

The Yokomo Dog-Fighter

1/10th Electric
4WD off-roader
by J.B. Varley

Any self respecting electric racer already knows the virtues offered by Yokomo's range of electric motors and now they are offering their own kit to fit round the established off-road motors available.

This kit comes with full independent suspension, differential to the rear wheels and four wheel chain drive.

For those with an engineering interest in building kits, then disappointment is in store. This kit comes almost ready built, but that does allow you to get the car on the track in double quick time with optimistic thoughts of hammering the opposition. These words are not just writers' licence, because

the car has a meaningful, aggressive look to its make-up and cries out to be driven hard.

The entire gear train and limited slip differential comes ready built in a tough plastic case. A little adjustment via a single socket cap screw, soon had the necessary slip to the diff, which I found to have a very smooth run to it. This differential case is bolted direct to a one-piece black kydex chassis plate. Kydex as most of us know, is used for bumper material, and would seem perhaps an odd material for a chassis. In this case the chassis and bumper are formed as one and once all suspension and battery supports

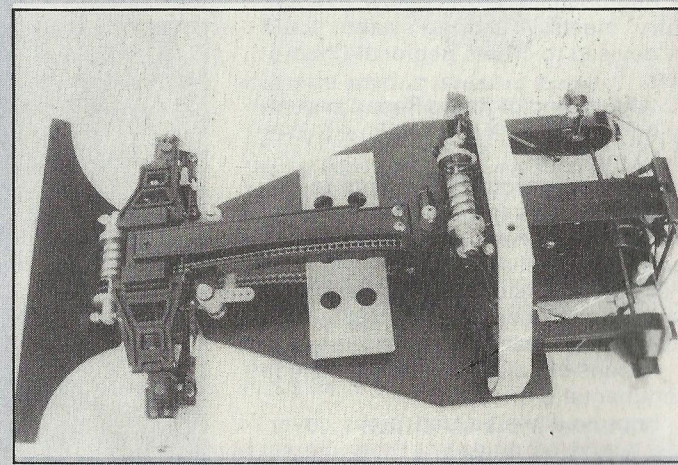
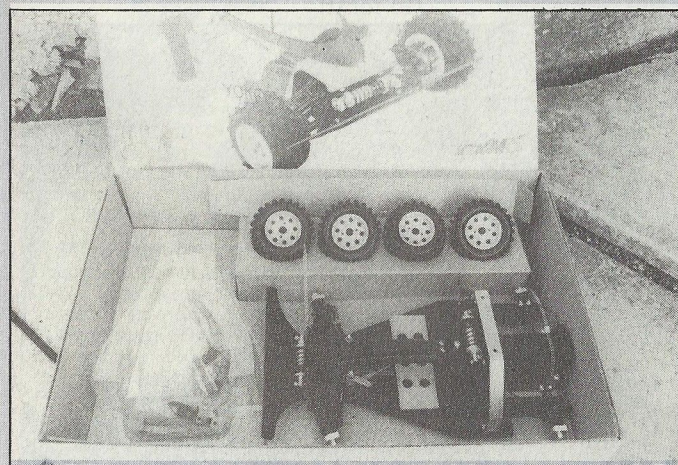
are attached, forms a strong, flexible plate that can take the hardest knocks from both the side and beneath.

Swinging arm suspension, pivoted from substantial blocks bolted to the chassis and utilising the ball ended driving dog principle for drive shafts, is incorporated at the rear.

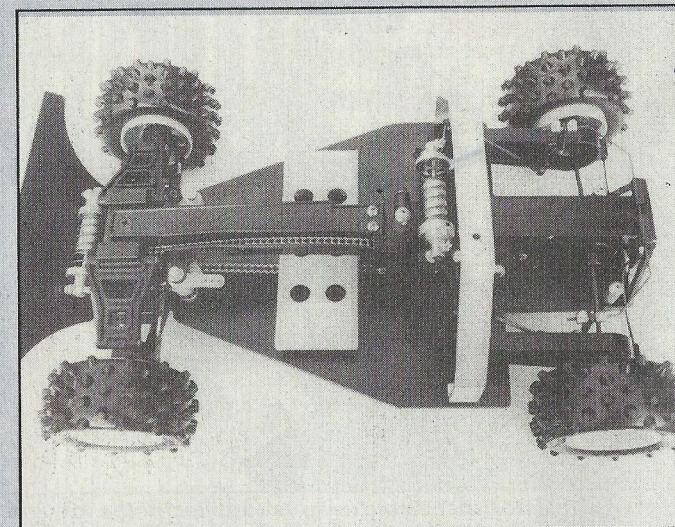
An adjustable rose jointed arm links the suspension arm with a bell crank which is pivoted from the top of the gear train housing. This linkage from each suspension arm works an adjustable mono shock absorber.

