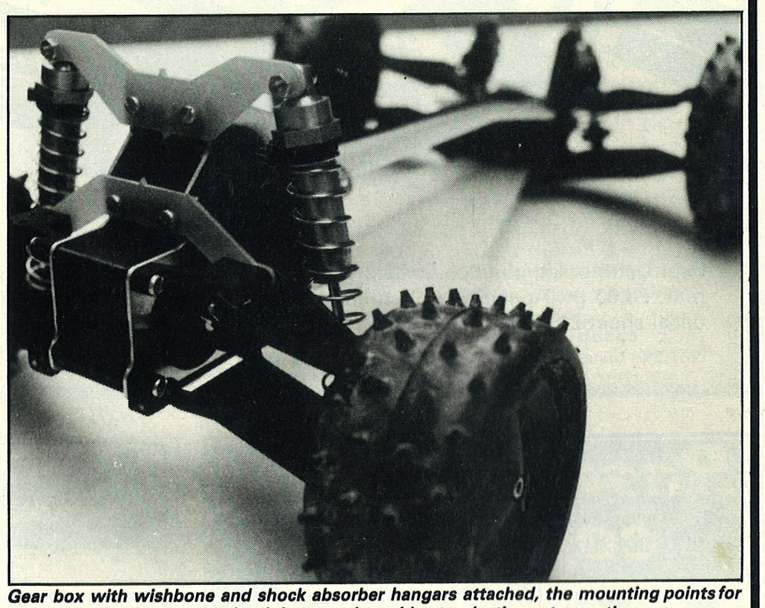
Schumacher Cat



Gear box with wishbone and shock absorber hangars attached, the mounting points for both hangars also secure aluminium gearbox sides to plastic centre section.

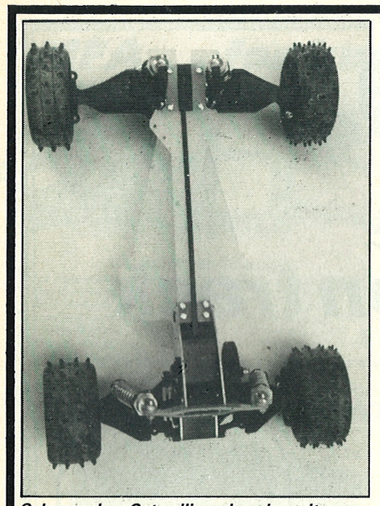
After evaluating this review kit it was decided that it should be separated into two parts. The reason for this is that the Schumacher Cat, as well as being a drivers car, is very much a car for the builders and for this reason perhaps requires an extended review.

The first thing that strikes you about this kit is how light the box is, so light in fact that it could be thought that someone's sense of humour was at work and that half the components had been removed. However, on closer inspection it was found that this was not the case and that the parts of the Schumacher Cat were all present and correct. This first impression also gave some indication of the finished weight of the car which should prove to be reasonably light.

The kit itself is well presented, with all components in sealed plastic bags, each with their own number clearly printed on the outside. The body pan, belt guard, gearbox covers, driver and bodyshell are all moulded in lexan and like other cars have to be trimmed to suit by the constructor. The instructions for the Schumacher Cat are quite comprehensive, and need to be studied carefully not just glanced over, this is not because the instruction booklet lacks anything, it is simply because the Cat is very well engineered indeed, having said all that, it is obvious that Cecil Schumacher is still not happy with present instructions, and takes great care to point out that if further instructions are needed then do ask for them, updated instruction booklets are also now available.

Construction

Construction begins in earnest loctiting two thrust washers in place on their carriers, these will eventually hold all the ball bearings in place on what is the heart and soul of this car, the ball differential and combined integrator, it is this integrator which takes the drive from each half shaft via two drive belts rearwards through a slipper device, and then via another, longer drive belt to the front transmission, this rather intricate but very efficient slipper is really acting as a torque splitter, which, by a simple adjustment will split the drive between the front and rear wheels from 50/50 all the way down, in whatever increments are needed to 0/100, this means that whatever the track conditions are like, the Cat can be adjusted to put down available power and grip in just the right place. Everthing that turns inside the Cats very different gearbox is ballraced, in fact rotation of every shaft is so smooth there literally is no vibration. The front transmission consists of a single, ballraced, toothed gear wheel, inside an adjustable housing, adjustable in the sense that the whole transmission housing is held in place between the chassis plates, one upper, and two lower rails, between these rails the whole housing slides thereby adjusting the tension on the front drive belt. Care must be taken when assembling the transmission housing to the chassis, as at this stage the two halves of the housing are not screwed together, a certain amount of twisting may occur resulting in damage to the ballrace housing if the two halves are not held firmly in place whilst assembly of this stage takes place. The Cats drive shaft linkages from the front transmission both have to be pressed onto one way clutches,



Schumacher Cat rolling chassis as it nears completion.

the best way of doing this, is to employ the front gearbox shaft as a jig, before the front transmission is assembled of course!.

Assembled in this way the whole unit is then gently squeezed together using a vice.

