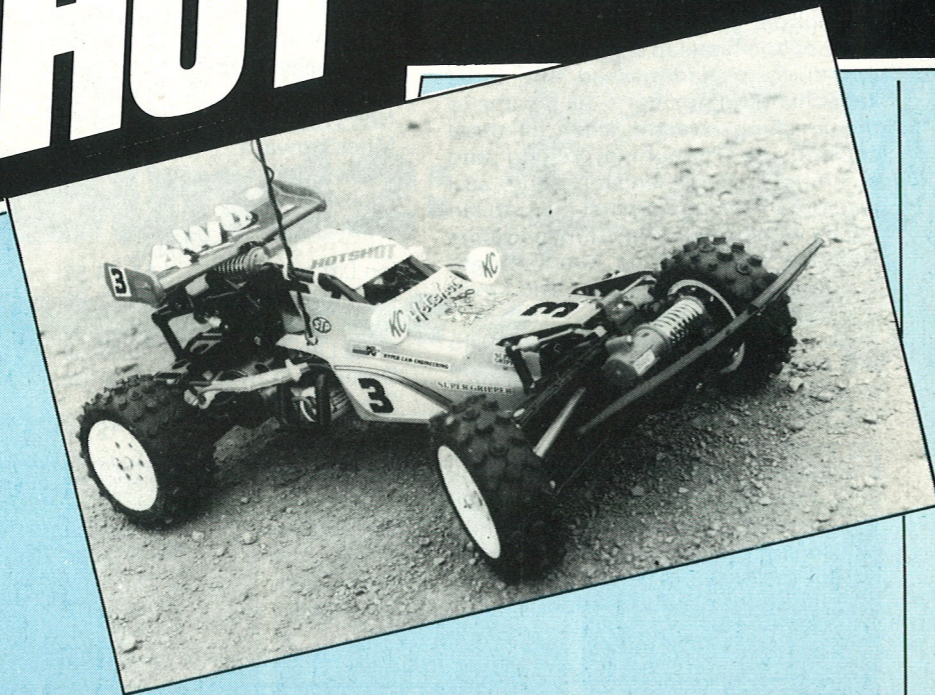


# HOTSHOT

**Tamiya's four wheel drive standard kit contender is reviewed by JOHN VARLEY.**



Tamiya Plastic Model Company of Japan have produced such a wide range of model car kits, that one could be excused in thinking that they have a policy of one every six months.

With the exceptionally rapid growth in interest in 1/10th racing, and the ever increasing competition between manufacturers, Tamiya have added to their range their four wheel drive racing car, the Hotshot.

The concept of this kit, is a central box monocoque, wishbone suspension with mono-shock absorbers, bevel gear differentials, with shaft drive connecting front and rear drive.

The packaging of all parts comes up to Tamiya's high standards. The art work on all exploded views in the assembly instructions is of exceptional quality and greatly aids the builder.

A close look at the mouldings that make up the chassis and suspension parts, gives the impression of overly complex parts. However, this is because all mouldings have been produced for maximum lightness and strength, coupled with careful thought to the shape of each shape. This allows for very high quality of finish, because all thicknesses remains constant, thus preventing any shrinkage of the moulding when it cools after injection.

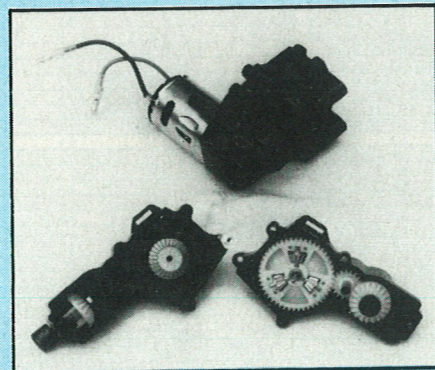
Drive at both front and rear is by bevel gear differential. Nylon spur gears with diecast bevel gears, linked up with internal splines onto hardened steel drive joints. The drive joints are the only rotating parts in this kit that run in ballraces. All other rotating

parts run in nylon bushes, something that the serious racer would have to improve on for greater efficiency in their racing.

