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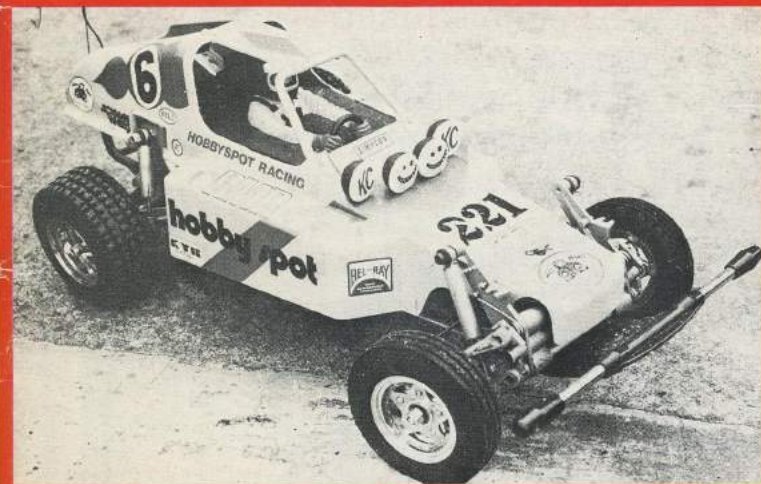
Modeller

December 1980 Price 60p
Vol. 2 No. 9.

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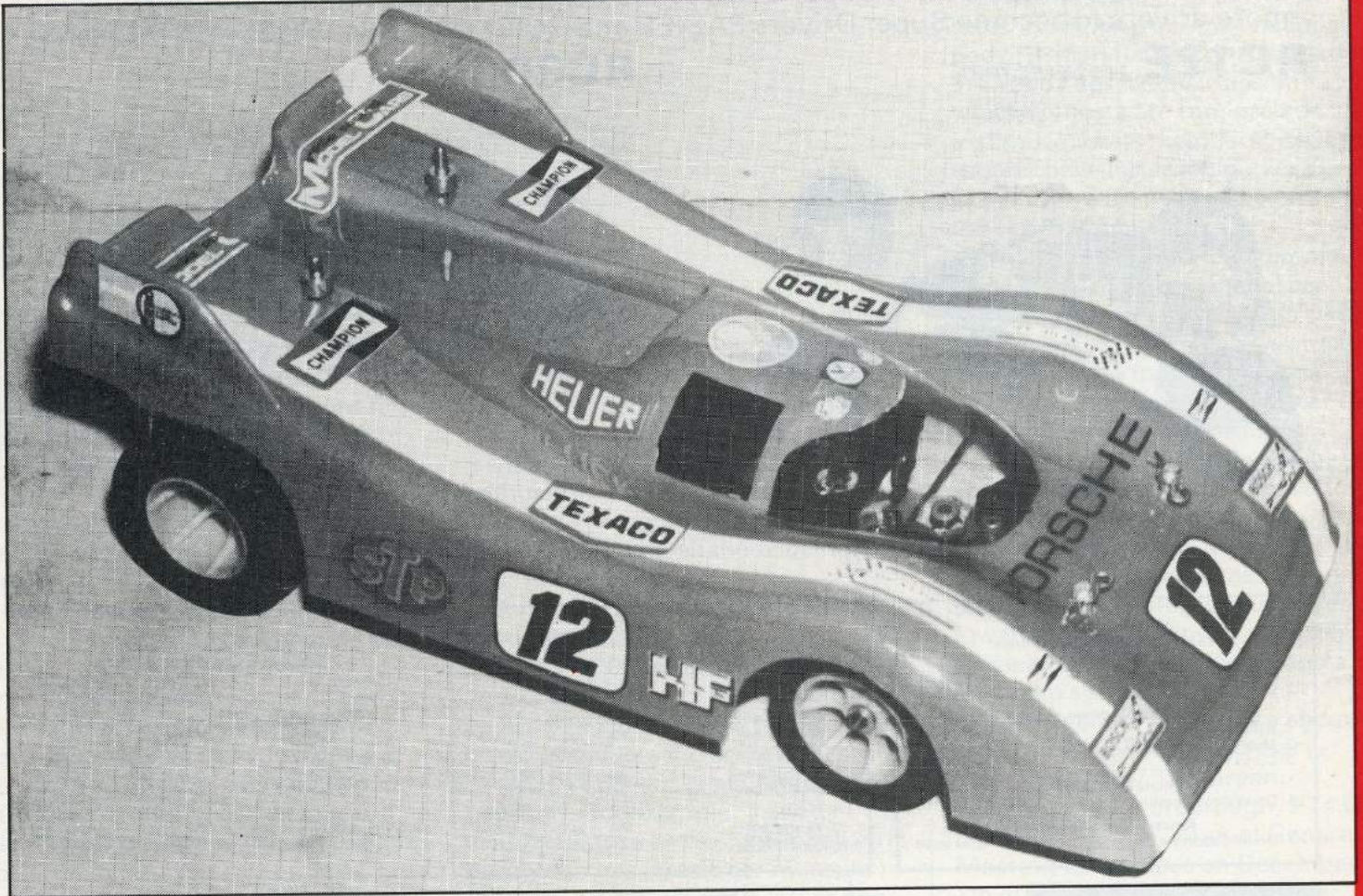


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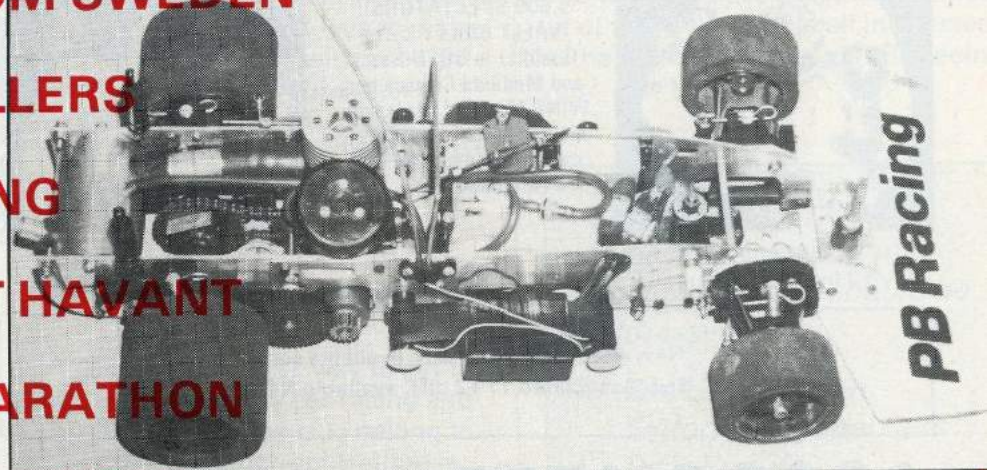
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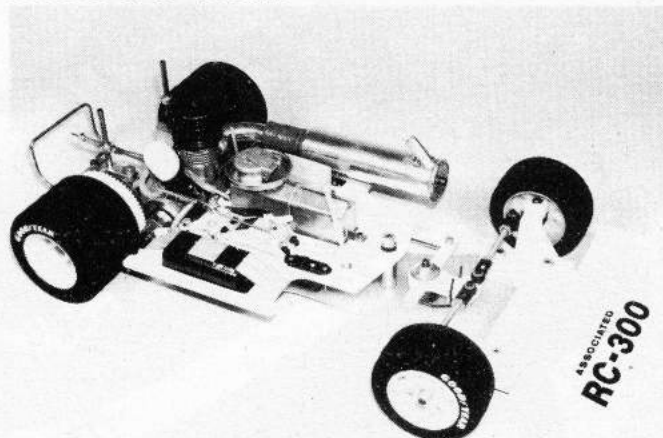
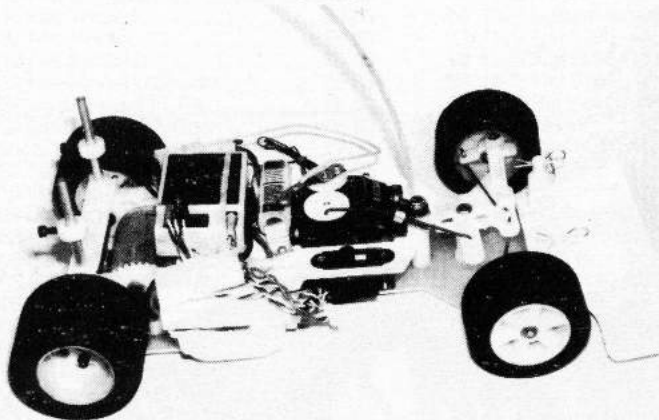


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| WINTERNATIONALS ORLANDO, FLORIDA USA | | |
|---|------------|---------|
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| 2. Mike Rowland | Associated | USA |
| 3. Gene Husting | Associated | USA |
| 4. Phil Greeno | PB | England |
| 5. Bill Jianas | Associated | USA |
| 6. Roger Curtis | Associated | USA |
| 7. Arturo Carbonell | Delta | USA |
| 8. Phil Booth | PB | England |
| 9. Keith Plested | PB | England |
| 10. Jack Jacobs | Associated | USA |

| WORLD CHAMPIONSHIPS GENEVA, SWITZERLAND | | |
|--|------------|---------|
| 1. Phil Booth | PB | England |
| 2. Bill Jianas | Associated | USA |
| 3. Chuck Phelps | Associated | USA |
| 4. Fujio Sasuga | AAT | Japan |
| 5. Naoki Ishihara | Road Ace | Japan |
| 6. Rick Davis | Associated | USA |
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| 5. Bob Errington | PB | England |
| 6. Ronnie Ton | Serpent | Holland |
| 7. Phil Greeno | PB | England |
| 8. Curtis Husting | Associated | USA |

At the WINTERNATIONALS race, BILL JIANAS qualified 1st with 32.8 laps, RICK DAVIS 2nd — 32.0 and JACK JACKOBS 3rd — 31.9. BILL JIANAS was in the lead at 65 laps when he lost a front tyre. At the WORLD'S CHAMPIONSHIPS, Ishihara from Japan qualified first, CURTIS HUSTING 2nd, JEFF ROLD 3rd, BILL JIANAS 5th and CHUCK PHELPS 6th. At 38 laps, CURTIS was leading with JIANAS 2nd and PHELPS 3rd. CURTIS's engine locked up, JIANAS's engine died twice and PHELPS ran out of fuel giving the lead to BOOTH. At WIESBADEN, CURTIS HUSTING was TOP QUALIFIER and the only car to turn 21 laps. JIANAS lowered the individual lap record to 14.0 seconds and DEBBIE PRESTON was TOP QUALIFIER from the Semi's.

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Editorial

THIS WILL MAKE the fourth issue offered to you since we joined forces with **Auto Modeller** so that sufficient time and material has appeared to invite readers' opinions and wishes for the future. This should be a fairly easy thing to do. You express needs; I will do my best to provide them.

With both ic 1/8th interests and 1/12th (and even 1/10th coming up) electric cars there must be an amount of give and take. In the next few months certainly electric will have the major share; when spring comes then more will be devoted to outside operations. Do not forget the next forward surge which will be 'off road' racing in both scales. This is surely the way things will go for the most of us who like to enjoy fun with their cars without too serious a dedication to race winning. Off road is something that you can do in the garden, on a playing field — indeed on very nearly any old field.

For the keen — let's not say 'serious' — racer there are a host of new things coming along. We know all about the all round independent suspension cars, already here and those coming. I hear that the Serpent people already have one on the stocks for 1981; Franco Sabattini will certainly field such a car in his SG Futura range; while in the States much is going on at the Associated secret workshops with their eyes very much on the World Championships in Indianapolis next July. Certainly there will be a lot of keen rivalry to decide the 'King of the Hoosier State'!

Unsporting People

There are also a vast number of unsporting people who do not have any urge to race their cars against anyone else but have a great enthusiasm for building perhaps veteran or vintage cars, or three-wheelers, and finish them lovingly as near to scale as maybe.

Some of these are static models never intended to move out of their showcases, but many are powered and I wonder if they feel they are being neglected. Please let me know if you would like the occasional scale car that works but is not intended to be raced. For example, I saw a wonderful turn of the century electric brougham in a classic car museum in Canada. It was almost as tall as one of artist Emmett's caricature cars, with a bow window at the front, with a single seat for the driver, equipped with a tiller, railway coach type doors and windows ... I would love to make it up in say 1/8th scale with enough power for dignified progression if there was any degree of interest. Maybe I will anyway, just for my own fun.

Join Up & Control the Sport

THE VERY BEST way to get the most out of the car racing and building hobby is to belong to the association controlling it. We have mentioned EFRA (European Federation of Radiocontrolled Automobiles) which is a 19-nation strong body handling

affairs for Europe. Above them is the world organisation IFMAR (International Federation of Model Auto Racing) which will be behind the world championships. But before that we must get in at the 'grass roots' by joining our own national body (British Radio Car Association). This body agrees the rules under which contests are run, provides insurance for its members, issues a regular newsletter telling what's on in the future and generally protects the sport/hobby from any undesirable trends. For example, throughout the world model car racing is still an amateur sport with trophy awards and not cash which would bring in the 'professional element'. This is adequately catered for by some degree of trade sponsorship to drivers they hope will show off their products to advantage. However, there are plenty of opportunities for the newcomer still in the 'rabbit' class to race against his equals, and progress upwards towards 'tiger' status in easy steps by means of limited classes and a handicap system.

If you want to know more about it drop a line to: BRCA Secretary, Tom Martin at 7 The Green, Werrington, Peterborough, PT4 6RT (Tel: 0733 72114). Annual General Meeting takes place on December 7th at The Post House, Leicester. There should still be time for you to join and have your say in future events if you write or ring him up. You will also have a chance to meet a lot of very nice people all interested in the same things as you! Be seeing you?

