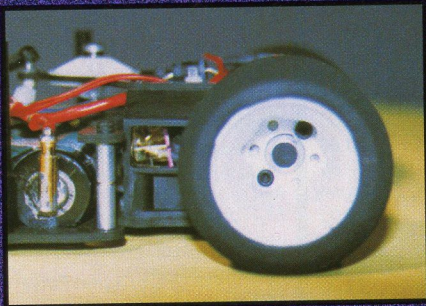


Note how thick the main chassis plate is. Also the non-reactive caster top blocks are fitted at this point.



The top of the rear bulkhead was cut away to aid cooling.

Why do you go racing?

Well why do you, in 90% of cases it's to drive a well handling, very fast racing car, correct? So how come the two fastest classes of Electric On-

the driving, a well set-up Pro-Ten or 1/12th car is pure heaven and blindingly fast, go and watch Spash or Griff or better still beg, borrow, no don't steal, a car and try it yourself. I recommend it. Anyway it's car time.

H.P.I. Road Star 12G

As most 1/12 and Pro-Ten cars come without bodyshells you are greeted by a fairly small box, in the 12Gs case a rather "sickly" yellow

Little and

Hopefully as regular readers of RRC, you will have seen the dual reports from the 1/12th and Pro-Ten World Championships in California, June 1996. From those reports you will no doubt remember the large amount of new cars that were running in prototype or pre-production form, well at last the final production version are slowly drifting on to our shores. Over the next three issues RRC will be doing "Head to Head" reviews of the cars from Associated, Trinity and H.P.I. This month we start with two from H.P.I.

A Pair of Stars

In the past few months H.P.I. products have been regularly appearing in RRC's pages, and I make no apology for this. The more I see of their range, the bigger fan I become, all the cars have been of a very high quality, have built well and have driven beautifully.

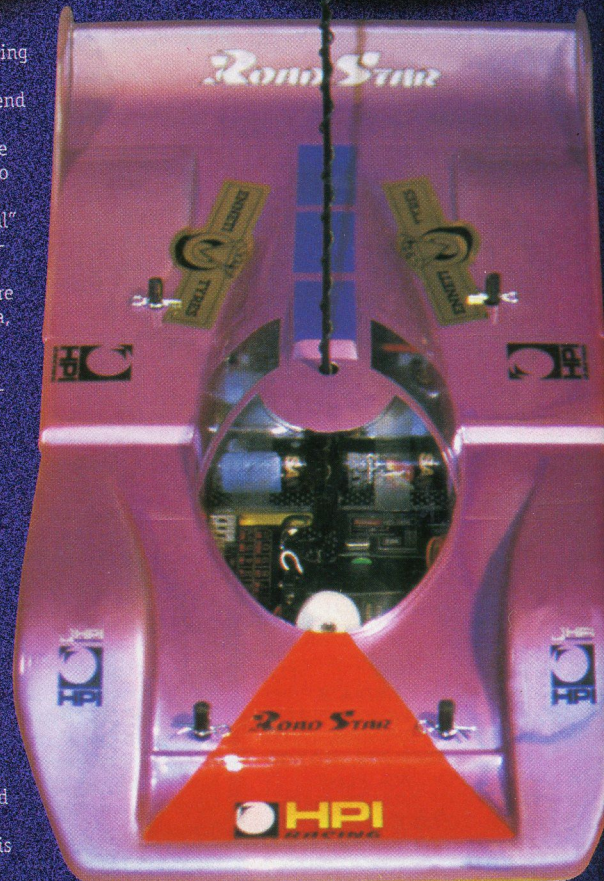


road racing cars get so few new faces racing them. Is it the look of them?

Maybe it's time to follow the world trend and change to GT bodyshells, this has worked with scale saloon cars. It can't be the cost either surely, most 1/12 and Pro Tens cost less to buy than a competitive touring car, gone are the days of "special" cells and motors, in fact most buggy racers have cells in their tool boxes which are ideal for both formulas. Tyre costs are no more than any other on-road formula, with the current "Jap" rubbers around tyre wear is not really a problem. I do understand with 1/12th running on carpet you have to race indoors, but the National Series runs in the Winter, where would you rather be, cold and wet or dry and warm, no contest.

8 Minutes

With 1/12th you get 48 minutes fast and furious racing every race day, this has got to be a plus. All right if you have spectated at a 1/12th meeting a lot of the drivers carry bags of kit, it really isn't necessary, a good driver will always make the difference. The other bonus is that the cars are very simple to work on and most of the maintenance is biased around motors and tyres. The best bit is



A top-down view of a purple and red Formula 1 car, likely a Williams FW18. The car features 'Rondeau Sinau' branding on the front wing and a black 'HPI' logo on the nose. The cockpit is visible with a steering wheel and a roll-over protection structure. The car is shown from a high angle, highlighting its aerodynamic shape and the placement of various components like the front wing, sidepods, and rear wing.

1. A variable spring rate at the wheel end.
2. A major reduction in un-sprung weight, for better wheel control.
3. A much simpler steering block/axle.
4. A very quick change springing system for quicker set-up changes.
5. Lighter suspension parts.
6. A very easy method of ride height adjustment (shims on the king pin).

