On TEST

SILVER STAR SPEED CONTROLLER

Following on from the test in the September edition of RCMC on the *Nosram* electronic speed controller we now have the new *SPEEDMASTER FET Controller*. As the previous review covered the basics about speed controller theory I shall not repeat them here.

The first unit to be produced has fully proportional forward and reverse control and there will be a forward only version to follow which should be available by the time you read this.

These controllers are very well presented with a stepped top heatsink around them as opposed to the more common heatshrink that we have become used to. The *Speedmaster* utilises nominally 5 FET's. These same FET's are used in both forward and reverse operation. This is the first of a few unique features of these units. In use the controller gives fully proportional control from a slow gentle start right through to full power in BOTH directions. However, to recap on a point made in the *Nosram* review, the *Ferranti I.C.* supplies a full pulse length in the forward direction but only about 95% pulse length in reverse. Therefore although this controller is virtually symmetrical in its supply for both directions there is a slight advantage in wiring the motor the correct way round. The other reason for correct orientation is that reverse is brought into operation by a pair of relays. Two relays have been used so as to get heavy enough contacts. Under very low Ni-Cad conditions it is possible for the relays not to select reverse. I must stress here that this is only under very low conditions i.e. towards the end of 'dumping'.

Having fully controllable reverse using all 5 FET's does also mean that there is no limit to the amount of reverse used. Some controllers have only 2 FET's for reverse so only momentary use is available!

Setting up of the *SPEEDMASTER* is also very simple. Only one preset must be set which is for deadband and brakes. If the controller is set such that dead stick is in the forward side of centre then no brakes will occur at dead stick. However, if the controller is set so that dead stick is slightly biased to reverse then dead stick brakes will come into action. This biasing is still within deadband so no drive in either direction will occur after braking unless the stick is moved out of the deadband region. This is a lot more difficult to explain than to set when you have the unit in front of you! The full power point is reached at about 15% below full stick movement and is fixed using high tolerance components which ensures that all modern radio equipment will work properly with this unit.

As with other FET controllers these use voltage doubling circuitry to ensure that the FET's are driven hard on when required. The forward only unit will have voltage tripling to help drive the brake FET's.

Built in Voltage

The controller has a built in 5.7 volt supply for the receiver which has been very carefully designed to supply power as long as possible. There is therefore no need for the use of other receiver batteries or *BEC* 'systems'. If the unit is connected up incorrectly only minor damage will occur and the FET's should remain intact. The prototype unit has been in use for some time at tracks which have suffered from severe interference and no damage has occurred.

Apart from protection and presentation the heatsink which surrounds the unit has another important use. In FET's the junction impedance increases with temperature. So, as the FET's warm up in use their impedance increases. Having a higher resistance they will warm up more as current flows through them. Again this causes more temperature build up and a snowball effect occurs. By providing the units with a decent heatsink to begin with this effect is kept to a minimum and therefore the controller remains efficient.

Under test on a 4 amp load the controller showed no sign of heating up so the heatsink obviously does its job. In use the unit only warmed up slightly. Temperature build up also depends upon the motor in use and the available airflow. The unit was tested with a modified motor inside a fully enclosed 'CAT' with no problem.

Should the unit fail the manufacturer assures me that he will repair or replace the unit very quickly.

Tech Spec.

Weight: 63g without heatsink
65g with heatsink
Size: 68mm.L 35mm.W
23/31mm.H
V. Drop: Typ. 0.032V
At 4 amps across FET's.

If the user requires the unit to be light then the heatsink can be removed. If doing so bear in mind what has been said above as the efficiency loss is probably of more importance than the weight saving.

The heatsink top is stepped about half way along which is why two figures are given for the height.

V. Drop. This is interesting as people pay a lot of attention to this figure when quoted for controllers. However, upon testing a piece of multistrand 1.5mm square copper wire (which incidentally is the maximum size which properly fits most connectors in use) the drop along a ten inch piece was 0.017 volts using a 4 amp load! Consider along with this the drop across most connectors and there are more losses external to electronic speed controllers than internally.

Value for money this unit has to be good. All these features for a miserly £42.50. An excellent product for 1/10th buggy racers.

Available direct by Post Free Mail Order from *Speedmaster* 60 Mancroft Road, Caddington, Luton, LU1 4EL. Tel. 0582 34787.

G-Force Products . . .

This sleek looking bodyshell is soon to be available from G-Force Products, here fitted to a *Kyosho* "Optima" the shell looks great and we're sure will prove very popular. Available from G-Force Products 142A Fernhead Rd, London W9 3EN. Tel: 01-968 9023.