*All Editorial Enquiries,
Publicity Material and
Review samples should be
addressed to:*

**Dickie Dickson,
Editor, RC Model Cars
P.O. Box 30,
Hemel Hempstead,
Herts, HP1 1NL.**

Club & Track Review

Readying the car for the run



Dave lets it go

Marathon

Northavon Model Auto Club and a 1,000 mile Endurance Run

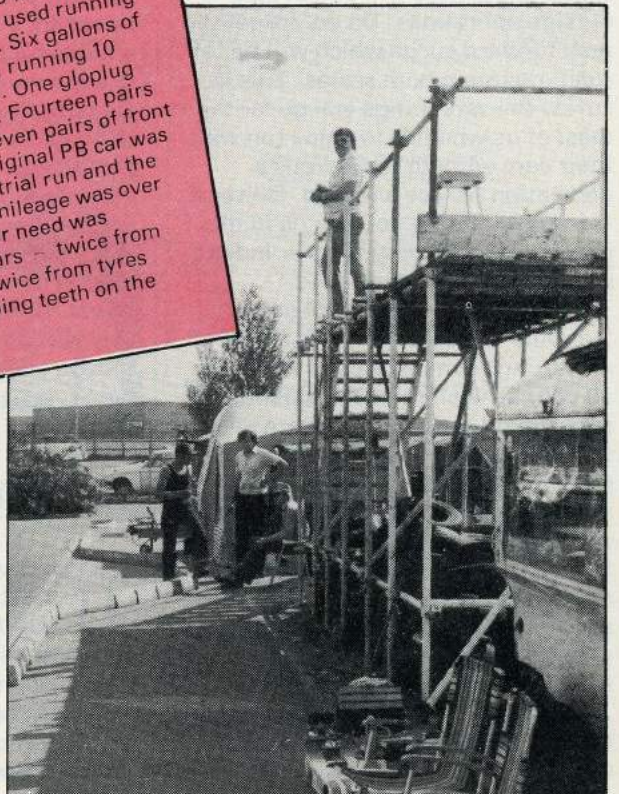
Promoted by club member David Jones the Northavon Club have been engaged on a most ambitious project this season. Way back in the spring a group decided to have a crack at some World Endurance Records – with an eye cocked towards the Guinness Book of Records. At that time a 24 hour record had been established in Hawaii in 1975, broken in England in 1978 and captured once more by an American team that same year. Current 24 hour record stood at nearly 540 miles in the period.

David and his team duly canvassed a useful degree of trade support with the initial aim of getting 600 miles. A trial four-hour run gave the drivers confidence in their ability; followed by the first real attempt. This was dogged with considerable time off track so that nearly 4½ hours were lost, actual running time being only 19½ hours, which nevertheless managed to clock up 516 miles.

With better luck, it was thought, a still more ambitious programme might be attempted, namely a 48 hour record! Once again this brave effort was frustrated as such thanks to rain which made the last hours of the run very nearly undrivable. However, a wonderful job was done which will be hard to beat – they managed 1000 miles (yes, one thou real miles!) in 40 hours 16 minutes.

Just for the record' readers may like to know drivers were David Jones and Mike Redwood (Bristol) and Jim Harrop (Oxford). The car was a PB 9 International; motor OS (two motors were used running 20 hours and 20 hrs 16 min. Six gallons of fuel at 166 mpg were used, running 10 minutes per 125 cc tankful. One gloplug (OPS Gold) in each motor. Fourteen pairs of rear tyres (211s) and seven pairs of front tyres (832s) worn out. Original PB car was same as used for earlier trial run and the first attempt so that its mileage was over 1600 and its major repair need was replacement of ring gears – twice from accident damage and twice from tyres running low and stripping teeth on the track.

The lonely driver - Dave on the rostrum



Southern Leage 1980 Results

The nine club Southern League has ended its second season most successfully in spite of the usual interruptions and postponements for shocking bad weather. Casualty since session No. 1 has been the London Club whose Hackney Circuit was lost to them for building. Hopefully another London Club will rise with a track again and restore the total. Two new clubs had been elected Torbay and Wessex — the latter a combination of two clubs I believe.

Once more, Bournemouth headed the table though not such a runaway victory as 1979. This time they were only a point ahead of second club with 47 and 46 respectively. Exmouth again made third place with 41 points. Others followed; Torbay (40) Mendip (34) Wessex (30) Aldershot (28) Southampton (28) Taunton (24).

Racing on each others circuits like this it is a splendid opportunity for up and coming drivers to gain experience under the rules which handicap experts by limiting total handicap of the four man team, with penalties in points if exceeding their permitted total. After these two good years with ic racing, there is a movement now to run a 1/12th scale electric league covering the same area. Already of course there is a similar Northern League running under sponsorship for ic., and the Midland club have run their electric league now for several seasons.

This takes care of the nasty suggestions sometimes made that the 'average' driver cannot get a look in at major events; this way the scratch driver is a positive asset, and has the chance of beating the best.

Mendip Model MRCC

Once again the Mendip Club staged their 4-hour team race to coincide with Pontins Modellers Holiday Weeks under the kindly sponsorship of Bulmers Cider. Dennis Jones acted as the efficient race organiser. The usual Mendip system for these races is to start from a staggered grid — just as in full size racing — to accommodate the nine team entry. This years line-up comprised Bournemouth, Cotswold Model Team, Red Dragons, Torbay, Pontins (A), Mendip, Pontins (B), Wessex, Gloucester, Throttlebenders.

The race started well with all cars getting off to fair run. Bournemouth pulled out in front with Mendip on their tail. At the halfway stage Bournemouth had a 20 lap lead on Mendip with Torbay in third place. Then just after the halfway mark at 2.35 disaster struck — the race directors nightmare! the lap counter packed up.

The race was stopped and resumed some half an hour later when the counter had been checked and was working again; happily laps recorded up to a stoppage had remained on view. Bournemouth again were winners (three years now on the trot!) Placings were: Bournemouth (729 laps) Mendip (676) Torbay (665) Wessex (654) Pontins (A) (625) Cotswold Models (614) Red Dragons (571) Pontins (B) (562) and Gloucester Throttlebenders (499). Thanks

to Bulmers and their Mr Colin Teague who presented the trophies plus members and non-club members who helped with lap counting and marshalling.

Boston Radio Car Club

Boston ran the second qualifying round of the Acadmeny Fork Lifts Championship on 28th September. This was the penultimate round of the series which will culminate in the final at Lilford Park on October 19th. Each competing club holds two meetings and runs both Formula and Sports/GT on the same day. Competing clubs this year are Lilford, Scunthorpe, Leicester and Boston. With improving weather the GT Steeping Circuit lap record was broken by club member John Milne with 16 laps in 5 min 2 secs.

Each clubs five highest finishers score points on a scale of 20, 19, 18, down to 1. This leaves the current position (prior to final)

Formula: Boston (423) Scunthorpe (352) Leicester (349) and Lilford (344) Sports/GT: Boston (433) Scunthorpe (374) Lilford (330) Leicester (327)

West Cumberland Radio Modellers

Secretary: Cal Long

124 Windsor Road
Westfield
Workington
Cumbria CA14 5BS

This is a club mainly devoted to aeromodelling but with a 1/12th scale electric car section. Racing takes place every other Friday from 6.30 - 10.00 pm, at a Boys Club in Bolton Street, Workington and has been going on now for nearly a year. New members will be very welcome, either by contacting the sec. as above, or just going along on a race night. Fifteen cars are normally racing as of now, with plenty of room for more.

Blackpool Radio Electric Car Club

Secretary: Mike Allen

23 Colwyn Avenue
Blackpool FY4 4ET

This is just a line to advise interested parties of their existence. Twenty four members strong, meetings take place on Sundays (1/12th electric only) 2.00 - 6.00 pm, outdoors if fine at Blackpool Tech College; indoors, if wet, in the Church Hall.

Wirral Model Car Club

Secretary: Dave Vine

8 Seaton Road
Wallasey
Merseyside L45 5HJ
(Tel: 051 639 8306)

Nearly two years old the club is devoted to 1/12th scale electric cars. New venue is at the West Kirby Concourse (Sports

Centre) on Wednesday nights from 7.30 - approx 11.00 pm. Club membership is still available at £2 per year for adults and £1 per year for juniors. Stock Cars (1/12th) are also catered for, and it is hoped that this side of the club can be increased, visitors and new members always welcome.

Bedfordshire Model Car Club

Secretary: H.G. Moulam

1 Castle Close
Wilstead
Beds
(Tel: Bedford 740 139)

Recently formed with fifteen ic car members active, plus two stock car drivers. Venue is a private car park with weekly meetings on Sunday afternoons. New members very welcome for any type of r/c model car sports person!

Potteries Area Twelfth Scale R/C Electric Car Club (P.A.T.S.)

Secretary: Dave Galley
61 High Street
Knutton
Newcastle
Staffs. ST5 6DD
(Tel: 0728 621555)

A nice thank you from Committee and club members for our previous mention and some news of changes. New venue is at the Sneyd Green Community Hall, Ralph Drive, Sneyd Green, Stoke on Trent, which will enable the club to offer a competitive scale type circuit and wooden floor surface plus a high permanent stage for rostrum. At typical members up to 30 drivers attend, including some junior members. Visitors and visiting drivers welcome, but check first with sec. From a neat little poster which the club have put up in shops, noticeboards and so on, we gather that meetings take place on Thursday evenings as above. Certainly a little posterette is a good propaganda idea to keep up membership and local interest.

Chessington Radio Car Club

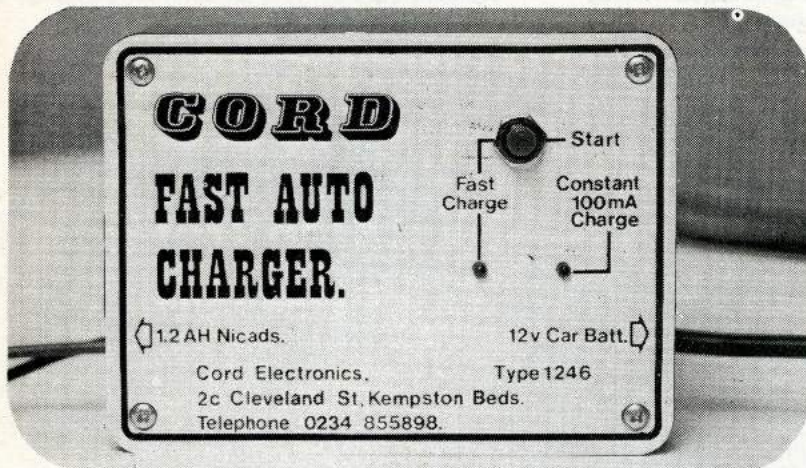
Secretary: Linda Woodger

10 Northcote Avenue
Tolworth, Surbiton
Surrey
(Tel: 01 399 2635)

Please note new address of secretary. This was given correctly in our recent club list but old friends may have missed it. Chessington has now branched out to cover all aspects of ic racing from what was initially a stock car club — perhaps absence of a London circuit has helped. The club was host for the Radio Stock Association 1980 Championship on 28th September; no doubt results and details will be forthcoming. For 1981 the championship will be held in the Midlands, on a circuit arrangement.

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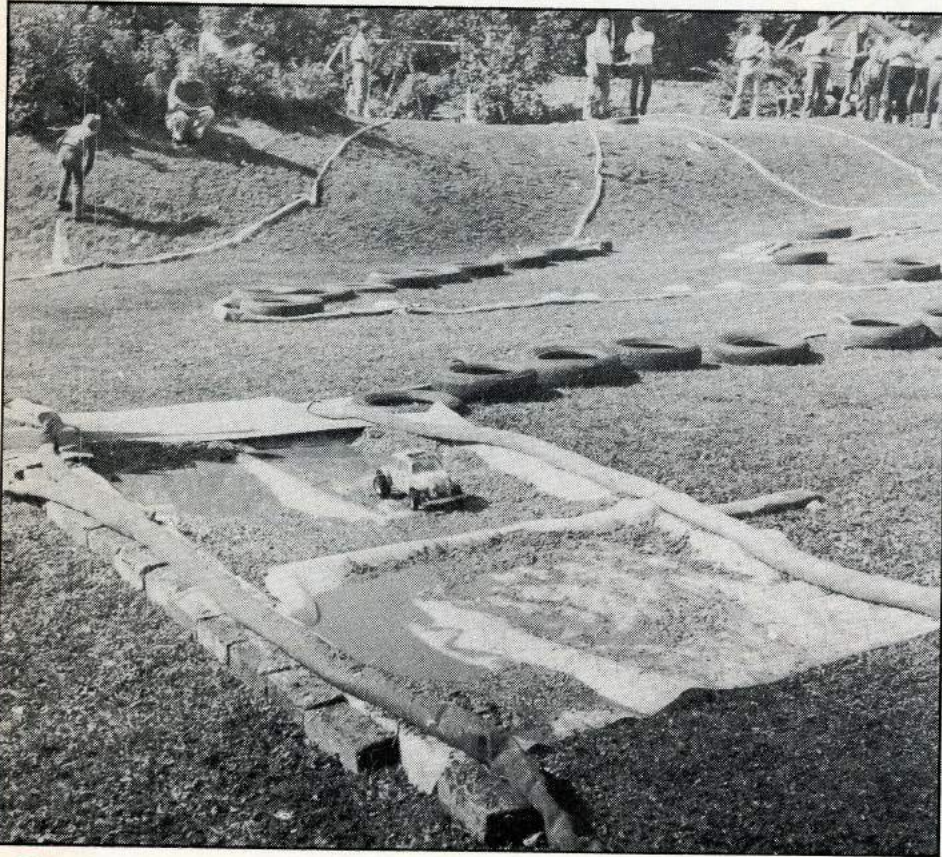
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The water splash with the high start and natural rostrum. Note the hosepipe marking of circuit



Off-Road Racing

**How to build a Cross Country Circuit and race over it.
An article based on the Chesterfield Rally Cross by
Les Pipe.**

Twelfth scale electric model car racing could almost have been invented for ale drinkers since so large a proportion of its meetings take place in clubs, dance halls and the like. This tradition was happily carried over to the 1/10th scale buggy racing by the Chesterfield model car club. They performed a splendid job of turning a nice sedate country pub lawn into what could only be described as an assault course! The natural terrain at the side of the White Hart pub lent itself perfectly to the deviously cunning course laid out on it.

The main course marking was taken care of by sand filled fire hoses. (Note: these can often be obtained from your nearest friendly fire station. You will very rarely have to pay anything more than a modest 'donation' for some good cause dear to them. With any luck you will end up like my own local club (Barwell) with enough hose to last a lifetime. We had 12 'forty-footers' for a small fee and after a lot of time spent pouring sand into them they have provided us with excellent markers.

The 1/10th scale buggies showed that with their higher wheel clearance and

rugged suspension they were more than capable of climbing over them ... but nevertheless it still defined the course clearly. While on hoses, don't leave them longer than 20ft, as longer hoses are difficult and tiring to fill with sand and shorter lengths are easier to transport and store. Cutting them is not easy unless tackled the right way. Required, a reasonably sharp masonry bolster, a house brick and a hammer.