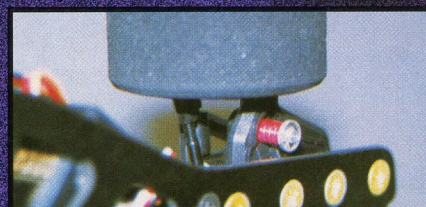
On the main suspension mount the top pivot point mounting block has two differing types, supplied, one has fixed caster, the other gives reactive caster, as I expected the chassis to generate a lot of "front end" grip I fitted the 0° block (I did test the reactive...see track test). The upper wishbone caster spacers were set to give maximum caster. Once complete these two sub assemblies are mounted to the chassis with alloy screws, the 0° packer being fitted under the block, this is the basic adjustment for ride height, the shims on the king pin, giving a finer adjustment.

Once complete you have a very smooth operating, very free unit, with all the adjustments you could ever need: caster, camber, ride height, spring rate. Finally a carbon brace fits between the "towers" to stiffen them even further.

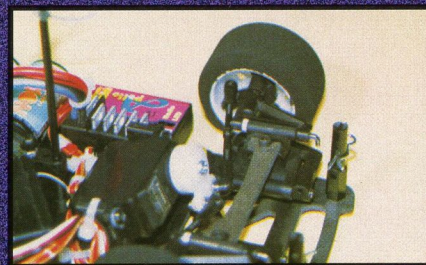
Large

Originally the 12G was never destined to arrive on any European shores and would only be sold in Japan, because of this the four page instruction sheet is in Japanese, but the exploded views and the translation in the parts list give you all the information you need to assemble the car.

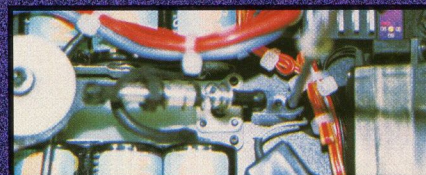
The "real" construction starts with the front suspension, H.P.I. really have a winner with it it's so simple, totally adjustable and completely unique. A large, three bolt mounted moulded tower carries a double wishbone, sprung suspension system. In the very long lower wishbone a ball jointed captive pin traps a small coil spring, giving an in board location. This achieves several things.



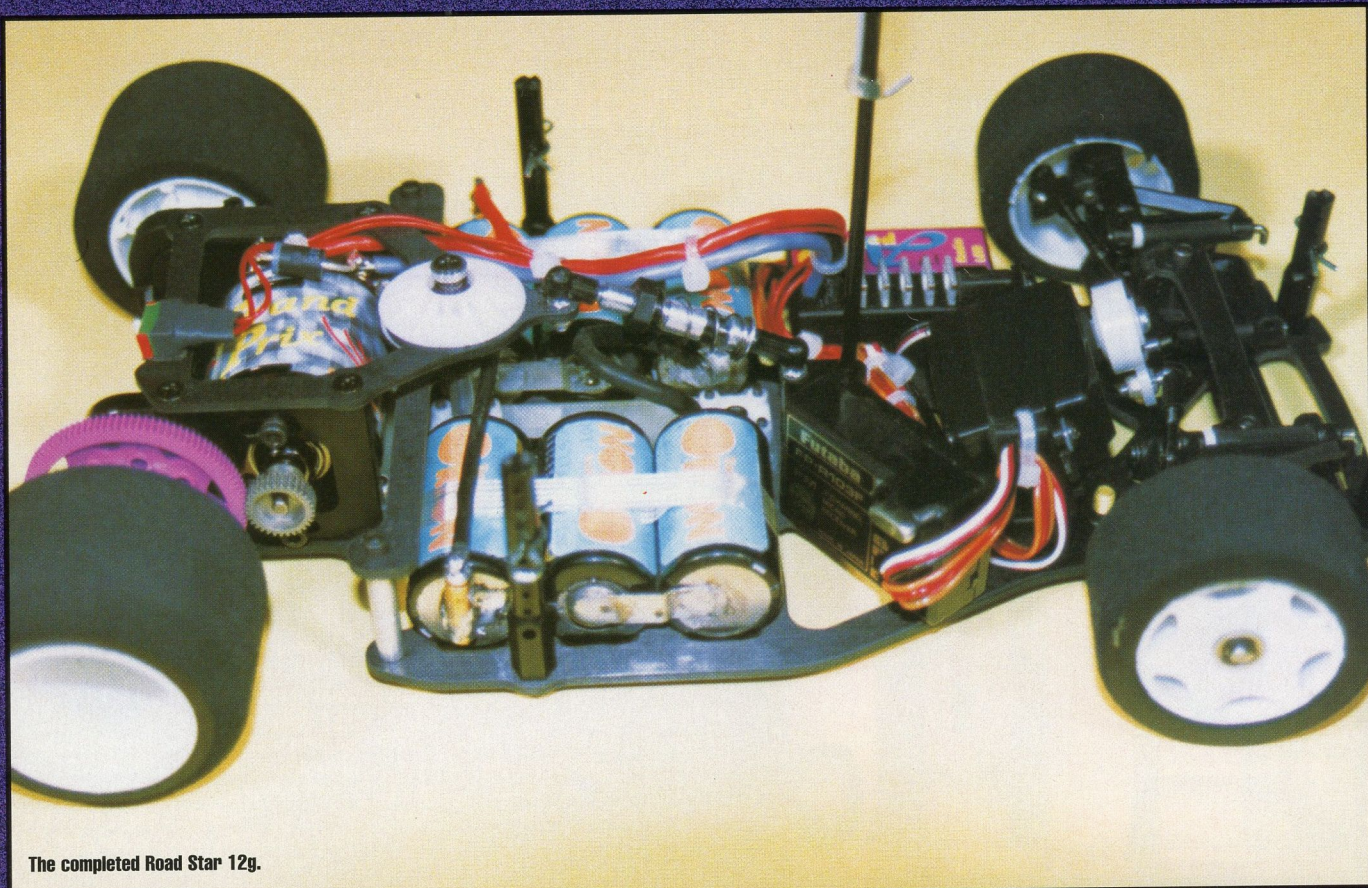
he Alloy "keeper" washer can be clearly seen below the inboard spring. Stops the "C" clip catching on the carpet



