On TEST

SICCOM 'MAGNUM'

From conception to birth Alain Lion's 'baby' has had its fair share of teething trouble. How does the future look for 1987?

This particular Rallycross racer has to be just about the most controversial model car ever to feel dirt under its wheels. Not because of any peculiarity of design principle, but for the host of questions and problems it posed for those unfortunate individuals whose lot it is to enforce national and international rules.

Siccom is a relatively well established French manufacturer with a long string of successes in Rallycross racing in France. By early 1986 its products had attracted a string of top drivers, including Pascal Gueye, and young Danniere, who along with Designer Alain Lion were to spearhead a determined effort to take both World and European Championship titles.

Its new product the 'Magnum' was intended to take the racing scene by storm, it did, but not in the way that its designer intended!

Every designer worth his salt knows the racing construction rules by heart and Alain Lion was no exception. However in this instance a sincere attempt to design a car to the limits of the dimensional rules went astray. To be fair to Lion, it is almost certain that the cumulative slips between drawing board and assembled car told against him. What had seemed to him to be a car within the rules stretched race scrutineers' tolerances to the limit the very first time the car appeared on the International scene. At the French Grand Prix in May of 1986 liberal attitudes allowed a car that was marginal in the extreme to run in competition.

Lion's mistake was to enable the driver to make such large adjustments to the car that at the limits of the possible settings, such dimensions as width and length were exceeded. However, the full extent of these problems were not realised until the European Championships in Mantua, Italy when the first car across the line at the end of the Final, the 'Magnum' of Danniere, was found to be not only very tight on the width but to exceed the maximum length permitted by 4mm.

Add to this an oversize fuel tank and the luckless race director had no choice but to disqualify Danniere. Following this I was able to talk to Alain Lion the designer and persuaded him of the need to modify the car by the time the World Champs took place in only one week's time.

Although the *Siccom* 'Magnum' did not win, sufficient cars made the Final to demonstrate its undoubted pedigree, albeit in the face of continued argument. Many people involved with the organisation of the sport felt that the car exposed a number of loopholes in the rules as they stood. Subsequently, by the end of 1986 the rulebook had been changed to encompass cars such as the 'Magnum'. The car that is described here can be considered to be fully legal for both National and International racing as the rules stand today.

Design

Overall, the design concept is distinctly *Yankee*-like; a forward facing engine drives an offset layshaft through a small diameter spur gear which transmits the drive via a pair of gears at each end to the front and rear gearboxes.

Small gears are of steel running on the larger gears which appear to be of Acetal. All the steel gears including those in the bevel gear differentials are very cleanly cut with what appear to be very accurate, well finished profiles. As a result of using bevel gears the differentials are small and therefore light leading to appropriately small casings nicely moulded in a reinforced plastic material. All of the shafts run in dust shielded ball-races of very substantial size, auguring well for longevity.

In all, three differentials are used, the third mounted in the layshaft is optional and this centre differential incorporates a neat slip-limiting brake. The drive enters the differential via a half-shaft, exits at the other end via a second and at first sight it seems impossible for the differential to transmit power. Logic says that the whole cage should spin without transmitting any power forwards to the front wheels. However, a combination of steel thrust washer and glass/epoxy brake pad ensures that the input end bevel gear can be friction loaded against the casing which then transmits power through to the output end. The amount of braking (or degree of slip if you like) is controlled by a spring loading system adjusted by an external collar on the front end of the layshaft. In practice the unit is said by owners to be simple to set up and reliable.

