

"The Ed"

Here in the UK we can be more than proud about the away British design and development has, like in full size motor racing, been at the cutting edge of Model Car racing for so long. In all areas you will find at the least one or more UK manufacturer, be it cars, electronics, motors, engines or bodysells, producing superb high quality products, that win races. Many of the products setting and developing trends which have been transported around the world, two very important items coming from one Cecil Schumacher ie: the ball diff and four wheel drive off road cars. These parts/cars transforming our sport forever. So as a little "trumpet" blowing exercise, RRCi will be visiting several of the "Best of British", giving you the readers an insight at what goes on within their companies and taking a look at their current product range. With this being the "first" article it seemed only logical to take a look at our most senior manufacturer. Now this was a toss up between two companies, Mardave and PB Racing, PB just taking it by a couple of months. So it's off too Southampton, camera at hand.

## PB Racing

### New Beginnings

Opening a hardware shop in the Portsmouth area, it didn't take long before Keith was supplying the local modellers with balsa, glue, etc.

This turned into the building and flying of model aircraft, and the first PB product, glow fuel. Fuel was hard to come by, at that time, and then it was only in small quantities. Keith took the challenge, after discussions with Customs and Excise a license was acquired to stock Methanol, glow fuel by the gallon being the result. The first PB success. With

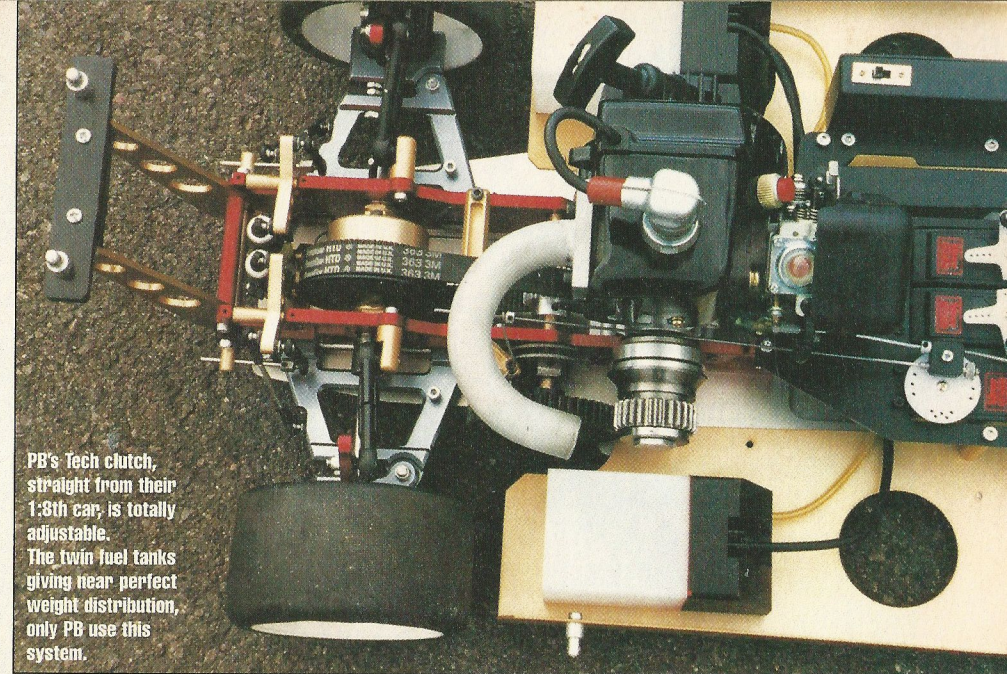
aircraft parts from the far east becoming more expensive, and harder to acquire, Keith had another quest. After reading books on vac-forming and injection moulding, a vac-forming machine was built, which is still in use today and a very rudimentary set of dies were created to make aircraft canopies and landing wheels. This became a really large business. So the basics of the current operation were in place.

