG

There are twelve different frequencies you may use this equipment on. These frequencies and their associated color codes are listed below. The color code is used as an easy means of identification at your local flying field and is indicated on the transmitter antenna by means of colored flags. NEVER USE YOUR TRANSMITTER WITHOUT THE PROPER FLAGS DISPLAYED AND ALWAYS CHECK TO BE SURE THAT SOMEONE ELSE IS NOT ALREADY USING THE SAME FREQUENCY.

Frequency	Flag
26.995	Brown
27.045	Red
27.095	Orange
27.145	Yellow
27.195	Green
72.080*	Brown/White
72.160	Blue/White
72.240*	Red/White
72.320	Violet/White
72.400*	Orange/White
72.960	Yellow/White
75.640*	Green/White

*Indicates aircraft frequencies only.

The proper flags are furnished with your unit.

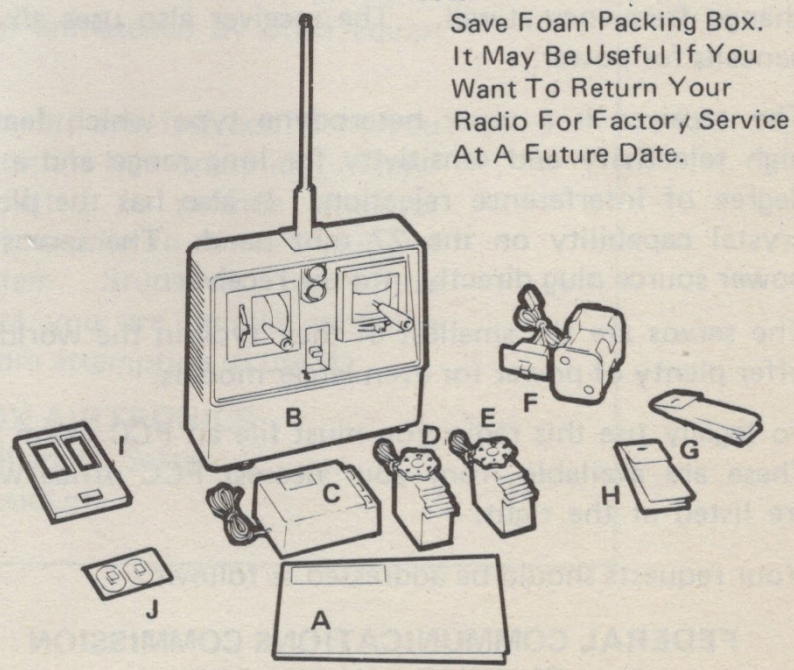
UNPACKING

When unpacking your equipment please be sure to check each item against the inventory list. If anything is missing please notify your dealer immediately.

CHECK LIST

A 1 – Instruction Manual
B 1 – Transmitter
C 1 – Receiver No. 8012
D 1 – Servo No. 80321
E 1 – Servo No. 80322
F 1 – Battery Case and Switch Assembly
G 1 – Set Proper Frequency Flags
H 1 – Package Containing Leaf Spring, Coil Spring, Screw and Washer
I 1 – Set Servo Trays and Screws
J 1 – Set Transmitter (TX) and Receiver Crystals (RX)

Note:
Save Foam Packing Box. It May Be Useful If You Want To Return Your Radio For Factory Service At A Future Date.



INSTALLATION OF BATTERIES

You will need twelve alkaline energizer pen cell batteries to operate your unit. These are high output cells and are size AA. They are available from most electronic stores, drugstores, etc. BE SURE YOU USE ONLY ALKALINE CELLS. Regular pen cell batteries are not suitable.

Eight of these batteries will be used in the transmitter as described below.

1. After removing cover plate as indicated in Figure 1 note the serial number of the transmitter. If your unit is ever stolen this is the only means of identification. Enter Serial No. on warranty card.

