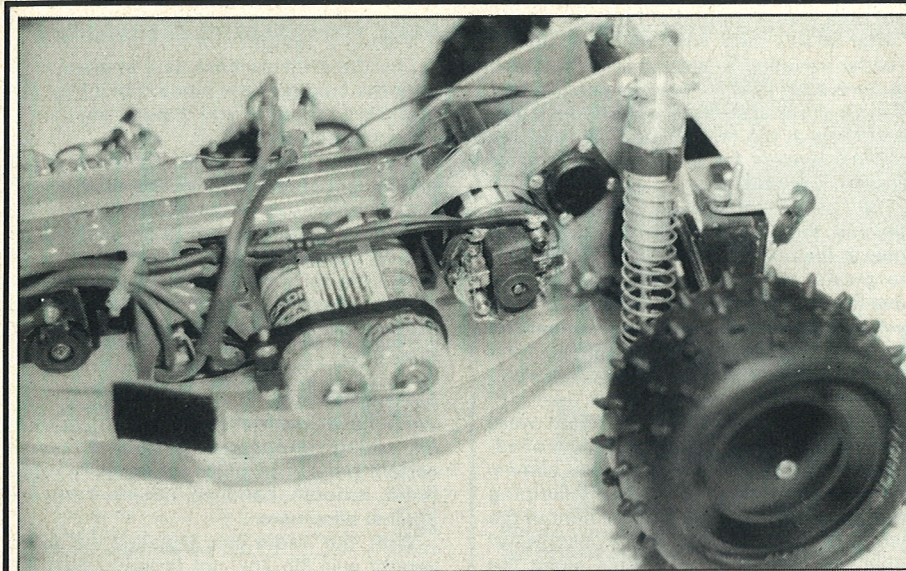
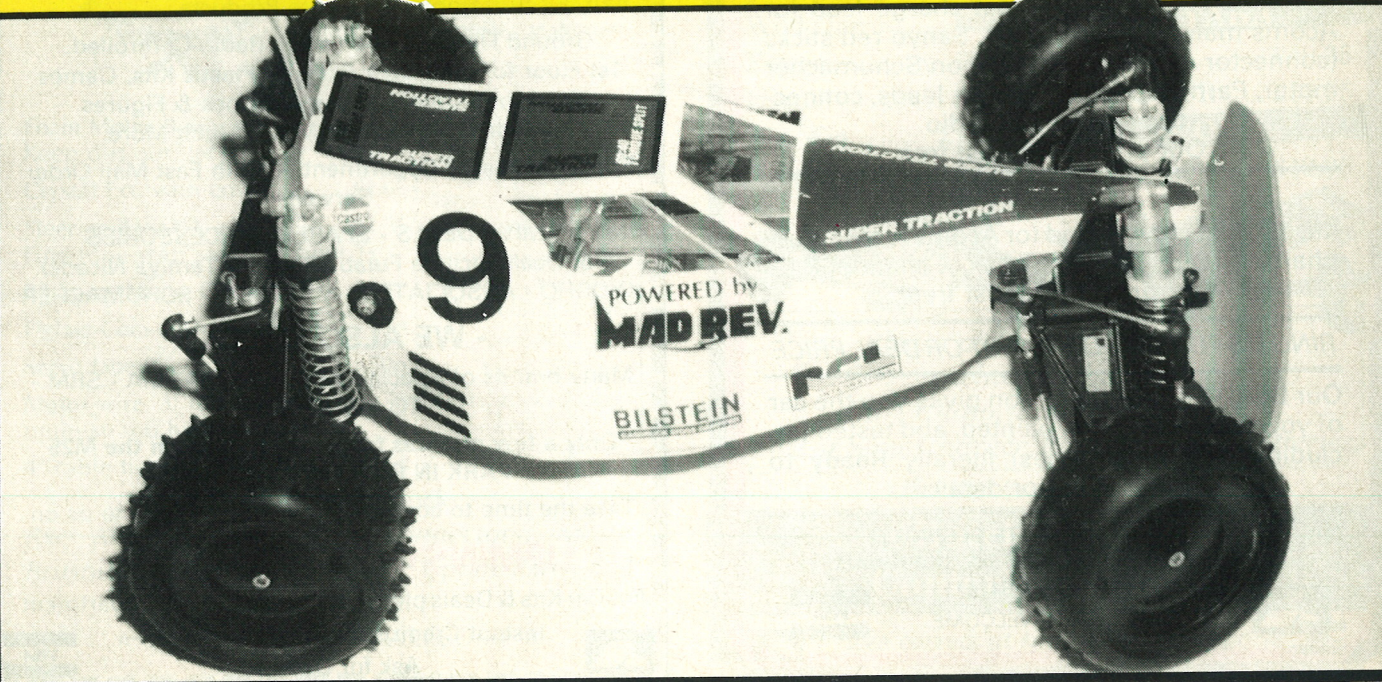