From this point it didn't take long before Keith became interested in cars. A real chal-

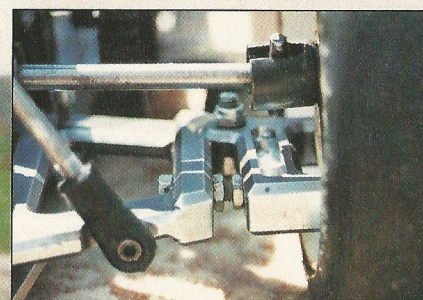
lenge, something, fast, furious and noisy. The love affair had begun. After trying a friends car, and feeling he could do far better, Keith went out and made one.

This was a quite a crude flat pan two wheel drive IC car. No diff, no suspension, direct drive and ABS plastic bodies. With Keith's know how and ingenuity, the car didn't stay basic for long, firstly a simple gear differential, followed by independent suspension.

By now PB Racing was up and running with help from



PB's Tech clutch, straight from their 1/8th car, is totally adjustable. The twin fuel tanks giving near perfect weight distribution, only PB use this system.



The rear toe-in has a very neat adjustment in the lower wishbone.

wife, Beryl, and son Mark, who had also got the "bug", parts and kits were rolling out of the door on a daily basis. Keith designed the cars, made the tools and ran the factory, and it's pretty much the same today. Shortly after all this began PB took its first World championship, with that "evergreen" at the stick's, Phil Booth.

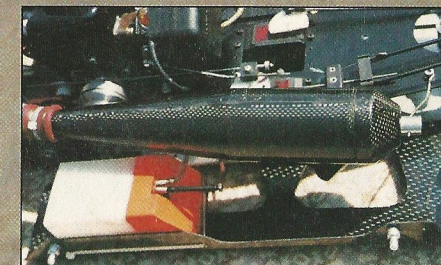
Since then PB just grew and grew in the high point of the 80s and early 90s PB's could be found racing on-road, off-road, electric and IC, with a great deal of success. But the depression of the 80s/90s hit the model car industry and PB hard and they just managed to stay afloat.

### A Phoenix...

With a much reduced product line they did survive, and in most peoples eyes, mine included, the current cars, with their mostly aluminium construction, are the best PB have ever built.

When you talk with Keith it's very clear he is a clever man, he knows what he wants from his products and he uses all his drive and enthusiasm to get it. With Keith's skills and the right kind of equipment to hand it is very easy and quick for PB to almost make a new part "overnight", so development will always be ongoing, Keith freely admits that he relies on customer feedback, to improve his cars.

Having survived twenty four years, he must be doing it right mustn't he?

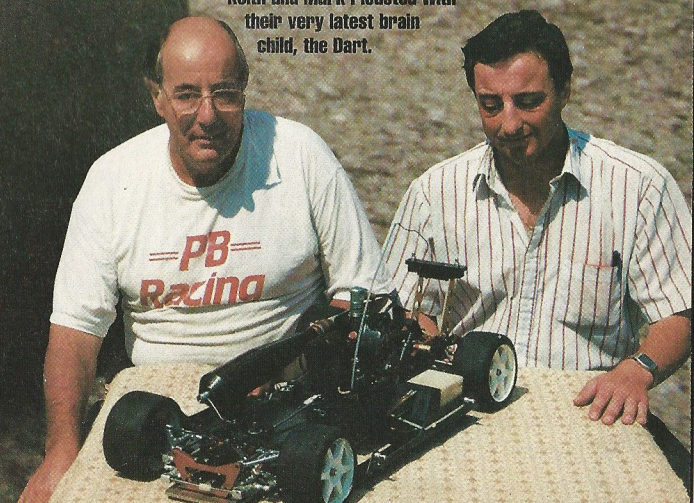


A carbon fibre tuned pipe will be part of the Dart's final spec.

### Current Range

Three cars are currently in production with PB, the 1/10th IC Apollo Pro (raced by RRC's Nitro News columnist Mark Boothman), the 1/8th scale IC Black Diamond available in two wheel and four wheel drive, and lastly Keith's new baby the Dart 1/5th Scale Car.

Keith and Mark Pleasted with their very latest brain child, the Dart.