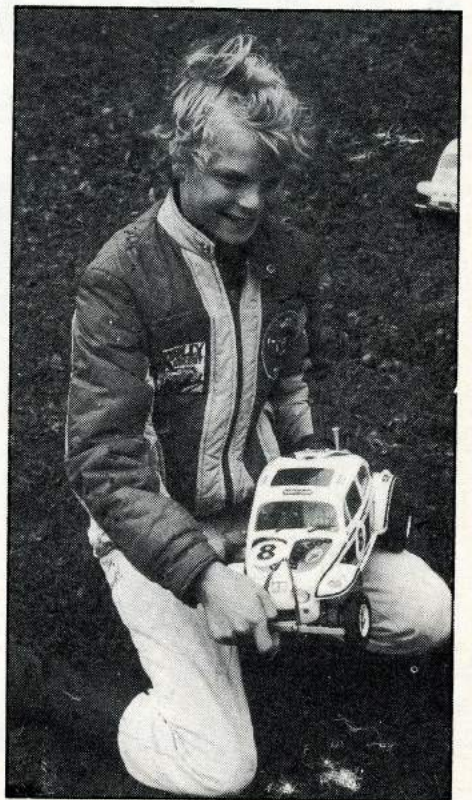
Back to Chesterfield! Tyres were also used for track marking and proved almost unsurmountable — though some of the buggies had a good try. Some novel features of the course included a sand trap and a water splash. They were cleverly done to avoid any damage to the lawn underneath (we may want another fixture there). Large sheets of thick polythene were laid on the grass and filled with sand, some bots dots underneath give it a rough and uneven surface, and a hose barrier kept the unit in place. Water splash followed the same lines with polythene sheeting and a ramp jump into the splash. Buckets were kept to hand so that water

could be replenished for the next car if need be. Secret of crossing was to hit the jump hard enough to clear the water; it didn't work every time. Motorcycle trial riders will know too that revs must be kept up! For those without water protection there was an escape route round the water splash. Other hazards included raised ramps one on the down slope with a splendid take off at speed and another slightly uphill which was not so spectacular.

Start was on a hillock which provided a natural rostrum for drivers. Cars went steeply downhill, twisting until they reached the water splash, then uphill to a ramp, downhill to another ramp, and, with turns and twists in between, returned to complete the lap by coming up hill back to the start hillock. Some needed a little human assistance here.

Basically the circuit was designed to be testing but possible, and not so hard as to involve a large amount of breakages — after all people do it for enjoyment, and breakages are the last thing they want. These vehicles have proved to be fairly strong, but there are limits, so, future organisers try and stay within them. Do give thought to the size of the obstacles.

Well, that about sums up what is needed for a Rally Course. The weekend was certainly a great success so let's have more of them. Joint sponsors were Jim Davis models and Tamiya, who I am sure could be tempted to do it again. The racing was very well organised with that man Maisey (the buggy entrepreneur!) after an exciting final. A lot of people turned up to watch this (I don't know how many came for the racing and how many for the beer!



Young Barrie Sholey Concours winner — his first entry in any contest

Line-up of car for the Concours judging



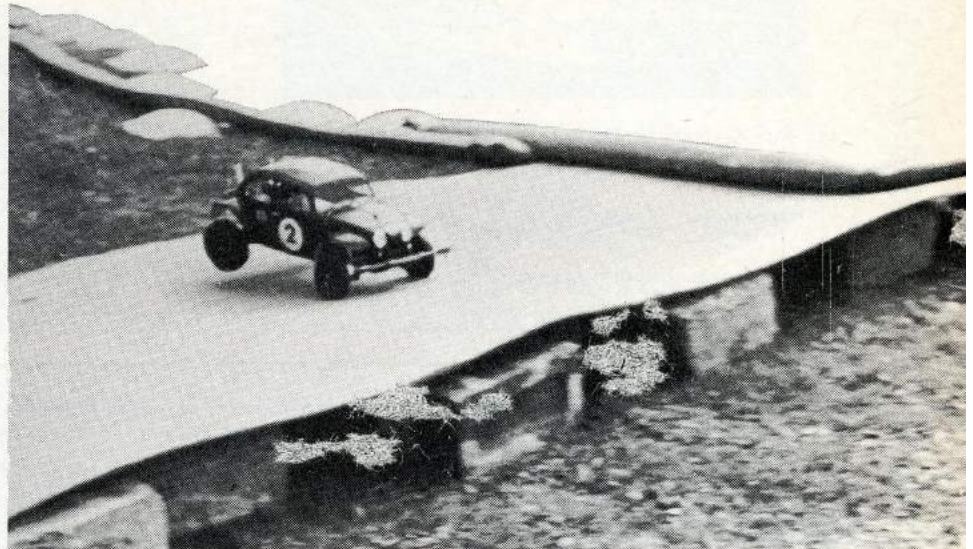
There were four finals. Novice and Open in 1/12th scale and amateur and expert in 1/10th. The 1/12th jeep men went well round a difficult course using the escape route round the water splash as they are not so well wareproofed as the buggies — though some did have a crack at going through the puddle. The buggy drivers were graded half way through the meeting as expert or amateur status ready for the finals. This led to one or two surprises as results show (don't know how you did it, Wayne!) All in all it was a very enjoyable and repeatable day. A big thank you to all who made it possible.

For any newcomer thinking of entering a buggy meeting, don't be put off by any of the so-called 'big names' being there. This side of the hobby is very open. The course and terrain are great levellers. A few tips for the newcomer may be welcome. Follow the manufacturer's instructions for assembling your buggy (or jeep) especially regarding silicone waterproofing round the joints. Make sure you lock tight all nuts and bolts on assembly and check them repeatedly even when locked as they sometimes (often) come loose.

A word on battery care; a lot of racers are now using fan blowers to help keep batteries cool when charging (a fan out of a car heater blower is the job — get along to that car scrap yard). They also increase the speed of recharging. It means, in the case of the buggy, regular removal of the radio crate lid — but this should present no real problem unless really deep water is being negotiated. (Your local motorcycle shop will be able to show you waterproofing aids that can be used on the little cars).

Another area needing attention by serious competitors is the area around the front ball joints. Track rods and joints supplied are rather flimsy. Replace with

Another hazard — the jump-off ramp with car at full speed to take off. Note rear wheels lifting



stout track rods (as for 1/8th use perhaps) of the bolt up together type. Buggies come with attractive looking lights; these are prone to breakages. Some lightening holes (without risk to strength can be drilled); a stronger roll-bar is also a good thing to install.

A lot of people have asked me about the chrome wheels I run on my buggy. These were done by Anbut Plastic Mouldings, Harrowbrook Estate, Hinckley, Leics. Any plastic coating company could be approached to do them. I find it best to go and ask the foreman or someone in the factory as management do not want to be bothered with one set of buggy wheels! You don't get anything unless you ask! Chrome wheels may not sound like anything other than a vanity mod but the chrome has proved to be very tough and looks as good as new after a messy hectic meeting.

I hope these few tips will help towards more enjoyable racing and encourage some novices to have a go. See you on the track.

RESULTS

1/12th Scale Novice

1. A. Jefferies
2. S. Harris
3. A. Harrison

4. D. Bailey
5. W. Davis
6. A. Allen

1/10th Scale Amateur

1. D. Foster
2. Steve Tilley
3. P. Maxfield
4. P. Atherley
5. Colin Spinner
6. S. Hiaden

1/12th Scale Open

1. Walt Bailey
2. M. Lee
3. R. Harrison
4. A. Mitchell
5. A. Corner
6. D. Elms

1/10th Scale Expert

1. Bill Maisey
2. Neal Francis
3. Walt Bailey
4. Les Pipe
5. P. Hopkinson
6. R. Harrison

Concours: Barrie Scholey

Barrie Scholey's concours-winning car



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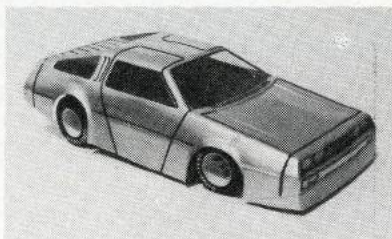
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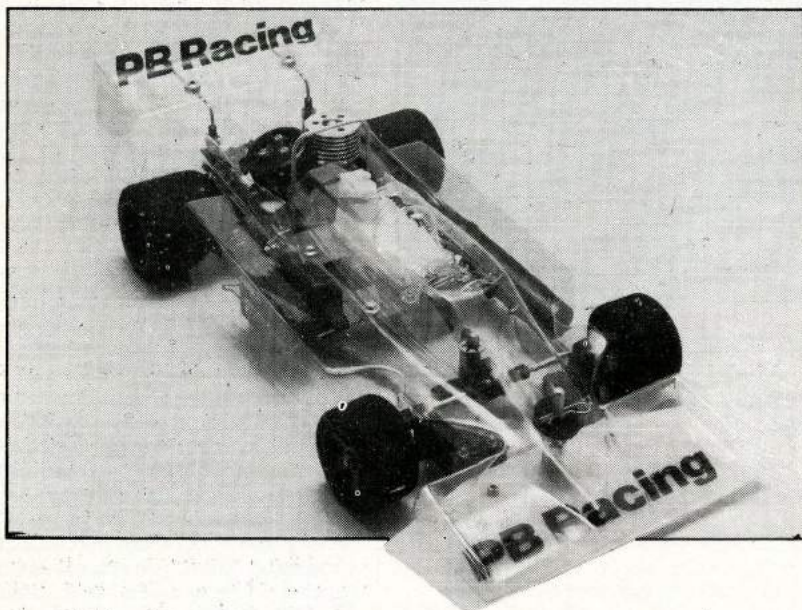
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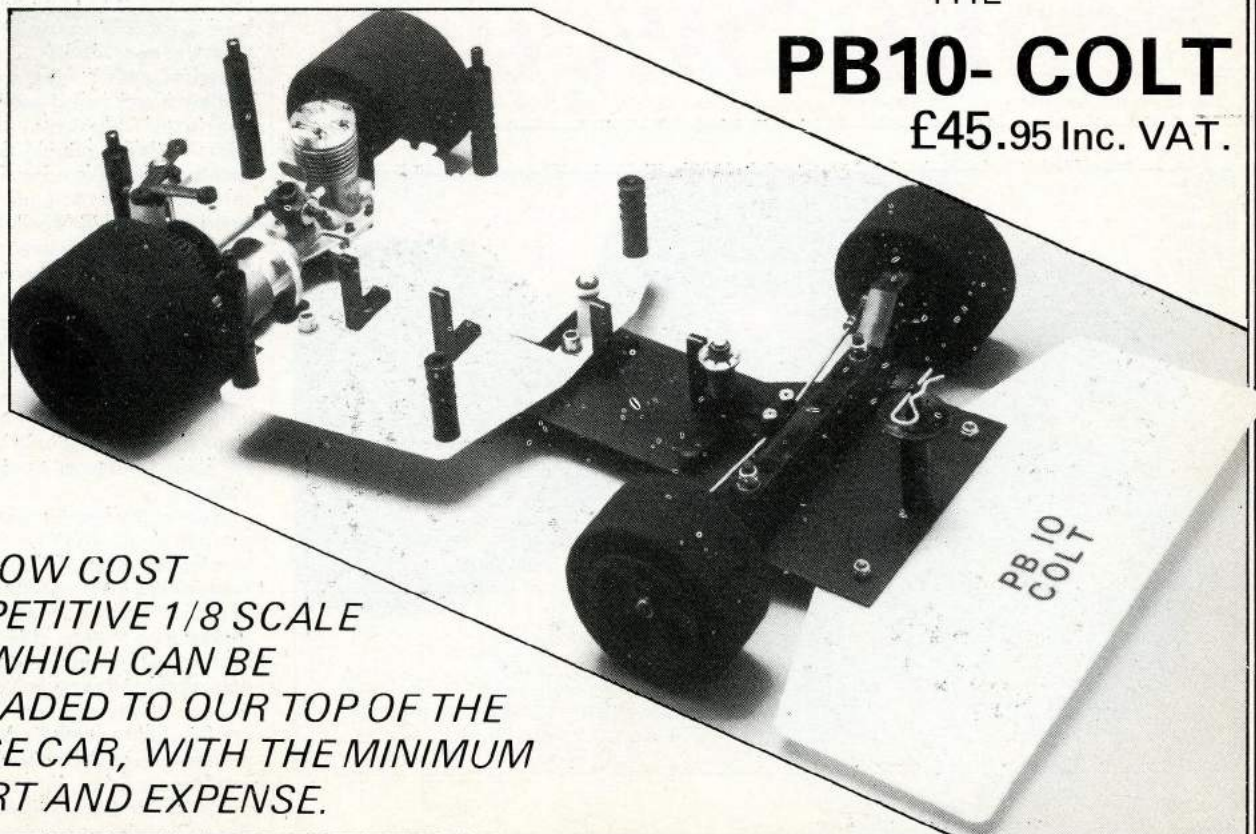
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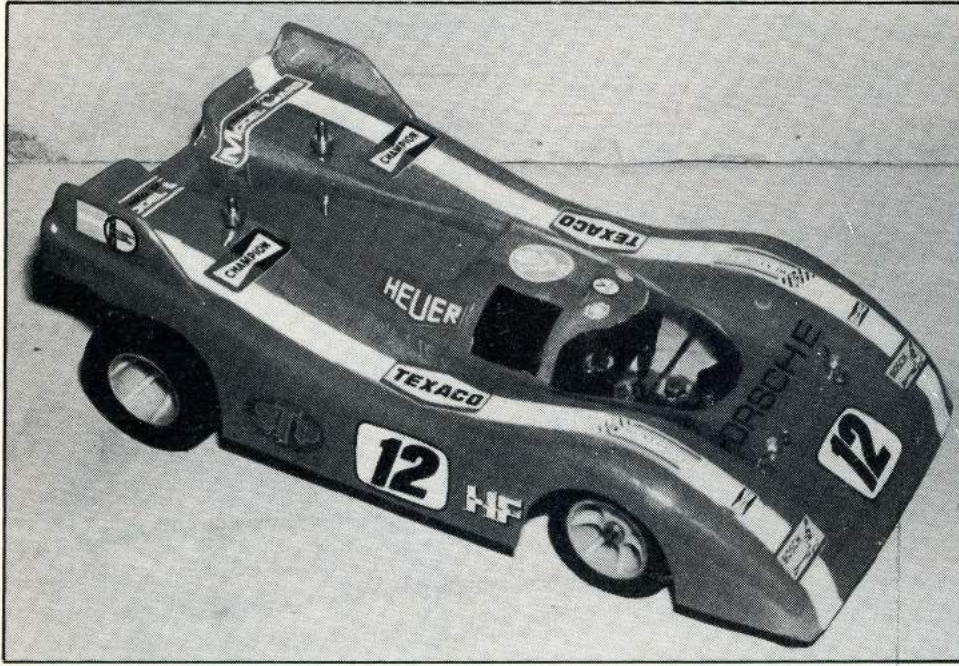
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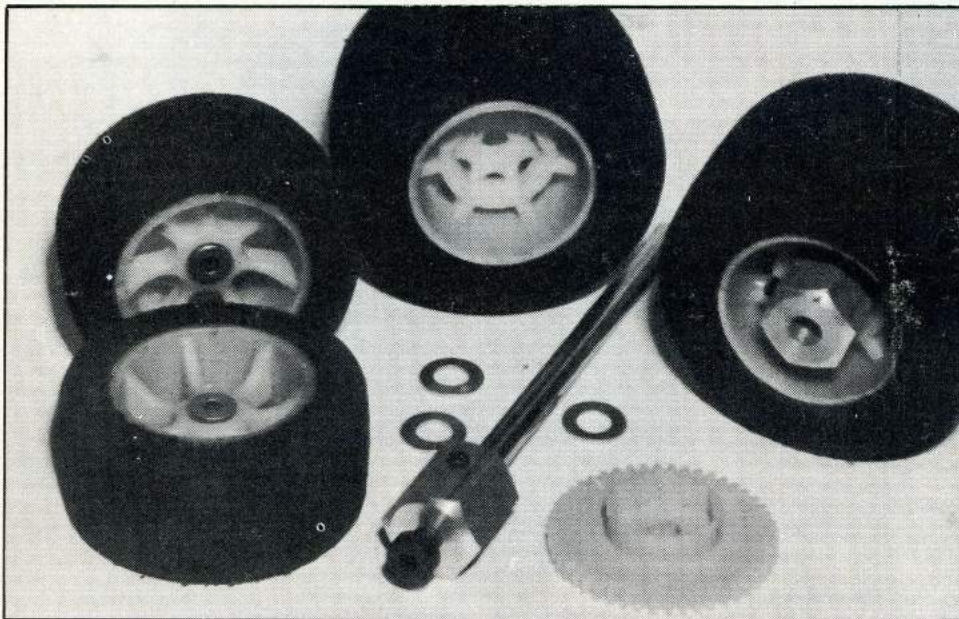