The output shaft drives front and rear, run with thrust races assembled inside both differential housings. These races and all other rotating and meshing parts are adequately lubricated with molybdenum grease provided in the kit.

When mating up the Mabuchi 540 motor to the diff. housing, a spacer is provided to locate the gear correctly, and small steel set plates either side of the locking screw, if you study the instructions carefully, allow for accurate gear meshing.

Suspension is effected through equal length wishbones at the front and unequal at the rear. Damping is through monoshock absorbers, with adjustable coil springs.

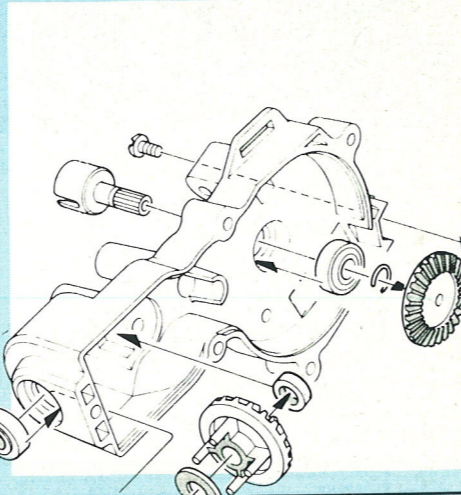


*Gearbox construction in the Hotshot is pretty complex, as revealed by this photo and exploded diagram.*

Unlike other manufacturers, Tamiya have not adopted the usual method of adjusting the coil spring, i.e. a collar that is adjusted along, and clamped onto the shock absorber body. In this instance, there are three settings for spring tension, adjusted easily by hand by means of a moulded nylon member sliding and rotating into each position, inside a fixed nylon member on one end of the damper.

Hardened steel ball and pin drive shaft ends fit into tubular alloy centre sections. Ball ended king pin joints are locked in position into the front wishbones with a thin steel plate. This appears robust enough and shouldn't cause problems in the long term.

Anti-roll bars are fitted to front and rear, connected through a substantial ball-jointed linkage to upper wishbones at the front and lower wishbones at the rear.



The rear suspension — or rather the transmission of movement to the single coil-over-shock — is incredibly complex. Must work well though, judging by racing successes.

The same substantial ball joints are utilised on front steering track rods, combined with Tamiya's own range of servo savers, to suit most makes of servo in use. The steering has no adjustable camber, and caster is pre-set by the angled suspension location points.

With plenty of steering toe-in applied when the car stands at maximum ride height, this is reversed to immense amounts of toe-out when the ride is at its lowest. Having seen several Hotshots performing against allcomers at top level meetings, these characteristics appear to have no adverse effect on the car's handlings (a lesson here for the purists perhaps).

The central box monocoque section comes in two halves. The longer top half, onto which is bolted the front and rear gearbox/diff. housings. This section incorporates room for the enclosed central drive shaft, along with provisions for fitting your radio switch and battery location lugs.

Offered up to this is the smaller moulding which incorporates the entire radio gear, and when screwed in position, gives virtual 100% weather protection.

Beneath the monocoque at the front, is fitted a flexible "sump guard" to protect the lower wishbones and steering from damage. This guard is further extended with a full width front bumper, suitably strong and flexible to protect your car and others on impact, and suitably angled and positioned to aid the car when landing from jumps.

The batteries are slung at the rear of the monocoque. Once more attention to detail shows the batteries positioned to the left of centre, in order to compensate for the motor, which is positioned to the right. The batteries simply held in position by a pivoting fibreglass plate, that acts as a stand for the car when working on it in the pits or workshop.

To finalise the chassis build, a nylon moulded roll cage is screwed over the

Front and rear suspensions both use double wishbone suspensions with mono-shocks and anti-roll bars.