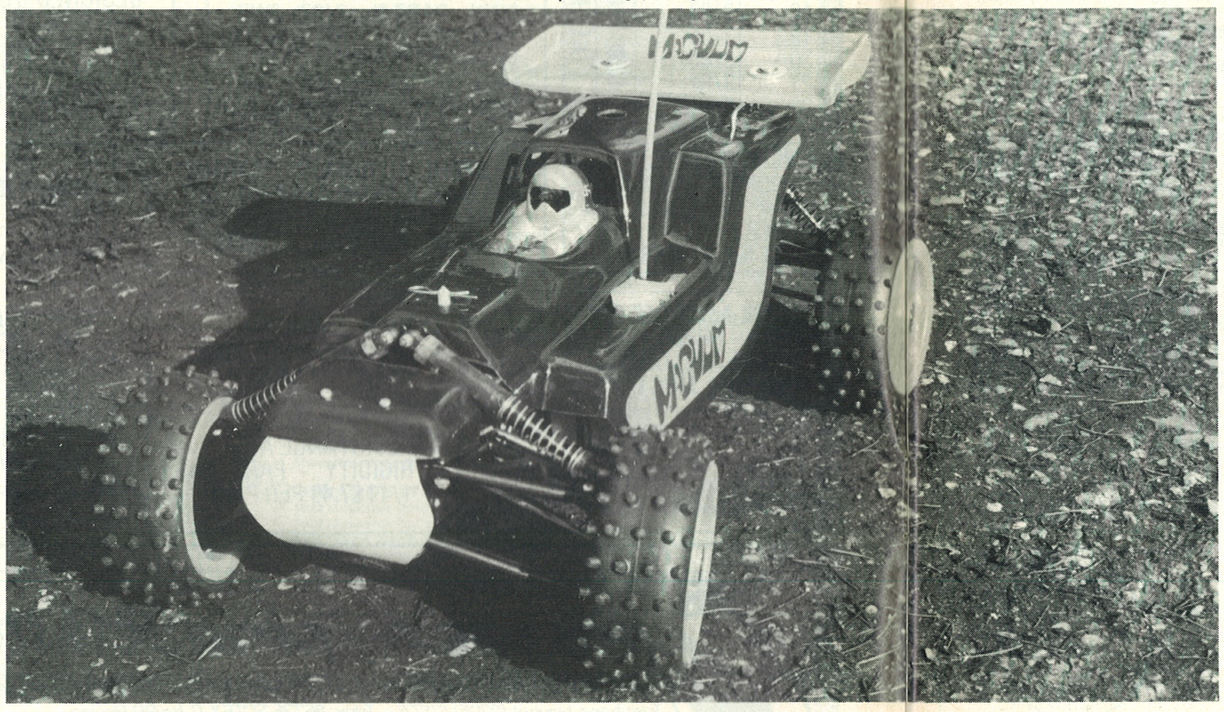
Drive between differentials and wheel spindles is via steel shafts fitted with 'proper' Hooke universal joints at the outboard end and ball and pin joints inboard. Using this system means that it is impossible to loose a drive-shaft. Dual disc brakes on the front and rear gearbox input shafts slow things down as necessary.

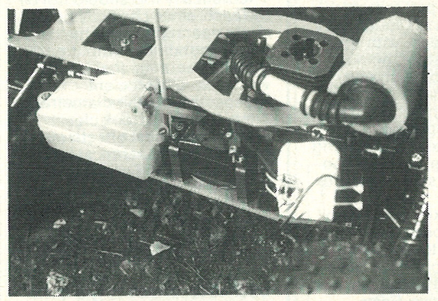
Clutch is the old reliable twin PTFE shoe type but the flywheel has a particularly wide circumference machined away internally to keep the weight down. A metal caged roller bearing is used, these bearings have proven very reliable in all types of clutch. A range of ratios is available, but team drivers report that only the kit standard ratio seems worth using as it is suitable for most conditions with the wide torque band available on most modern engines.

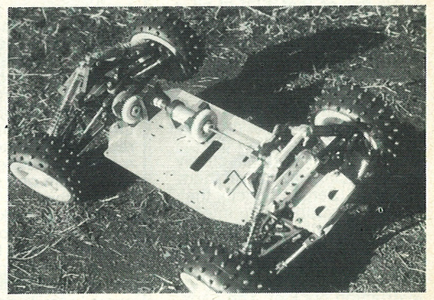
The running gear is mounted on a very substantial stamped aluminium alloy chassis. The top and bottom gearbox plates are formed from the same material with holes for suspension mounting incorporated into these and the chassis.

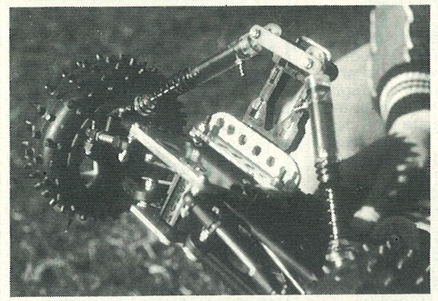
Wishbones are very long and the resulting movement at the wheels is potentially phenomenal but limited in such a way that even with large movements the chassis would be very hard put to bottom out, leaving the suspension in control at all times. Long wishbones can be over-flexible and the latest kits show an awareness of this by the addition of stiffening ribs on the wishbones.

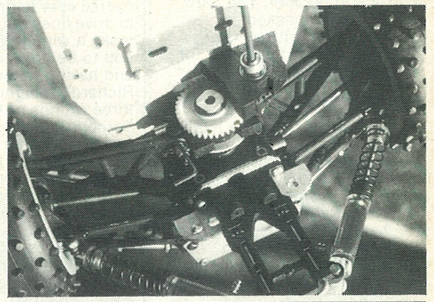
The uprights are designed with the spindle bearings ball-race mounted in eccentrically bored housings. This enables the user to rotate the housings so that the castor can be

