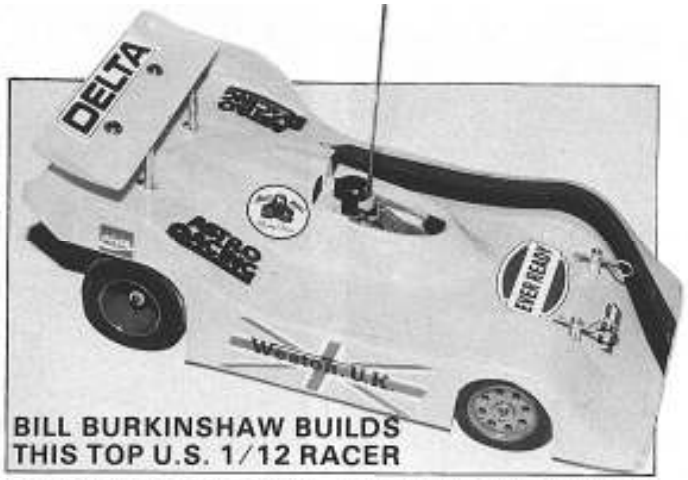
DELTA Phaser



BILL BURKINSHAW BUILDS THIS TOP U.S. 1/12 RACER

AS THIS WAS TO BE the third *Delta* R/C car kit that I had been lucky enough to have the opportunity to review, the nature of the packaging, contents and instructions held no surprises for me. For those readers unfamiliar with the dual 1/8th and 1/12th scale car manufacturers products, a few words will not come amiss.

Delta are a comparatively small company with brothers Bill and Ken Campbell providing much of the labour in both production design and marketing. A considerable amount of US Aerospace technology experience on the Campbells' part has helped to enable them to take advantage of advanced materials and manufacturing technology. The personal nature of the *Delta* business ensures that much of the moderate volume of production has a 'hand crafted' precision feel to it. *Delta* cars are by no means 'one-offs' they are batch manufactured to close tolerances and spare parts always fit as they should.

The Kit

Deltas 'Phaser' kit is a production version of the car used by Arturo Carbonell for his 1982 1/12th scale World Championships win, which allowed Art to be the first ever dual I.C. and Electric Champion. In technical terms the car incorporates a fairly stiff front chassis section with spring suspension of the front wheels. The front carbon fibre reinforced epoxy chassis is then flexibly coupled to a rear pod. One of the superb *Delta* dampers described in Model Cars Aug/Sept '82 issue controls the flex between motor pod and main chassis. Thus the front wheels are independantly sprung whilst the rear wheels are able to pivot in a controlled manner, the whole rear pod flexing to help contain motor 'wind-up' during hard acceleration.

Batteries are mounted directly onto the stiff carbon fibre chassis which, because the principles outlined above, does not form part of the overall suspension system. Provision is included for a resistor speed controller and also adjustable king pin inclination. The whole car is designed around the *Novak* R/C system of minature receiver and servos.

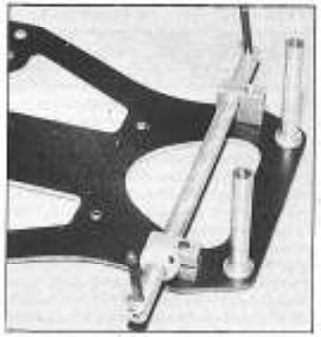
First production runs were of the basic 'without-electrics' kit with no differential (or rear axle) just a very basic box of parts to allow builders to incorporate their own existing components to the kit. The kit does include wheels, steering linkage, tyres, body mounting posts, servo mounting hardware and battery retaining tie-wraps. Instructions are in the standard *Delta* format of 'exploded view' drawings coupled to a numerically keyed assembly sequence with additional notes included. A full kit is soon to be available.

Assembly

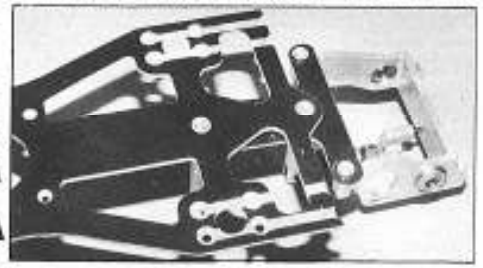
Assembly commences with the front axle beam, into which have to be pressed the king pins. These pins are hardened steel and once inserted to the correct depth they need trimming to length. A *Dremel* or similar electric power tool is really needed for this operation as the best way of trimming is to use an abrasive cutting disc.

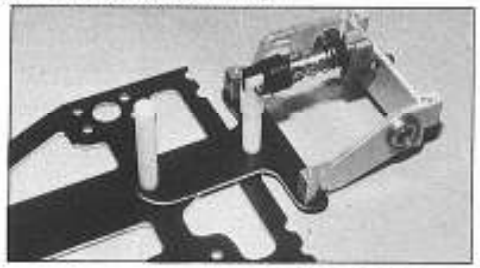
Don't forget to slide on the collars and mounting blocks before pressing in the second pin. Press in the pins using a vice. Hammering may distort pins and axle beam. I needed to polish the pins thoroughly with fine emery cloth to enable the steering blocks to slide freely up and down on these pins.

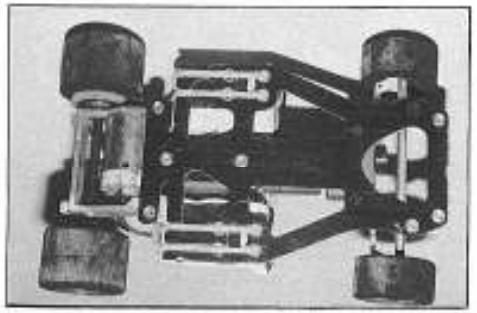
Mounting the axle beam and many of the other components to the chassis is accomplished with special aluminium screws featuring a curved slot. Before attempting to insert these screws you must prepare a screwdriver blade in accordance with the diagram included in the instructions. Failure to do this can result in badly damaged screws.

