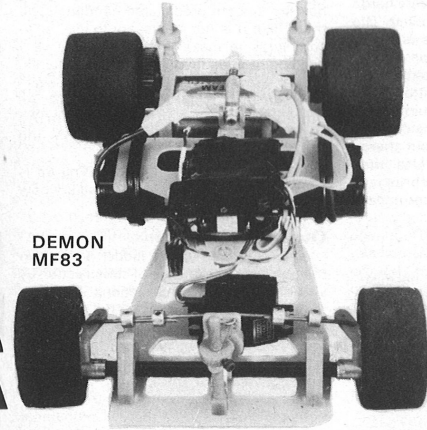


# 3-IN-ONE SPECIAL 1/12

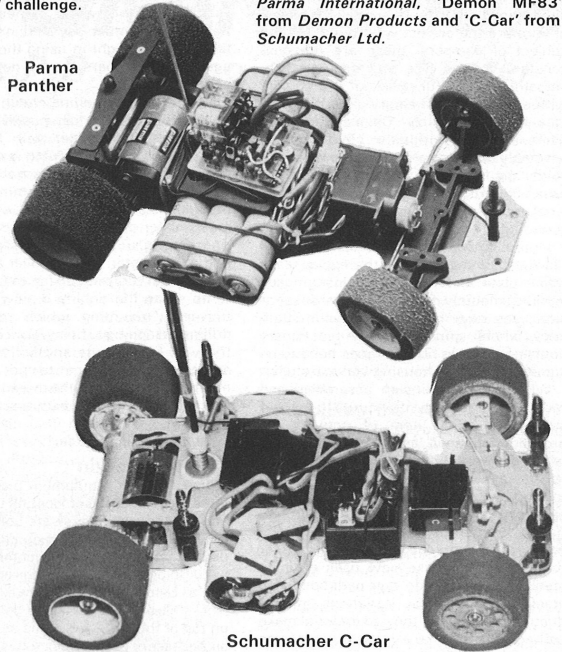
ELECTRIC 1/12TH SCALE racing has undergone a welcome transformation during the past year with the almost nationwide acceptance of carpet as a racing surface. From club level right up to National BRCA meeting level, fair, competitive and enjoyable racing has rekindled interest in this aspect of the hobby. Chassis design has also undergone substantial changes to cope with the 'high grip' nature of carpet (as opposed to non-grip nature of polished wooden floors). Various manufacturers, having witnessed the immense success

of the *Associated 'RC 12i'* not only in this country but worldwide, have set to and produced their own answers to the *Associated* challenge.

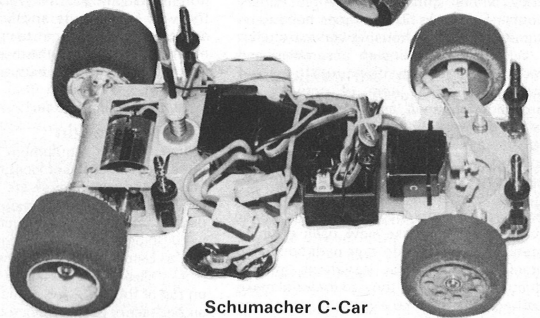
On test here are three of the strongest challenge to be seen on the home front, the 'Panther' from American company, *Parma International*, 'Demon MF83' from *Demon Products* and 'C-Car' from *Schumacher Ltd.*



DEMON MF83



Parma Panther



Schumacher C-Car

## DEMON 'MF83' Reviewed by LEWIS ECKETT

THE NICK ADAMS *Demon* 'MF83' car has undoubtedly been most keenly awaited by the 1/12th racing fraternity due, simply, to its long history of design, development, modification and testing. Prototypes of the car were first seen at the Ally Pally club late last year, these, designed and built by Mervyn Franklin (MF — Mervyn Franklin, see?). These first examples featured a rubber wheel rear end damping system, adjustable castor front end and lightweight GRP chassis and shaker plate construction. A great deal of further testing by the *Demon* team was carried out and subtle modifications made, leading one to suppose that at least Nick Adams has taken the pains to prove his product before launching it onto the market.