This shock absorber is of the constant velocity type, and if assembled correctly, gives a very good damping effect. With the high leverage effected by this rear set up, the adjustable spring had to be compressed to its virtual extreme, in order to achieve a suitable ride height for rough terrain.

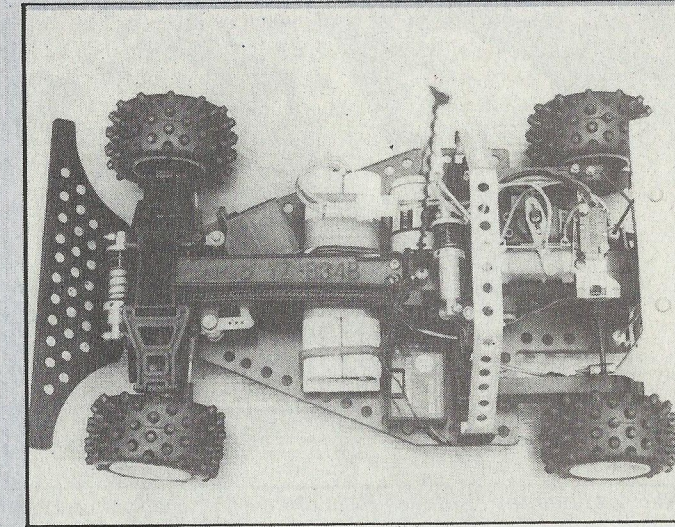
Left, the 'kit as it appears in the box, all but fully assembled. Right, close up on the pre-built chassis, with single suspension units fore and aft.



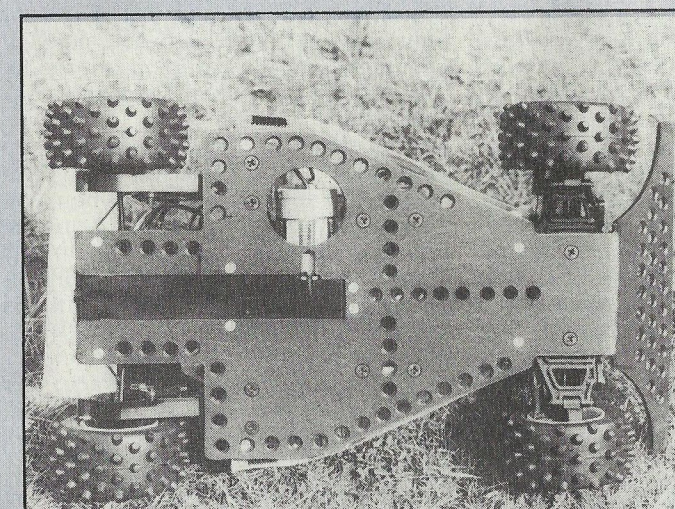
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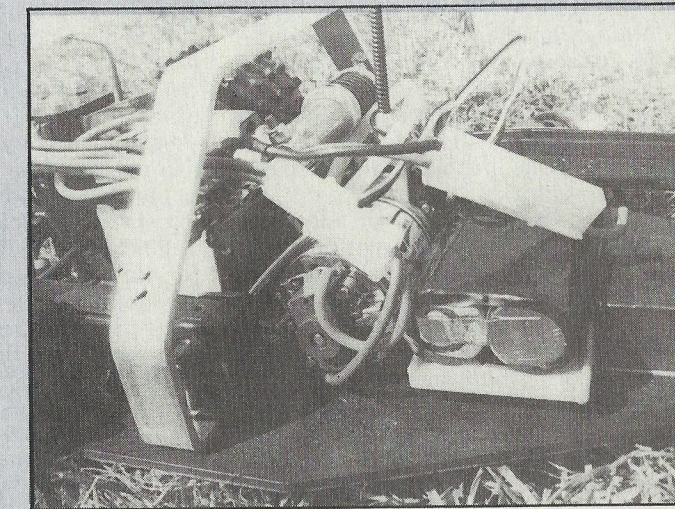
Roughly assembled with the unsecured wheels pressed on the hubs.