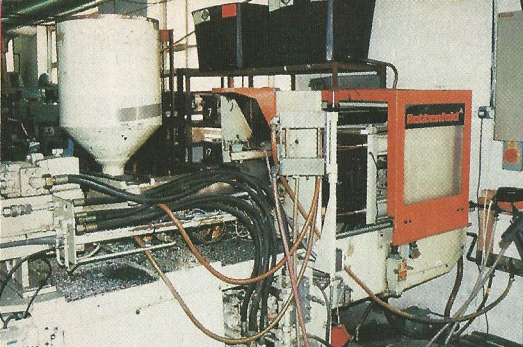


### PB Racing - A little History Lesson

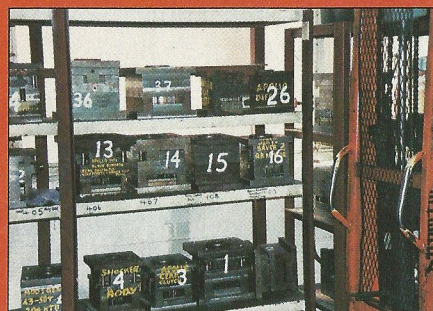
It's now some twenty four years since PB Racing appeared on the model car scene, producing a range of mostly fuel powered, although they have built several competitive electric powered racers, for On and Off road. At the helm is one Keith Plested, a legend in his own lifetime. Keith started his working life at Hoover, very much an "English" company at the time. Keith progressed quickly, attaining a very sound engineering and manufacturing base, something Keith has used to great effect. When Hoover developed the first automatic washing machine, our cousins across the Atlantic became just a little interested in Hoover, the company losing a lot of it's own identity at this point Keith needed a new challenge.

The view most of the competition will see of the Dart.

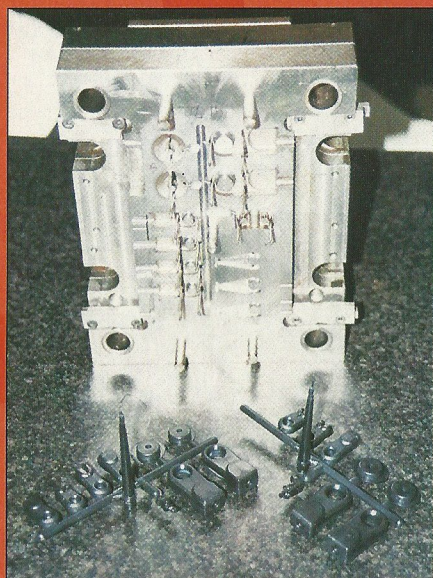




PB's hard working injection moulding machine.



Once you have the machine you need the "dies" to create the mouldings.



One of the latest "dies" from the Dart, ball joints caster shims etc.

## That's what we have come to see

Eighteen months ago Keith sat at a blank computer screen and began PB's biggest project, sorry for the pun, producing a 1/5th scale car. Fifth is probably the only growth area for IC powered cars at present, these leviathans seem

to be bringing more and more racers to the tracks, their high initial costs putting very few people off, and with the petrol powered engines, running costs can be somewhat lower than many of their fuel burning cousins.

Starting from scratch Keith designed a "total" package, also having several class winning 2WD cars in the bank, so to speak, an effective design came very quickly

## A Solid Foundation

As with any racing car, the chassis is the foundation for success, the Dart has a full length 6.5 mm thick 7075T6 aircraft alloy one. No cut outs are used, so the smooth bottom should allow you to "surf" the kerbs, maximum strength being the major goal. A certain amount of machining on the inside face, keeping the weight down.

Having a solid foundation, is a great starting point, to keep the correct 60/40 weight distribution, which Keith's long experience suggests is the optimum layout for a 2wd car. From the world go the Dart being designed as a total package.

## Total Package

The heart of the car, the Zenoah engine is bolted to the two very stiff alloy side plates, which also support the differential, layshaft and rear suspension. The current car has been built around the Zenoah engine, but other options will be available.

Mounted to the front of the engine is PB's Tech clutch, this gives complete adjustability for pre-load and slip. Based on the clutch from PB's 1/8 scale car, the clutch has been totally reliable to date.

From the clutch, drive is taken to a steel layshaft, this material may change in the production cars, via a moulded spur gear, a choice of gears will be available. Their design allowing ratio changes without moving the engine to change the mesh. Also mounted on the layshaft are twin fully floating brake discs, with Ferodo® pads.

