

P40C

MARINE MOTOR MIXER

For 2-3 motors

ACTION

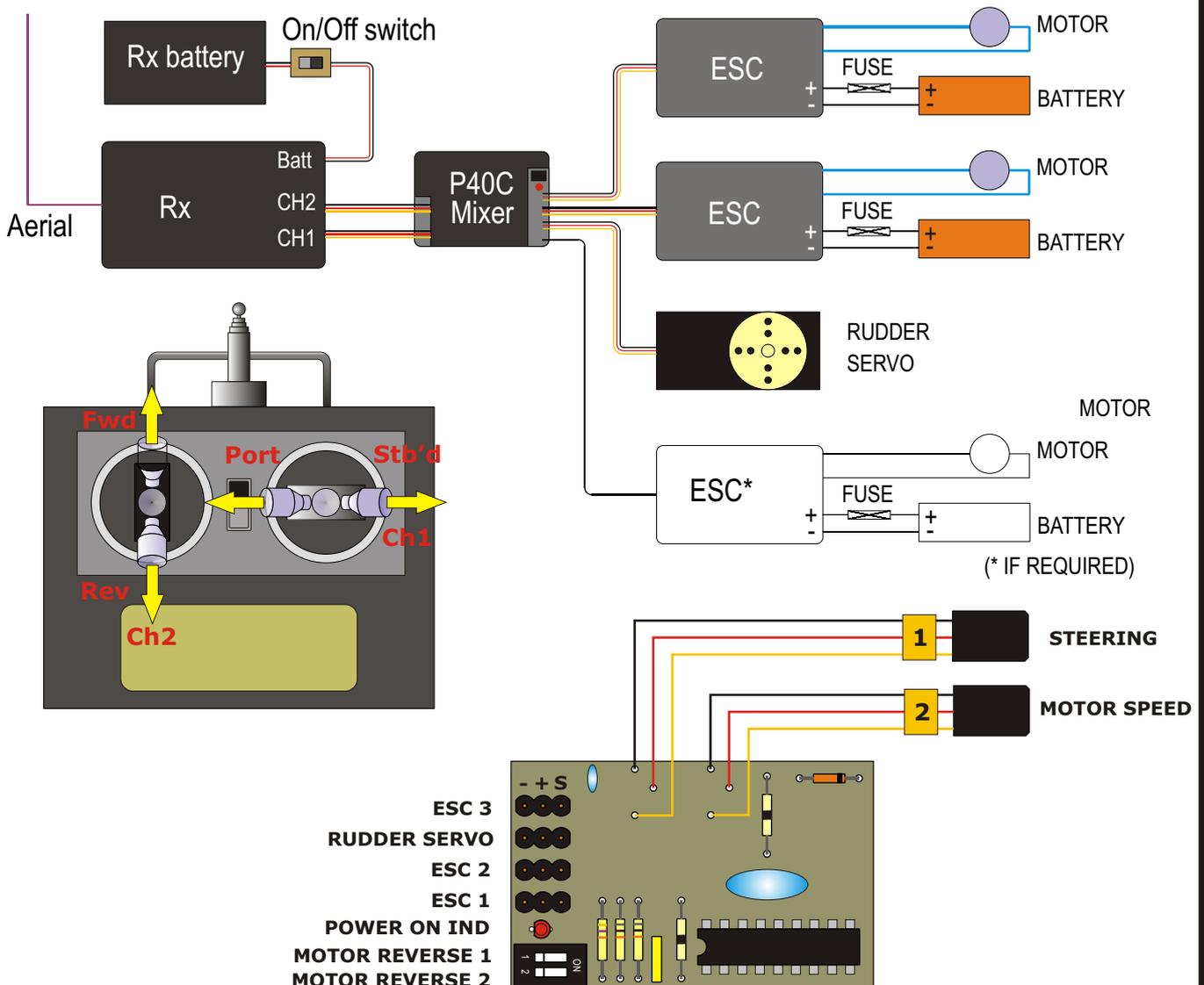
R/C ELECTRONICS

This on-board marine motor mixer will suit models with up to three speed-controlled motors. You will have full differential control of the port and starboard motors in both forward and reverse direction from only two channels of your R/C system. The P40C can also be used with 4-6 channel radios. It has proved to be compatible with virtually all currently-available ESCs, although we recommend using ACTION units (of course...) for untroubled operation. The use of speed controllers fitted with BEC is not recommended but can be accommodated. While it is possible to use up to three ACTION Condor speed controllers from one main battery we recommend the use of separate battery packs for each motor/ESC to avoid any complications which can arise with resetting microprocessor-based ESCs. Straight-through output connectors are provided for the steering (rudder) and a third (central/unmixed) motor speed controller, if used. This eliminates the need to buy and install expensive Y-leads. Full installation and setting-up drawings and instructions are provided.

Minimum input pulse length
Maximum input pulse length
Neutral (centre stick)
Receiver voltage
Case size
Power ON indicator
Adjustments

0.9ms
2,1ms
Autoset (takes 2 seconds)
4.8v - 6v
55 mm x 36mm x 20mm
LED
Motor reversing via 2-way PCB switch

DO NOT USE EITHER A 5-CELL RECHARGEABLE PACK OR A 6V LEAD-ACID BATTERY FOR THE RX POWER SUPPLY



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REQUIRED INPUT PULSES (BOTH CHANNELS)

Minimum pulse length	0.9ms
Maximum pulse length	2,1ms
Neutral (centre stick)	Autoset (takes 2 seconds)
Receiver voltage	4.8v to 6v MAXIMUM DO NOT USE 5 CELLS OR A 6V LEAD-ACID BATTERY FOR RX SUPPLY
Output pulse drive direction	Switched reversers
Output connections	Three speed controllers & rudder servo
Power-on indicator	LED
Case size	55 mm x 36mm x 20mm

OPERATION