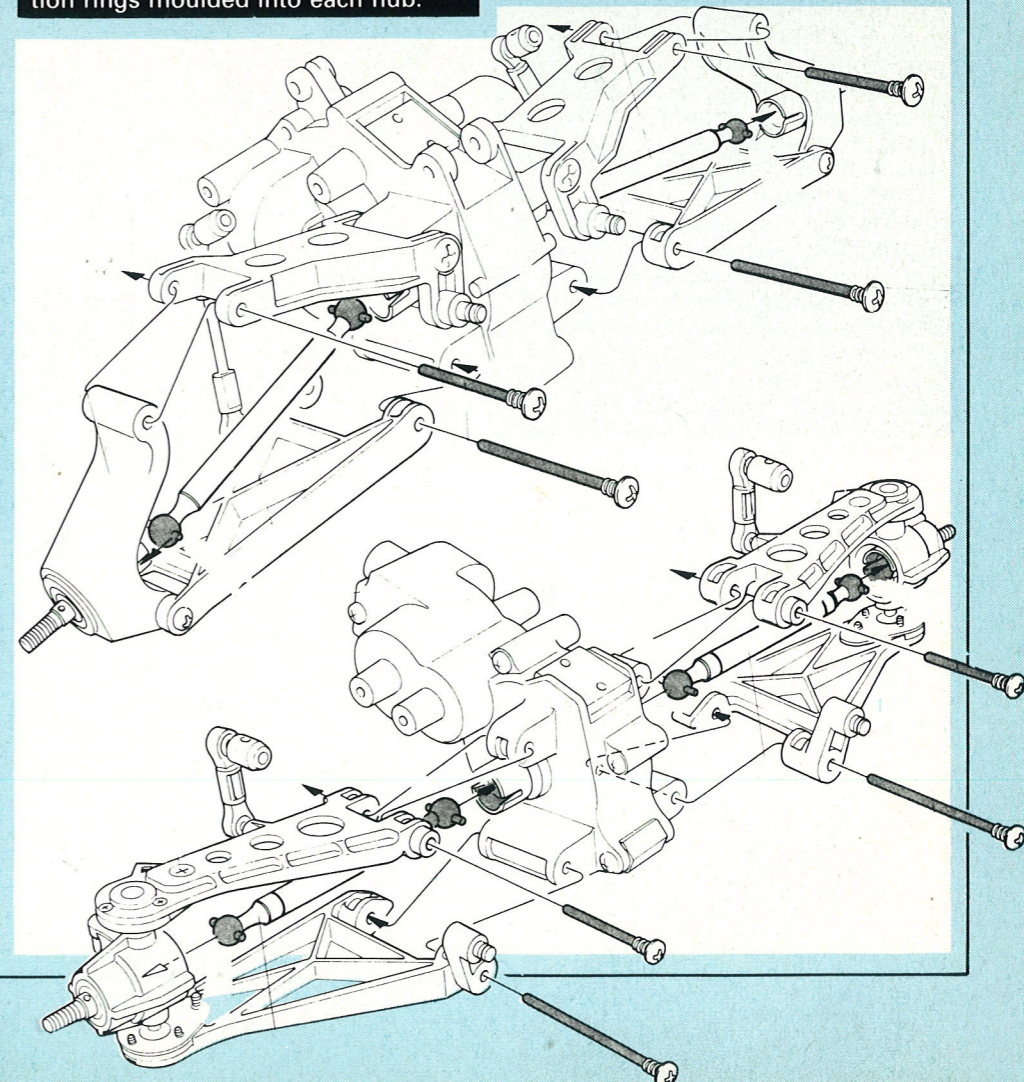
driver section and extends to the rear to protect the shock absorber actuating links and wishbone pivot points. Onto the roll cage is fitted two fibreglass plates, that retain alloy heatsink housings enclosing the resistors for the first and second speed on the controller plate supplied with the kit.