Note how close the track rods come to the top wishbone pivot pin.



The two small grub screws to the left and right of the shock absorber are used to set the chassis "Tweak".



To Close??

Two fairly substantial triangular mounts are supplied to mount the steering servo to the chassis, as has become the fashion this is angled back at 18°, this is to reduce the chance of "bump" steer. This was the only part of the kit which gave me any trouble. Obviously the mounts are designed to take most types of servo, I was using a Futaba 132SH, and however I mounted it the turn-buckle track rods fouled the top wishbone mounting pin, when the suspension was up full bump. I suspect the problem was that H.P.I. don't feel the 132 is a current servo, I did try a Sanwa 141HS and its Airtronics brother, and they both fitted with ease. So choose your servo carefully. So back to my problem, this was solved by trimming 3 mm from the top pin.

Shocking Pod

The next part of the build is the rear pod and the Delta type shock absorber. H.P.I. have spent little time in the design of pod, as it is a pure "rip-off" of the Associated 121W, this is not to say it's bad, imitation being the best type of.....

There really is very little to say about it, all the parts fell together with no filing or fettling required. A 1.6mm "T" bar made of glassfibre is the

main "spring" and roll control device, this is mounted to the chassis by captive mounted design balls; this allows a very "soft" roll action. A central disc type friction damper being the final roll control. Again this is the tried and tested Associated style unit. So by applying different greases to the friction discs a range of roll stiffness can be found.

The Delta style damper is a little fiddly to assemble for one with large fingers as me, but once bled its action is very good. A 30w shock oil was included in the kit. I would recommend a little time is spent running the spring pre-load adjusting nut up and down the shock body, as mine was very stiff.

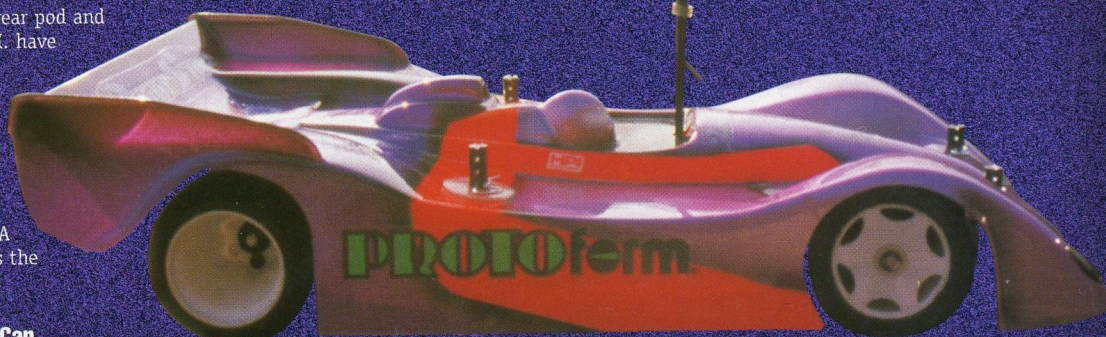
While you are assembling the pod it's a good idea to insert your motor before fitting the L/T bulkhead, as it's impossible to insert from the top or bottom. Also it's a good idea to file a radius on the trailing edge of the spacer plate that goes between the "T" bar and the bottom graphite plate on the pod. This will allow a larger range of pinions to be fitted to the motor, without it fouling the pod.