Always switch on your Transmitter first, then your receiver. Wait three or four seconds before moving either of the transmitter sticks, to allow the microprocessor in P40C to set itself to the incoming neutral signals. When closing down, switch off the receiver first, followed by the transmitter. **DO NOT PLUG OR UNPLUG ANY CONNECTIONS TO THE RECEIVER WITH THE RECEIVER POWER ON. IT CAN FATALLY DAMAGE MICRO-CONTROLLERS.**

CONNECTION and TEST

Connect the plugs on the two fitted leads marked I & 2 to the steering and motor speed outputs of your radio control receiver. Connect the port and starboard speed controllers to Motor I and Motor 2 output connectors, ensuring that the leads are fitted the right way around (See drawing). The third (middle) motor speed controller can be connected if you are using one. The last connection is the steering (rudder) servo. **If you are using ACTION speed controllers then you should use a separate battery for each motor/speed controller.** This is to avoid "ground loops" on the negative power rail which prevent correct resetting of the microprocessors.

SETTING UP YOUR MIXER

Please follow these written instructions ***in exactly the order they are written***, referring to the Setting Up diagram. Remember that this unit is actually a computer and that there is a regime involved in its operation. Ignore this and you'll quickly become frustrated!

The instructions assume a few basics:

Your transmitter has servo-reverse facility on both the motor and rudder channels. The motor control is on the LH stick of the transmitter, while you steer with the RH stick. You have two spare servos to act as test dummies while you set things up. Your model has the conventional outward-turning props when viewed from behind the model i.e. Starboard = Clockwise and Port = Anticlockwise. If you have inward-turning motors, set up the system exactly as shown and, when finished, simply reverse the connections to the two motors so that they run in the opposite direction. Easy!

