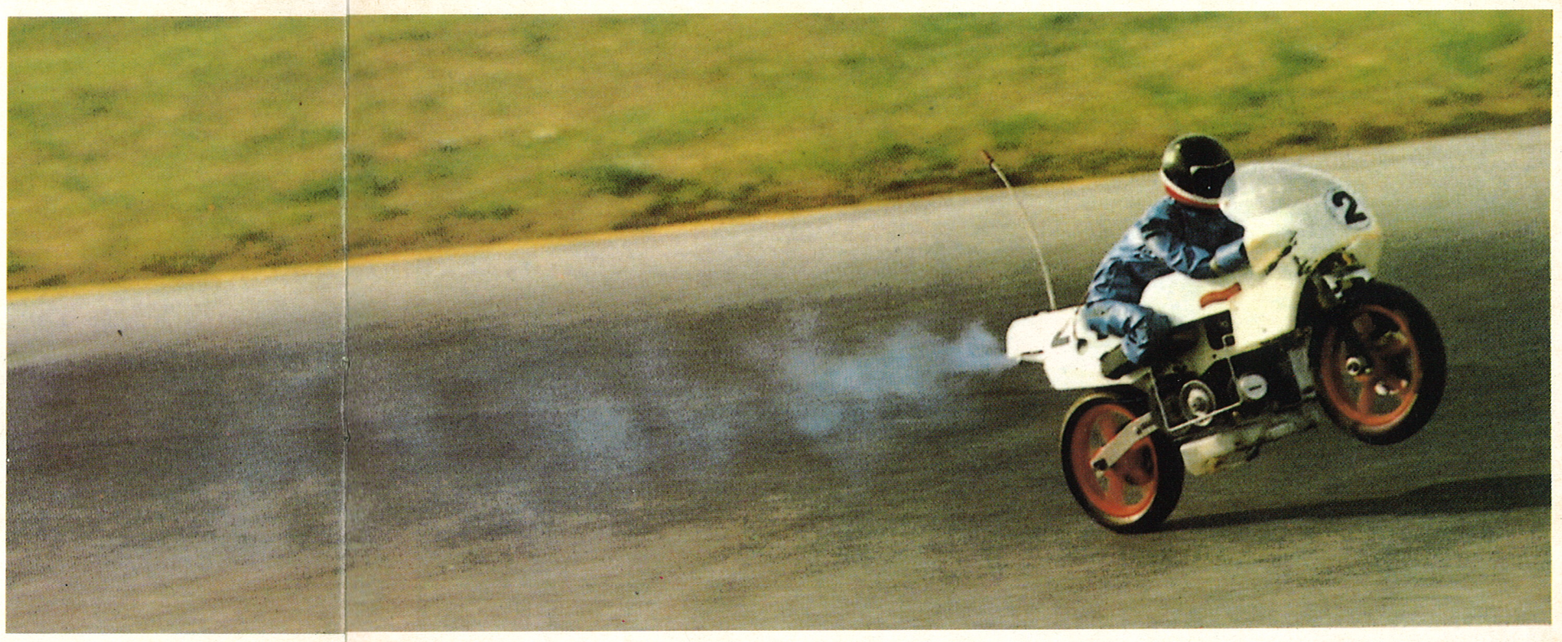


COMMANDO

Why are we featuring a quarter scale motorbike track test in R/C Model Cars? Why not says Colin Leake

They are a funny lot editors. Granted most are able to put together a reasonable magazine, but as a breed they seem to have a remarkable disregard for logic (or journalistic licence as it's usually called).

I suppose this accounts for the fact that I received a phone call one day a few weeks back telling me the magazine title had been changed to 'Radio Controlled Model Cars' followed by another a few days later, to ask if I would like to review a quarter-scale motorbike!

See what I mean.

To be fair to the editor I had previously seen one of these bikes in action and heard that they were being raced on the continent. I had actually expressed an interest in reviewing one, so I suppose I shouldn't have been surprised when one suddenly turned up.

