

**P40E**

## MARINE MOTOR MIXER

For 2-3 motors



This on-board marine motor mixer will suit models with two or three electronic speed-controlled motors. It now has four user-selectable 'degrees' of mix which make it suitable for models from fast launches to very manoeuvrable work-boats such as tugs. This offers full proportional control of motors and steering from only two radio channels, although it will work with sets of four or more channels. It has proved to be compatible with most electronic speed controllers which are equipped with full forward and reverse power function, *including those for brushless motors*. Use of BEC is not recommended but can be accommodated. We strongly recommend the use of a separate battery pack for each motor to avoid the complications due to earth loops which can arise with resetting microprocessors.

Straight-through output pin connections are provided for a rudder servo and a third, unmixed speed controller for a central motor. This eliminates the need for Y-leads.

### Neutral setting up (centre stick)

Receiver voltage

Case size

Power ON indicator

Adjustments

Autoset (takes 2 seconds)

4.8V - 6V\*

55 mm x 36mm x 20mm

LED

Four different degrees of motor mix via 2-way PCB switch

**\*PREVIOUS VERSIONS OF THE P40 COULD NOT BE USED WITH A 5-CELL RECHARGEABLE PACK OR A 6V LEAD-ACID BATTERY HOWEVER THE P40E CAN BE USED FROM ANY 4.8V / 6.0V / 6.6V BATTERY**

### OPERATION

Always switch on your Transmitter first, then your receiver. (Allow the two to 'bind' if you are using a 2.4GHz set). Wait for a further three or four seconds before moving either of the transmitter sticks; this allows the on-board microprocessor to set itself to the incoming neutral signals from the transmitter. When closing down, switch off the receiver first, followed by the transmitter.

DO NOT PLUG OR UNPLUG ANY CONNECTIONS TO THE RECEIVER OR MIXER WITH THE POWER SWITCHED ON. IT CAN FATALLY DAMAGE MICROPROCESSORS.

### MODES OF OPERATION

P40E has four different degrees of mixing, depending on the type of model into which you have fitted it. These are set by moving the little switches 1 and 2 as follows:

Mode 1: SW1=ON; SW2=ON - This is designed for fast models such as patrol boats and modern lifeboats. The inner motor in a turn is reduced in speed by applying increasing amounts of rudder command but it will not go into reverse, irrespective of how fast the model is travelling. This avoids the model slowing down noticeably when a turn is applied.

Mode 2: SW1=OFF; SW2=ON - This allows the inner motor to go into reverse at full rudder but restricts that reverse speed to 25%. It suits slightly slower models than Mode 4 or where a little more manoeuvrability is required.

Mode 3: SW1=ON; SW2=OFF - As Mode 2 except that the inner motor can reverse up to 50% full speed at full rudder.

Mode 4: SW1=OFF; SW2=OFF - This is the classic "spin-on-the-spot" mode where the inner motor can be made to run at full reverse speed with full rudder and a little throttle. It is designed for very manoeuvrable models such as tugs.

Note that NONE of the modes allows the inner motor to reverse at full throttle and full rudder which would cause a drastic "lurch" in the model's progress at speed. Selection of the correct mode is down to the user by seeing what the model does when different throttle and rudder commands are given. If in doubt we suggest starting with Mode 1, which is the most "gentle" mix.

### CONNECTION and TESTING

Connect the plugs on the two fitted leads marked **S** and **T** to the **S**teering and **T**hrottle outputs of your receiver. Connect the port and starboard speed controllers to Motor 1 and Motor 2 output pins, ensuring that the leads are fitted the right way around (See drawing). The third (central) motor speed controller can be connected if you are using a central motor. This will follow the throttle control *only* and will not be affected by any mixing. The last connection is the steering servo. IF YOU ARE USING ACTION SPEED CONTROLLERS THEN YOU SHOULD FIT A SEPARATE BATTERY FOR EACH MOTOR to avoid the possibility of ground loops which could cause loss of motor control.