Plug the mixer into the receiver, connect the steering servo to the mixer output and switch the radio system on. Check that the servo moves in the right direction on given command to steer the model with the rudders. If necessary, use the reverse switch on the transmitter to change the direction of rotation of the servo. **Leave this switch alone for the rest of the set-up procedure.**

P40C



Plug a spare servo into each of the mixer's ESC outputs and switch on. *Allow 4 seconds for the AUTOSET function to activate before moving any sticks on the transmitter.* Move the transmitter sticks and check that the servo discs move as shown in the first three rows of the diagram. You may need to use the Tx servo reverse switch on the motor channel and/or one of the small DIL switches on the mixer to achieve this, or maybe just reverse the positions of the servos on the bench in front of you. Note that the motors will remain at Stop until there is a *slight* amount of forward or reverse applied via the LH transmitter stick.

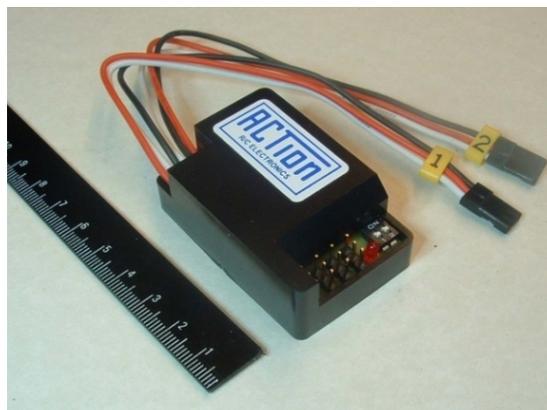
Now try the commands in the last four rows of the diagram. Adjust only the mixer DIL switches to achieve the required results. If it's of any help, our Futaba Attack-R 2 channel set has both Tx reversing switches set at Normal and the DIL switches on the mixer are set to 1 and 2.

When you are happy with the results, make a written note of the positions of the Tx reversing switches, the mixer DIL switches and which servo (Port or Starboard) is connected to which of the two ESC outputs from the mixer.

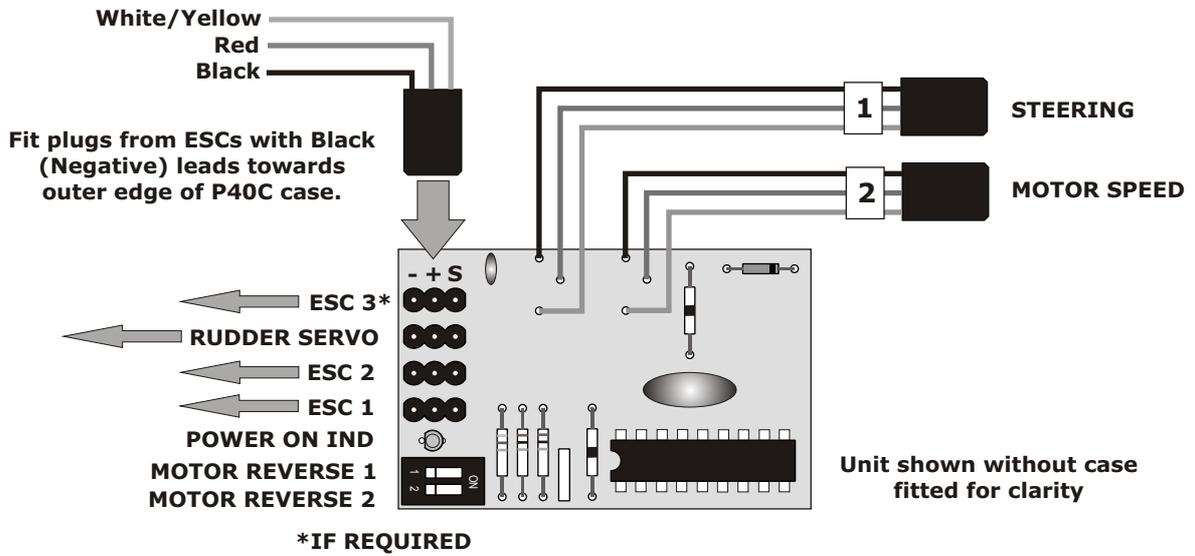
Now disconnect the test servos and install the mixer in the model. Connect the Port and Starboard speed controllers to the corresponding mixer outputs. Connect the motors to the speed controllers and the speed controllers to the main drive batteries. Switch on the radio; move the Tx sticks and test the commands in Column 1 of the setting-up diagram against the propeller rotations shown in Column 4. Adjust the neutral and peak settings for each speed controller, if necessary. If you have ACTION Condor ESCs then they will automatically take care of these settings every time you switch the system on. The mixer will also detect the position of the Tx sticks and set this as its neutral position when you switch on, BUT you must wait for four seconds after switching on for these auto-settings to come into effect before moving the Tx sticks.