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Minicars Porsche 917K completed and decorated Decals from various places (ie. the 'come in useful box')



Minicar XII From Sweden



Wheels, rear axle and interesting hexagon drive blocks

ENTHUSIASTS in Scandinavia are just as keen on R/C car racing as everywhere else, and, perhaps because of the long dark winter nights have a special affection for the 1/12th electric mode which they can enjoy indoors. Again, slightly off the main stream of development, they have evolved their own style of layout. This has proved successful enough to interest American manufacturers, who supply a great deal of the hardware used there. These manufacturers, in their turn, imported a number of Swedish ideas and in at least one case have a Swedish design expert on their staff. So it is very interesting to have a typical kit from those parts to try out — the Minicar XII. The brand name will certainly be known to followers of the sport in 1/8th scale, since founder and ace driver Per Gustafsson is a former European champion. The kit is being imported by AMPS Ltd., of Hertford who have supplied the review kit.

Instructions are in English, as might be expected, and go into a mass of detail and have some useful diagrams. My general arrangement sheet was rather poorly printed which made me all the more careful in putting the parts together. As usual, I started with the sticky job of putting on the tyres. The yellow plastic wheels are most attractive being a modern spoked variety such as the latest Honda motorcycles are sporting these days. If you don't like the yellow you could always spray them with silver paint, or even get a friendly plastic factory to chrome them for you as Les Pile suggested recently in one of his meeting reports. Tyres provided seem, strange to say, very much outdoor type so that you may find a softer mix more suitable for indoor use. That's up to you.

In the best modern style the front steering unit is in two separate items. Follow the drawing carefully to get them facing the right way (I got it wrong at first go!). Parts are plastic mouldings and very nicely made. Instruction to insert kingpin into suspension arm using a rubber mallet need not be taken seriously. It can be pressed in happily in a machine vice, or if brute force proves essential use a light hammer, but protecting the pin with a small piece of scrap wood. You may need to ease steering blocks a little by pushing them back and forth a few times to ensure a free fit. Locking of parts and attachment of wheels is via circlips. Easy to lose on the floor so stick them on a length of sellotape for safety and work over a sheet of white paper.

Now to the rear end of the GRP chassis plate to attach the plummer blocks which should be rubbed on emery paper to remove any flash. Oilite bushes can be pressed into them to take the back axle in due course. At this stage I like to fit the motor (a standard 05 type) which presents no problem. Rear wheels have stout hexagon hubs which fit in the hex sockets on the plastic portions. A little firm pressure gets them bedded in tight. The larger gear wheel also has a hex socket to take up the drive. Since we are building the Porsche-bodied car, the wing tubes are

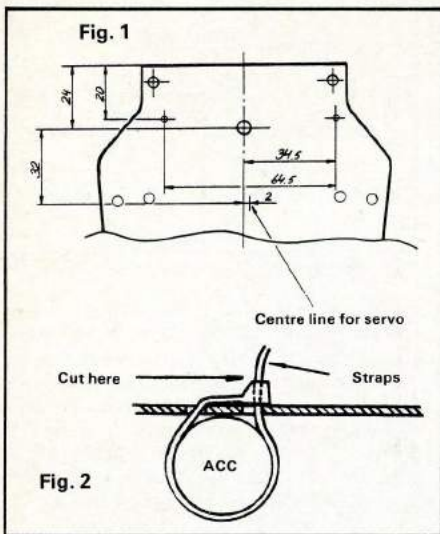
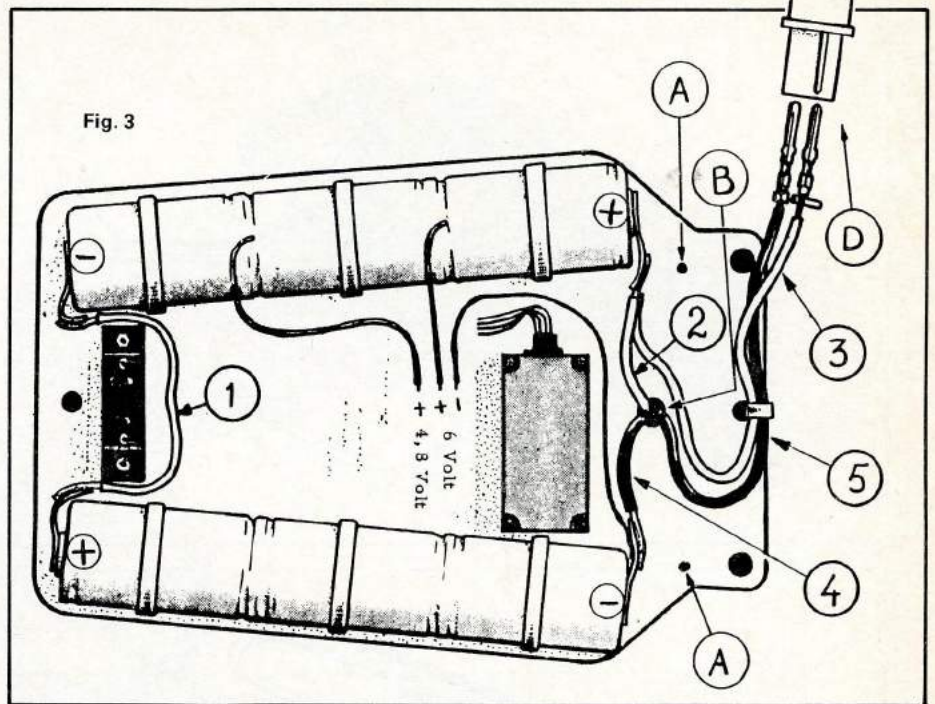


Fig. 1. Drilling radio plate. Check against equipment to be fitted

Fig. 2. Attaching nicads with cable ties

Fig. 3. Underside of radio plate showing where to tap in for Rx battery power



pressed into the front holes on the plummer blocks.

With front wheels fitted — hoping no circlips have gone astray on carpet, we can consider the steering gear. Here — like all good modellers — I move away from the instructions because I like a more ambitious servo saver than the style provided.

The 'official' assembly involves the simple light spring loaded connection direct to the servo. I have used a spring loaded servo saver of the usual Micro-Mold, Jerobee type. In my case a Jerobee which I happened to have handy from a parcel of goodies sent over recently. It involves locating the servo between the front wheels. An alternative position is under the radio plate but this means putting the receiver on top of the plate and alters the whole 'Swedish style' of the layout.

Black plastic radio plate is already drilled to take the nicads, which are underslung and fixed with cable ties supplied, which are then cut short. Holes for front and rear attachment are also drilled. A diagram gives location of remaining holes for fixing of resistor. Location of servo for same is also indicated. Check that your bits do fit where holes shown (mine didn't — as a stray hole on plate indicates!) It remains to cut out hole for servo, tightest fit recommended — drill holes for fixing screws; and hole for on/off switch close to front attachment hole. My nicads were joined by a very long lead which I shortened and re-soldered to allow just enough spare to go round radio plate attachment hole.

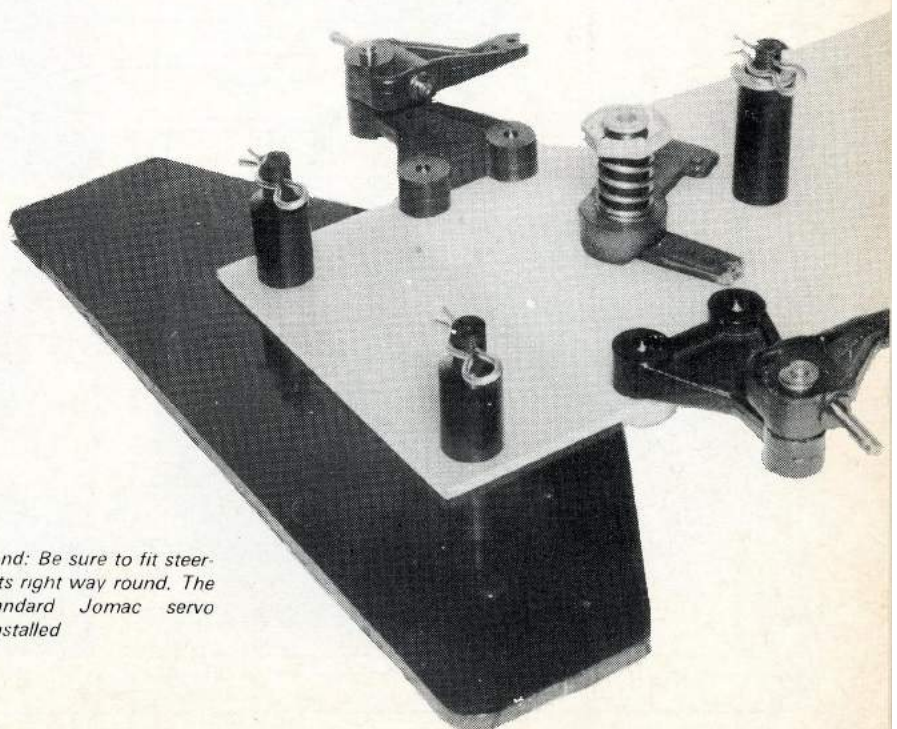
A clear diagram is provided for attaching leads to nicads and motor plus lead-outs to receiver. You can tap the nicads directly for Rx power checking whether your receiver is operative on 5v or 6v. However, I was

lucky enough to pick up a couple of suitable diodes (man never had them in stock before) and used them to block off current with a straightforward lead from the 7.2v end. In making these connections note that there is also a diagram showing microswitch and resistor to enable car to be reversed. This microswitch did not figure in my kit though the resistor did — only the sketch. There are no kit instruction references to this so I can only assume it comes in a deluxe kit version. Since this it quite an advanced kit I include a photo of the right micro-switch. I know that Micro-Mold carry it, so does Ted Longshaw (it

is a Bo-Link spare) and comes with installation instructions.

I have used my little MacGregor outfit for this car and Rx fits best Swedish style (just) between the nicad banks, though the sundry leads require a bit of tucking in. If you want to put your steering servo under here then Rx can sit on top, on a piece of double sided servo tape. This is certainly easier to get at than underneath for changing crystals etc., but not so effective in keeping weight as low as possible. I wonder how much it matters really?

Body provided was a Lexan Bo-Link Porsche 917-K, perhaps the most popular



Front end: Be sure to fit steering units right way round. The non-standard Jomac servo saver installed

Fig. 4. Connections from Nicads to motor and resistor

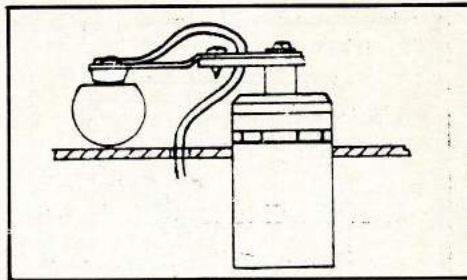
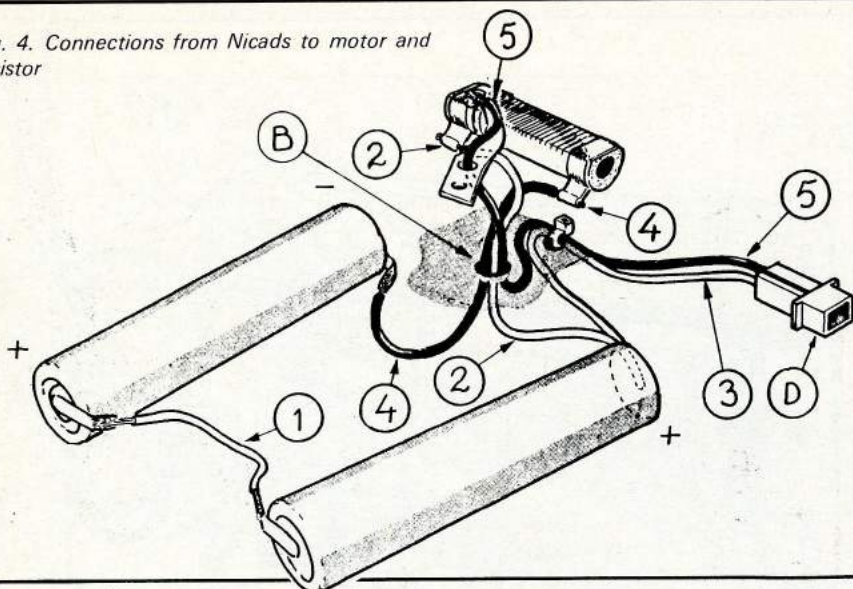


Fig. 5. How resistor and servo 'button' should be fitted

and practical bodyshell ever. Alas, the front body posts supplied were not quite high enough to clear my forward based servo — nor would they have fitted without it being there — so I found a couple of spares from that so useful workshop item, the junk box, and used them instead. They were cut-down adjustable ones from another kit.