The 'Commando' is a one-quarter scale racing motorbike powered by a 3.5cc model car racing engine. It is available in three forms. The basic model has no suspension at all and I am told is a bit of a handful to drive. Next comes a model with rear suspension and rear brakes only. Finally we have the top of the range model which forms the subject of the review with suspension and disc brakes front and rear.

First off I must emphasise that this is no novelty or rich man's toy. It's a serious racing machine that is built and raced in large numbers on the continent.

Construction

The main frame of the bike is formed by two substantial fretted alloy plates which bolt either side of the front and rear suspension units, the motor servo mount plate and the engine mounting plate. This provides an incredibly rigid structure that is most unlikely ever to suffer any damage or distortion.

The engine is mounted on conventional alloy blocks, rather longer than those which would normally be found on a car. In our case the blocks had been drilled for an *OPS* engine and we intended to fit a side exhaust *NovaRossi* so they had to be redrilled and tapped.

Eldest son Steve actually built the bike. He is possessed of a natural cackhandedness that can only be described as awesome. I often wonder why I ever let him loose with tools. After he had predictably broken a tap in one of the holes we opted instead to re-drill the mounting lug holes in the engine to suit. It has to be said here that in contrast to the rest of the bike, which was beautifully made, the way in which the blocks had been drilled and tapped was appalling. The holes in both were way off line. If we had been fitting an *OPS* we would have been in trouble. As it was I was able to compensate when I drilled the engine lugs.

These blocks mount on a substantial cast alloy engine platform which bolts between the side-members. In our case because we were fitting the *NovaRossi* a little work was necessary here with a round file to elongate the rear slots.

The motor plate actually bolts into slots and can be moved both backwards and forwards and rotated to provide perfect mesh between the clutch bell pinion and the main drive gear located on a layshaft. With one of the adjustment screws hidden by the main drive gear wheel it looks difficult. In practice it's not too bad, one leaves this screw slack until the correct adjustment has been achieved then the gear wheel is removed to tighten up the last screw.

I have already mentioned that we used a side exhaust motor. It's worth noting that although provision is made for both and rear and side exhaust motors a side exhaust one gives the neatest and potentially most reliable installation as all the plumbing is contained within the frame.