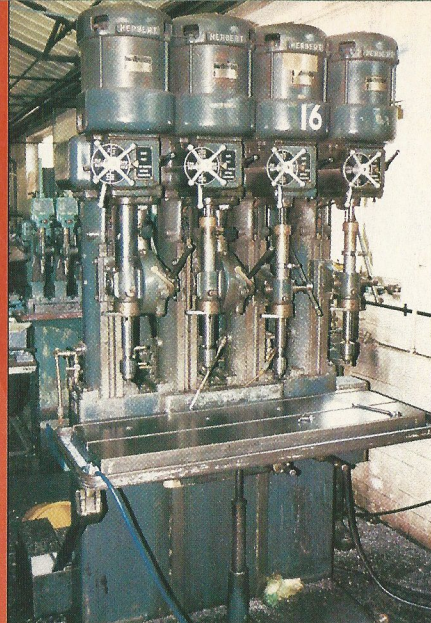
A point to note about the brake discs for the Dart, most manufacturers turn and then surface grind their brake discs. This Keith feels is still not accurate enough, so the Dart's discs will come from a sheet of steel which has been "lapped in", for a truly perfect finish.

## Belt and Pinion

From the layshaft drive is transferred by a HTD (High Torque Drive) drive belt, this being far more efficient than the chain drive used by many.

The "wrap around" between the belt and the pulleys has to be seen to be believed, no tensioner being needed, in fact the prototype belt has been running quite "loose" with no sign of damage, belt life could be as much as fifty

At present the Zenoah engine will be supplied with the Dart.



Ready for mass production.

hours. An alloy cased twin pinion gear diff being the last part of the "chain". In testing both twin and quad pinion gears have been tested. The straight cut tooth pattern being totally reliable. Obviously the twin pinion diff giving a nice weight reduction. On the prototype a "mechanical" form of "slip reduction" had been fitted, but the traction of the Dart being so good means this will not be used on the production cars. Simple steel "dog bone" driveshafts make the wheels turn.

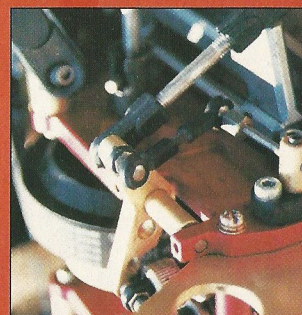
## Wide Base and Pushrods

From the side plates, alloy wide based wishbones with two out board mounting points, for added strength, support composite hub carriers. Twin ballraces and steel axles complete the drive train. A single top link runs back from the upright to the side plates. The composite upright should take the "shock loadings" caused by kerbs or racing incidents, without failing, which wouldn't be the case with an all alloy construction.

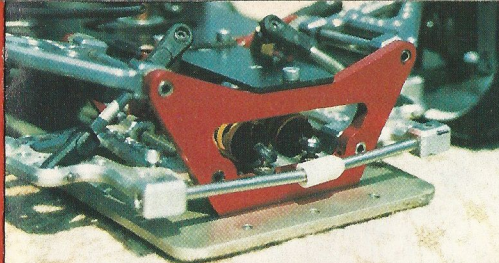
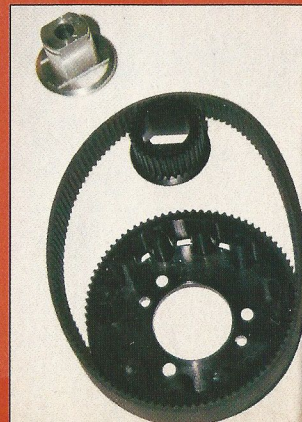
Don't forget these cars are very heavy and develop a lot of grip. A neat adjustment in the lower wishbone (see photo) controls toe in/out, the top link allowing camber adjustment.