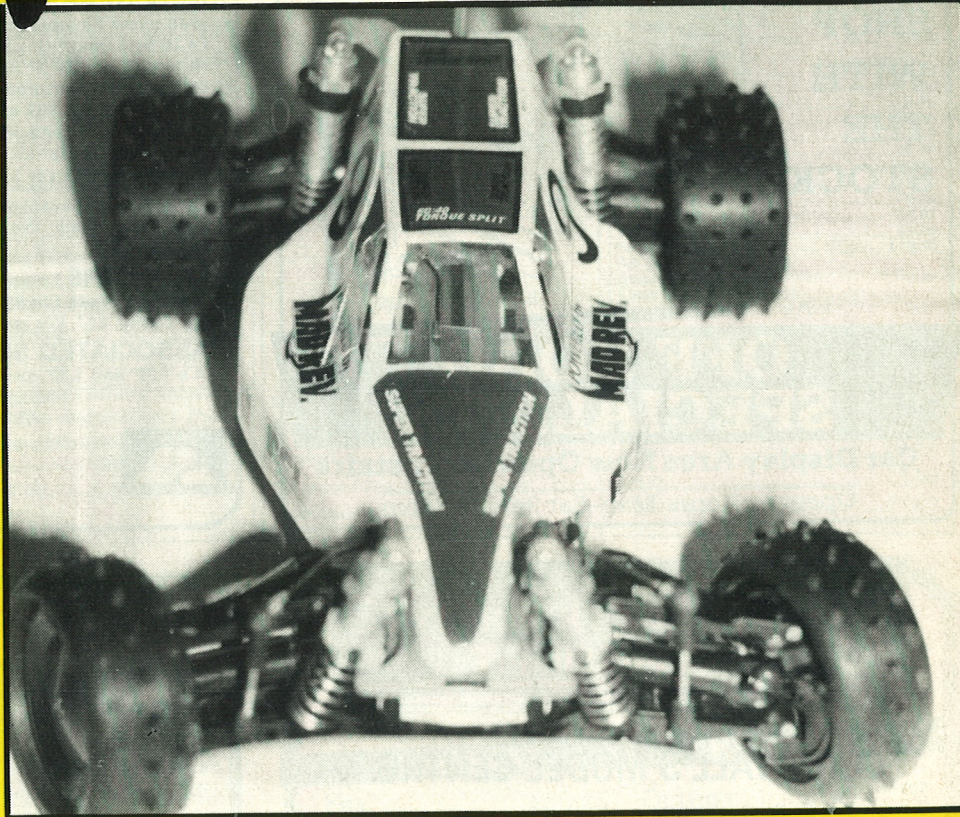
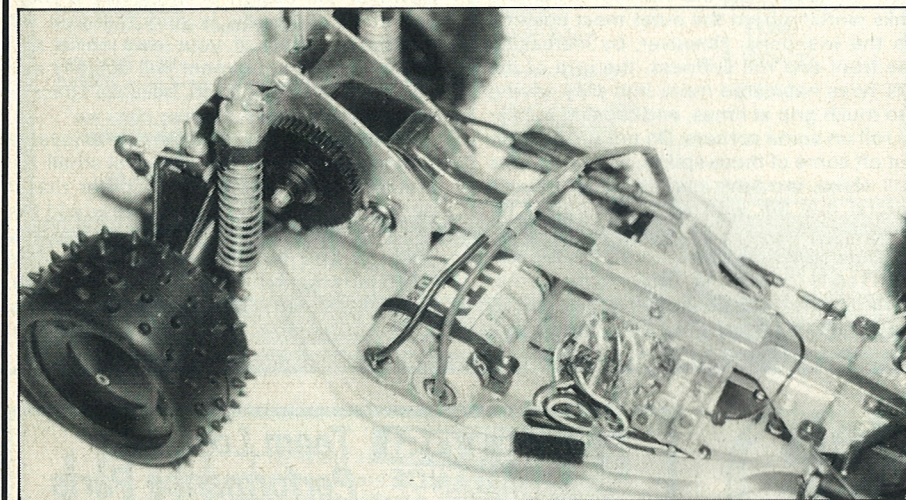