### **SETTING UP YOUR MIXER**

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

The setting up directions assume a few basics:

- 1) Your transmitter has servo-reverse facility on both the motor and steering channels;
- 2) The motor control is on the LH stick of the transmitter while the steering is on the RH stick;
- 3) You have two spare servos to act as guides while you set things up (don't worry if you don't, but you'll then have to connect the mixer straight to the ESCs and motors for setting up); and
- 4) Your model has the conventional outward-turning props when viewed from behind the model i.e. Starboard=Clockwise and Port=Anticlockwise. If your model had inward turning motors then set up the system exactly as drawn and, when finished, simply reverse the two wires between each motor and its speed controller so that the motors now run in the opposite direction - easy!

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

Plug a spare servo into each of the mixer's ESC outputs (motors 1 and 2) and switch on. *Allow four seconds for the Autaset function to activate before moving any sticks on the transmitter.* Move the throttle and rudder sticks and check that the servo discs move as in the first three rows of the diagram. You may need to use the servo reverse switch on the transmitter throttle channel. Now try the commands in the last four rows of the diagram. You should need only to adjust only the position of the servos on the bench at this stage (i.e. swap over port and starboard) to effect the necessary changes. When you are happy with the results make a note of the position of the reverse switches on the transmitter for future reference.

Now disconnect the servos and install the mixer in the model. Connect the Port and Starboard speed controllers to the corresponding mixer output pins (Motors 1 and 2 - as dictated by the test servos). Connect the motors to the speed controllers and the speed controllers to the main drive batteries. NB if you are using BEC-equipped speed controllers then you MUST disable the BEC in all but one of them by removing the Red wire from the black plug which fits into the mixer. If you are using a separate battery for the recommended) then you must disable the BEC in ALL of the speed controllers. Switch on the radio. Move the transmitter sticks and check that the props turn in the correct direction as per the last column on the diagram. If either of the motors runs the wrong way then simply reverse its connection to the speed controller. (Brushless motors have three wires to the ESC; swap over any two of these wires to reverse the motor direction). **DON'T REVERSE THE CONNECTIONS FROM THE BATTERIES TO THE SPEED CONTROLLERS unless you're a fan of minor explosions and expensive, grey smoke.....** Adjust the neutral and peak settings of your speed controllers as per the supplier's manual if necessary. ACTION Condor ESCs have full Autaset and will take care of any further setting up automatically each time you power up. Remember that you MUST ALWAYS wait four seconds after switching on before moving either of the transmitter sticks.

### **RECOVERY SERVICE**

A recovery or repairs service ensures that you will not be left with a dead unit for any reason.

The Service Charge for this kit is £18.00 including parts (including return shipping cost IN UK).