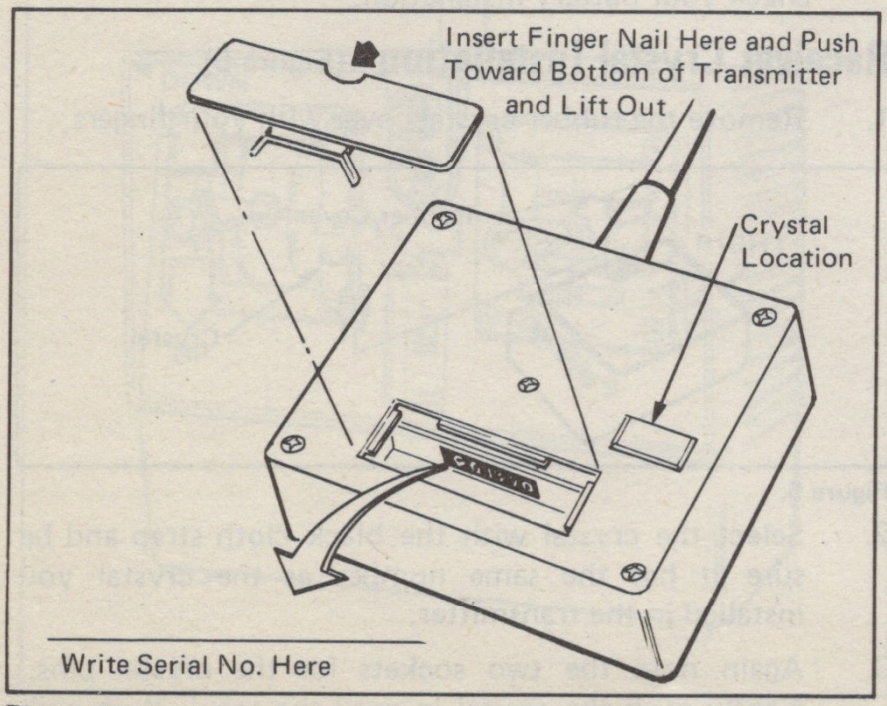


Figure 1.

2. Now install the 8 batteries as indicated in Figure 2. The negative end always goes toward the spring. Four inner cells first, then the four outer cells.

3. Replace the cover plate. DO NOT TURN ON TRANSMITTER AT THIS TIME.

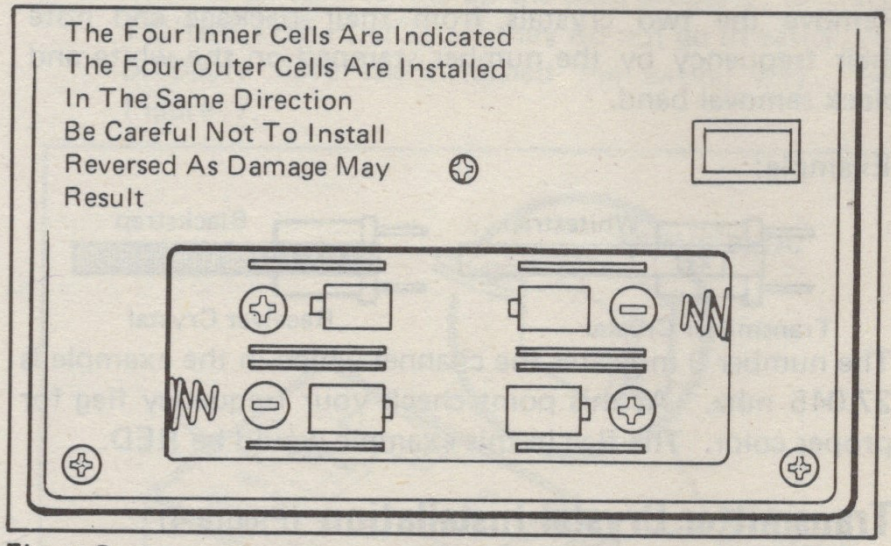


Figure 2.

4. The other four cells can now be installed in the receiver power pack. Note that the proper polarity of the cells are indicated on the plastic case. See Figure 3. Again the minus (–) end always goes toward the spring.

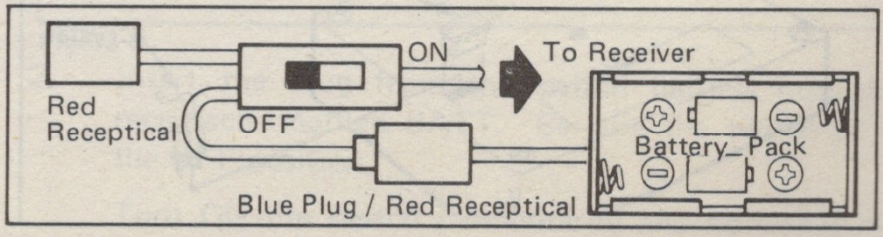


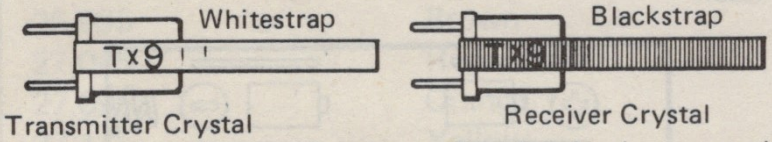
Figure 3.