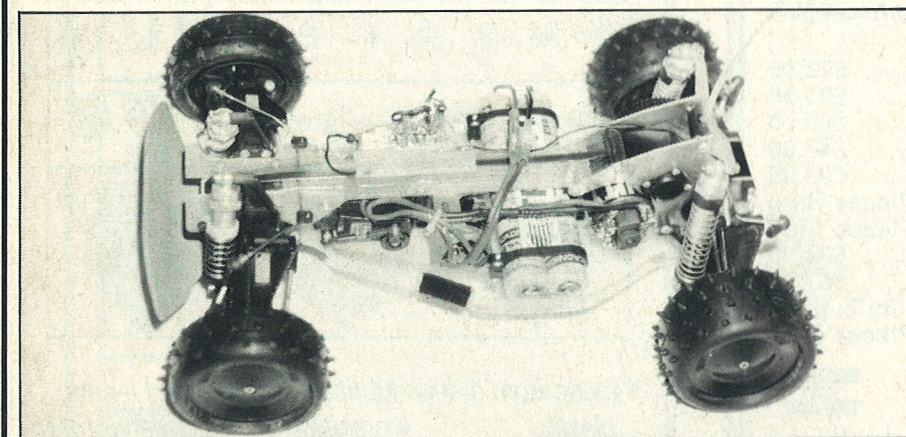
*Schumacher*  
Part 2



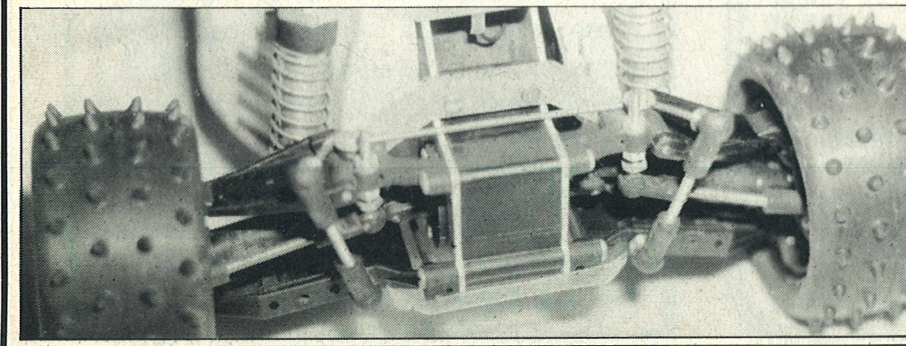
Above: Trinity motor was always more than adequate for the Cat.



Above: Space is prohibitive inside the Cats bodyshell, make sure your radio gear will fit.



Above: Everything shoehorned in. Below rear castor adjuster and anti roll bar.



**Part two of the Schumacher Cat Review, this month we go racing.**

Last month we took the Cat from a box of parts to the rolling chassis stage. This month we look at the performance of the new Schumacher Cat.

Setting up any racing car, whatever the size or scale is necessary and vital in order that both the car and the drivers potential is realised, the Cat is no exception to this.

The overall concept is very tidy, purposeful and obviously well thought out. Close examination of all parts, be they fibreglass, moulded nylon, or aluminium, shows an attention to detail and an extremely good level of quality.

The drive train is smooth and free running with the use of the fine toothed belts. Tensioning all three belts is simple and fairly quick to achieve.

The nylon universal drive shafts are extremely light and effective, but it is certainly no easy task to assemble them.

The car utilises the full width of track available, but has a wheelbase, shorter than all of its nearest competitors. This short wheelbase gives the car a fast 'turn-in' effect on cornering, which must be taken into account if you are used to a conventional four wheel drive car. When using the word conventional, we are referring to the car which has all four wheels driving at all times, the Cat does not fall into that category, because of its one-way clutch drive at the front wheels.

**One Way Clutches**

The simple principle of using one-way clutches is that when the car is driven in a straight line, the rear wheels drive the car, with the longitudinal belt driving the front wheel axles. With the front wheels rotating quicker than their axles the 'overroll' of the wheel allows it to run free, as with conventional ballraced front wheels on a two wheel drive car. The approach to, and exit from a corner, can result in a loss of traction at the rear, and with the rear wheels rotating, but not pushing the car forward the difference in drive is taken up, thus allowing the clutches to lock up and take up drive at the front.

We found that with this drive principle, the tendency to use the power understeer of conventional four wheel drive cars, was not possible. You had to approach corners as you would with a two wheel drive car, and any subsequent loss of rear end traction, be used to good effect by getting the power down that fraction of a second earlier than normal, in order for the front to effect a quick pick-up in drive, allowing a rapid tight line exit.

These changes from understeer to oversteer, have got to be used to the drivers benefit when racing, the Cat does not take kindly to merely being 'pointed' at the corner with the hope it will still be on all four wheels at the point of exit. In a nutshell, you have got to drive with consideration of the cars capabilities.