Before final assembly, check to make sure that you can read the writing on the face of one of the one way clutches only, if this is not the case, make it so, as once pressed in place the clutches are there for good, by doing this you have made sure of the correct direction of rotation. A final word on transmission do not over tighten any of the drive belts, as this could cause friction damage to the bearings.

Suspension

Locate but do not firmly attach the gear box cover next, as this will be firmly screwed into place once the lower wishbones are assembled. Care should be taken at this stage to chamfer the locating pin which can, due to its manufacture, have a sharp or jagged edge causing possible wear to the pivots. When completed the wishbone mounts are attached and the whole lower wishbone assembly is bolted to the chassis also securing the rear of the gear box cover. The upper wishbone is secured via an extension arm to a transverse hanger plate. Once the rear suspension has been built attention can then be turned to the front wishbone assembly. Cecil Schumacher has developed a novel system which should prevent serious suspension damage in the case of any front-on collisions. This allows each side of the front suspension to swing rearward on impact and to swing back immediately into place with the use of rubber return bands.

Shock Absorbers

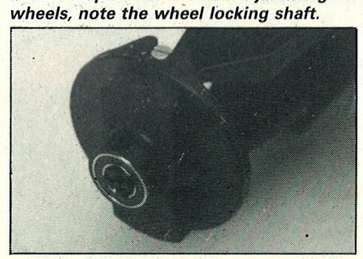
These are units of high quality, internally they are very straightforward consisting of two seals, one doughnut seal and one that is contoured to take a metal stop ring these being held in place by a plastic plate and, most importantly, by a circlip. The business end is no more than another plastic plate secured on the shocker shaft by two circlips and there are a choice of damper plates to suit. One end of the shock absorber unit is mounted about halfway along the rear bottom wishbone and secured to the transverse hanger plate at the other end. This allows the suspension units a long travel without bottoming.

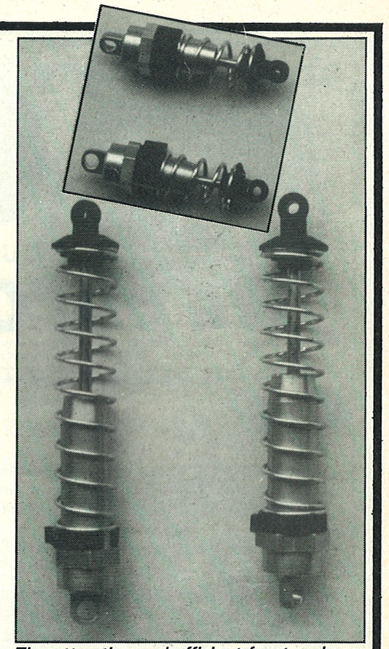
The front units are exactly the same only smaller and are mounted in more or less the same fashion, the only difference being the mounting posts, again a Schumacher design which as stated earlier allows the whole unit to swivel in the case of a crunch.

Drive Shafts

The drive shafts are assembled, or rather pushed together, and are about one inch longer than they need to be before final assembly. This allows for any telescopic movement, but more especially for ease of inspection and maintenance. The hard part is fitting the spider into the universal joint housing and this is where we must admit to the fact that one of ours broke when we first tried. Care must be taken when these two parts are assembled, the best method we found being to stand the whole drive shaft in hot water to soften it and then push the spider very gently home. In this way no tears will be spilt.

Front wheel backplate, a new idea that should stop stones and debris jamming the wheels, note the wheel locking shaft.





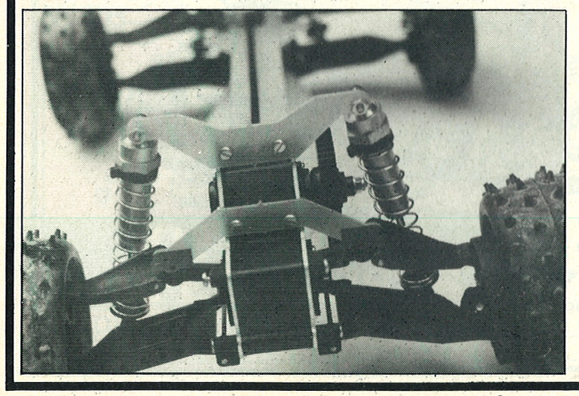
The attractive and efficient front and rear shockers, note the simple to use adjusting collars.

Wheels and Tyres

Another very innovative part of the Cat design is the wheels, or rather the method of mounting them to the car. One bolt is half the secret, the other half is that the wheel itself has a course, four split shaft moulded into it. This locates onto the drive shaft hub which also has the same split shaft device, but the really clever part is the wheel backplate which serves three purposes. It acts as the wishbone upright, it holds the output end of the driveshaft, and it stops the ingression of stones and dirt which cause wear and extra battery consumption through friction induced drag.

'Well, as most of you will remember, 'Radio Race Car' ran a feature on the prototype Cat. As you can see from this article, Cecil Schumacher has not rested on his laurels. The design and development has progressed even further and although this is the current production model, you may rest assured that development will not stop here. Next month comes the really exciting bit as 'Radio Race Car' take the Cat from its rolling chassis stage and goes racing!

The Cat's tail, this shot shows the suspension geometry in full.



Front transmission and suspension set up showing Schumacher's innovative knock back system, note elastic band used as return spring.