INSTALLING THE CRYSTALS (27mhz)

This applies only to the units on 27 mhz. The 72 mhz units are set at the factory and can only be changed by a licensed technician. Should you wish to change the frequency on one of the 72 mhz units it must be returned to the factory.

Remove the two crystals from their package and note their frequency by the number stamped on the white and black removal band.

Example:



The number 9 indicates the channel which in the example is 27.045 mhz. At this point check your frequency flag for proper color. The flag in this example would be RED.

Transmitter Crystal Installation (Figure 4)

1. Remove the rubber cover from the crystal location on the back of the transmitter. This is easily removed with your fingers.

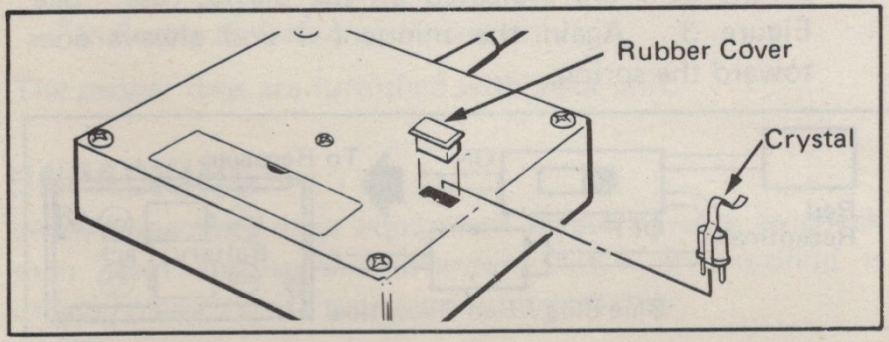


Figure 4.

2. Looking thru the hole you will note there are two sockets for the pins on the crystals.
3. Line the crystal up with these holes and gently push it into place. The top of the crystal should be flush with the back of the case. Push the cloth strap into the case. Replace the rubber cover.

   REMEMBER THAT THE TRANSMITTER CRYSTAL HAS THE WHITE CLOTH STRAP.
4. Now turn on the transmitter using the ON-OFF switch located on the front. The two indicator lamps should light immediately and be of the same intensity. If they do not light or are of different intensities turn the switch off immediately. If this should happen check your battery installation.

Receiver Crystal Installation (Figure 5)

1. Remove the rubber crystal cover with your fingers.

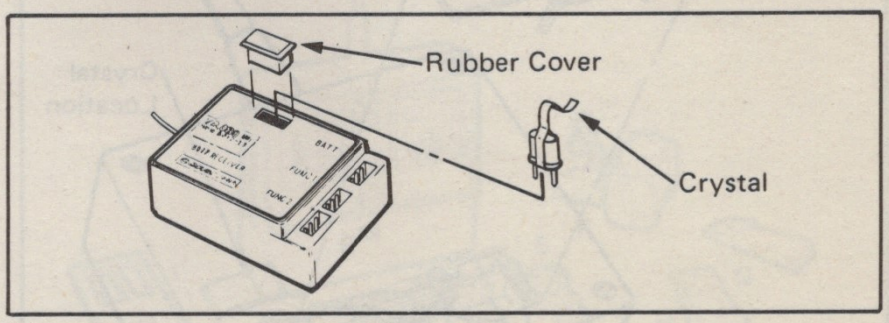


Figure 5.

2. Select the crystal with the black cloth strap and be sure it has the same number as the crystal you installed in the transmitter.
3. Again note the two sockets for the crystal pins. Gently push the crystal in until the top is flush with

the receiver case. Tuck the strap into the case and install the rubber cover in the same manner as the transmitter.

This completes the installation of the batteries and crystals and the unit is now ready for the bench check.