**Motors**

We ran our car using two different motors, a Demon 25 turn single wind on a 16 x 55, which proved more than capable of being competitive for straight line speed, and recently on a Trinity 2000 28 turn single using a gear ratio of 17 x 55. It was never left



standing at the start with the Trinity, and more than adequately held its own with the straight line speed. One of the cars endearing factors, was its ability to finish a five minute race with ample battery power left, this being a testimonial to a well designed drive train.

We come to the point where subtle changes were made, in order for us to get the handling to suit a style of driving.

**Suspension and Shockers.**

Observant readers may have noticed from our photo shots, that we have reversed the nylon blocks that act as pivot support for the top front wishbones. Subsequent changes from right to left, and vice versa of the top wishbones on this reversed pivot block, retains the status quo regarding the original steering castor built into the car.

The reason for this is simple, we did not altogether like the single mounting point for the shock absorbers, because of the restriction imposed upon the shock absorber by the design of that pivot block. By reversing it, we have allowed a choice of three positions for the shock absorber, thus giving us a much wider range of settings when adjusting the front end handling.

At the same time, in order to retain suitable stiffness and car ride height with the short actuating length the shocker was working at, an extremely highly rated spring was used. With the very small movement of the piston in the shock absorber cylinder, thicker oil than we would normally prefer was used, in order to effect suitable damping.

Yes the car damped well, with this set up, especially when tested with the car in a static mode, but this front end stiffness did not

help over rough ground at high speed.

After all this then, what have we got? — A wider variation in setting. — What have we done with this? — We have used 3 in 1 oil in all shock absorbers, and tried out softer springs at the rear, using Schumachers snap-on spacers for quick and easy compression adjustment.

The shock absorbers are adjusted between the last and last but one outer holes in the rear wishbone. The further out, the greater the stiffness in cornering. We have then re-adjusted this rear roll stiffness by trying out the anti-roll bar in either the first or second inner most positions on the wishbone, and thus found that we weren't far from a suitable setting for us.

At the front, softer springs again were tried, utilising the maximum amount of adjustment the shock absorber body allows. The thinner oil allowing sufficient damping because of this increased movement of the piston, by mounting the shock absorber in either the second or third hole along the front wishbone. Roll stiffness being very well contained by the roll bar actuating links working from the outer most position on the wishbone. However, by increasing the front end roll stiffness, the grip of the Cat tyres has come more into play, giving too much grip at times, and causing the car to roll on some corners. Do not be afraid to cut off some of those spikes, as the pictures will show, we have ended up with just a central row left with all of the others removed.

When setting the rear track rods for rear end toe-in or toe-out, make certain that both adjustable links are exactly the same length. With one of the rear wheels operating at a differing angle to the other the

driver will experience difficulty in keeping the car in a straight line.

The Cat's instructions will suggest you alter the height of the inboard pivot for the rear track rod, until you dial out any bump steer characteristics.

If you play around with this pivot height an element of rear roll induced steering can occur, which can under some track conditions be a further 'tweak' in order to set up the car. We ourselves prefer to run with very little rear toe-in and no rear roll induced steering, finding that steering around the sharpest of corners was no problem.

**Conclusions**

We believe now that only minor changes in oil, spring tension and positional play of certain parts, has given us an even more rapid, smooth handling car, to compete against allcomers.

With 'our' radio gear installed the all up weight was 3lb 7oz, not far away from an acceptable level for power to weight ratio. However the design of the chassis, lexan undertray and body, is such that you are advised to check if your own radio and speed control equipment will actually slot into place easily enough, because space is somewhat limited.

All in all the Cat has been an enjoyable project, there have been several small alterations made to the car, in order that it performs to our driving style, we would like to point out however, that these are only changes and not recommendations. The Cat is a remarkable car in standard form, and should give any owner/driver many hours of reliable racing most of which, spent at the front of the field.

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**2 CHANNEL RADIOS**

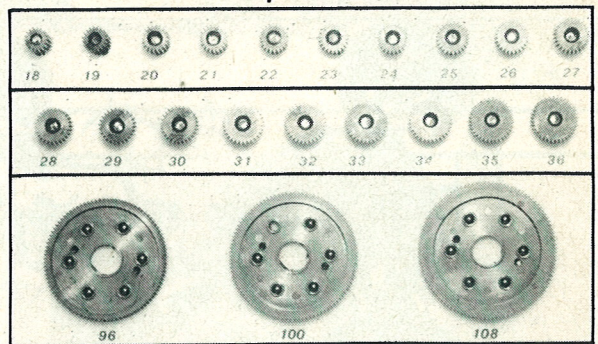
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