### Construction

As is normal practice these days the *Demon* is supplied as a conversion kit containing just the bare chassis, motor pod and front end. A pleasant surprise was the

inclusion of an accurate exploded view drawing plus written instructions on putting the car together and setting up.

The rear end goes together first and comprises of two injection moulded nylon bulkheads, two alloy rod spacers and a thin GRP plate. The alloy rod spacers are a push fit into the bulkheads and are then retained with alloy bolts screwed into each end. The instructions stress that the pod must be assembled completely square. Further advice from the *Demon* team is to cyanoacrylate parts together to form a super rigid assembly. The GRP plate fits across the top of the two bulkheads and provides the mounting for the shock absorber ball-joint as well as the rear body posts.

The main chassis is bolted to the motor pod next with alloy countersunk screws. The moulded bulkheads are already tapped to accept these and caution must be taken not to overtighten and strip the plastic thread. Not wishing to take any chances I

cyanosed these in as well. The chassis itself is manufactured from 2mm thick GRP, deeply waisted at the rear end broadening outwards at the front. I must confess that at first sight it looked decidedly frail compared with other types available — still time would tell.

The front end follows on and employs the adjustable castor/axle beam system pioneered by *AYK* of Japan. The axle beam is machined from carbon fibre with aluminium end caps and centre section. Two injection moulded uprights clip onto the beam either side with an aluminium clamp in the centre to retain the beam firmly. The two end caps are pre-drilled to accept the kingpins for the *Associated* style stub axle blocks. To give front-end suspension two springs are fitted above the blocks and retained with circlips. To allow the axle blocks to move up and down freely it is necessary to either polish the kingpins or smear them with silicon grease. Grub screws located in either end of the beam

# SCALE CARPET RACERS

retain the kingpins and it is a good idea to file a flat on the pin and Loctite the grub screw in to avoid any embarrassment at a later stage.

As mentioned earlier the stub axle blocks are very *Associated*-ish, however, there are subtle differences, for instance the stub axle placement has been moved back to offset it from the kingpin by 0.050in. thus allowing the wheel to centre more easily in a straight line. The outside face of the block has a small thrust area moulded around the stub axle exit to space the bearing away from the block. Finally the steering arm has an increased rake angle incorporated to allow it to clear all types of wheel hub.

To adjust the castor angle or kingpin inclination is simply a case of loosening off the centre clamp screws and rotating the beam to the required angle.

Still on the subject of the front end, the injection moulded uprights also act as steering overthrow stops, the problem being that, with this type of layout — using new style *Associated* blocks — the wheels have a tendency to push the steering arms over centre if shunted hard. This locks up the steering as the servo cannot push it back due to the acute track rod angle.

Moving on from the front end, the shaker plate screws onto three injection moulded nylon pillars, once again these have been pre-drilled and tapped. Apart from adding the front body post the only item left to prepare is the rear, motor-pod damper.

The *Demon* kit contains one of the new *PB Racing Products* shock-absorbers of the type used on the 'Alpha GP' 1/8th scale I.C. car. These shocks are of the 'constant volume' type, the damper piston moves through both ends of the barrel and is sealed with O-rings. As no air is contained in the barrel a smooth, symmetrical action is achieved. The shock-absorber in the *Demon* kit features a ball-joint and spring fitted to the damper piston. Filling the shock with oil (the instructions recommend 3-in-1) is quite critical to ensure that no air bubbles are contained. I left mine standing upright for an hour and experienced no problems.

A small nylon moulded saddle mount retains the shock-absorber onto the shaker plate. The instructions contain information on how to set up the damper-spring arrangement to give the correct amount of rear end flex and ride height.