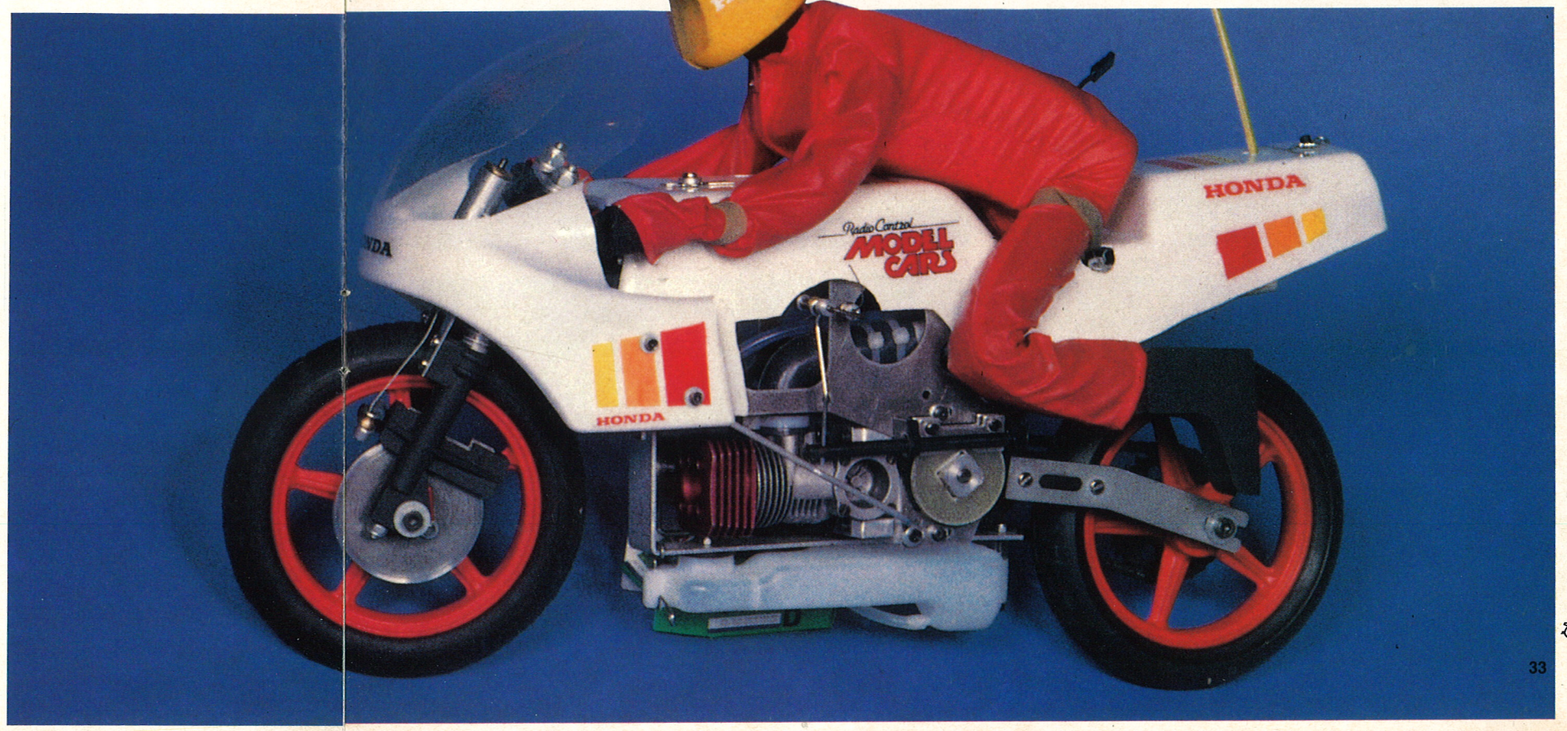
The clutch is very similar to those found on *SG* cars. Two PTFE shoes held in by round springs which have legs that project up through the shoes and held in place by having the ends bent over. The main difference between this and the set-up more normally found on the cars, with which we are all familiar, is that the clutch pins are located in a small aluminium carrier rather than on the flywheel. The flywheel is carried on the end of the clutch nut adaptor furthest away from the engine so that it may easily be reached with an electric starter.

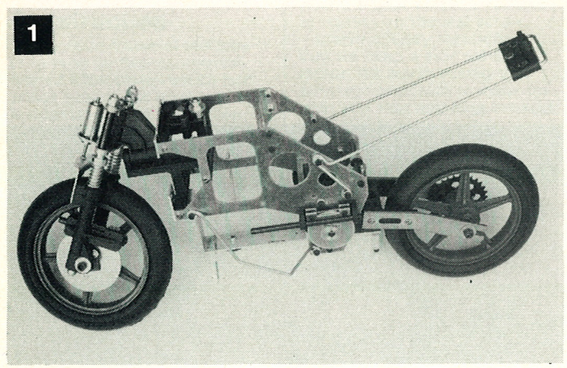
We had trouble actually fitting the clutch, the internal threaded portion of the nut was threaded right to the end instead of having a short drilled out portion at the engine end to allow it to pass down over some of the plain area of the engine crankshaft as say an *SG* one does. The result of this is that on our *NovaRossi* engine we could not tighten the clutch pin carrier on its tapered cone. As the threaded portion was so short we opted to make a small packer to go between the engine front bearing and the cone, rather than further reduce the threaded area by drilling out the nut.

From here the drive is taken to a large main gear which is fitted to a layshaft behind the engine. Again we had problems. There was end float in the shaft which we decided would do little harm, so we left it alone. We also found that the large gear wheel ran very much out of true. Even with the benefit of a lathe, there was little we could do to correct it, so once again we left well alone on the assumption that sufficient play would quickly develop to allow the gear wheel to line itself up at speed.

