

Radio Control Basics

The Transmitter

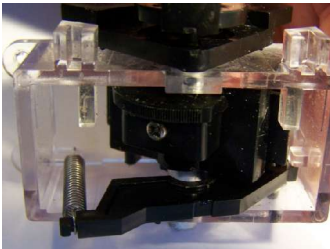
Seawinds require that 2 channel radio control be used. The transmitter used is the standard two stick unit, such as the Futaba Attack.



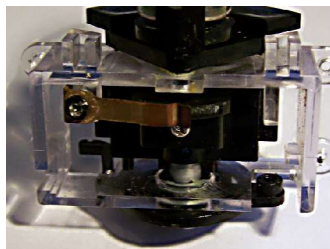
These are usually set up for aircraft use with the elevators on the left and rudder on the right. The sticks self centre which is required for aircraft and for the yacht rudder.

Sail Control Ratchet

For sail control the centering should be changed to a ratchet. This requires that the transmitter be opened and, on the left stick, the spring and cam lever removed and a drag link attached with a screw. These are usually available from the shop for a couple of dollars or can be made from a metal or plastic strip.



Remove spring and arm



Attach ratchet drag strip

Reversing Switches and Trim

There are switches to reverse the action of the sticks and these should be set so that the rudder turns the boat to the right when the stick is moved right. The sail control can be set so that the sail are pulled home to the 'on the wind' position with both the stick and the trim pulled fully down. For sailing 'off the wind' the stick and the trim can both be moved fully up. The trim on the rudder control should be used to set the rudder exactly central before the boat is launched and not moved after that.

If a servo is replaced in the boat with a different brand or model then this may work in the opposite direction and so the reversing switches should be used to correct this.

Multi-Channel transmitters

If the transmitter has more channels, such as the DX5e which is used because it is 2.4MHz, then the sticks will move in 2 directions to control the four channels. The aircraft throttle control will be used for the sails as this does not self centre.



Different models are made and the throttle may be on the right stick (Mode 1) or on the left stick (Mode 2) to cater for individual preference.

The Mode 2 model should be purchased as these units are often not modifiable.

Crystals and Frequencies

Transmitters are made for a specific frequency band: 27MHz, 29MHz, 40MHz, or so and only the correct band's crystals should be used.

Safety Strap

A strap or rope can be used around the neck to hold the transmitter as this allows both hands to be used for launching and recovering the boat, or for other needs. Some models have a loop for this purpose. If there is no point to attach a strap then the case may be taken apart and a hole or two drilled in the front to take a rope. Just push each end through a hole and put a figure 8 knot on the end.

Batteries

Usually alkaline or rechargeable batteries can be used. Some models have connectors for a battery charger of the correct type so that the batteries can be charged while still in the unit. See the appropriate user manual for your model to determine which charger to use.

My experience is that the battery box clips are not reliable and can release or break allowing the batteries to fall out. This is bad enough if it occurs when sailing, but can be worse if the batteries then fall into the pond.

Some tape over the battery box lid should be used to prevent this opening inadvertently.

Transmitter Aerial



The aerial should be extended fully for best range. The tip must be covered by a protector, such as a table tennis ball, to prevent damage to other people.

The Receiver

The receiver must match the transmitter and operate in the same band. The receiver must have the matching RX crystal to the transmitter's TX crystal with the same frequency.

When installed in the boat it should be protected from water by being in a sealed plastic bag or a balloon. The use of vaseline or similar around the wire exits will repel water and a couple of cable ties around this will help seal it.

This should be mounted where it will not sit in water, such as velcroed up under the deck or strapped to the servo tray.

Boat Batteries

The battery wiring supplied with a standard set is suitable for aircraft because it is lightweight. Being of fine unplated copper wire it is liable to corrosion in wet and salty conditions. An appendix on replacing this with plated wire is attached.

The batteries should be made waterproof by being bagged and should be firmly secured with velcro or rubber bands into the compartment.

The Receiver Aerial

The aerial can be threaded into a 1mm plastic straw and this can be sprung into the foredeck area so that it sits up under the deck, or it can be extended and passed up a hole in the deck or a hatch and run up the rigging.