### Bits and pieces

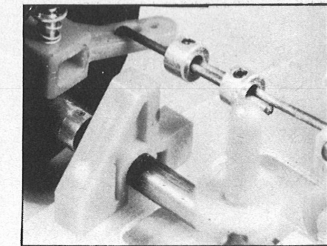
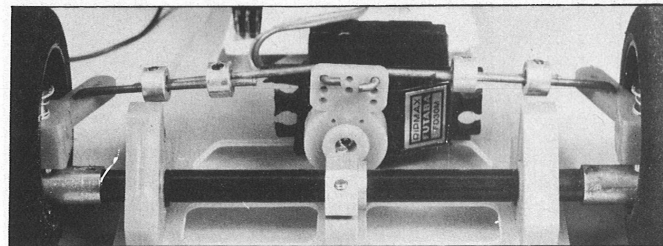
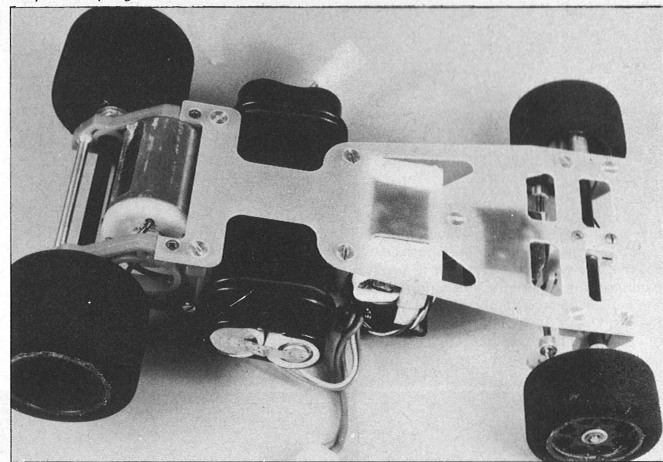
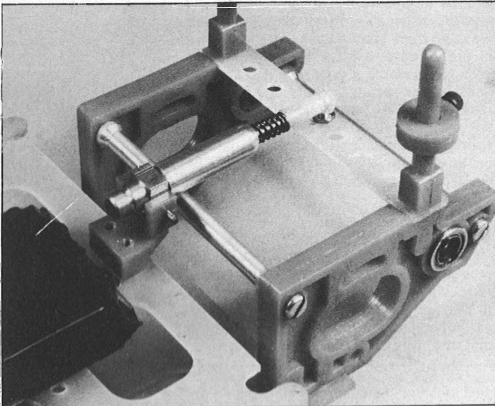
All my radio gear was transferred to the new car without problems, the shaker plate is designed to accept 'stick' type Ni-Cad packs retained with large rubber O-rings. These mount underneath the shaker plate

giving the car a very low centre of gravity. The *Demon Products* '2C' electronic speed controller was fitted as a matter of course.

### On the track

It's difficult to be positive about a car's performance around a circuit as so much of

*Right: completed rear end pod including constant volume damper. Various racing sources recommend leaving the alloy rod screws out, thus allowing the bulkheads to twist and then return to their original position. Below: underside of the original kit chassis, the cutouts behind the front screws have now been reduced to give extra strength. Bottom left: complete front end, the alloy clamp screws should also be treated with a thread locking compound. Bottom right: steering blocks, steering overthrow/axle clamps and suspension spring.*



what happens is subject to individual opinion. Suffice it to say that I found the *Demon* to be as responsive to my commands as I could wish it to be — sometimes too much so! On the carpet it was extremely stable using my standard tyre set-up of *UFFRA* Whites at the rear with Greens at the front. One aspect that did become noticeable of the car's behaviour was that there seemed to be no 'punch' out of the corners. After a brief consultation with Nick Adams it was revealed that the damper was set up too hard and had been restricting the rear end flex. Several answers are available, thinner oil, softer spring and modifications to the damper piston. This involves filing a small 'V' in the displacement ram to allow oil to flow past more easily.

#### End notes

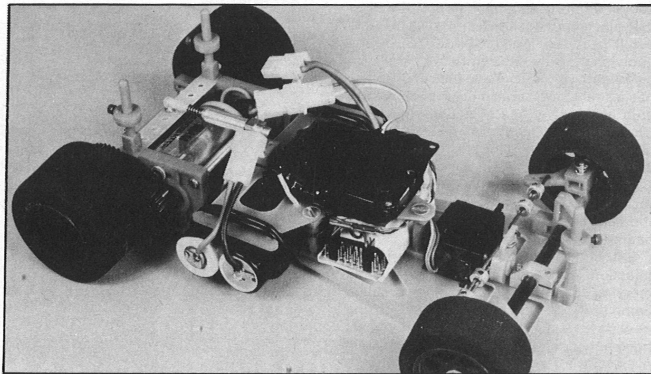
The car is definitely well thought out and proven in its design by Nick and the rest of the *Demon* team drivers. £40.00 is still a lot to pay for what is ostensibly half a model car but considering the quality of the parts and the way in which everything fitted

together first time it is well worth it. It feels good to race a British product anyway.