The same layshaft carries the small primary chain sprocket and provides the pivot point for the rear suspension arms which are located on this shaft by ball-bearings.

Finally the same shaft carries the single fibre-glass disc that works as a rear brake, the gearing of the chain and the size of the rear wheel is such that whilst the brake will slow

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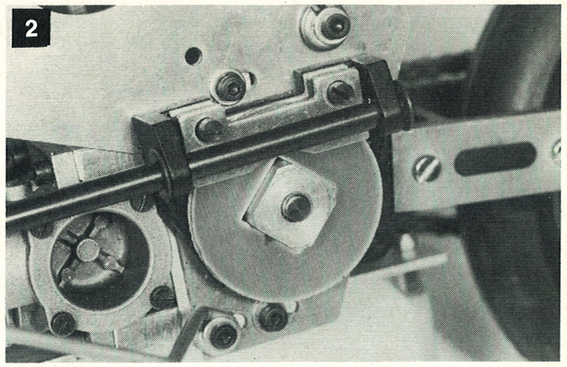
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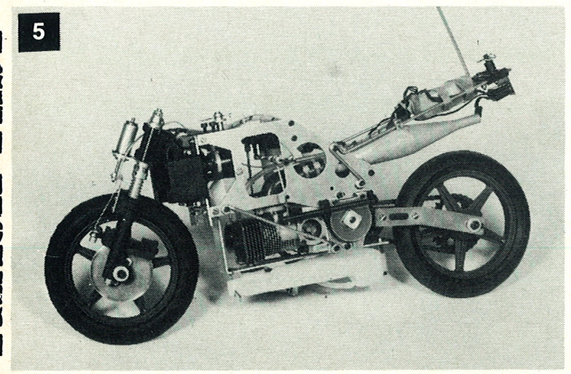
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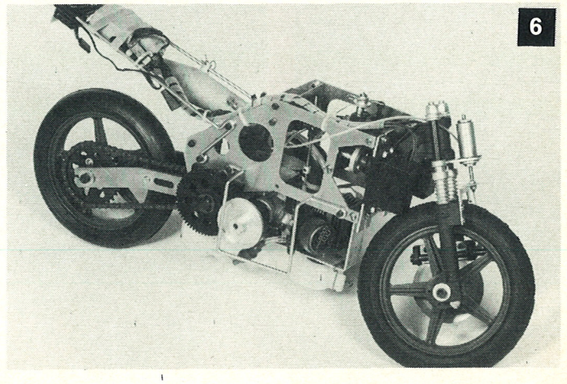
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'TRACK TEST'

the bike, there is little chance of locking the rear wheel.

The rear suspension consists of twin swinging arms fitted to a single plastic moulding pivoted as already mentioned. The actual suspension is provided by a single coil spring over an oil-filled shock absorber located well forward and acting directly on the plastic moulding. The top end is located on an alloy bar bolted to the two side panels.

A conventional roller chain takes the drive to a large sprocket fixed to the rear wheel. Chain tension may be adjusted by sliding the wheel in slots provided in the twin suspension arms.

Both wheels are moulded in a very realistic looking five spoke design in red plastic. It's nice to see that the manufacturers have been able to get these large wheels to run very true. The tyres are made of virtually solid rubber. In cross-section they could best be described as a 'C' shape, but with such thick walls as to make them virtually solid when fitted. Getting them on correctly requires a considerable amount of muscle. Once on press them well down to make sure they are running true, then run a little super glue round the edge to prevent them squirming on the wheels.

The wheels are fully ball-raced, as is virtually everything else on the bike, and run on hardened steel shafts that are bolted between the forks.

It's worth noting that the instruction diagrams show two small spacers on these shafts which we did not find included in the kit. Being inclined to be hasty by nature we made some, then fitted them as shown only to find that the wheel was very stiff. A quick measure up with a vernier revealed that they were not necessary. Indeed we were imposing a side load on the bearings by fitting them. Presumably a design change had taken place.