The higher the aerial reaches the greater the range can be.

The Servos

The sail servo should be a Hi-Tech HS-765HB or equivalent sail arm servo. Some servos will only swing through 90 degrees while the HS-765HB can travel the full 110 degrees that is available between the Seawind's keel tube and servo tray rear mounting post.

The rudder servo can be any standard servo of the correct size and only needs a 90 degree swing.

Crossarms and Sail Arms

The arms supplied by the manufacturer of the servo should always be used. The servo output shaft may be the wrong size for a different brand. In particular a Hi-Tech servo has a smaller shaft size than the Futaba servo and a Futaba crosshead on a Hi-Tech HS-422 will not grip correctly even if the screw holds it tightly down.

Removing and Replacing the Tray

The servo tray can only be removed and replaced one way, sometimes this way is not found easily.

Remove the batteries, the servo arms and the four screws holding the tray. Move the tray to port (left) and pull the starboard support post up through the hatch, the tray will follow. To replace push the tray into the hatch with the starboard post going in last.

Setting up the Servos

After installing the servos in the tray and the tray in the boat the servos should be centered before attaching the crossarms. If this is not done then upon switching on the servos may try to put the arms beyond the limits of the space available and could cause damage.

1. With the arms removed from both servos turn on the receiver and the transmitter. Check that the servos are on the correct channel and work in the required sense with the reversing switches.
2. Centre the transmitter sticks and trims so that the servos are in the centre of their range.
3. Fit the arms as directly athwartships as possible. At this stage the sheets and rudder pushrods should not be fitted.
4. Check that the full travel of the servo is available by operating the sticks and trims.
5. Attach the sheets to the arm with the adjustments at the boom as loose as possible. Ensure that the arm can travel its full range without jamming the knot into the turning block or running out of boom travel.
6. Attach the rudder pushrod after adjusting the length to best suit the centered position.

New Zealand Radio Yacht Squadron

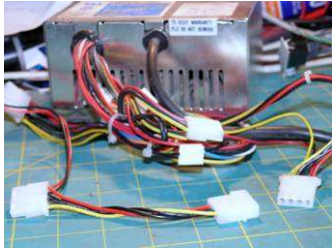
Web site: <http://Azonic.co.nz/NZRYs/>
Secretary: pfa@Xtra.co.nz

Appendix 1: Better Battery Wiring

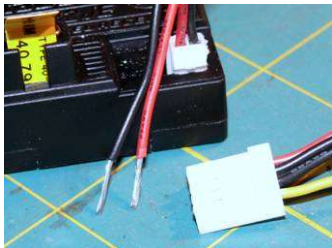
The wiring supplied with radio control gear is lightweight plastic coated copper wire. This is ideal for aircraft but is not a good choice for boats, especially in salt water. The copper corrodes easily leaving a black surface which is difficult, or impossible, to clean if re-soldering is required. The corrosion eventually reduces the strength of the wire causing breaks at exposed points, such as where it is connected to the battery box, the switch or the connectors. This corrosion will run down inside the plastic coating.

The servo wiring is usually adequately protected because the ends can be sealed inside the servo and bagged in the receiver.

What is needed for the battery connection is plated wire of a heavier gauge and connectors that are more resistant to corrosion. Old PC power supplies have this type of wiring, nickel plated copper, and Molex connectors. Matching male connectors can be easily and cheaply



obtained from PC accessories such as fans or power splitters.



The two pin 0.10 inch female connector into the receiver can be found on some PC fans with plated wire. Or this can be cut and carved from a floppy disk connector as shown

here. This also shows the plated wiring.

If rechargeable batteries are used then the battery box can be discarded and the batteries glued together. Wiring can be soldered onto the cells, but do this quickly with a hot iron to reduce the possibility of damage. This can then be wrapped in tape, preferably 'self



amalgamating' and bagged to exclude all water. Seal where the wiring emerges and use a cable tie.

You will need a charger that will work with a block of cells and an adaptor that uses the same type of connector to recharge the batteries.