Finally, I did manage to break a chassis, albeit by running it at full speed into a wall pillar. The GRP snapped right across the cut-outs behind the front axle beam

mountings. Still, a new chassis was obtained in double quick time and proved to be modified to make it much stronger in this area.

The *Demon* 'MF83' is available from selected model shops, price £39.95.



## SCHUMACHER 'C-CAR'

Reviewed by JOHN GLEN

CECIL SCHUMACHER, the man responsible for first developing the Limited Slip Differential for 1/12 scale electric car racing produced his first production chassis back in 1981 a version of the revolutionary folded chassis. During 1982 this car enjoyed considerable success, racing on polished wooden floors with siliconed tyres. However, with the more or less universal move to carpet racing, it has become increasingly clear that these Lexan chassis are not really competitive on this medium. It is, therefore, not surprising to see a move back to the flat plate chassis of the pre-Lexan days, although all the cars now available are technically more advanced than anything available previously.

Cecil's new car, designated the 'C' car (the 'C' presumably stands for 'Carpet'), is no exception. The car features a friction damped rear suspension similar to that first seen on the *Associated* 'RC 12i' although in a refined form. The front end is a break from the norm, featuring wishbone front suspension complete with coil springs which are adjustable for pressure, and anti-roll bar. The kit supplied was an early example and modifications have been made since.

The conversion kit supplied for review (a complete rolling chassis is also available) came sealed in a plastic bag containing all the parts necessary to construct a chassis ready to accept my ball races, differential, steering blocks, etc.

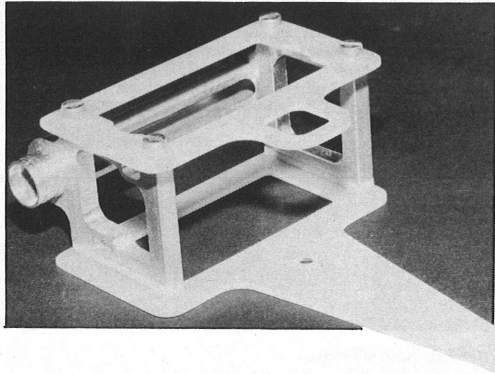
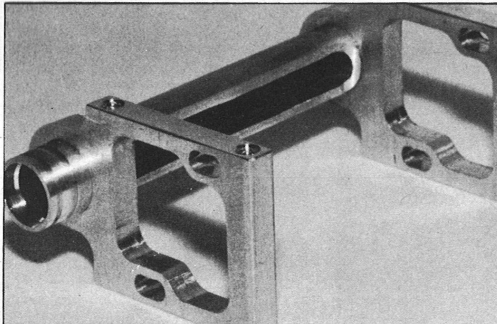
All small components are sealed in a

small plastic bag of their own, to prevent loss on opening the packet. The GRP chassis components are beautifully cut out on Cecil's new computer controlled milling machine. The machined rear motor pod consists of two parallel uprights, between which the axle tube sits, thus ensuring that the axle ballraces remain parallel at all times.

#### Assembly

No instructions were supplied with my kit, these are still in the process of being written, so I had to rely on the exploded view diagram as a reference for assembly.

*Below left: the two alloy side plates and axle tube bonded together. Below right: the completed motor pod.*



I decided to make the rear motor pod first. Assembly of this begins by fixing the computer machined side plates on to the axle tube. The drawing shows that the side plates are retained on the tube by circlips; these were not present in the kit. As far as I could see, the circlips would not serve any useful purpose anyway, as the side plates are a firm press fit on the tube, requiring only a drop of thread lock to ensure that there was no chance of the tube working loose. This assembly is now mounted to the top and bottom plates with four spacers sandwiched between to allow a degree of ride height adjustment. The lower plate forms the rear flexible part of the chassis apparently so designed to reduce the possibility of tweaks.