Whilst on the subject of the instructions, it's also worth noting that they are in Italian! In practice the drawings and the photographs included in them are so clear that with the exception of the above we had no difficulty in actually building the bike. To be fair, *DWA* have provided an English booklet that is designed to cover the aspects of building and setting up the bike that the diagrams cannot cover. In this they have been very successful in maintaining a balance between entertainment value and clarity. The examples say it all.

"As with real motor-cycles a counter-effect is obtained when clamping the rear wheel for braking, therefore, it is indispensable to adjust the effect of brake which has a fluid and efficient functioning so as to arrive at jamming of rear wheel only with the control stick at end of stroke."

Even better is:

"The trajectories on the runway must be programmed and pre-selected beforehand, so as to allow the motor-cycle to board the bends correctly and to pull itself into the correct trajectory."

The throttle and brake servo is located just under the seat of the bike. Its position provides a good straight pull on the throttle and the rear brake linkage. The front brake being operated by a cable which works off the rear brake linkage.

The bike comes with its own special tuned pipe which exits neatly over the rear wheel and is located via its own integral bracket. This also carries the radio receiver, switch and whip type aerial.

The fuel tank is a long thin blow moulded affair which is slung beneath the bike. Not possibly an ideal position, but the only practical one available. Refuelling is a bit tricky. The tank has to be unclipped and lowered from its mounting to allow fuel to be added, not only is this difficult, but it also means the tank is sloping the wrong way. I watched a video of some Italian races and the most effective technique seems to be to enlist the help of two pit men. One holds the bike whilst the other sees to the refuelling.

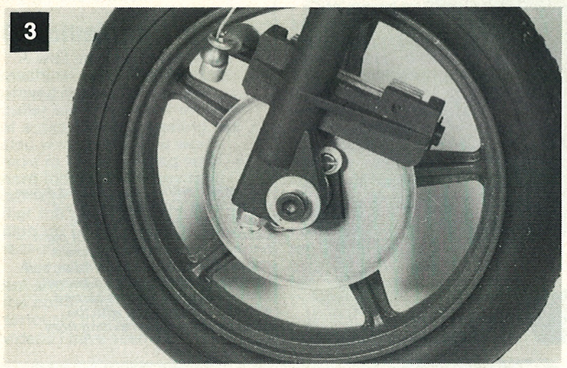
Steering

Now we come to the really interesting part. How does the bike steer. Basically the whole front suspension unit can be leaned over to either the left or the right. The whole thing is ball-raced, but it does take considerable force and it is very necessary to use two servos to achieve this. One important point to remember is that the servos must be in phase, so that they are not fighting each other. Slots in the adaptors are provided to make this possible. Failure to ensure that this is correctly carried out, could easily result in at least one burnt out servo.

The overall effect of this is to cause the bike to lean over into the bends. The actual steering is free to pivot between two stops, and finds its own position when the bike leans over into a corner. It all sounds unlikely, but in fact it actually works very well.

Front suspension is provided by twin sliding forks each of which is operated on by a coil spring. Damping is provided by a single massive damper. This gives the slowest damping I have ever seen on a model. It took nearly a full second to return to the extended position. We took the manufacturer's advice and made a small notch in the outside of the piston. It still feels over damped and I suspect a bigger notch will be found necessary with racing experience.