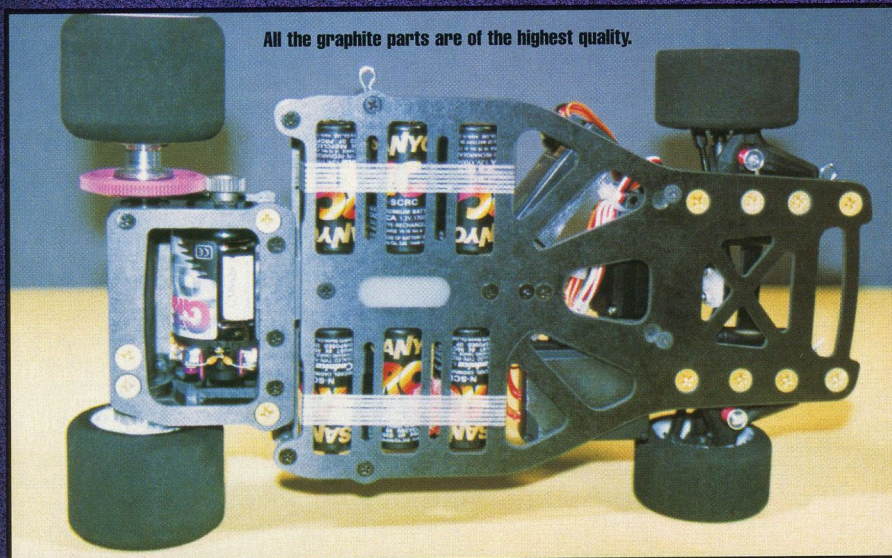
A Minimum of Components

The last part of the build is the diff/rear axle. On the face of it the diff appears to be an Associated copy, this is not the case, the diff has the absolute minimum of components to make it work. The major difference being you can adjust the pre-load on the diff without any disassembly, also the outer hubs are threaded so no adjustments are required when you change wheels, it's great.

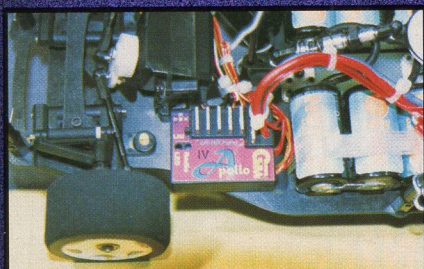
The axle is 6mm carbon fibre and is fully ballraced, well almost, the 64dp (100T) spur gear is supported by a nylon bush in the kit, this I replaced with an Associated ballrace. Greased with H.M.L. diff lube the action was smooth as a babies bum, with quite a range of settings available.

The PROTOform Courage, looks better than most of the current "Closed Cockpit" 1:12th body shells.





All the graphite parts are of the highest quality.

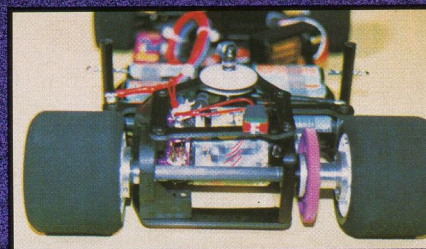


GM's Apollo speed controller just fitted in. Worked well too.

race it, so a trip to my local club in Brum was called for. Central having been running for many years and have a hard core of 1/12th racers, and they race all year round.

At their Friday night club meetings they run 5 mins and 27T motors, as I had fitted a GM Evo 2 18 triple during the build, my first job was to change the motor, what a pain.

After a quick phone call I managed to "blagg" a motor from RRC's resident expert Andy Griffiths of A.G.R. fame. This motor was built to full B.R.C.A. 1:12th Standard regs (44° advance etc). So prior to racing I set the car up as follows:



Associated copy rear pod.

First Run

With a fresh set of Orion 1700 Activated strapped in, and the rear tyres treated with TQ, full width, front tyres just the inside 3mm treated, it was off into the unknown. I had previously set the car up to run straight, as there would be no time for a "trimming" run. The track that confronted me was quite small, with a very tricky chicane and one very fast power-on sweeper. The buzzer blew, I dumped the throttle, W O W..... my car left the line like a scalded rabbit, and dead straight, got lucky didn't I.

A 60° right hander was the first obstacle, I gave the brakes a dab, and turned in, the response was instant and I clipped the hose hard, first conclusion, loads of steering, mental note: turn down rate control. The rest of the heat was series of testing laps, every time I pushed the harder, the harder it wanted to go, 5 mins over.

After the steam level had lowered, I contem-

Final Prep

All that was left was to mount the electric's, tyres and body. As I had already fitted the servo and motor I went for the electric's. A GM Apollo speedo was tapped to the left of the steering servo and a Futaba 40 meg mini stood up on end to the right of the servo. Both fitted with the minimum of fuss. The receive mount was backed up with cell tape wrapped around the chassis.

As the 12G comes without any tyres a small selection of tyres were sourced from GM Racing, the front wheels being ASSOCIATED pattern, so a wide choice is available. At the rear H.P.I. have moulded their own pattern wheels, nothing else will fit.

Four extremely large body mounts are included in the kit, they are very strong being solid bar. A range of holes are drilled in them for ease of adjustment, trimming to fit being all that is required.

Finally a bodyshell was chosen and painted, as the 1/12th H.P.I. Jaguar XJ14 was not available at the time of the review I fitted one of the new PROTOform Courage Porsche W.S.C. shells, this as can be seen from the photos is an open cockpit. This type of shell is now legal for 1/12th.