Construction of chassis/radio plate is straightforward following the drawing provided. To begin with, two GRP strips have to be attached to the chassis, these being clamped between the chassis and radio plate posts. These strips provide the location points for the rear motor pod assembly, this being the next component to be added to the chassis.

Before fixing the radio plate to its posts it is necessary to fix the dual purpose damper/roll over mast post to the same. Ensure that this is well and truly tight as if it does come loose it will be necessary to remove the radio plate from the chassis to re-tighten it. Six coil springs are provided for suspension/damping three long and three short. One long and one short spring are used for the damping system the remaining four being used on the front wishbones. Damping is by means of two PTFE washers compressed together by two springs over the upper plate of the rear motor pod thus providing very smooth operation of the rear end.

The front suspension proved to be rather confusing at first, mainly due to the drawing provided being none too clear in places and actually had no information at all as to how to fix the anti-roll bar. I have seen the new drawings provided in the latest kits though and they are much clearer, providing all the information necessary to construct the front end easily. I particularly liked the use of O-rings in the pivot pins as this should prove to be a very hard wearing method of hinging the wishbones and also makes it very easy to change castor angles.

#### Control installation

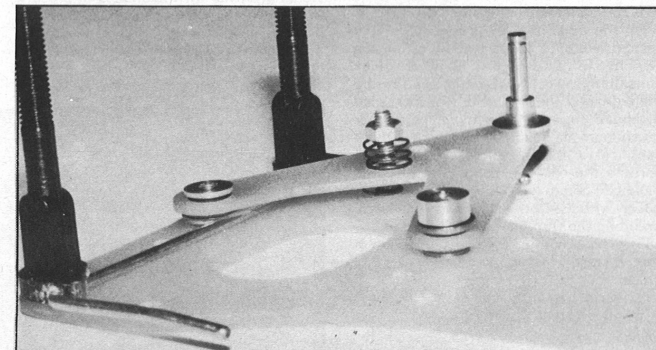
I used a *Futaba* '30M' servo for the steering, this fitting on to the servo mounting plate, attached to the top of the rear wishbone pivot points. No problems were encountered and there is plenty of space to fit most types of servo here. The *J.R.* receiver I fitted did not leave much space. This had to be placed across the chassis, its edges protruding over the sides. I was slightly worried about possible damage to the receiver in this position,

although this seems to be unfounded as no damage has occurred so far. Speed control was provided by means of a *Demon* '2C' unit, there being more than enough space for this on top of the radio plate. Most speed control systems should fit easily here.

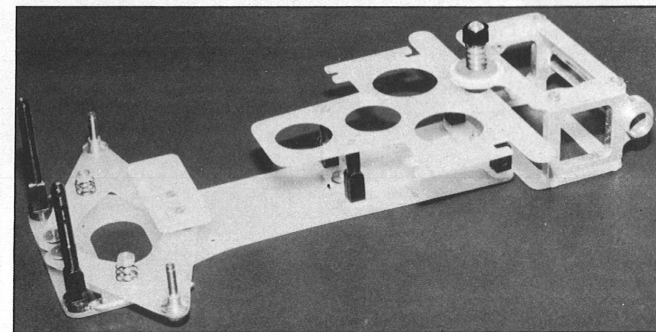
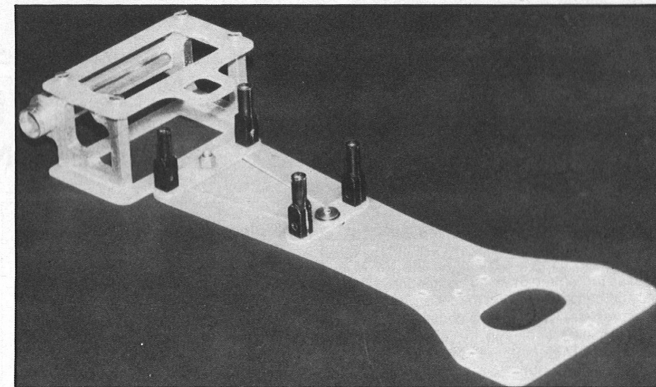
Finally, installation of Ni-Cads, differential, steering blocks, etc., all items provided

by the purchaser from their old car.