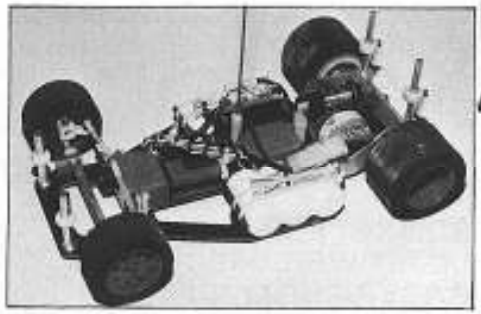


Above: simple front beam can be swivelled to adjust kingpin inclination by undoing a single locking screw. Scratch some marks to provide a neutral reference datum on beam and mounting blocks. Below left: rear pod is fixed to main chassis by 'T' shaped epoxy glass/carbon 'spring'. All light alloy screws used in chassis. Below: the pod has damping provided by excellent Delta constant volume damper. Spring adjusts ride height.









Above left: underside of chassis is drilled and grooved to take tie-wraps for either four or six cell battery pack. Six cell Sait pack used for this 'Track Test.' Above right: complete car - note use of mini-tie-wraps to neaten R/C equipment leads.

It is really a very simple chassis to put together, all the parts fit precisely and the notes on the exploded drawing seem to cover all of the potentially annoying little stages where small pieces need a little trimming or other modification before assembly. I fitted an *Associated* differential (suitable ball-races for the rear axle are included) for which *Delta* rear wheels are designed, and a *Reedie* 'Modified' motor for initial runs.

Control Equipment Installation

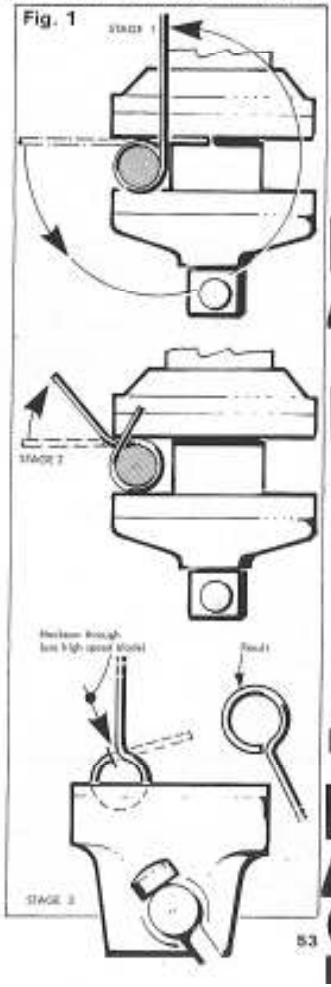
During a recent visit to the USA I obtained a complete *Novak* 1/12th car system and the 'Phaser' presented an ideal opportunity to appraise this. *Novak* servos slipped straight into the mounting supplied but, a quick check revealed that when used in the 'Phaser' layout as shown (and with my *Futaba* 'L' series transmitter) *both* servos moved the wrong way.

After some ten minutes work with soldering iron and tweezers, both servos were reversed. Quite simple really, the motor connections are swapped over and also the outside connections to the servo feedback potentiometer. The centre pot connection 'stays as is'. Once I had things moving the right way it became a simple matter to mount the *Parma* mini resistor and *Kimbrough* servo saver and complete the speed controller wiring in accordance with the instructions. I used standard *Sait* 1.2AH Ni-Cads in twin 3 cell side-by-side configuration. The chassis is in fact drilled and shaped to take either 4 or 6 cell packs.

The front nylon post for the speed control mount is drilled to accept a piano wire whip to which the *Novak* receiver aerial can be soldered after first trimming off an equivalent length. Fig. 1 shows the method I used to bend a neat 'eye' on the end of the wire.

Novak state that their receiver is designed to be connected directly to the 6 cell pack, no regulator is necessary, although *Novak* recommend the inclusion of a single diode in circuit to prevent inadvertent reverse polarisation damaging the internals. Just a thought, why didn't *Novak* fit this diode into the receiver, then it would really be foolproof? The result of 7.2 volts plus being applied to the servos is tremendous speed. Servo travel is large too, and a rate pot is really necessary for the steering, with the linkages as shown by *Delta*, steering lock is excessive.

Fig. 1



Running the Delta

There are various adjustments available to enable the driver to dial in the car to the circuit — king-pin inclination, toe-in, damper oil and spring adjustment and both front suspension spring rate and pre-load. Front spring rate change is simply accomplished by changing the springs! Pre-load is set by fitting washers under the retaining 'E' clips.

With all settings as per instructions the car behaved impeccably on the relatively smooth tarmac outside my house, the *Delta* tyres front and rear providing good balance, but the proof of the pudding as far as I was concerned lay on the carpet.

As soon as possible, I visited the local Bicester club to run the car on their Euro-style carpet. First runs showed that the very fast *Novak* servos would take quite some getting used to. In fact, I had never driven any car with such rapid steering response. A minor but annoying problem came to light during early runs, involving the *Associated* steering blocks I had chosen to use. Because of the geometry, a knock can straighten the steering. A change to earlier style (non-sprung front end) blocks cured this problem. Without reverse, the occasional excursion from the track is very time wasting so no startling lap times were put in. However, with standard kit tyres treated with Tesc, the car is fast, responsive and very predictable. Weight is 921 grammes with no attempt having been made to save weight.

The *Delta* "Phaser" is available from Phil Greeno Models, price £69.95 (CMK122).

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