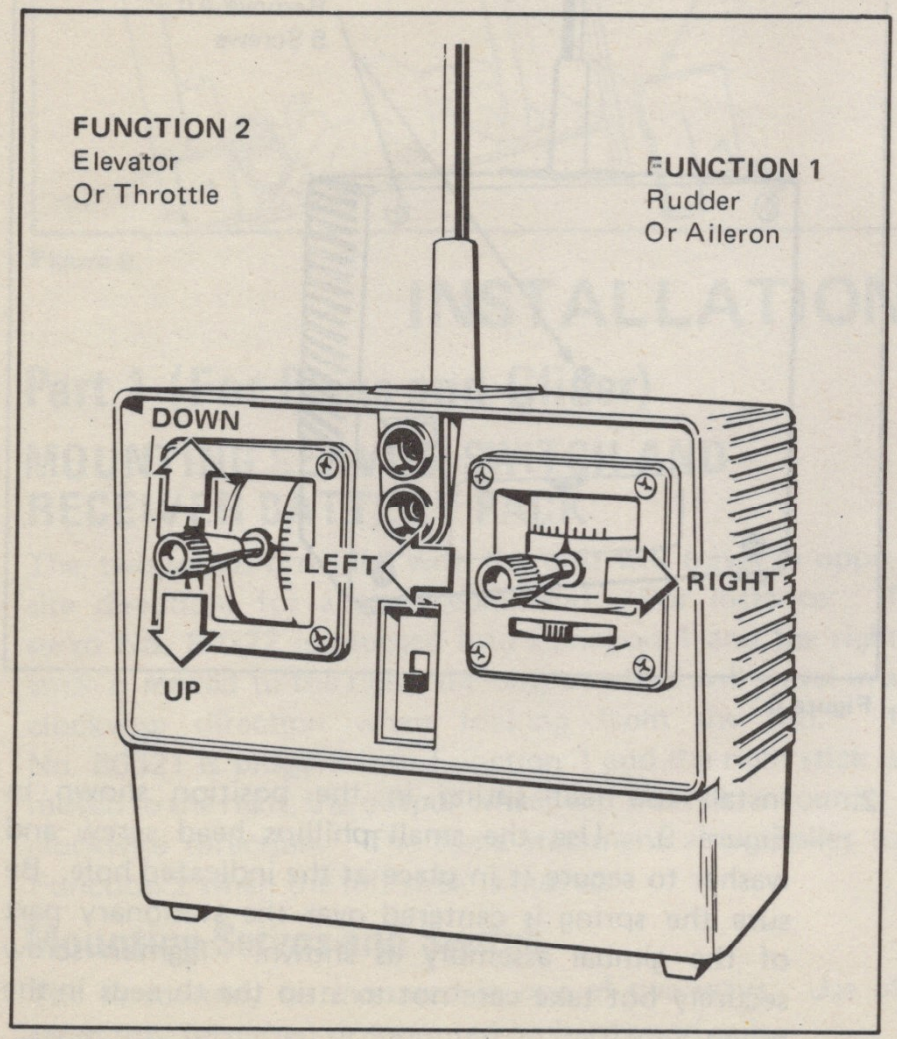


Figure 6.

BENCH CHECK

1. Select the two servos and plug one of them into the receptacle marked Function 1 and the other into the receptacle marked Function 2. Note that the plugs and receptacles are polarized, i.e., the pins are off center. Be sure to line up the plug properly. DO NOT FORCE THE PLUGS. If they do not go in easily, you probably have them turned the wrong way. See Figure 7.

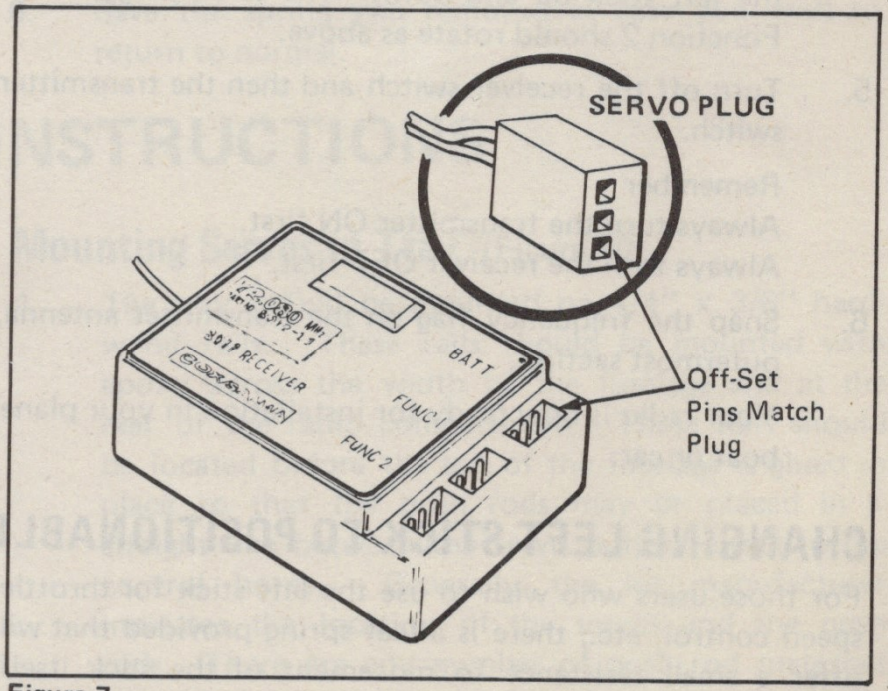


Figure 7.