Braking at the front is taken care of by a single disc brake. The disc is made of aluminium alloy and is acted upon by twin steel pads. The operation of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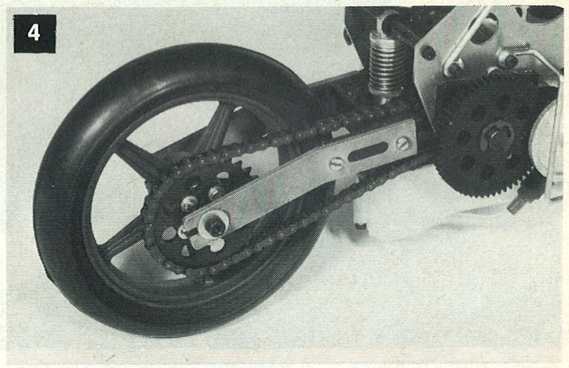
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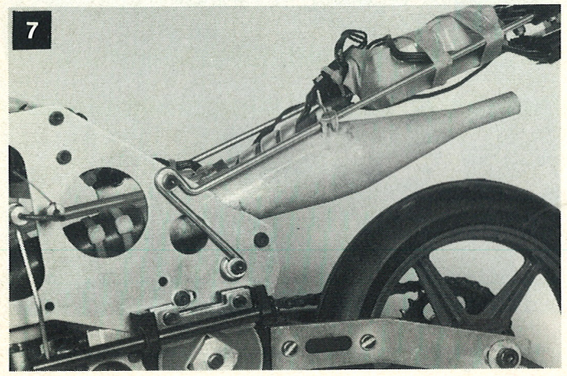
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1. The bare bones of the DWA 'Commando' showing the exceptionally strong centre chassis section.

2. Close-up of the rear disk brake which uses a single GRP disk running in steel pads. The small disc size means that locking up the rear wheel is virtually impossible.

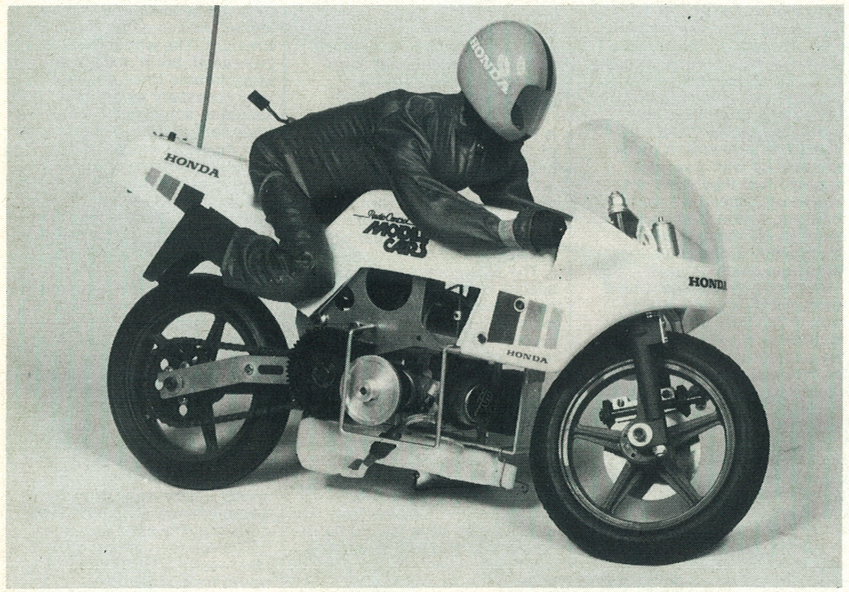
3. The front brake, which is connected to the rear unit via an operating cable, has a larger diameter disc of aluminium running in steel pads.

4. Rear-end detail showing twin swinging arms, single coil-over-shock damper and roller chain and sprocket.

5. The completed rolling chassis with side exhaust *Rossi* motor in place. Use of a SE engine keeps the exhaust outlet conveniently sited through the chassis.

6. From the other side showing the access to carburettor, clutch flywheel and throttle brake linkage.

7. The exhaust outlet blows straight out of the back keeping the rest of the bike clean. The radio receiver sits above, along with the switch on its own bracket.



Above left: with bodywork and driver in place the 'Commando' cuts a realistic and exciting attitude: despite the Leakey quality of paint finish. Left: foam driver figure is encased in a single piece riding suit topped with a vac-formed helmet. The R/C battery pack is carried within the main body with the receiver connection exiting from behind.

this is by a cable connected to the rear brake mechanism. It's a little tricky to get this right and the adjustment is very crude indeed. If we race the bike, and we will if we can find enough people to race against, I will fit an adjustment mechanism similar to those used on bicycle cable brakes. I guess this aspect will turn out to be fairly important as it is clear that the front brake does the bulk of the work in stopping the bike.