Held within the sideplates are the rear shock absorbers and adjustable anti-roll bar. Pushrods run from the wishbones to very neat rocking levers which connect to the vertical coil over shocks. A choice of springs will be available. Quite a stiff roll bar runs between the cantilever rear body mount, short arms or "blades" connect

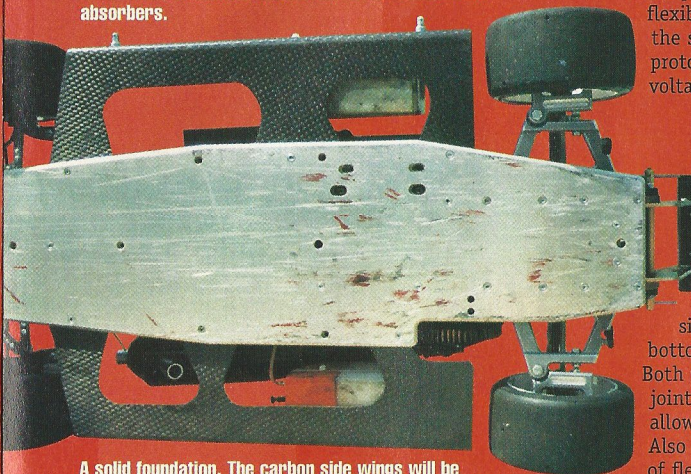
Rear pushrod and anti roll bar, the rear roll stiffness is adjusted by the length of the blade.



The rear fine pitch belt and pulley.



A very stiff front roll bar fits between the bottom wishbones. Also note the position of the front shock absorbers.



A solid foundation. The carbon side wings will be available as an option.

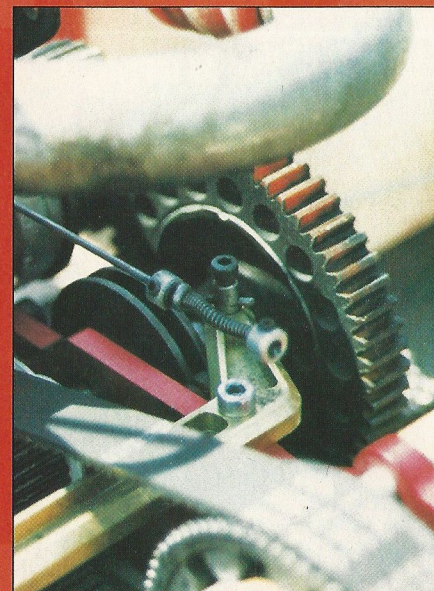
again by pushrods to the rear rockers. By altering the length of the blades, the rear roll stiffness can be altered, again a range of "blades" will be available.

I must admit I felt that the shocks were a little on the small side, but Keith assured me with their 100% pure silicon shock oils no problems have arisen even after a long final.

## Saddle Pack?

Keeping to the perfect 60/40 weight split, two small saddle tanks, supply the fuel to the engine. Mounted low on the side wings, cool air should run over them, the right hand tank supply fuel to the left hand tank and then to the engine. On the production car the side wings will be folded alloy, but PB will be able to supply the carbon "wings" used on the prototype as an option. The side wings will also be part of the six point system for mounting the bodyshell.

An alloy brace supports the brake operating cam. A single top link, is used at the rear.



The other bonus given by mounting the tanks on the side is that it frees up space on the radio plate. A very simple FRP plate runs from the alloy side plates at the rear to the front alloy bulkheads. Cut outs in the plate coping with all types of layout, twin or single servo steering, single throttle servos. A neat box will be supplied to mount the receiver, a flexibly mounted plate supporting the six cell battery pack. On the prototype Keith running a battery voltage warning light system.

## Front End

Twin alloy bulkheads run transversely across the chassis, unequal length alloy top and bottom wishbones hang from them. Both wishbones have composite ball joints at the outboard end, these allow track and camber adjustments. Also they will offer a certain degree of flexibility in the case of a sudden impact. The same type of inboard suspension is used at the front as the rear, this time with shocks lying horizontally.

A ball and socket front anti roll bar runs between the bottom wishbones, as can be seen from the photograph it is very stiff, so the Dart should generate a lot of rear end grip.

## All the other bits

As standard the Dart comes with outboard front disc brakes (an option on many others) these are cross drilled and run on alloy hex drives. Cable operated calipers have steel pads working on Ferodo® friction material. A neat mechanism on the servo is used to set the front to rear brake balance, this is critical for good handling: too much front brakes giving understeer, too much rear the opposite.

A central indirect servo saver connects via turnbuckles to the injection moulded front hub carriers. Some neat shims clip in between the top wishbone, setting the degree of caster.