Track Test

As no permanent 1/12 tracks are laid in the UK the only way to test the car was to go and

Front

Springs	Kit red (.065mm)
Caster	6° (kit) - non reactive
Camber	11/2°N
Tyres	Blue (H.P.I.) - 48mm Dia
Ride Height	5 mm under front edge
Tracking	Parallel

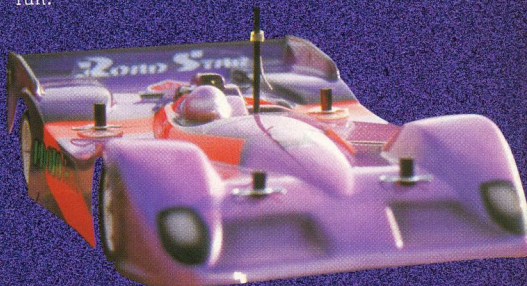
Rear

"T" bar	kit (1.6mm)
Tyres	Blue H.P.I.- 52 mm dia
Ride height	6mm under pod (middle ride height spacer)
Shock oil	30w
Shock spring	standard (pre loaded to allow 2° anti-squat)
Central damper	as kit (Parma diff lube on plates)
Motor	AGR 27T B.R.C.A. standard
Gearing	25P x 100SP = 40.8 mpr @ 52mm tyres
Speedo	GM Apollo (4hz) IV. Set 80 amps (dead stick brake)
Bodyshell	PROTOform Courage Porsche and trim tab
Car tweaked level with adjusting screws on "T" bar.	

plated the first run, the car turned in well on all the corners, changed direction impeccably, but washed-out in mid corner. Speed was plentiful. Brakes amazing. My first thought was to increase the width of the front tyre treatment, but that could make the car "twitchy". So I decided to change the front caster blocks for the 4° reactive blocks. The rear tyres had worn 1/2mm, so I didn't change the gearing. No other changes were made.

2nd Run

The caster change could be felt straight away, mid corner steering was much improved and the speed through the corners could be carried on to the somewhat short straights. Two problems did rear up, firstly the car was now grip rolling. Secondly, at the four minute mark the motor went a little soft and the can was quite warm at the end of the run.



The Fixes

To stop the grip rolling I decided to fit stiffer front springs, this would reduce the roll into a corner and stop the car digging in. The motor problem was a little more of a head scratcher. Checking with the other drivers revealed most were running similar M.P.R.'s, so the other option was a lack of cooling. Looking around at all the Associated cars showed that most had cut away or drilled holes in the L/H bulkhead, out came the Dremel and the top section of the plastic bulkhead was ventilated. No other changes.

3rd Run

All the previous ills had gone, the car was sharp, very fast, a dream to drive, yes there is a but, at around 4 minutes the car began to slide, the tyres had started to "go" off.

Due to the high level of grip the car was generating, the tyres had gone "soft". This was very simple to cure. A firm set of Yokomo's (Jap rubber) was bolted on and treated the same as the first run. As the motor was now running cooler I decided to chance my arm and gear up a little (30% being left in the cells at the end of the third run). The MPR was increased to 42.4 (26 x 100 @ 52mm).

Final

What can I say, Christmas had come very early, sensational, there wasn't a car that was any better, damn their drivers, traction was brilliant,

Final Set-up

Front Springs	Green (0.75)
Caster	6° + 4° Reactive caster block
Camber	11/2°N
Tyres	Yokomo
Ride Height	4 mm (smaller fronts)
Rear "T" bar	kit
Tyres	Yokomo (52mm dia)
Ride Height	5 mm under pod (middle spacer position)
Shock Oil	30w
Shock Spring	Standard (pre-loaded to allow 2° anti-squat)
Roll Damper	As kit (Parma diff lube)
Motor	AGR 27T
Gearing	26 x 100 = 42.5mpy @ 52mm dia tyres

So that's it for the 12 over to the 10.

The Same But Different

parts, due to their size the job was completed much quicker, Dremel one - Road Star nil.

Detail Differences

Assembly again starts with the front suspension, at first I thought it was identical, no so. But one very neat idea broke cover, but it was on the 12G?

When locating the "C" clip on the captive pin for the inboard springing I looked high and low for the alloy protection washer which was fitted on the 12G, to no avail. Then the penny dropped, with the 12 running a very low ride height and on carpet, it would be relatively easy to rip the "C" clip off so the alloy keeper was added, neat. Obviously with the increased ride height of the 10 and with it running on tarmac, H.P.I. don't think you need it, I think I might be tempted to fit one. The other difference is major, in H.P.I.'s never ending quest for adjustability, two options are given for the front axle, centre point or trailing. The trailing set-up gives a much "softer" steering response, but won't quite give the ultimate grip level. As with the 12G you are given the choice between reactive and static caster blocks. Having felt the change in the 12s handling I built the 10 with reactive caster from the word go.

Nice Touch

Exactly the same servo mounts come with the 10 as the 12, this time though a servo saver

turn-in sharp, but not twitchy, high speed handling was a dream, all it really needed was Spash or Griff at the sticks.

Tail End

The 12G has a very strong family resemblance to the Associated 12LW, it has all its strong points, but add a much stiffer chassis plate and H.P.I.'s ingenious front suspension you have a totally different animal. Adjustability being the key. A totally quality racer. I suggest you try one.