The only adjustment which should be made now is to reverse the direction of rotation of the motors, if necessary, by reversing the connections from the ESC to the motor. *Don't change either the Tx or Mixer switch settings*, or it's back to Step #1, I'm afraid.

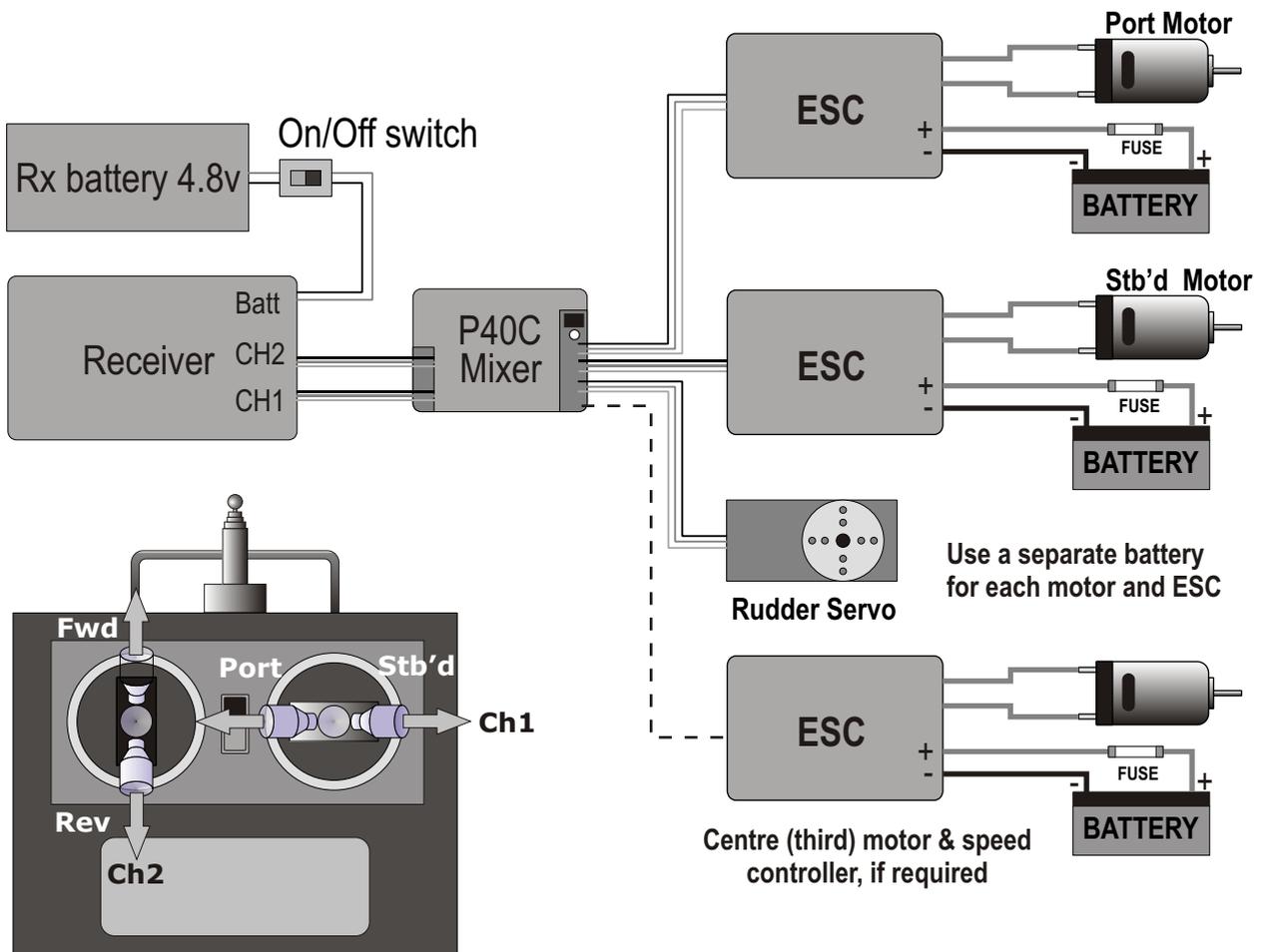
As we use the same transmitter for several different models we have found it a good idea to have a "Settings" card for each model which we can keep in the lakeside toolkit. Use this to note the settings of the Tx reversing switches.