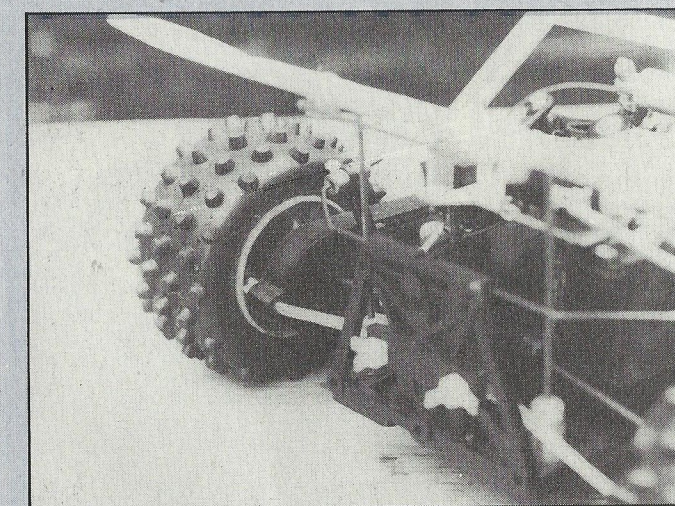
One of the problems with any four wheel drive electric car is the weight. John drilled holes in every available area to reduce the car's mass.



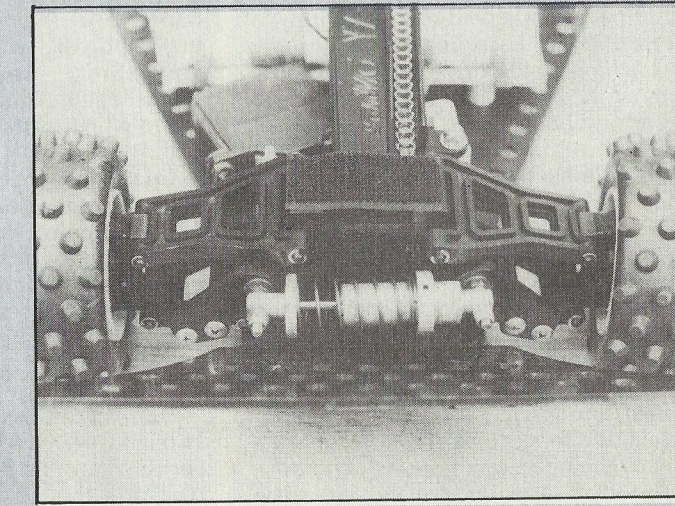
This view of the Dog-fighter's underside shows that much of the kydex chassis had to be left unperforated, more to protect the radio than from any strength considerations.



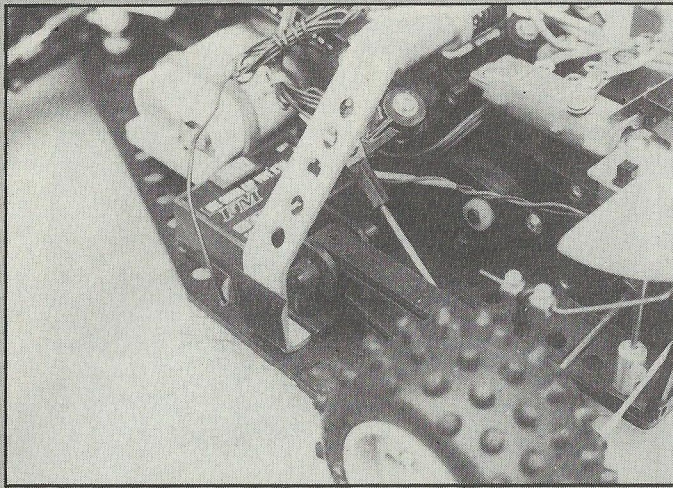
A close up of the battery installation, right next to the motor so wiring lengths can be kept to a minimum.



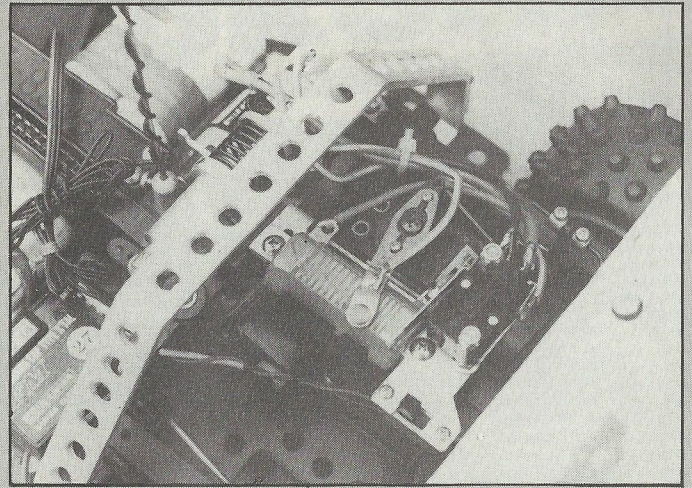
The rear suspension incorporates an anti-roll bar, which can be seen here extending from either side of the top of the rear chassis upright. Nylon tie wraps from chassis to suspension arms stop the arms rising too high.