Quick Spec

2WD Graphite flat "pan". Saddle Pack . Fully ballraced. Alloy motor mount. Graphite axle. Adjustable ball diff. Central roll damper. Oil filled shock absorber. Double wishbone. Unequal length front suspension. Fully adjustable. In board front springs. Dish wheels.

Testers kit

Radio	JRX756
Receiver	Futaba 40 meg Mini
Servo	Futaba 132
Speedo	GM Apollo IV
Motor	AGR 27° 1/12 standard
Cells	Orion 1700 Activated SCRC SPs
Bodyshell	PROTOform Courage Porsche WSC

ROAD STAR 10G

This time you're greeted with a much bigger and better box but still no bodyshell. As you would expect a lot of the parts are the same as the 12G, and again there is a large amount of high quality carbon fibre. The Road Star 10 has several "brothers" of a much lesser spec, but surprisingly several of their parts are included with the 10G, but none of them are used, very strange.

Even More Dust

Another gleeful evening was spent sanding and sealing, strange I thought I did this last week. All the graphite was just simply high quality. Even though there were more graphite

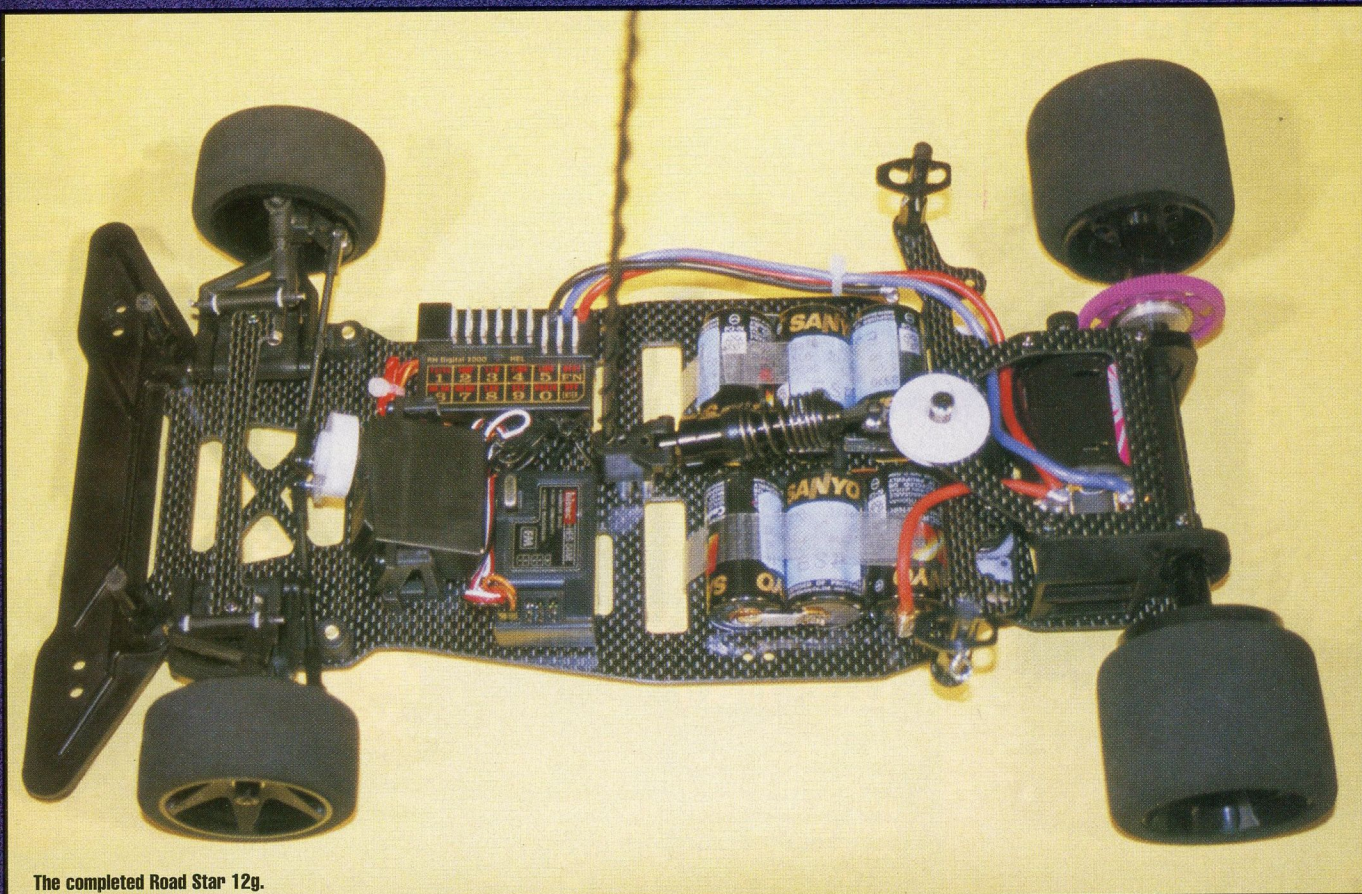
was included, nice touch. A ballraced Futaba 3003 was mounted between the towers. No problems were encountered with the turnbuckle track rods this time. I think the servo was mounted slightly further back this time.