Determined just for once to follow the instructions exactly I left the body untrimmed and started the painting job. Windscreen and side windows were masked off with Frisk. This, as you may know, is a thin clear self adhesive film used by graphic artists to mask off or protect their work. It peels off without leaving a trace. I use it a lot in magazine work but it is ideal for this secondary purpose. A big roll costs only a few pence. Two strips of sellotape lengthwise, well pressed down masked off the decoration. Inside of the Lexan shell had already been wiped over with a little washing up liquid suitably diluted using the washing-up J-cloth. Then with a fill-up of orange from the Greeno Supa Car range suitably diluted in its turn and the old Humbrol spray and a bottle of air I managed three thin coats in the morning and another after lunch. I left it overnight and then stripped off my decoration sellotape which worked a treat.

The white paint to follow was harder as I had to clean the glass container (and myself) but that after rather too thin coats began to give the orange a decent background build-up with No. 4 coat; one more for luck and the windscreen and side windows were stripped of their Frisk. Just a little run on screen to disfigure it. A small paintbrush dipped in thinners loosened the run which could be wiped off with a tissue. Another light dip of thinners and the pane was clear. If runs are not too extensive (usually our own fault!) they can always be cleaned up with care.

Final touches included a good sprinkling of decals. Nowadays they are mostly the self adhesive transparent backing kind which take no time at all to put on. Mine are a mixed bag from unfinished sheets including PB Graupner Jerobee and Mardave — never throw things away!

I enjoyed putting this Swedish kit together. It has a lot of good features and I would recommend it to anyone who has already made a kit or two and run them with average success. This may prove the breakthrough and get you amongst the winners; it has the potential but the driver has got to get it out as always. Thanks Minicars and AMPS for the fun of building another car.

Marking for Positive.

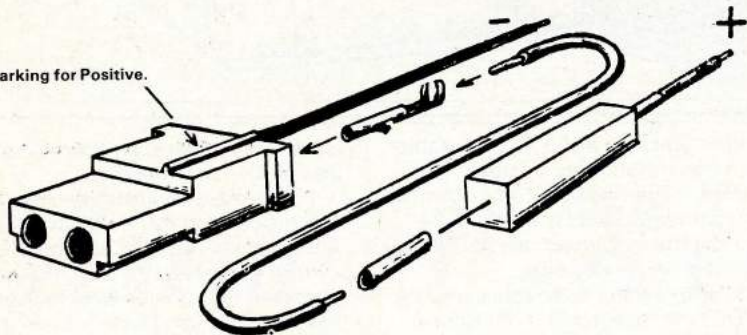


Fig. 6. Plug & Socket assembly: Positive is marked & cannot short if fitted thus.

Figs. 7, 8, & 9. Circuit and details for micro switch reversing facility

Fig. 7

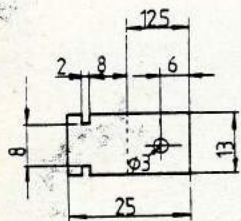


Fig. 8

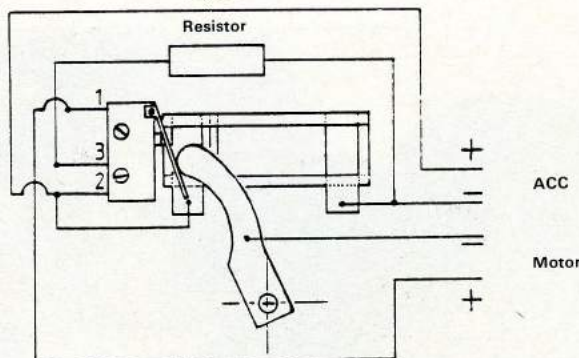
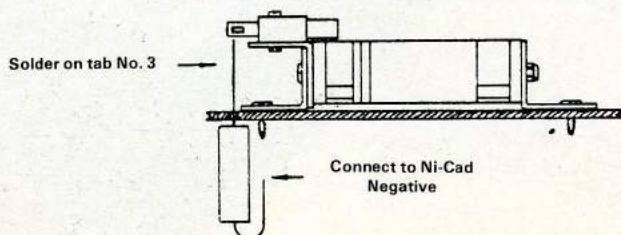
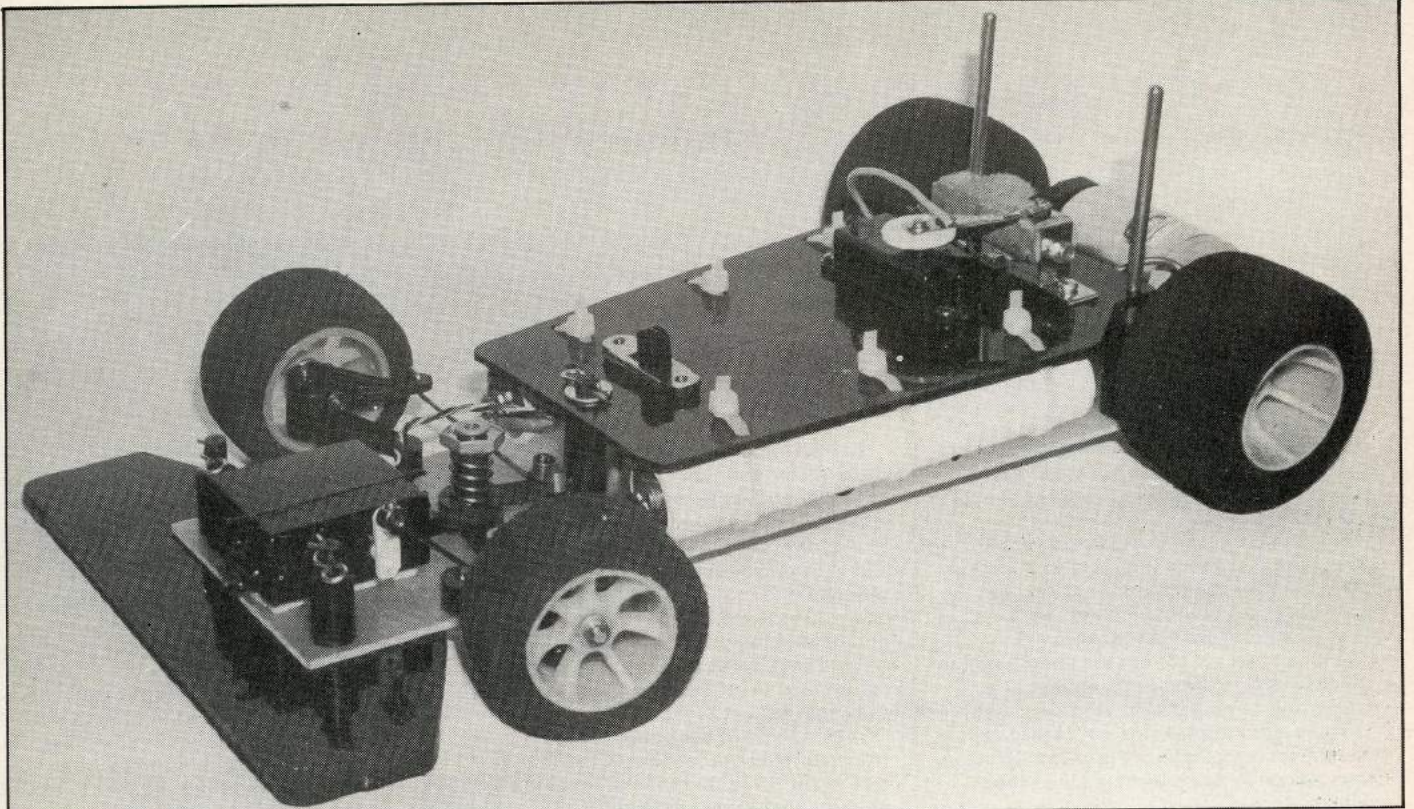
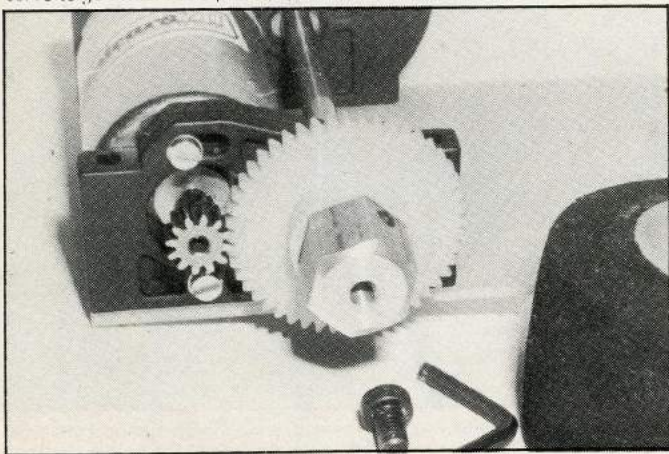


Fig. 9

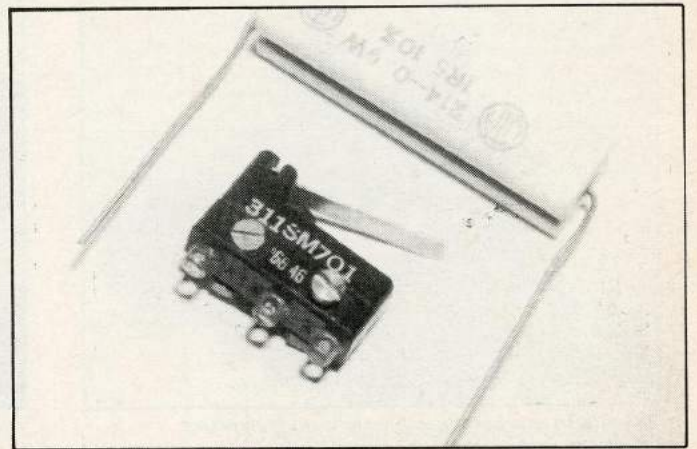




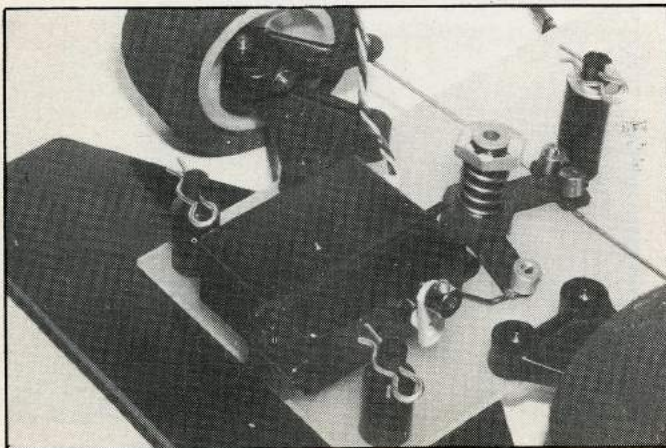
The bare chassis complete. Rx is fitted under radio plate between nicads 'tubes'. If desired can be placed on top of radio plate, allowing steering servo to go under radio plate



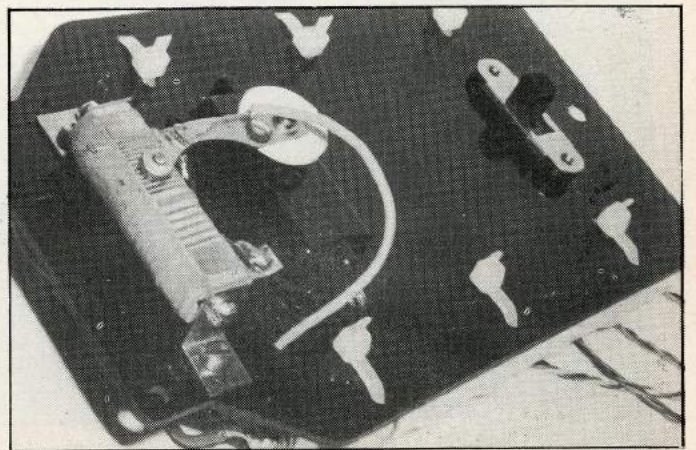
Detail of hexagon driving block and gear assembly



Micro switch & resistor if reverse desired



Forward location of steering servo. This required substitute body fixing posts to be fitted, though probably needed in any event



Radio plate with nicads underslung, resistor in place and speed control servo fitted. On/Off switch on front

Speed Controllers for Electric Cars

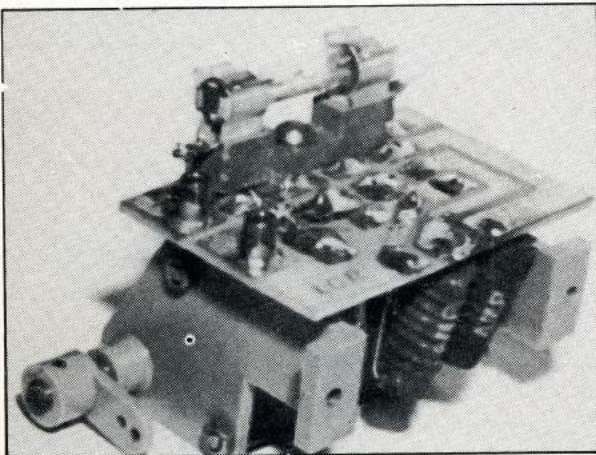
AMERICAN MADE electric cars (and indeed cars made in Japan for the US market) make use of a resistor type speed controller which is basically a ceramic core on which the resistance wire is ribbon wound or a similar flat plate serving the same purpose. A wiper is attached to a servo disc and wipes across the wire windings in an arc to vary the speed. Many of these ceramic type controllers are exactly the same as those used in hand held speed controllers for slot racing, so that the arrival of rc electric cars must have been a boon to those who had kept their slot car stocks!

British and European kit makers decided almost from the start to use a printed circuit board which again used a variety of wiper to move across it and control speed. The very first British kit used a series of cams to control their cars but it was less efficient and more expensive than a pc board. Early examples were quite crude and tended to burn out in part by unintentional shorting, but, by dint of continuous experiment and improvement, they are now very reliable.