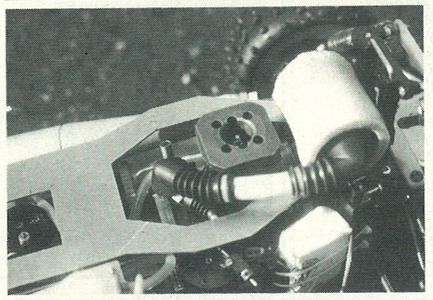


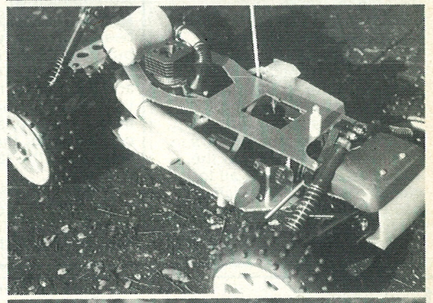


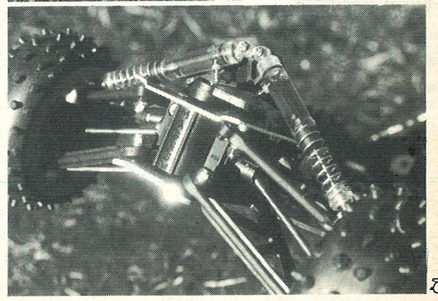












This page clockwise from top left: first, throttle servo and fuel tank are positioned down one side of the car. Serpent tank is used. Chassis exposed to reveal centre drive-shaft and differential unit. Rear-end drive system and gearbox. Chassis with top plate in place and engine, radio fitted. Front suspension with unique 'see-through' dampers. Centre differential unit with slip-limiting brake system incorporated. Heavy duty filter arrangement is a must for competition rallycross racers. Rear suspension with long stroke dampers.

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altered. Large diameter wheels carry low profile tyres which are clamped in place and require no glue.

All important damping is catered for by the very long stroke shocks fitted with coil-over springs. The dampers are supplied ready filled and are transparent to enable the state of the oil to be seen at a glance. The wishbone end mountings are well outboard and the very high mounting angle means that a lot of oil is moved about as the pistons travel. Volume balance is maintained by fitting a silicone tube between the two dampers front and rear.

A stiff aluminium plate boxes in the chassis producing a very rigid unit which allows the suspension to work effectively.

The ancilliaries are all there, fuel tank (Serpent, check the volume of yours if you intend to race at National races), servo mounting brackets, wing set, body shell, decals, silencer and a comprehensive instruction booklet. The parts are all bubble packed on backing cards with all groups of parts collected together for ease of assembly.

On the track

Unlimited potential, it has to be said. Although the 'Magnum' was designed for the hard, low-traction surfaces of the French circuits, the undoubted virtues of reliable mechanics, lots of suspension movement and adequate damping have got to mean that the car has potential on our own native tracks.

High ground clearance and excellent grip from the low profile tyres can give rise to problems and the advice of importer Richard Stitson of *Windsor Models* would be disregarded at your peril. Early attempts at running the cars in 'French Trim' resulted in the 'Magnum' overturning all too easily. Rest assured, Richard has things well tapped now.

My own experience with the 'Magnum' on the track was a chapter of disasters. No disrespect to the car, but a lost wheel on the first try, a missing clutch bearing next time out and rear tie-rod ball-joint broken after that limited my driving!

I said I was checking it out for owner Richard who had already demonstrated that particular cars performance by beating Alan Harman, Tommy Chung, Tony Miller *et al* to FTD during the race heats that preceded my trial.

Coming straight from my own *Serpent* 'Cobra', the 'Magnum' felt a little sluggish off the line but very smooth, minor bumps just did not seem to exist. Bigger bumps benefitted from a burst of power, the 4% overdrive to the front helping to pull the car onto line. Steering I found very good at high speed, with the desirable understeer, helping to keep the car on a smooth line. I did find that on the smoother sections of the track understeer changed very rapidly to oversteer, dissuading me from pushing the stick too wildly from one side of the box to the other.

Adding a thicker grade of oil to the rear dampers tuned the 'Magnum' more to my liking and my brief experience gave the impression that the car was overall easy to drive. Easy to drive does not of itself make a winner, it sure helps you to be consistent though, and having followed Alan and Richard's 'Magnums' through three rounds of heats with my *Serpent* I appreciate that they had to work a lot less to stay in front of me than I did to nearly keep up with them!

The *Siccom* 'Magnum' is appearing in greater and greater numbers now as more drivers succumb to its somewhat ungainly looking French chic. Prices of the kit are competitive, *Windsor Models* the importers have been in the Rallycross business right from the word go, they look like importing and supporting it for some time to come, making this machine a very serious contender for the privilege of separating the racer from his money.

Windsor Models, 45 Albany Road (off St. Leonards Road), Windsor, Berks.

Reviewed by Bill Burkinshaw.