One point here, to change a motor it is necessary to remove the GRP top plate, although this is no real hardship. All motors should fit, although an *AYK* 'GZ1200' motor I fitted in the car proved to be a tight squeeze.



*Above: the front wishbone suspension layout and anti-roll bar positioning. Below: the main chassis and motor pod together. The tongue and groove system allows the chassis to remain tweek free. Bottom: the chassis complete including steering servo mounting plate and rear pod damper.*



### On the Track

First tests on the track were plagued with track rod problems, these continually bending due to being too soft and giving about 90° toe out, making the car totally undrivable (these rods were purchased by me separately from my local shop I hasten to add). Having cured this, I arrived at a good tyre combination from my tyre box.

On the track, the car proved to be very responsive, but I found it to be rather too twitchy in a straight line. A quick consultation with Glyn Peglar, one of the team drivers, and the castor was increased by about 1/8 in. at the front, making the car much more stable in a straight line without sacrifice to responsiveness. Through the corners the car is a delight to drive the balance being virtually neutral under power with the front end tucking in sharply on lifting the throttle, although in a totally controllable manner with no suggestion of the rear end breaking away.

### Conclusion

The 'C' car is certainly competitive at top level as can be seen by its results so far this year, most notable probably being first over the line in the Euro-Champs final in Milan in the hands of Andy Dobson.

The instructions in their reviewed form left something to be desired but latest versions of the exploded diagrams are

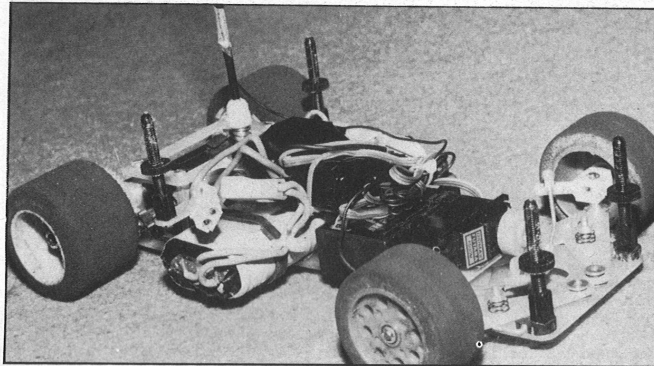
much more informative and when the Instruction Sheet becomes available no problems should be encountered.

At present the car does not come with steering blocks provided, the purchaser being expected to provide his own *Associated* steering blocks. Cecil is however, working on his own examples at present which will also allow use of his excellent live stub axle units. It would be nice to see these blocks provided in the conversion kit when they become available.

At £45.00 for the basic conversion kit, it

is rather expensive, but there is no denying the quality, the alloy and GRP components being machined very cleanly and accurately.

Incidentally, latest kits are packaged in a small cardboard box (a much nicer way of packaging a product than in a plastic bag) which is always useful afterwards for carrying spares. Not many spares should be needed however, as the car appears to be very well thought out and strong, having survived several very heavy crashes during first tests.

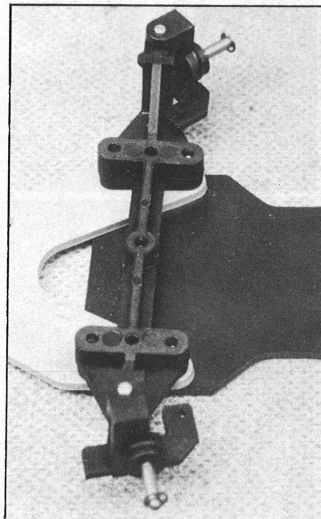


## PARMA PANTHER

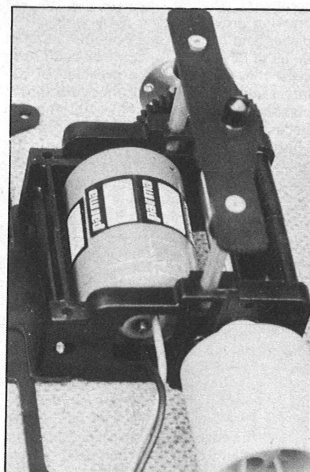
Reviewed by JOHN CUNDELL

THE NAME OF *PARMA*, an American company based in the lakeside town of North Royalton, Ohio, is well-known to electric slot car enthusiasts in the UK as well as the United States. The company has also gained a reputation in recent years for their resistor type speed controllers and polycarbonate bodies in the world of R/C car racing. Their latest release, the 1/12th Suspension 'Panther' car, is a determined attempt to make strong inroads into the R/C electric car scene.