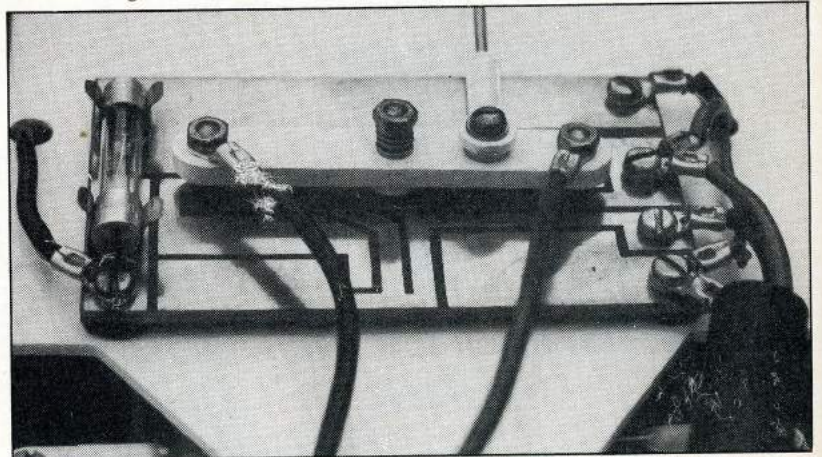
A third type of controller is the transistorised proportional little 'black box'. Cost is rather high but it has certain advantages as well as snags. Main

advantage is that a separate servo for speed control is not needed so that the cost of this can be offset against cost of the controller (amounting to more than half its cost!) Disadvantage (shared with the ceramic type resistor) is that forward speeds only are possible in the standard models.

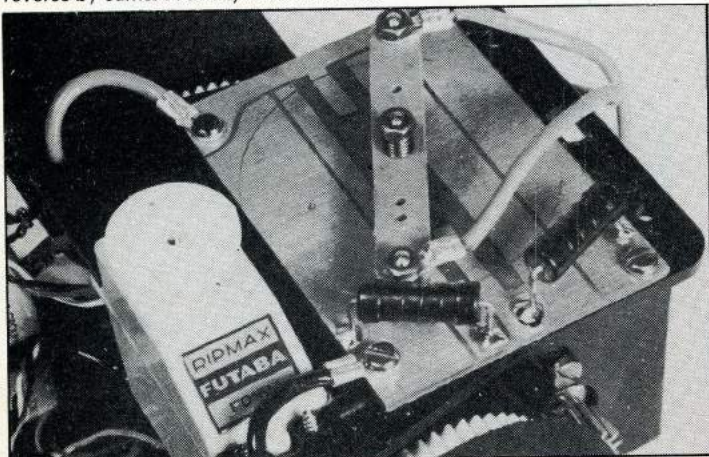
The printed circuit boards provide both forward and reverse speeds — this latter can be very useful if you get into a tight corner. Some of the very latest electronic controllers do permit limited reverse, but the cost goes up again. In the same way it is possible to modify a ceramic type to give a limited reverse facility.



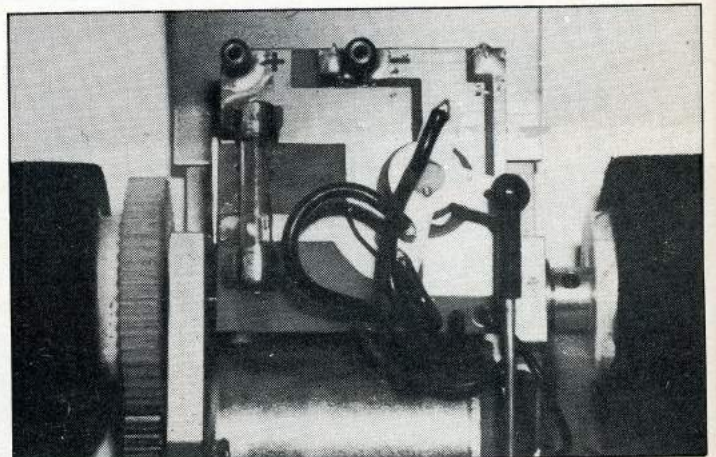
First British type operating three forward speeds and reverse by cams. A safety fuse was fitted



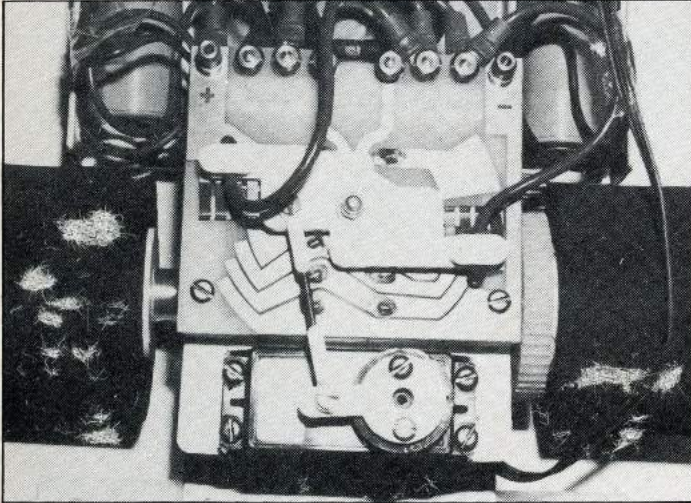
First of the printed circuit boards with quite limited range. Safety fuse still retained



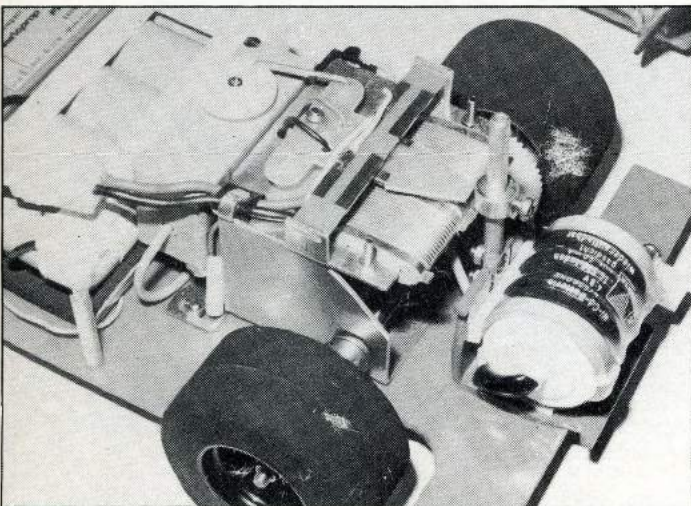
A rather more ambitious board. Connection from servo yet to be made into any one of the three holes in lever. Note additional resistances coiled on right.



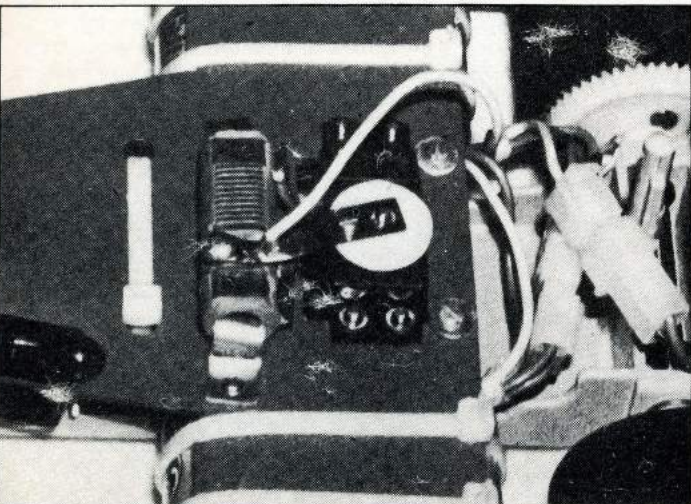
Another fairly early version: again still with fuse



Circuit board with choice of 4- or 6-cell operation and six forward speeds plus reverse



Japanese style ceramic core wire wound. Flat shape allows more contact area



Swedish version with round ceramic core, placed directly on radio plate with underslung nicads

How the Controller Works

If you switch on an electric motor it goes flat out until the battery to which it is connected has been exhausted. By putting a controller in circuit with the motor you are preventing this flat out performance. The slower you go the longer the battery will last; the faster you drive the shorter time you will have.

A six-cell ni-cad has six cells each of 1.2 volts, or expressed another way 1.2 amp-hours. That is they will each supply 1.2 amperes for one hour. The energy storage in a six-cell is six times this of course. However, you will not be using it at this rate but probably at about 6 amps or more so that instead of an hour's running you will be down to 10 minutes or less.

If you think of your domestic electric light bulb the higher the watts marked on it the brighter the light and the more current consumed. This is why the careful householder adjusts the brightness of his lights to his needs — it helps keep the bill down!

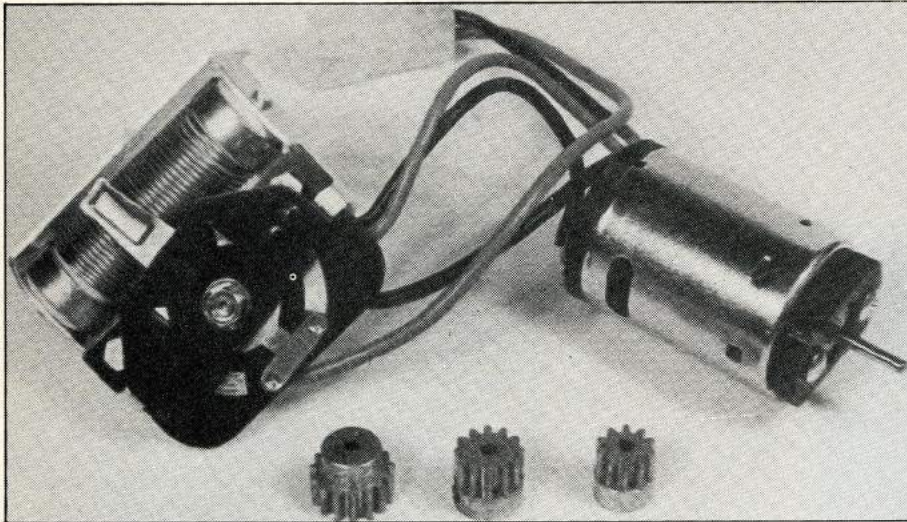
When you block the passage of current with your controller by making it pass through a winding of resistance wire this blocked current must go somewhere — it is dissipated in heat as you can easily feel. There is, alas, no way of sending it back unused to be stored for when you need it! **All** speed controllers waste this current in heat losses, some more than others.

Ceramic Wound Resistors

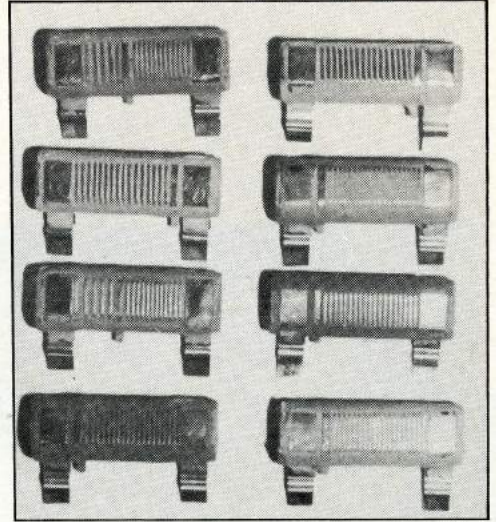
Experts will tell you that in theory this is the best type of controller to use, **provided** they add, it is perfectly assembled. It can have low heat loss and can be changed to suit particular types of circuit layout or track surface.

A colour coded range of these resistors is available (from Parma amongst others). Lower ohm resistors give fast high speed response, but don't do so well at slow speeds. Higher ohm resistors give better slow speed response but are not so good in response at high speeds. They must be kept clean and the button on the swing arm must be in good contact with the windings. A fine emery cloth will serve to keep the resistor clean and current passing. With this type of controller you must anticipate braking or accelerating since there is a degree of time lag. This can be helped by shortening the wiper arm throw or by using servos with a fast response. Another way, with brake band type resistors is to reverse them — using the shorter brake band as your speed band and vice-versa.

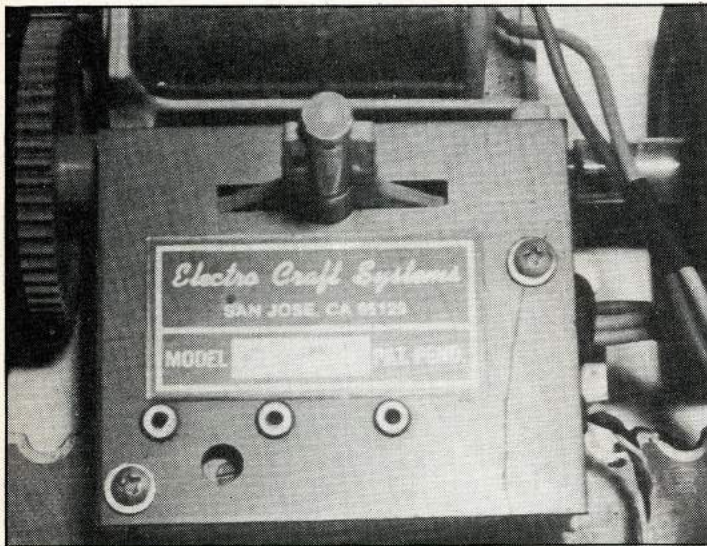
You can also obtain (Jomac) an adjustable brake pot which can be used to adjust your maximum braking level. It can be used with any resistance type speed control system.



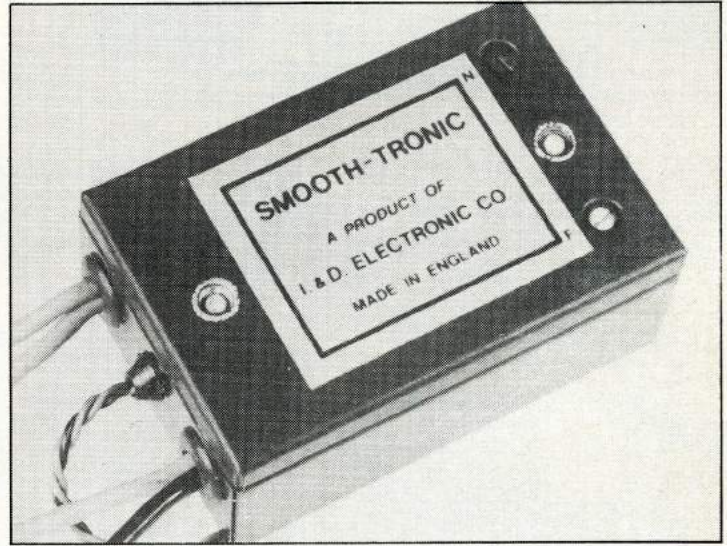
Wire wound ceramic core with attached wiper plate to go on servo as fitted for Eleck motorcycle. Note also motor and choice of gear ratios.