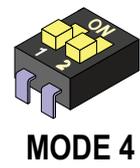
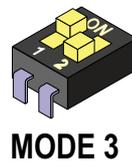
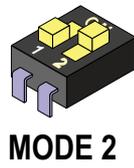
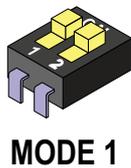
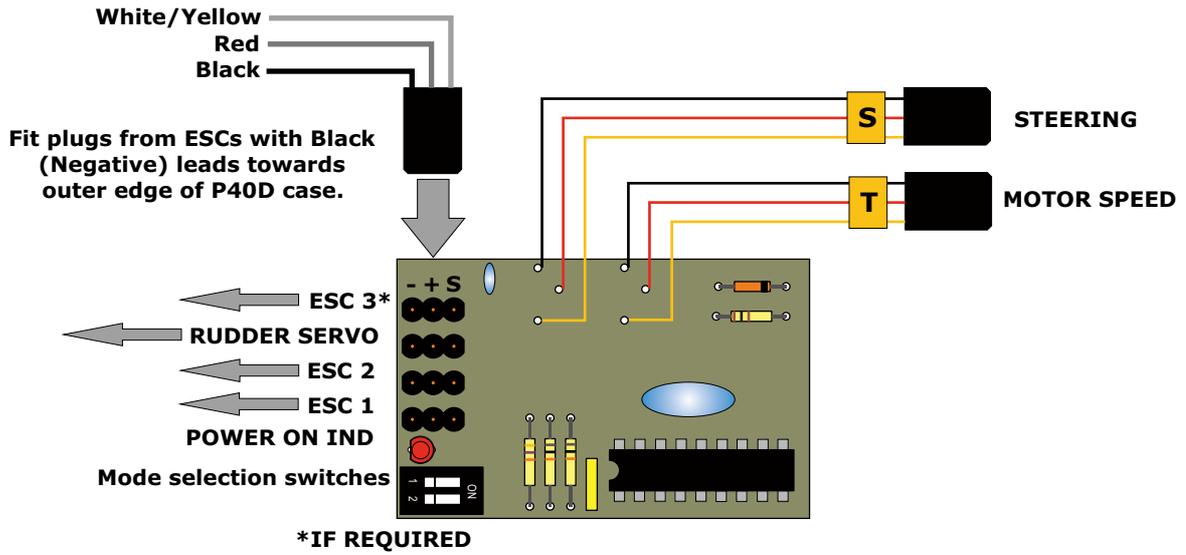
All returns should include full Credit Card details (Name & Address of cardholder, Card Number, Expiry date and 3-digit Card Security Number)

**ACTION R/C ELECTRONICS, 1 Llwyn Bleddyn, Llanllechid, Bangor LL57 3EF, United Kingdom**

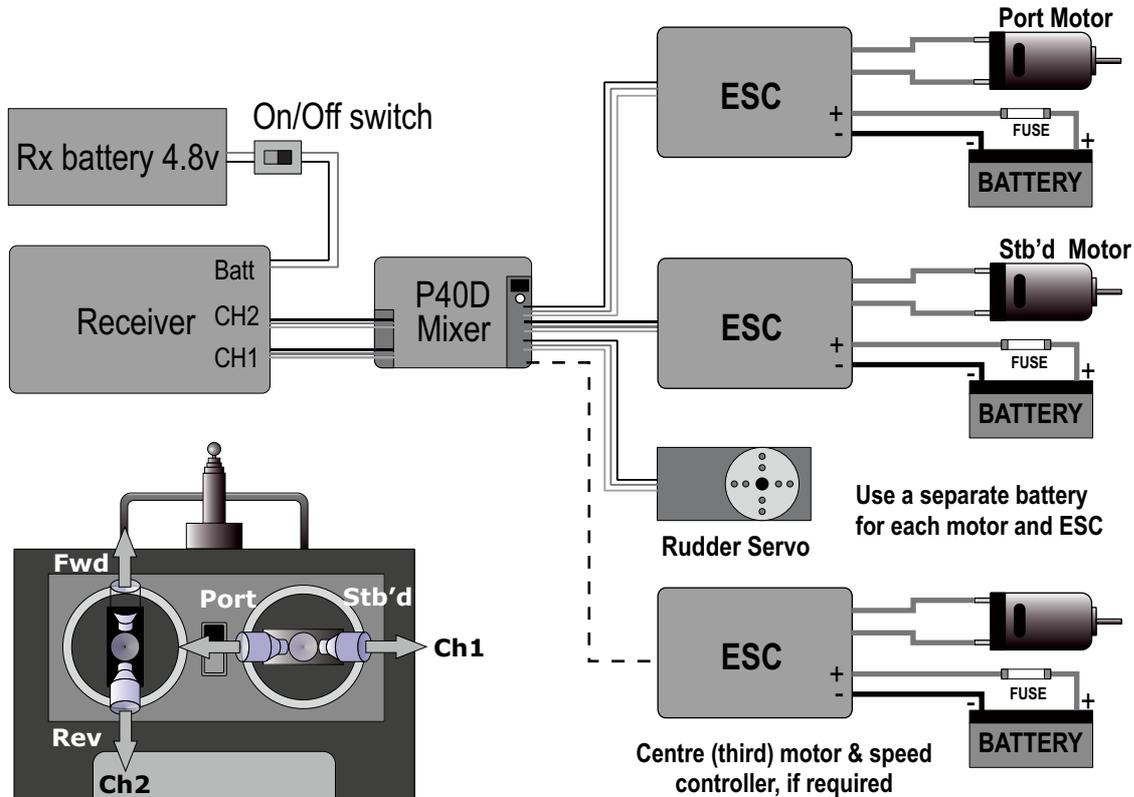
The small print.....