The kit is supplied in a strong cardboard box and is available as the basic frame or it can be purchased with motor and computer-matched Sanyo cells. Apart from the major chassis plates, all other components are packaged in plastic numbered bags, i.e., front end kit, rear end kit, wing tube kit, servo saver kit, accessory pack, *Parma/Associated* steel differential, wheel hub kit and resistor. The other items are chassis plate, flexplate and throttle servo plate in glass fibre, front and rear tyres and bumper. The kit which includes the electrics featured a *Parma* 'Renault' motor, six 1.2volt, 1.2Ah *Sanyo* computer selected Ni-Cads, connectors, wire and roll over antenna. Finally, there is a comprehensive



Left: 'Panther' front end, the central bolt hole takes the camber adjustment screw. Below: rear end blocks, differential and motor.



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instruction package which includes exploded diagrams and photo illustrations plus a separate sheet on the differential, and a help sheet of eleven hints and tips on setting up the car for maximum performance by American racer and World Champs qualifier, Bud Bartos. This latter sheet contains some very useful advice and should certainly be read before construction commences, as indeed should the basic information.

### Assembly

Assembly commences with the front end and no problems were experienced. The unit is very similar, indeed one might say exactly similar to the *Jomac* 'Lightning' unit and features a camber adjustment screw, which should initially be set up parallel. One point to watch is that the king-pins move freely in the front axle, mine was free, but if there is a little stiffness this can be removed by rubbing the pins with wet and dry paper, followed by steel wool. Oilite bushings are supplied as standard but if you wish to fit ball races, as I did, the wheels and stub axles are completely compatible with races available from UK model car specialist shops. The wheels are retained by the usual E-clip. Bearings are also easily applied to the rear end which is again very 'Lightning-ish', featuring axle cams and motor cam to give maximum possible adjustment to axle height and gear mesh. Pains have been taken by *Parma* to keep the weight down and it is not recommended to drill any further lightening holes in the front or side webbing although one is permitted to open out the holes in the rear webbing to half an inch. The *Parma/Associated* differential is straightforward to assemble but don't forget the smear of grease and make sure it is put together in the correct sequence. The lightweight alloy hubs are well machined and already drilled to remove all excess material. The plastic wheels are bolted to these with two set screws.

Ready trued wheels and tyres are available in soft and medium on rear and soft, medium, medium firm, firm and hard plus combo medium-soft and medium-hard on front, or you can fit and true your own tyres on the yellow plastic wheels. They will not take standard sleeves, being fractionally too large, but it only takes a few moments to unscrew the set screws and change wheels, and of course there is no chance of these getting knocked off during a race.

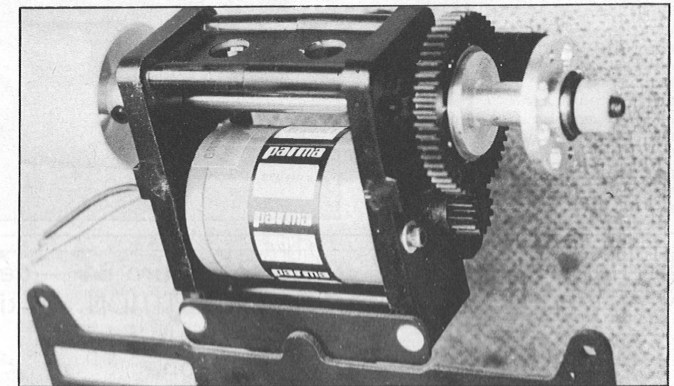
The rear pod assembly fixes to the main chassis plate through the T-shaped flex-plate and four alloy self tappers. The standard plate is .063in. thick and should be fitted if you intend to race on carpet or outdoors on asphalt. However, for the really slippery surfaces, a much flexier plate is required. A .032in. thick plate is now available and should be obtained and fitted for silicone racing. It is also desirable to carry out a further modification for silicone