Separate nylon adaptors fit onto all stub axles and precisely locate in position, each one piece nylon wheel hub. Thermoplastic moulded tyres are marked on their side walls for correct rotational assembly on the hubs and require no glueing in position because of the very substantial annular location rings moulded into each hub.

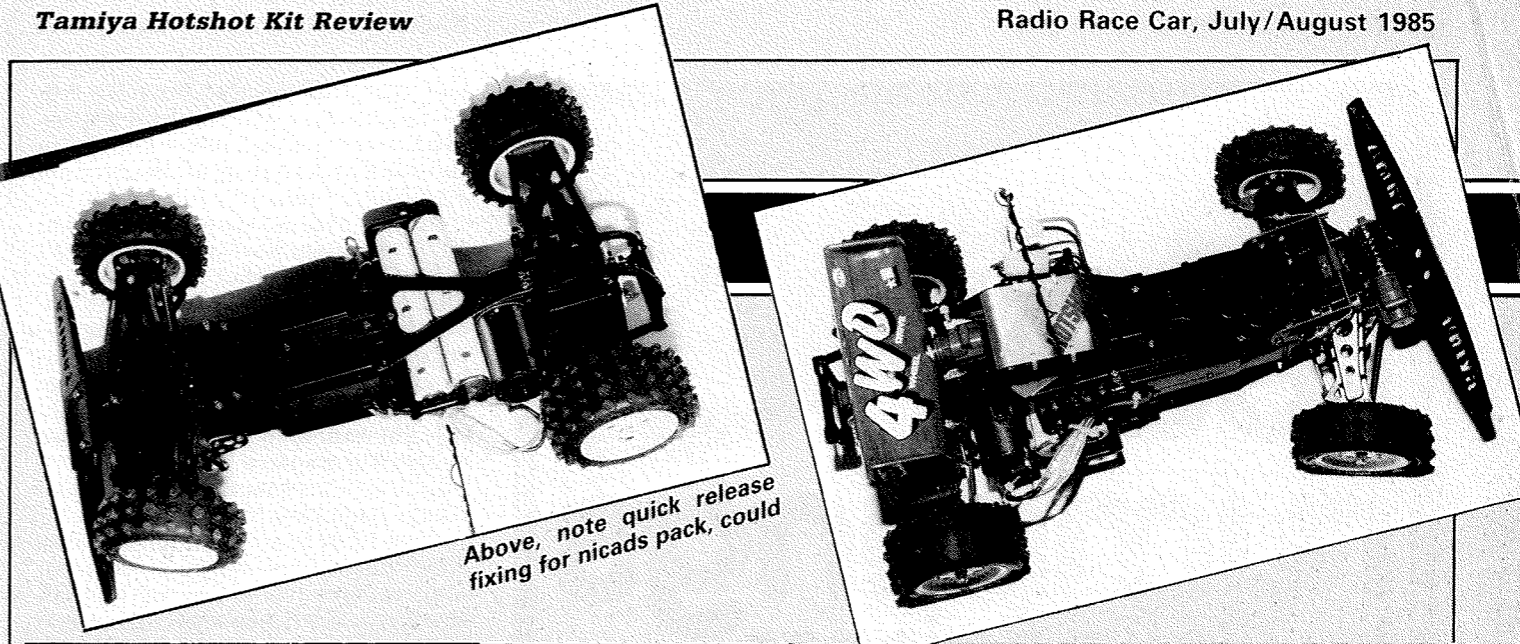
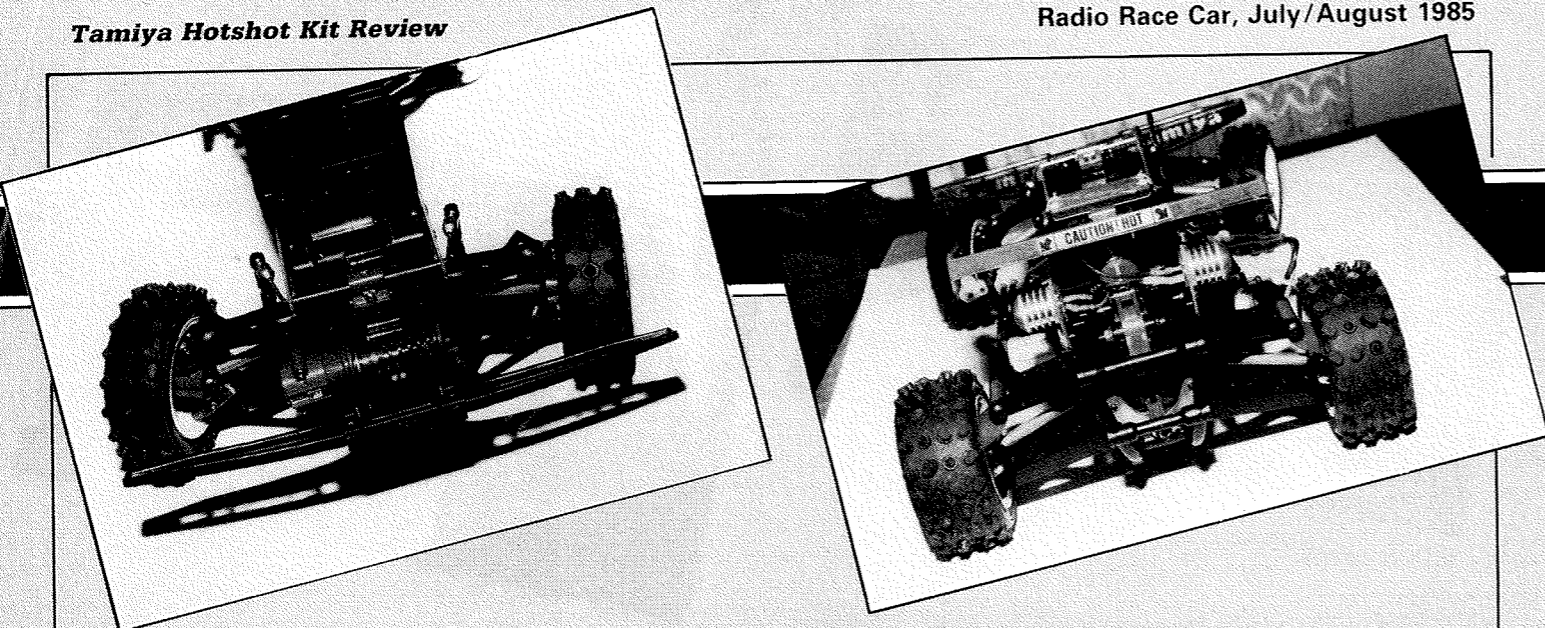
To finalise, you have a very light-weight lexan body and aerofoil to paint to your own choice of colour, and a sheet of decals are provided to give the car that professional look.

