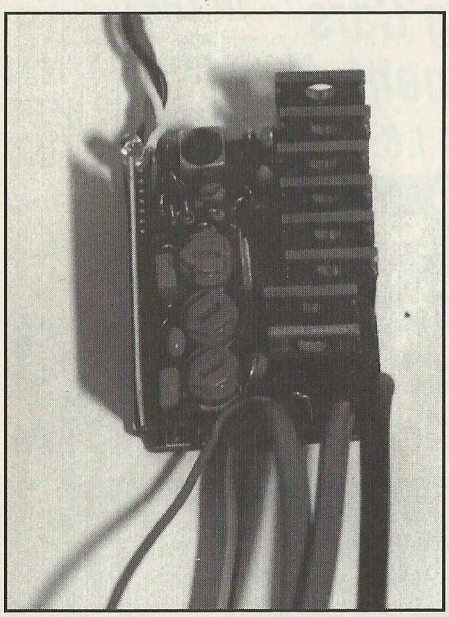
The New NOSRAM DOMINATOR

RRC has had one of the new high frequency Nosram Dominator speedos on trial for a short while now, however, before we report on our findings, a few words with Nick Marson seemed appropriate.

R.R.C.: "Why do we need high frequency, and what does it mean?"

N.M.: "All electronic speed controllers switch the current to the motor (on and off), in order to control its speed. The repetition rate of this on and off switching is called the frequency. All earlier speed controllers switched the motor at a relatively low frequency. This was a compromise on motor commutator life, motor efficiency and battery duration. All speed controllers in general made use of commercially available integrated circuits that were originally intended for radio control servo amplifiers. There was nothing wrong with these controllers and they were vastly superior to the servo operated wiper board controllers that are supplied with some of the entry level kits. Increasing the frequency of the on and off switching improves the motor efficiency, reduces comm wear and improves the battery run time. This is because with the higher frequency, the motor is fooled into thinking it is being supplied with a steady voltage rather than a chopped voltage. This is to our advantage as a



D.C. motor, such as we use in our cars, is intended to run off a constant voltage. In addition to the high frequency, we have incorporated some trick Schottky battery recharging circuitry that combined with the high frequency really allows you to gear up and still last 5 minutes."

R.R.C.: "Funny how you should say that, in some back to back comparison tests, we found that with the Nosram Dominator, we could gear higher."

N.M.: "I'm not surprised, we aimed for efficiency and found it! That's what Research and Development is for."

R.R.C." "How long have you been developing the Dominator?"

N.M.: "Work first started about 3 years ago. It was apparent then, that the controllers in use at that time had a limited life at top competition level. The first high frequency Nosram controller was launched about 18 months ago, at the British Grand Prix at the N.E.C. About 25 prototypes were made and supplied to our sponsored drivers, to help in our Research and Development programme. We have had plenty of good results with this controller, both nationally and internationally."

R.R.C.: "The Dominator is very small, in fact it's smaller than my receiver. It's definitely the smallest I have seen. How did you manage it?".

N.M.: "Possibly the only criticism of Nosram controllers in the past has been their size. The design goal for the Dominator was not only to be the best but also the smallest. Coming from an Aerospace background we have employed miniaturisation techniques more common with Aerospace products than commercial ones. The unit design is ergonomic, in that components susceptible to damage by the user can easily be repaired without an expensive repair bill.

The integrated circuit silicon chip, used in the original Nosram high frequency controller, has been further integrated, absorbing more of the circuitry and also incorporates a number of additional features. If you look at the white board that stands vertical to the main P.C.B. (Printed Circuit Board), this is in fact a thick film ceramic substrate. Under the black blob, is the silicon chip that we designed and had custom built. This in itself contains 4,000 transistors! In addition to the "chip" there are over 30 other electronic components on that ceramic substrate, although you can probably only see two surface mount components with the naked eye. This ceramic board is the Dominators' brain and is housed under the small bulge in the plastic box."

R.R.C.: "You mentioned new features. Can you tell us a bit about them?"

N.M.: "We have incorporated a 'Digital Input Filter' that substantially reduces susceptibility to glitches generated by your motor, or radio interference, also a failsafe timer removes the drive to the motor if the car is out of range, or if the transmitter is turned off. There are also some other trick circuitry features to make the motor smoother and more responsive."

R.R.C.: "Aha, I did feel that the mid range was good. It didn't feel like an on-off switch. I know a lot of people have been waiting patiently for the Dominator's release, couldn't you have brought it out sooner?".

N.M.: "Quite possibly, however, we felt it was better to get it right first time out and not cut corners. It's not always best to be first to market a product, particularly if you can learn from others' shortcomings. All of your readers will have heard of an RC10, but not all will remember the Scorpion, and the Scorpion was out first."

R.R.C.: "Thanks Nick for your time, I'm off to see if this new Dominator will fit in my 1/24th scale Tamtech!"

We have tried the Nosram Dominator in both on and off road cars, and can definitely confirm that not only is it very small but very smooth and progressive with as much punch as you can use when required. The torque limit monitors current drawn by the motor and is not just a time delay as featured on some controllers.

Some of the main features are:

Size, 42mm x 32mm x 20.2mm.
Weight, 46 gms.
On resistance, 3mΩ.
Continuous current, 300 amp.
Instantaneous current, 960 amp.

To conclude, we have a small, attractive, high frequency controller, that will fit anything from a 1/12th car upwards. It is free from interference and does not upset the AMB lap counting system. In use the controller is extremely smooth, making the car very easy to drive.

Most importantly the Dominator is sensibly priced at £119.95 with a fast and economical repair turn around service, well done Nosram.