What a Rear-end

Now we come to the "piece-de-resistance". Not content with a unique front suspension H.P.I. have come up with a totally innovative rear suspension. Built around the normal type rear pod (alloy motor mount, composite bulkhead, top and bottom plate) a "sprung" beam is located on the chassis centre line. Centrally pivoted the beam carries two springs located on an alloy bridge. This gives total control of the roll stiffness without affecting any of the other parameters. At the far end of the beam, are pivots which the bottom of the pod bolts too. This allows the pod to "squat" under acceleration. All this is controlled by a large capacity alloy spring/damper unit.

So you get the best of both worlds you can have a high roll-stiffness for very agile handling and a "soft" squat which should give maximum traction away from the bends. Once again the ride height can be adjusted with "cams" in the pod (6





The completed Road Star 12g.

positions available). A very neat chassis brace/come body mount completes the chassis build, the central "disc" damper mounting from it. Once again Parma diff lube was smeared on the friction faces.

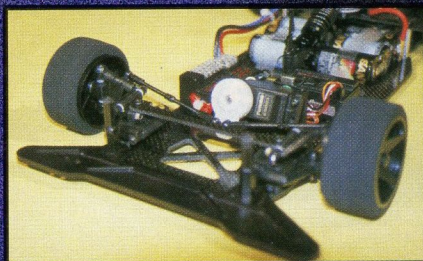
Twin Cone

The final part of the build is the rear axle, the 10G has a slightly different set of components, the spur gear running on a "boss" machined on the axle. It's a relatively easy job to machine the boss off and use a ballrace in the centre of the spur gear, this gives a much smoother "diff" action. Instead of a single thrust washer on the 12, the 10 has an alloy thrust cone with twin cone locking washers holding the adjustment.

Finish It Off

A satisfactory set of pre-tuned H.P.I. Greens are included with the kit, so it's just glue and mount. Once again the rear wheels bolt on, so no messy diff adjustments needed when changing tyres.

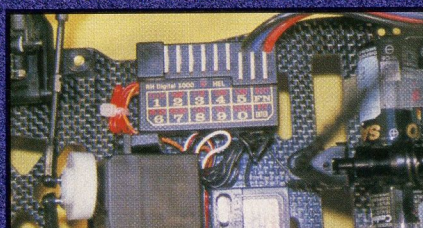
The same rod style body mounts are included, but with some very neat pivoting "shoes" for the shell to sit on. An H.P.I. Jaguar XJR14 bodyshell topping it off. Due to the very tight production schedule a "racers" paint job had to be done, all right I'm a lousy painter.



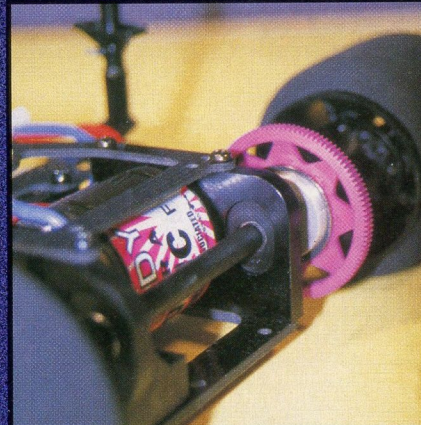
The front suspension of the 10 is nearly identical to the 12.



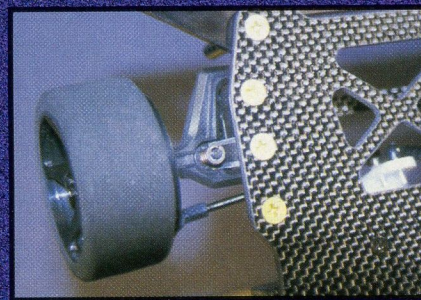
The two alloy spacers under the shock mount can be used to adjust the level of anti-squat.



GM Galaxy speed controller, review to follow soon.



The cams to adjust the ride height can just be seen in the alloy motor mount. The same system is used for both 10 & 12.



Just the "C" clip this time no alloy keeper.

Electric's

With any of the Pro-Tens space is never a problem, so any radio gear will fit, my choice for the 10G being a G.M. Galaxy speed controller and a Hi Tech mini receiver. Motor choice being a Reedy 15 Quad.