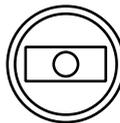
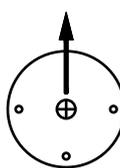
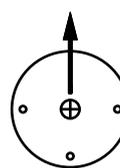
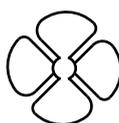
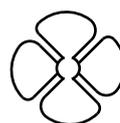
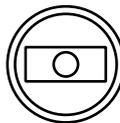
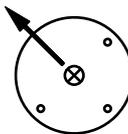
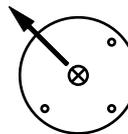
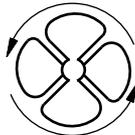
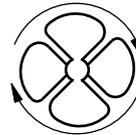
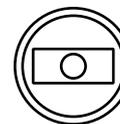
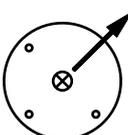
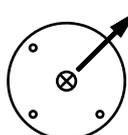
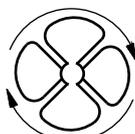
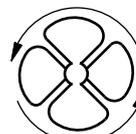
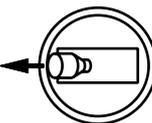
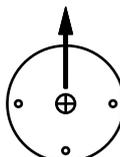
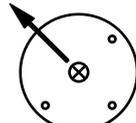
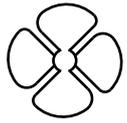
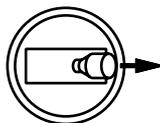
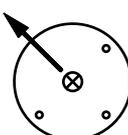
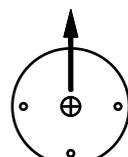
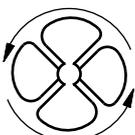
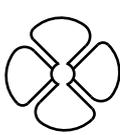
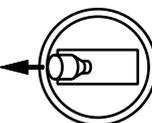
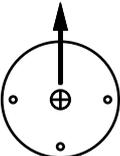
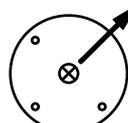
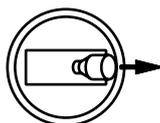
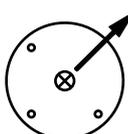
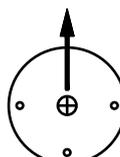
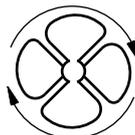
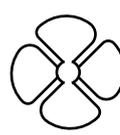
Connections from speed controllers and receiver to P40C Mixer



Wiring for complete R/C installation



SETTING UP ACTION MARINE MIXER USING TEST SERVOS

COMMAND	Tx stick positions		Test servo disc positions		Prop direction/speed	
	Motor	Steering	Port	Stbd	Port	Stbd
DEAD STOP + NO RUDDER					 STOP	 STOP
FULL AHEAD + NO RUDDER					 FWD	 FWD
FULL ASTERN + NO RUDDER					 REV	 REV
FULL AHEAD + HARD TO PORT					 STOP	 FWD
FULL AHEAD + HARD TO STBD					 FWD	 STOP
FULL ASTERN + HARD TO PORT					 STOP	 REV
FULL ASTERN + HARD TO STBD					 REV	 STOP