A full length vacuum forming gives the impression of a fuel tank and seat. A second vacuum-forming bolts to this and makes up the windscreen and faring.

At this point panic set in. The editor told me he wanted colour pictures and a really good paint job. Now those who know me will know that painting bodies has never been my strong point. A few dobs of colour in a badly cut mask, which as always in my case managed to creep round the edge of the masking tape, did not seem to form a very auspicious start. Still three coats of white with an airbrush eventually produced a reasonable looking body and the addition of a few stickers now means that all will be well if I am careful what angle I take the photos from.

The rider is formed from a single oblong of foam with the arms and legs made from foam rubber tubes supported on wire. A single piece riding suit covers the body. Small shaped blocks of foam form the feet. The whole lot is topped by a two-piece vacuum-formed helmet. It sounds crude, but the effect is good. The rider is securely held on to the fairing by elastic bands.

The battery pack is carried within the foam inside the riders back. I have heard of people attempting to lower the centre of gravity by mounting the batteries low down in frame of the bike. Don't bother to try it. The effect is to make the bike too stable so that it will not go round the bends.

On the Track

Driving the bike takes a bit of getting used to. You have to lean it hard over into the bends then literally over-correct to bring it up again. Once confidence has been built up, it can circulate the track surprisingly quickly with a fair turn of speed down the straight. It's even possible for the really brave to do a wheelie. Setting the bike up was a little strange and suspect, that on more bumpy tracks we would have to soften the front suspension.

The only problem we encountered was negotiating the two tight hair-pin corners on the Crystal Palace track. A natural problem of racing a quarter-scale bike on an eighth-scale track.

Conclusions

A well engineered real fun machine. When we ran it, it proved to be a real crowd-puller even though it was not at a regular race meeting. It's also very tough. You would have to hit something very hard indeed to do any real damage. I also liked the way that the radio gear is mounted high up where it should stay reasonably clean.

As I said at the start they are not a toy and their racing on the continent is taken very seriously indeed. On the videos I have seen the meetings have been very well attended with large crowds of spectators. Because of the way they handle the racing proves to be very exciting. Most of the overtaking is done in the corners. Approach too fast, run wide and you'll find the bike behind, tucking neatly inside you. The leading bikes are constantly swapping places.

One would imagine that they are a handful in the wet. Not a bit of it on the same videos they have been racing in pouring rain with standing water on the track that would defeat most cars.

At around £350 they may at first glance appear expensive. Actually when compared to the latest four-wheel drive cars they are not. The kits are very complete. To the £350 all you need to add is one engine, a relatively cheap side exhaust buggy one will do and the radio gear admittedly with three servos.

With a car you can purchase a competitive car like a *Serpent* or *PB* for say £300, but to this you have to add some three different body shells, the radio gear and a host of tyres and wheels. I generally reckon that you need at least two engines as well. The sum total of this being considerably more than is needed for the bike.

On running costs the bike wins hands down. The tyres appear to be virtually everlasting and since only one tyre appears to be currently available, the set of wheels and tyres that come with the kit are all you need.

It is as well to fit a good racing engine as the bikes do shift down the straight. Having said that, the engines do not take the hammering they would take in an 1/8th scale circuit car and one engine should easily last all season.

Fuel consumption is again very low when compared to circuit cars and there is less need to use the high nitro content fuels some car racers find they need to qualify.

To my knowledge there are already three of these bikes either running or being built in the UK. Ted Longshaw has one, Walt Bailey another and we have the RCMC bike. As Ted tells me he's finally seen the error of his ways and is going to return to 1/8th scale circuit racing we may even be able to get at least three bikes together to put on a few demonstration races next season.