When the Dart goes into production it will be in 530mm wheel base length to suit either the Audi A4 or BMW M3 bodyshell, other bodyshells and wheelbases will follow. At present PB does not have its own wheels, but any FG or Dynamic wheels will fit, also I believe the first completed cars will come supplied with PMT tyres. The final part of the puzzle is the exhaust system, when I visited the factory PB had just

received its first carbon tuned pipe, this may be used in final production. But with the on-going development with exhausts it may be better to buy your car without it.

## How's it gone so far

Very well, can be the only comments. The early failures of the Dart can be put down 100% to parts "bought" in by PB, mostly ball joints, Keith having not got his own mouldings into production. In the last Top Scale National Keith was running in the "A" final, so it's on the pace already, with very little development.

The first production run of the Dart should be on PB's shelves as this mag goes to print, hungry for more then contact Star drive Cars Ltd, t/a PB Racing on tel no (01705) 492310 Fax: (01705) 492320

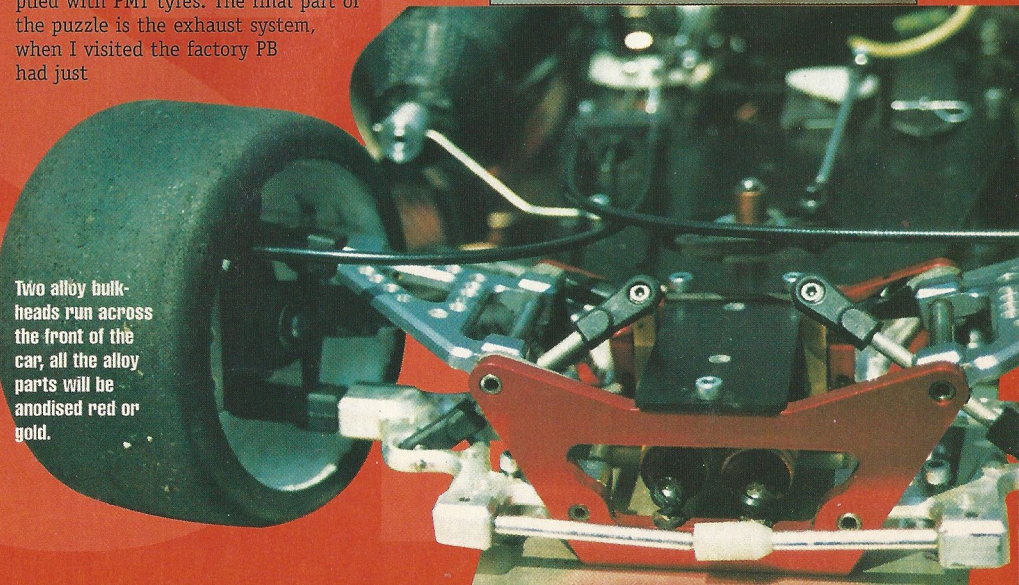
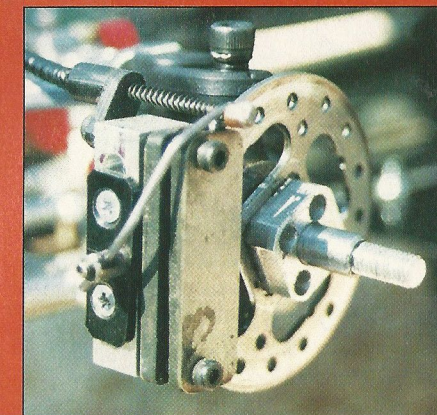
**The Dart will be available as follows:-**  
PB51 - Rolling Chassis in kit form  
PB52 - Rolling Chassis with bodyshell- kit form  
PB53 - Rolling Chassis with bodyshell, motor, tuned pipe and manifold- kit form  
PB54 - Additional cost for fully built car.

## Strength to Strength

Well it seems PB's family team is running as strong as ever, all their products are doing well and are good value for money. They all carry the "Plested" mark, quality and performance, no frills, just a 100% racer, and they're British.

Keep it up PB. **RSC**

Fully floating lightweight brake disc's will come as standard.



Two alloy bulkheads run across the front of the car, all the alloy parts will be anodised red or gold.