ACTION R/C Electronics guarantee all products to be free from manufacturing defects for 12 months from date of purchase. This does not cover suitability for specific applications; components worn or damaged by use, tampering or incorrect connection; alteration to original components; damage to batteries or other equipment through use; misuse, or shipping damage. Where goods are found to be faulty, the customer shall return them to ACTION R/C Electronics in their original condition and with their original instructions, packaging etc. Our liability is limited to repairing or replacing goods to their original specification and will not exceed the cost of the goods. By using the product the user accepts all liability. Where a fixed repair charge is applicable, ACTION R/C Electronics shall undertake repairs to the extent that they are judged economically viable. Where such is not the case then the customer will be offered the option of crediting the repair charge towards the cost of a new unit or having the faulty unit returned and the charge refunded (less the cost of return carriage). We reserve the right to modify this guarantee without notice.

### CONNECTIONS TO P40E



### MODE SELECTION SWITCH POSITIONS

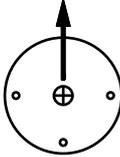
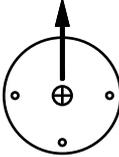
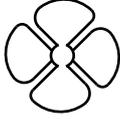
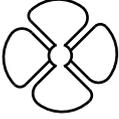
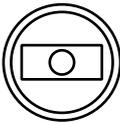
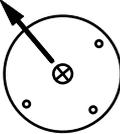
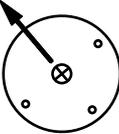
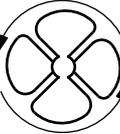
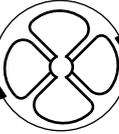
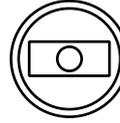
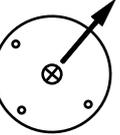
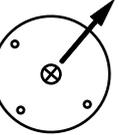
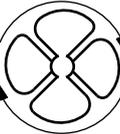
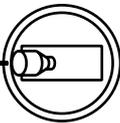
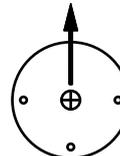
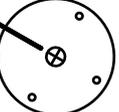
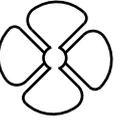
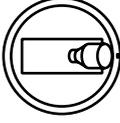
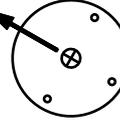
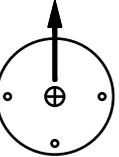
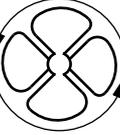
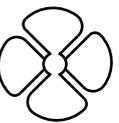
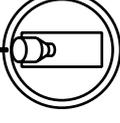
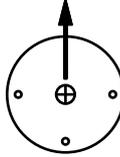
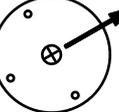
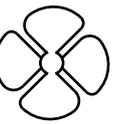


### SYSTEM CONNECTIONS

ACTION do not recommend the use of speed controllers fitted with Battery Elimination Circuitry. If you do use these then you MUST either disable the BEC in all but one of them or, preferably, disable it in all and use a separate 4-cell rechargeable pack for the receiver, as shown. BEC is disabled by removing the RED (Positive) wire from the ESC plug which fits into the receiver. If there is a slide switch fitted to the ESC then leave it ON or the ESC itself might not work.

## SETTING UP ACTION P40E MARINE MIXER USING TEST SERVOS

*Set two on-board switches to ON and ON (Mode 1)*

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