Range of resistors from Parma, USA. Note variety of windings. Wide spacing indicates braking area. Available in various ohmages.



Electrocraft electronic proportional speed controller. Very thin and designed to fit on Jerobee chassis pillar. My first and still going after nearly four years.



Smooth Tronic very neat and matchbox size. First British made on the market and integral part now of Spectron kit car.

Printed Circuit Board Controllers

This type has the virtue of a built in reverse facility. As flat plates they are not difficult to install. Control methods vary slightly. They may have wiper arms attached directly to the servo disc or there may be an arm extending over the pc board pivoted about the middle to which a control rod from the servo disc is attached. This would seem to provide the best contact with the least strain on the servo.

According to their design they can have a number of different speeds (gears shall we say?) limited by the size of the pc board. Up to six gears (or subdivisions of the board) is quite practical without too cumbersome a plate. There is always the risk of burning out a gear (the metal of the pc board is very thin) but that need not stop you — you just jump the non working gear. The beauty of these multiple gears is that speed is smoothly and progressively controlled thus helping to get the most out

of each battery charge, and also by the very smoothness ensuring a minimum of unrehearsed slides on a too slippery track.

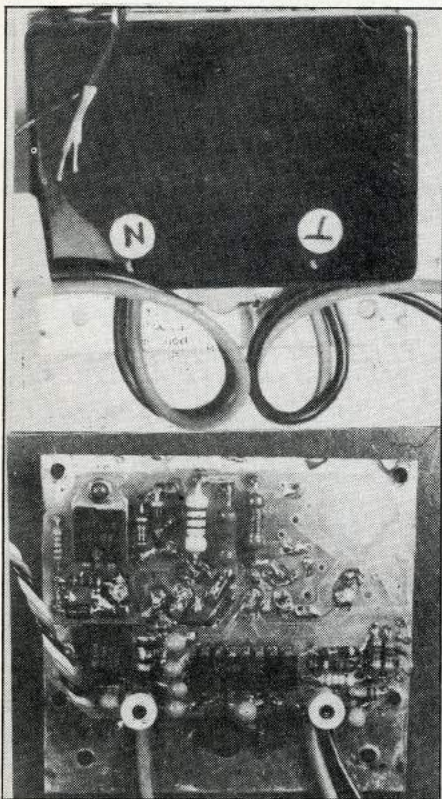
Electronic Speed Controller

Finally comes the electronic speed controller. This is normally fully proportional forward speed and dynamic braking, plugging into receiver with a regulated 5-volt supply taken from the motor ni-cads which eliminates receiver battery and throttle servo. The latest types also offer the additional facility of reverse.

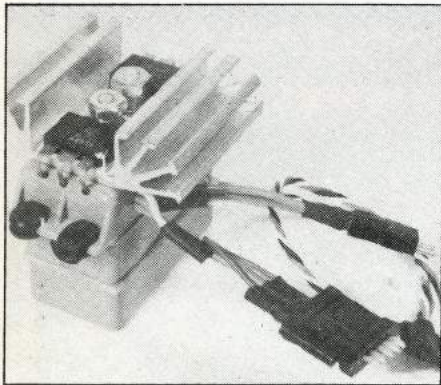
The package comes in a stout container with detailed installation instructions (not difficult) and should last out a number of cars. If you unscrew it you will find a complicated pc board layout. Do not fiddle with it unless you are nearly good enough to design your own! According to make there will be limited adjustment that can be made without opening the little black box — this should content you.

The first one I had was the Electrocraft from USA which came with my Jerobee package deal. Unfortunately it was wired up so that my throttle went the opposite way to my normal left handed usage. However, Richard Gammon, of Smoothtronic and Spectron fame, was visiting and he saw that the expert maker had provided an alternative wiring change on the pc board and in a couple of minutes had effected the change with a tiny little iron and it has worked right way round for me ever since. But I would never have dared to do it myself — let alone know which wire to move!

Richard's Smoothtronic was the first electronic controller to be readily available over here and has continued to be in demand. It is included in the Spectron car kit made and marketed by his firm I & D Electronic Co., now of Peterborough. It could be claimed as the first British kit that could regularly be expected to win contests 'straight out of the box'. The



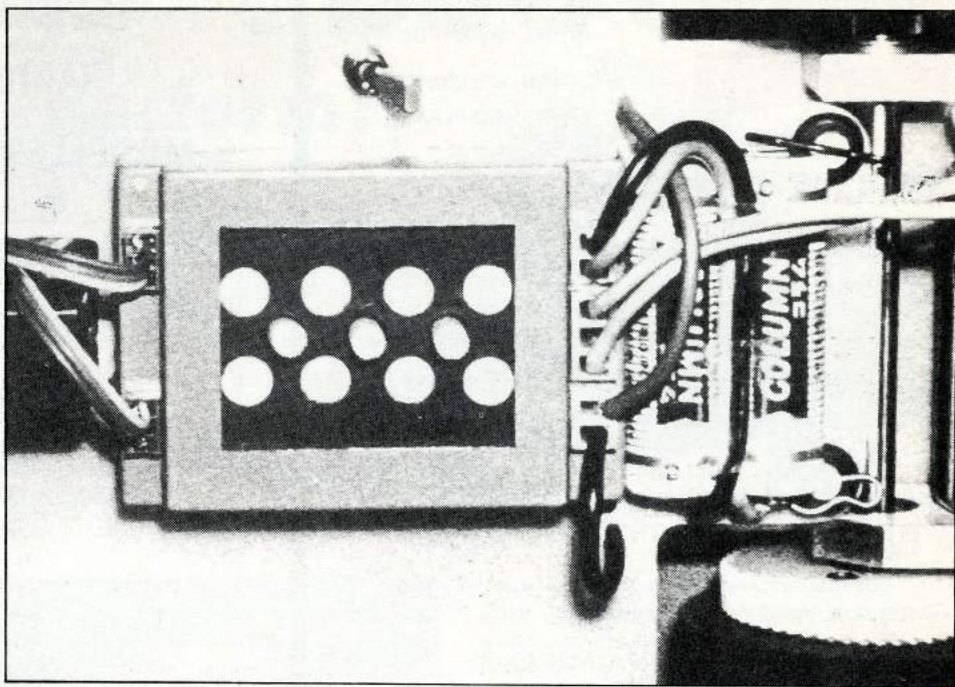
Nick Adams Demon, shown as box and internal layout. Originally made for clubmates, now being produced in three figure monthly output for Gemini kits.



Interesting electronic speed controller from USA by JoMac. Fins are for cooling. Size is same as servo case (perhaps even same moulding).



Another British unit, small and neat by Unicorn Electronics.



Clever experimental unit by MacGregor Industries. Not commercially produced as yet. Two little batteries operating reverse not accepted for official racing.

smooth tronic is about the size of a matchbox.

Next in line of public appearance — this is not intended as a which is the best list! — came Nick Adams' Demon I. Nick is Chairman/Editor of the now famous **Ally Pally Newsletter** as well as a founder member of the Ally Pally Electric Car Club the first London r/c electric car club with its original circuit on the high speed skating rink at ill-fated Alexandra Palace. The Palace authorities had already decided they could let the hall at better rates than the club paid, so a move had already been made before the fire. The original Demons were made on a one-off basis to order, mainly for club members and done as a spare time occupation, now Nick has teamed up with Phil Greeno and more are being made for sale and insertion in the Gemini car kit designed by Phil and as car fans will know an outstandingly successful kit, also 'straight out of the box' winner quality.

Another very interesting electronic controller comes from L & M Electronics. This is rather squarer than the others being $2\frac{3}{4} \times 2\frac{1}{2} \times \frac{3}{4}$ in in size. It enjoys a limited form of reverse in standard form. Pulling back the stick through the neutral point you come to reverse, wait 3 seconds and reverse operates. As soon as the stick is moved back to neutral the reverse effect ceases and forward motion is resumed. It is really intended as an occasional 'get out of trouble' facility — quicker than a marshal would move the car in a race perhaps!

The usual external access to trimpots is provided. I got mine from Brian Field of The Red Baron Models in Enfield.

Unicorn Electronics of Coventry have brought out their Unitrol (I saw it first at

the National Championships in Bradford in 1979). This is another almost matchbox sized outfit $52 \times 33 \times 32$ mm dimensions. It enjoys both forward and reverse speeds — the latter with no delay. Considerable power adjustment is possible to suit the skill of the driver; on loss of radio signal brakes are applied by a failsafe unit.

MacGregor Industries whose radio outfits will be well known have also come mildly into the market with experiments in this area. They showed a prototype controller at the Nuremberg Toy Fair which followed quite different lines with the reverse function operated by two mini cells. However, this idea has not, I think, been pursued since it was pointed out to them that these extra mini cells would be barred in racing by the existing rules. A pity perhaps since it looks a very neat job and the extra batteries are insignificant in size ... but rules are rules.

From USA comes the Jomac controller which has the virtue of novelty. It is designed to be the same size as a servo and uses a similar type of case. It has an outside (and outside) heatsink with fins such as are seen on ic engines which should give adequate cooling. It works on a feedback system where it adjusts car speed to that signalled by transmitter. It also has adjustable torque which means that it can be set to suit track surface — an asset with very slippery floors. Brake is also adjustable. It appears to operate only with Jomac receiver.

The electronic controller range do use rather more current than other forms of speed control, but this extra is really so small regarded as a percentage of power available that it can be ignored in making your choice.



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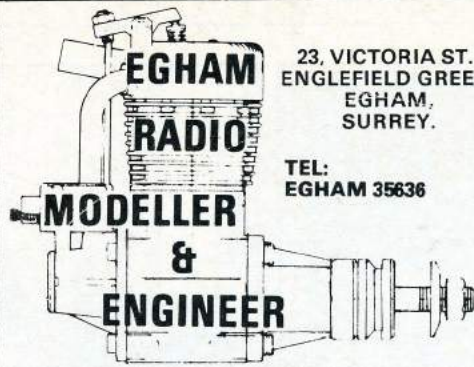
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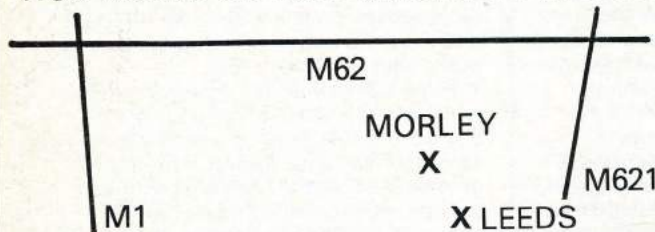


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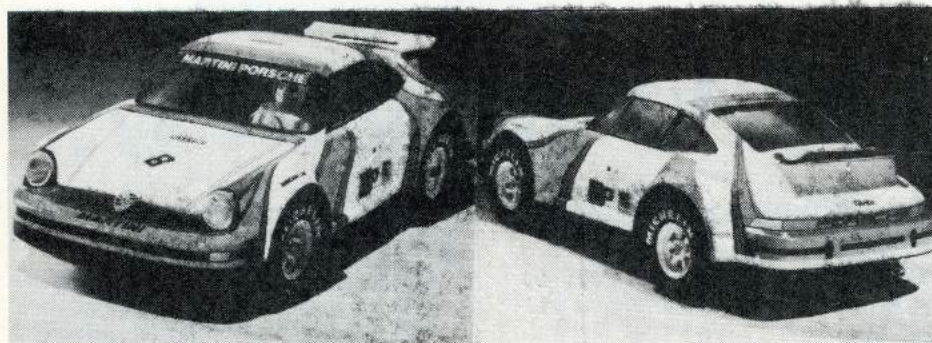
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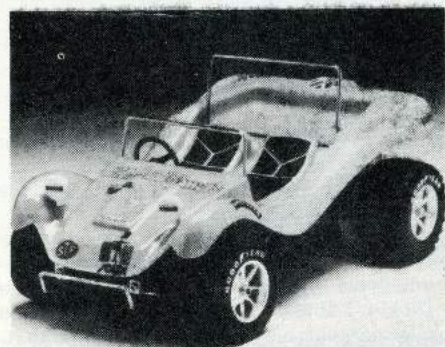
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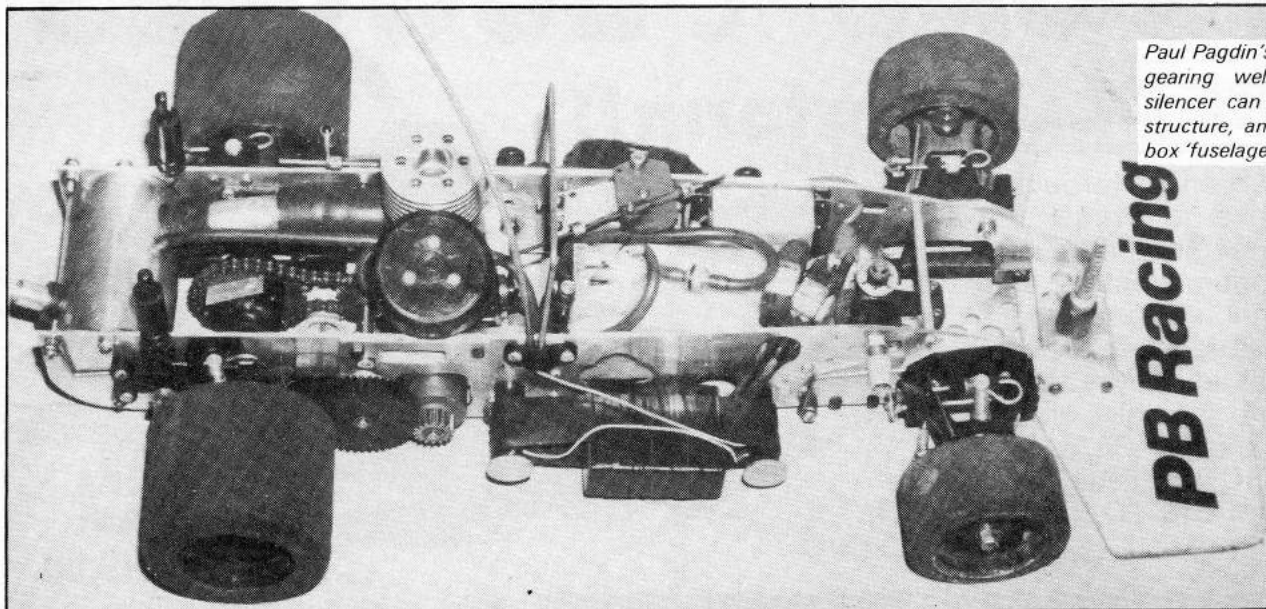


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Paul Pagdin's Prototype car. Note gearing well clear of ground, silencer can as part of rigid box structure, and slight narrowing of box 'fuselage' in front

IT ALL HAPPENS AT HAVANT...