racing to the throttle plate arrangement. This rather rigid plate is designed to accept a mini-type servo, there is no way a standard *Futaba* or equivalent will fit, and to operate on the *Parma* resistor by means of the wiper arm supplied. Whilst being a bit fiddly, the system goes together satisfactorily. The plate is fixed to the front top of the rear pod and to a rigid plastic supporting pillar raised from the chassis plate. Three small rubber grommets are supplied to fit between the throttle plate and the pod and pillar in order that rear end flexibility is maintained. This system is perfectly satisfactory for carpet operation but leaves the car too rigid for silicone use. There needs to be much more float on the pillar-throttle plate attachment and I have simply removed the grommet and drilled out the throttle plate to quarter inch diameter and left the self-tapping screw about an eighth inch proud. This modification has

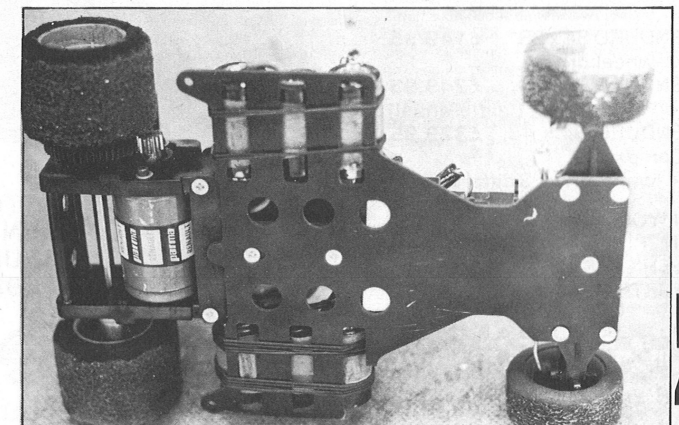
made an incredible difference to the handling of the car. If you intend to use an electronic speed controller, this can be mounted under the throttle plate if it is of modest dimensions, or otherwise on top. A nearer arrangement than the throttle plate is to use another flex plate and mount the speed controller on to it.

Body mounting is facilitated by a rear body post on two alloy tubes mounted in the rear pod and by two posts at the front. This is entirely satisfactory although I prefer the one post at the front arrangement as can be seen in the photographs. There is enough adjustment in the mounts to accept a wide variety of bodies.

The receiver fits snugly onto the chassis with the servo tape supplied in front of the battery-throttle plate set up, and backs onto the steering servo. A *Kimrough* spring type servo saver is supplied which will fit the majority of mini servos, and even a



Above: the rear pod viewed from underneath. Motor changing is very easy as is the interchanging of wheel hubs (*Associated, Jomac*) due to the 'universal' hub carriers. Below: complete chassis underside.



standard servo, as can be seen in the photographs, following the careful use of a needle file on the servo output spindle. With the resistor car, a diode is supplied which drops the battery voltage down to receiver level. A stiff wire antenna fits to the throttle plate, this doubles to lift the receiver aerial to an effective height and even more effectively to operate as an anti-turn over device. One evening's racing with it removed soon proved its usefulness and it was quickly reinstated. The little bit of excess upper weight is far outweighed by being able to stay upright. Of course, if you are the type who never turns over, that's another story!

### On the Track

The car is competitive and is strong, especially important for most levels of racing. The quality of all components is excellent and strength has not been sacrificed for lightness. The *Parma* 'Panther' will run successfully on its first outing, if correctly assembled, particularly on carpet surfaces and then there are ample adjustments provided all round to allow for finer tuning. For silicone use it is imperative that maximum flexibility is allowed for in the assembly of the pod-flex plate-chassis area, otherwise a few frustrating hours will result. To start with, on carpet use medium rears and medium-firm fronts and for silicone I suggest the softest rears you can find and hard fronts. Also,

don't forget to round off both the outside and inside edges of the rears.

### Conclusion

A fine kit from the States which will find a large following on our shores and which fully comes up to the high quality standard

that we have come to expect from *Parma International*. The *Parma* Suspension 'Panther' is distributed in the UK by Helger Racing, 72 Lauderdale Tower, Barbican, London EC2Y 8BY. £62.50. Basic kit less electrics.