Pre test set up

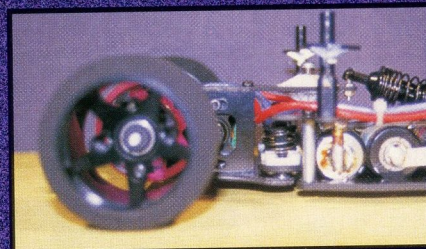
Front	
Spring	kit (0.80)
Caster	6° + 4° Reactive
Gamber	1° Neg
Front Axle	Quick (centre point)
Tyres	Kit H.P.I. Green
Ride Height	6mm under bumper
Tracking	Parallel
Rear	
Roll Springs	kit (1.20mm)
Tyres	kit H.P.I. Green
Shock Oil	30w
Shock Spring	Standard (pre loaded to allow 2° squat)
Ride Height	7mm under pod (max ride height on 61 dia tyres)
Central Damper	kit (Parma diff lube on plates)
Motor	Reedy 15Q
Gearing	25 x 96 = 40.84 @ 61mm dia
Speedo	GM Galaxy (standard pro file) Torque 60 amps
Bodyshell	H.P.I. Jaguar XJR14

the sign of a good car. Down the straight the car felt just as stable. This time the car went into the banking with no lift at all, a lot more "steering" input being required. Into the hairpin, no trouble this time. Down the short straight, brake and up to the alpine drop, a dab of throttle and the car was round, down and on to the bottom straight, a quick "twitche", through the chicane, round the Dunlop hairpin and back on the straight, phew. I'd got grip, I could really "love" this car.

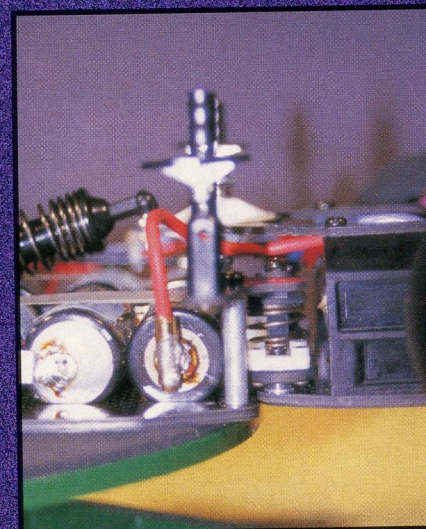
At this point the rear tyres were running a little small and the pod was grounding on the bumps. As the ride height was at max a change of tyres was called for. Having checked out the last Ashby race report by one Mike Haswell, I had acquired a set of Corally Gold Hard fronts, and Corally Silver Star rears as used by D. Spashett. Also I decided to go for additive. I treated the rears full width with AgyGrip the fronts just the inner 2mm, although there was grip it was still low.

Last Run of the Day

What a transformation, grip was amazing, the handling sharp as a razor but giving great confidence. Brakes? who needs them. As the skies had started to darken, three laps were done on the watch, 18.76, 17.61, 17.51 on for "A" final pace, and I'm no great shakes



Both the "Roll" control beam and springs can be seen to the left of the alloy pillar.



Quick Spec

2WD Graphite "Flat Pan". Saddle pack. Fully ballraced alloy motor mount. Graphite axle. Adjustable ball diff. Central damper. Oil filled coil over damper. Sprung roll control. Double unequal length wishbones. Fully adjustable. In-board front springs. Multi spoke wheels. H.P.I. Green tyres.

Track Test

As Ashby is RRC "Standard" test track, my kit was packed and away we went. For this time of year (mid Jan) the weather had been very kind, it was dry, well nearly.

Run 1

As the track was just a little damp, no tyre additive was used. With a warm set of ESP's fitted I very gingerly prodded the throttle, I was away, after a couple of "trimming" laps I decided to give it the gun, the rear squatted and we were off, down the back straight at warp factor nine, a slight lift and into the banking, only a tiny steering input was required, not a good sign. Turning into the hairpin had the back halfway round, not quite spun. I eased in the throttle and the car straightened, not quick or smooth. A few more laps confirmed my fear. The rear roll stiffness was too firm. Fortunately I had acquired the full range of roll springs from G.M. Racing, H.P.I.'s UK base.

I quickly replaced the 1.20 rate springs with 0.90 (white) springs. Also the untreated front Greens were replaced with H.P.I. Blues (harder).

Run 2

The track was now almost bone dry, just one damp patch by race control. Immediately the change could be "felt" on the sticks, always

as a driver. Then down came the heavens, end of play.

Last Lap

What can I say that I haven't already said, the 10G was easy to build, and easy to drive, and was very quick. The relatively small changes I made changed the car to suit the day, a very good sign.



Head to Head

Both the cars featured carry a strong family resemblance, both have quality written all the way though them, they're racers, pure and simple. With H.P.I. having a solid service base in the UK you will see more of them, and they're going to travelling fast, probably in front of your car, if I'm not much mistaken.

The H.P.I. range is available from GM Racing/H.P.I. UK, address in their ad.

I would like to thank, Kent Clausen, Gunther from GM, Mike Drescher and Les of H.P.I. UK for all their help with this review. **RRCI**

Testers Kit

Radio	JRX756
Receiver	Hi-Tech Mini
Servo	Futaba 3003 (ballrace fitted by CD)
Speedo	Galaxy HE3000
Motor	Reedy 15Q (light springs - cut brushes)
Cells	ESP370
Bodyshell	H.P.I. Jaguar
Tyres	H.P.I. Blue. Corally Silver Star Corally Gold Star

Final Set-Up

Front Tyres	(no changes) Corally Gold Star (hard)
Rear	
Roll springs	.90 (white)
Tyres	Corally Silver Star (soft)
Shock Oil	30w
Shock Spring	Standard (pre loaded to allow 0° squat)
Ride Height	7mm under pod
No other changes.	