2. Insert the plug from the switch harness into the receptacle marked BATT. Be sure the switch is in the OFF position.

   Turn ON the switch momentarily and note that the servo wheels move slightly.

3. Unwrap the receiver antenna and let it hang over the edge of your bench keeping it away from the servo and battery wires.

4. Turn on the transmitter and then the receiver switch. The servos should move to their neutral position. Now move the right stick both left and right. The servo plugged into Function 1 should rotate both clockwise and counterclockwise and return to its neutral position when the stick is released. Now move the left stick up and down. The servo plugged into Function 2 should rotate as above.

5. Turn off the receiver switch and then the transmitter switch.

   Remember
   Always turn the transmitter ON first.
   Always turn the receiver OFF first.

6. Snap the frequency flag on the transmitter antenna, outermost section.

   Your radio is now ready for installation in your plane, boat or car.

CHANGING LEFT STICK TO POSITIONABLE

For those users who wish to use the left stick for throttle, speed control, etc., there is a leaf spring provided that will offer a small resistance to movement of the stick itself. Using this will allow the stick to remain in any position you so choose.

The following steps are required to make this change and the reverse is required to return it to the normal spring loaded configuration. Refer to Figures 8 and 9.

1. Remove the five screws indicated in Figure 8. Then remove the back.

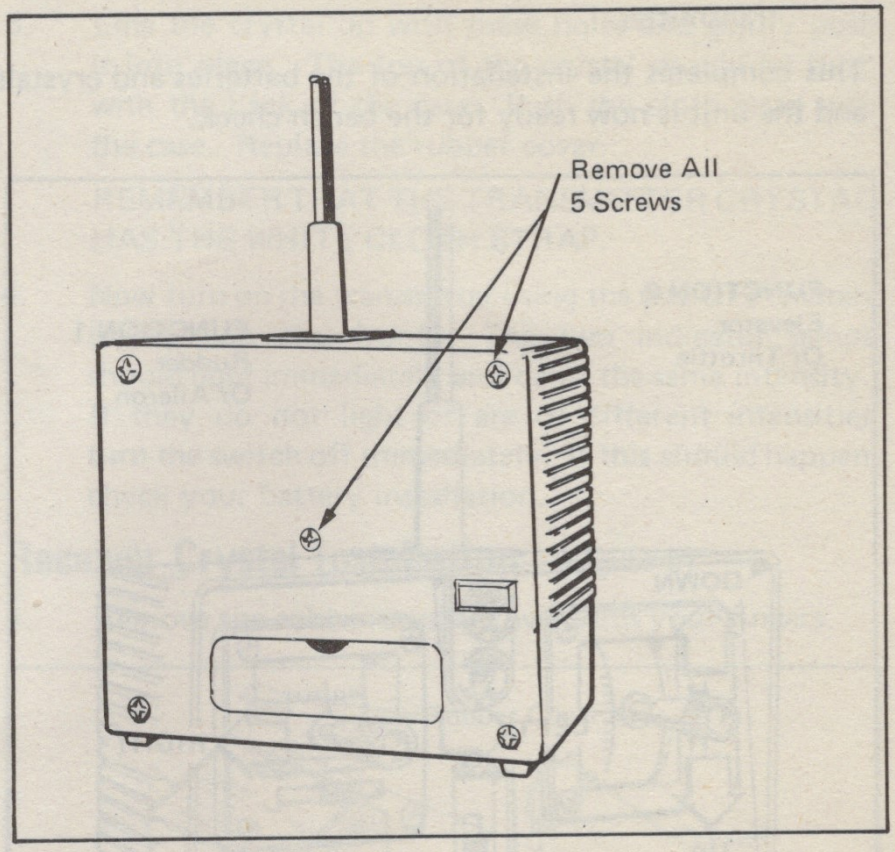


Figure 8.

2. Install the leaf spring in the position shown in Figure 9. Use the small phillips head screw and washer to secure it in place at the indicated hole. Be sure the spring is centered over the stationary part of the gimbal assembly as shown. Tighten screw securely but take care not to strip the threads in the nylon.