In keeping the car completely Riko orientated we decided to install an Acoms AP-227 MkII two function radio control system.

By using the kit controller, we are able to dispense with the Acoms switch and radio battery case, because the Hotshot comes complete with a radio switch and voltage regulator assembly to run off the main nicad cells.







Above, note quick release fixing for nicads pack, could

All wiring comes ready prepared to fit the kit controller, of three-speed forward, and two-speed reverse, direct onto the servo in the case provided. Using this radio we found assembly of all parts a particularly tight fit, but summoning up all of our patience, we finally got everything in place.

Now what of the car, once we put it into use? Weighing in at 3lb 11ozs in "box standard" form with no expensive lightweight radio gear, it would appear to be par for the course in terms of power to weight ratio compared to its contemporaries.

The narrow, compact, centre monocoque section keeps down body roll to a minimum, and what roll does occur appears to be handled well by the two anti-roll bars.

The offset weight distribution of battery and motor aids predictability in cornering.

The fabricated drive shafts run well and shouldn't, looking at the depth of location, be any problem under hard racing conditions, as far as depositing themselves around the track goes.

The hexagon ended central drive shaft, I reserve my opinion about, following the poor performances of the self-same hexagon inserts on the Brat and Frog cars. Personally I would feel

more confident if the surface area of location doing the driving, were greater.

To date, the mono shock absorbers have proved adequate, over the worst terrain, but some people we are told have modified the internals with extra packing to improve the efficiency of the front ones. This is a point that remains to be seen on our car.

If you intend to race regularly, then ball races all round should be seriously considered. The nylon bushings supplied, will have limited life when

dirt and dust prove abrasive, but these are of course replaceable.

One area that will prove troublesome, due to excessive rapid wear, will be the pivot points for the front upper wishbones. Taking high shock loadings, spread across a short pivot length will quickly elongate the holes in the chassis lug that the pivot pin locates in. With this upper arm losing its rigidity then effects will occur on steering toe-in set up and caster angle becoming inconsistent.

Recent observations of a Hotshot

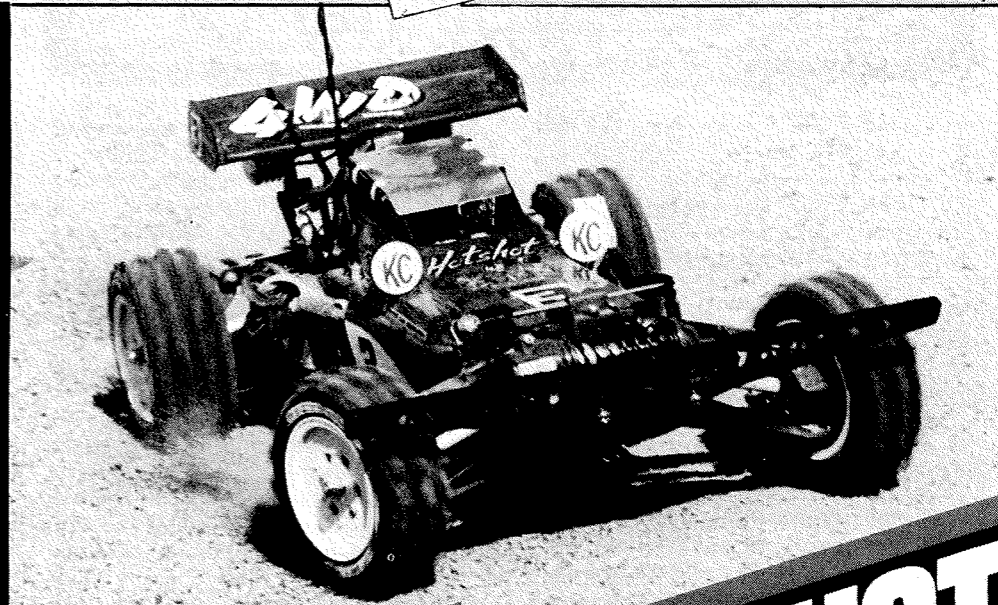
that had run for approximately one month, showed this wear as quite apparent, but it can be alleviated before it begins by making a supporting brace across the two inboard pivot points of the upper wishbones, and/or bushing the chassis section at this point.

However, enough of these complaints, because so far we have found the car competitive against all opposition. Using kit tyres supplied, the car performs beautifully indoors on carpet, with adequate steering to suit sharp corners, aided by slight power oversteering characteristics.

Outside, its recent showings at Sandown Park and second place to Jamie Booth at the Worlds End round of the Radio Race Car series proves the point that the Hotshot is highly competitive.

(i) Acoms 2 channel radio AP-227, MkII, (ii) Tamiya Hotshot 4WD 1/10th kit, available from your local model shop through Richard Kohnstan Ltd., 13-15a High Street, Hemel Hempstead, Herts.

Say you read about it in Radio Race Car.



**4 1/10 SCALE R/C HIGH PERFORMANCE 4WD OFF ROAD RACER**

**HOTSHOT**