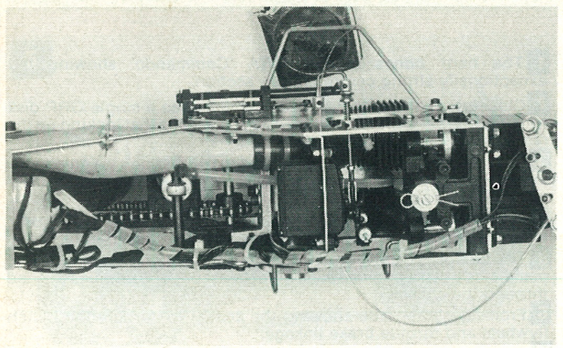
Will they catch on? Well they have certainly caught on in a big way on the continent. If we do find enough enthusiasts prepared to race, then it would be relatively simple to modify some of our existing 1/8th scale tracks to accommodate them.

One other attraction is that the need for a special track is not as great as with cars. Any large tarmac area such as a car park could easily be marked out to provide a racing venue.

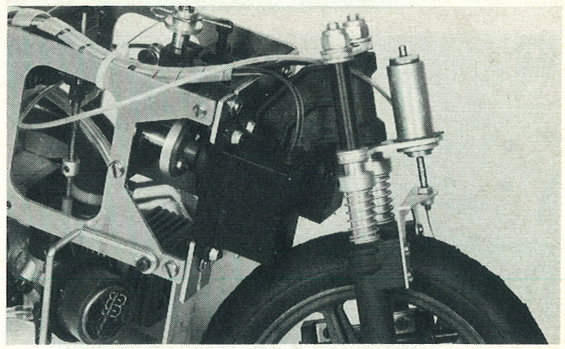
Yes the more I think about it, the more I am convinced that they will catch on. There's a large pool of drivers who like IC powered devices, yet have found the competitive world of eighth scale track racing just too expensive when then try to compete at the top. Many turned to Off-Road racing only to find that the costs were greater than they had expected and the nature of the track often failed to produce the excitement they had been used to.

With these bikes racing is fun and very little equipment is needed. Build it, turn up at the track with the bike, a starter, the radio gear and a bottle of fuel and you are ready to race. Let's hope it remains that simple and we don't finish up in a few years time with twenty different grades of tyre rubber to choose from or the need to add a whole host of go-faster goodies to shave seconds off lap times.

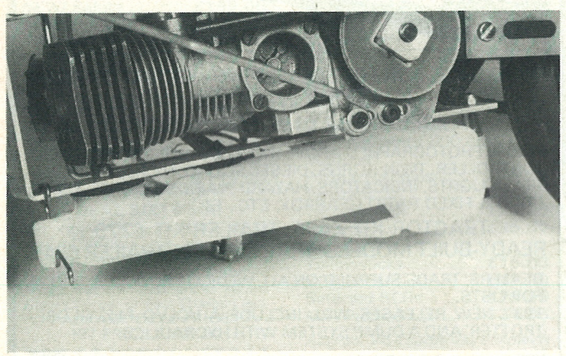
Above: fine tuning in the pits at a typical European meeting – gives some idea of scale.



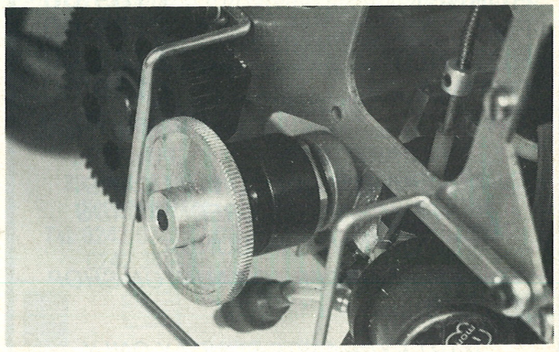
Above: the view from above showing the insides of the chassis. Depite the space restrictions, layout is neat and uncluttered.



Above: twin-servo steering set up must be carefully alligned to ensure servos are working in sync. Also note single oil-filled damper.



Above: blow moulded fuel tank is specially shaped to fit underneath the chassis.



Above: clutch and flywheel whilst readily accessible for starting are also protected by side nudge bars.