Front suspension showing linkage to coil-over-shock unit. Velcro pad is to retain body shell.



Receiver nestles on the chassis plate aft of the main power nicad. Note ball-link and bellcrank linkage to coil-over-shocker.



Ceramic resistor speed controller is supplied in the kit, and fits to one side of the gear drive to the rear axle.

To complete the rear end of the car, the kit comes along with an adjustable anti-roll bar and aerofoil, although this latter mentioned item is virtually there for appearance and couldn't in reality offer much to help in the car's handling.

A strong roll over cage is bolted over the rear gear train, held down by the same bolts that clamp the suspension pivot blocks.

Moving forward, the kit incorporates a nylon moulded platform for your 7.2v pack of nicads. A three part tie-rod steering system, with an adjustable servo saver, comes ready assembled, this system giving the advantage of no bump steer, even with the maximum of suspension movement.

The final part of this factory built kit is the front suspension and drive train. Unequal length double wishbone suspension is used, built around a neat, tough nylon bulkhead bolted to the chassis plate. Drive shafts and stub axles run in flanged oilite bushes.

The chain drive is partly sealed at the rear, and runs in a nylon moulded channel along its entire top length. No tensioner is incorporated, and any stretching of the drive chain has to be adjusted by the removal of the relevant number of links.

Now what does this leave the buyer to do themselves. Fill the shock absorbers with oil, glue on the semi pneumatic knobby tyres, paint and cut out the polycarbonate body, fit your own choice of radio gear and if you so choose, assemble the speed control.

This speed control comes virtually built, utilising a heavy duty ceramic resistor and micro switch reverse. Double sided tape holds the control bracket to the gear train housing, and double sided tape for the servo to the bracket.

Incidentally, the ready wired speed controller, has a diode built into its circuit, thus eliminating the use of radio batteries, and in this car, that is very

useful, because it weighed in initially at 4lbs overall weight.

With everything in place I took the car to the well established off road club in Birmingham, the Sandwell Car-Am Model Car Club (yes Car-am car, but we've had to move on with the times).

I can't admit by any means to being a convert to the 1/10th off road scene, but once I had got this litty baby moving, its total predictability was a joy to behold. Its weight was a disadvantage for accelerating out of very slow corners, but the four wheel drive gave the driver an immense advantage in the approach to corners.

Obstacles didn't exist, and the well damped suspension took the jumps very well. This therefore had proved that the car was competitive, and so I had two weeks to get it even more competitive before the next off road session.

A fair amount of drilling and machining and I managed to lose approximately four ounces in weight, but when testing the car on fairly rough terrain adjacent to my home, I had two of the front stub axle oilite bushes break, when their quite flimsy flange broke away from the main part of the bush. This failure allowed the entire wheel and axle to part company with the car.

Upon close inspection these bushes appeared to be of a sintered material and as such do not have the strength to withstand heavy, sharp, stresses against their flanges.

Bronze replacements were quickly turned on the lathe, and we were soon back in business, and ready for another club night.

The car remained very competitive and the night was spent trying out various settings on both rear anti-roll bar and adjustable shock absorbers to find the optimum settings.

Final conclusions are, that as their advertisements will say, the Dog-fighter has well and truly arrived. It is easily as competitive as most cars cur-

rently in racing use. Under the right conditions the four wheel drive has immense advantages over two wheel drive cars. The low centre of gravity gives the car good cornering stability coupled with the damping offered by the sizeable constant velocity shock absorbers.

The disadvantages are a high power to weight ratio, so make sure you have good batteries, especially when you are running with a diode. A lowish ground clearance at the rear makes the car a little skittish over indoor bot-dot obstacles, and finally those troublesome bushes that may, I feel, be replaced by roller bearings.

Coming almost ready to race, and available from all leading model shops at £89.95 or less, this kit is well worth consideration. □

All finished with the distinctive body in place, the Dog-fighter is all set to prove itself on the track.