THERE IT WAS ON THE DESK a great shining lump of metal cunningly indented: nearby stood Prototype No. 1, muddy and short of a wheel, like a mechanical tomcat back from the wars. Keith Plested, 'Mr PB' rose from his drawing board and pointed: "There you are! First of the moulding patterns. Took an hour and a half on the Bridgeport last night. A toolroom man would have taken days. Another seven to make before I go off to Japan".

"How did the Austrian trip go in Vienna?"

"Oh, I won the Sports/GT in the Austrian GP. Wonderful new circuit, longest in Europe — over 300 metres long. Blew up an engine in the Formula; all my fault I had been running that OS for meeting after meeting — never a fault. I had to re-build the whole chassis too after a monstrous glitch. But it solved one of my problems. I have been putting the cars together on a perfectly flat surface with all modern aids. There I had the usual rickety folding table to work on. I took about an hour with an interested crowd of spectators. It looked all right and I went on to take the Sports/GT with it. When we got home I checked it — only about a degree out of line. This means that the ordinary driver building a kit probably without our works facilities for accuracy can do just as well ..."

"I expect you're quite relieved that the season is virtually over?"

"Not a bit of it! I'm entered for the Australian Grand Prix in October, I shall be going there first and then on to Japan ..."

Keith went on to explain that he was making a start on production for the PB all-suspension car with its chain drive. He pointed out the immense variety of gear ratios possible with this new departure, and the location of the gears well above the

danger level of getting torn by road surface with tyres running low on rubber. Then the problem of fewer and fewer teeth on the smaller spur gear automatically solved by the second gear step between engine and gearshaft.

Development was still continuing but he had now completed, with the assistance of Paul Pagdin, two more Prototypes. The Booth/Preston car (the third semi independent suspension car with De Dion suspension) had been really a stop gap job by Dave Preston to get into the 'wobbly wheel' set at short notice. For all that, the car had just won the Belgian GP in Ghent.

With eight days before his departure and lots to do Keith passed me over to right hand man Paul for a detailed photo session and discussion ...

Dickie: Tell me Paul what part have you played in this development?

Paul: The idea and initial development was done by Keith, during the months before the start of this season. Since then I have worked with him to produce first one prototype and subsequently a total of four cars which are all in various stages of development although we are now very close to putting the car into production.

Dickie: Now, starting at the front of the

car, what kind of suspension springing have you adopted?

Paul: We have torsion bar suspension which is quite soft. But we can utilise soft springs because we are using oil-filled shock absorbers of the telescopic variety as in fullsize practice to damp excessive movement.

Dickie: And can you alter the rate?

Paul: Yes, the rate is variable but we haven't found it necessary to change this. We would need to change the torsion bar which I think is a three or four minute job but we have not, as yet, come across a circuit which requires a change of spring rate.

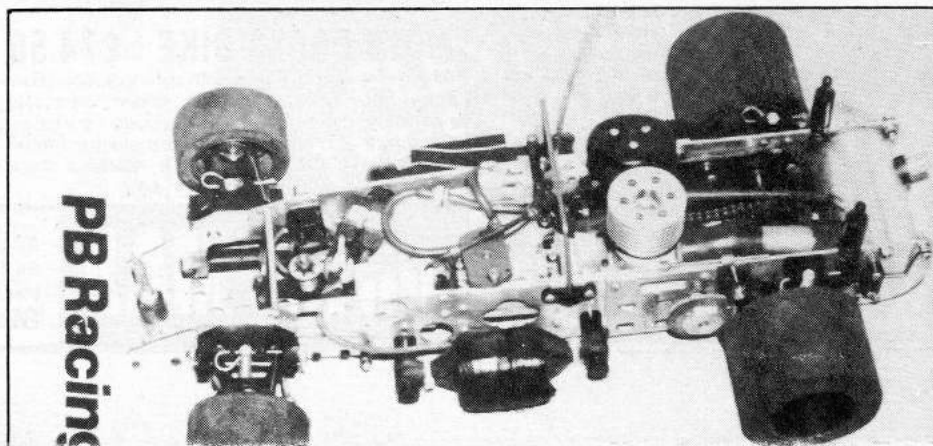
Dickie: Does this apply equally to the rear end?

Paul: Exactly the same system is employed with torsion bars and hydraulic shock absorbers. Again, we only carry one set of springs, but can adjust the right height which we find useful both at front and rear.

Dickie: I note you are retaining a rear end silencer with a straight through pipe to it; is there any special significance in that?

Paul: Yes, the silencer can is an integral part of the chassis and imparts a large degree of stiffness to the rear end. Using the construction which you see on the car

Other side view which shows straight through exhaust entry and location of disc brake



here we are able to retain a silencer which is adjustable, in that the length of mini-pipe can be changed by sliding the inlet pipe in and out of the can. Also it is improved because the exhaust is virtually a straight line, which is more efficient.

Dickie: Now coming to the chain. I did ask if you were using any special sort of chain, but I take it you are using any sort of available chain?

Paul: At this moment we are using as you say, available chain. On this particular car it is 5mm standard roller chain. I am almost certain that on the production cars it will be 6mm. This isn't due to any problems with the 5mm but 6mm is more readily available and even stronger.

Dickie: Well, that's important. Tell me, I see you've got a chain tensioner, that would, I imagine be retained on the production model in some form?

Paul: I would think so; some form of chain tensioner will be required unless we can get the design centres sufficiently accurate and chain life adequate without it.

Dickie: At the moment I think you are joining it with a link but in production I understand you will fit an endless belt?

Paul: That's quite true; in fact, this particular chain has no link — it is endless rivetted chain.

Dickie: The location of the chain and its accompanying gear is fixed permanently on the car and ratio changes effected by the spur gear — is that so?

Paul: This is quite correct, by utilising three clutch bells and three pinion gears we are in a position to have a wider range of ratios than one would normally use on a standard car.

Dickie: Almost like changing gears on a lathe?

Paul: Its a very quick matter also providing access to the clutch in a matter of seconds.

Dickie: I see that you have a box framework rather like a model aeroplane fuselage, slightly bowed coming through to the front.

Paul: Bending the chassis inwards of course gives a great deal of rigidity and we

think it is vitally important on a suspension car to have a very solid chassis that you can hang the wishbones on.

Dickie: At the moment you are using an OS engine — are you going to make it available for a general selection of engines?

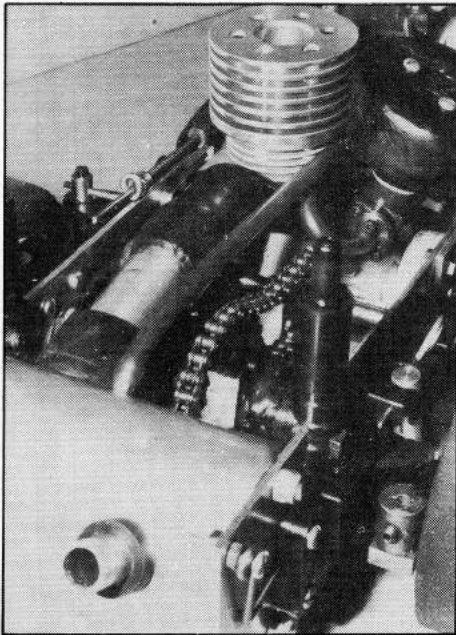
Paul: Yes, we are at the moment working on the rear exhaust engines. As it stands now the normal side exhaust engines will fit and before we get into production I am very confident we will have provision for the rear exhaust engines (Stop Press! Paul tells me rear exhaust engines can now be accommodated).

Dickie: But with a rear exhaust engine you will lose something of that straight through exhaust facility?

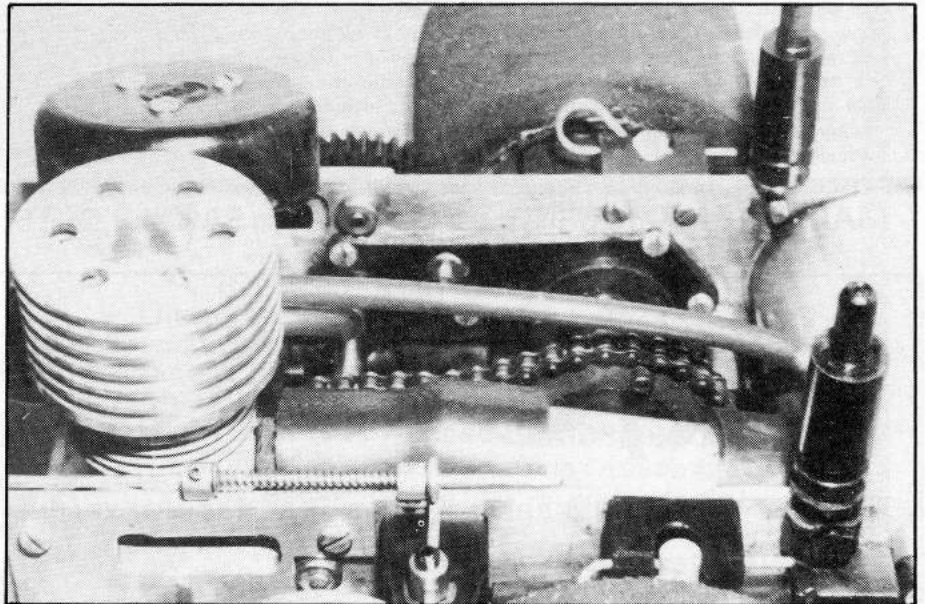
Paul: It will not be straight but we will still retain the rear can.

Dickie: Thank you very much for that. But can you give us any idea as to when it is likely to be in production?

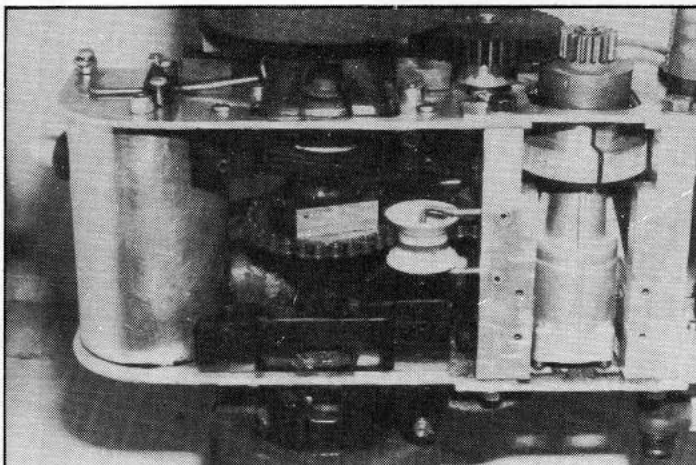
Paul: We are hoping for May/June next year.



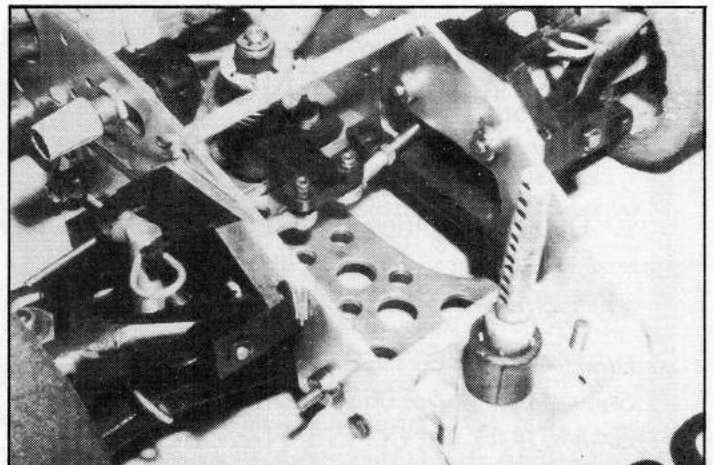
Another aspect of exhaust pipe and pressuring arrangement. Note also torsion spring



Close-up of exhaust pipe which can be adjusted; note also return tube to can pressuring fuel



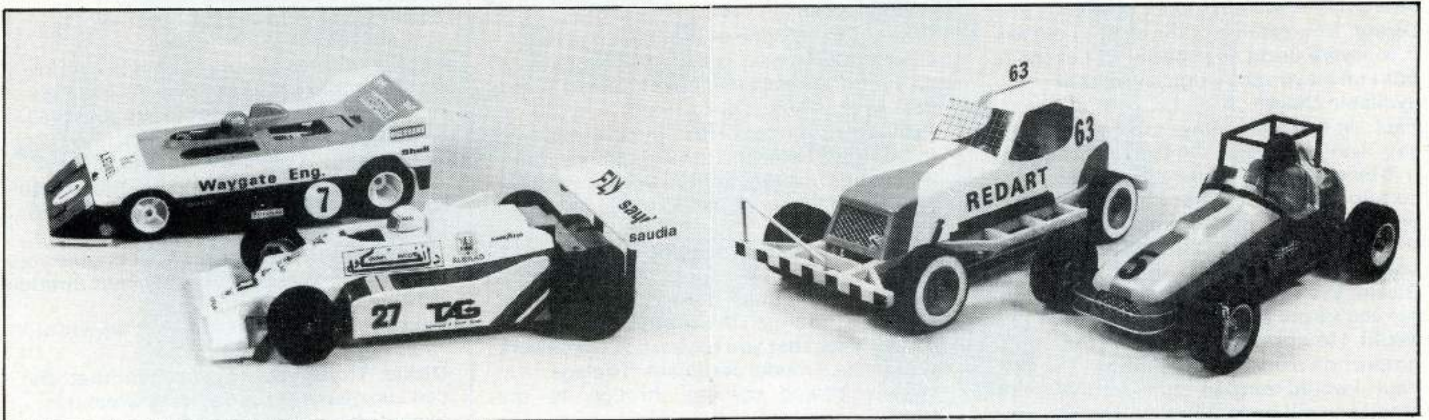
Underside of chassis showing chain tensioner. An additional plastic moulding will enclose most of this underside for waterproofing purposes



Front end which shows the wishbones and torsion springs to advantage. Paul has indulged in considerable chassis lightening here

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