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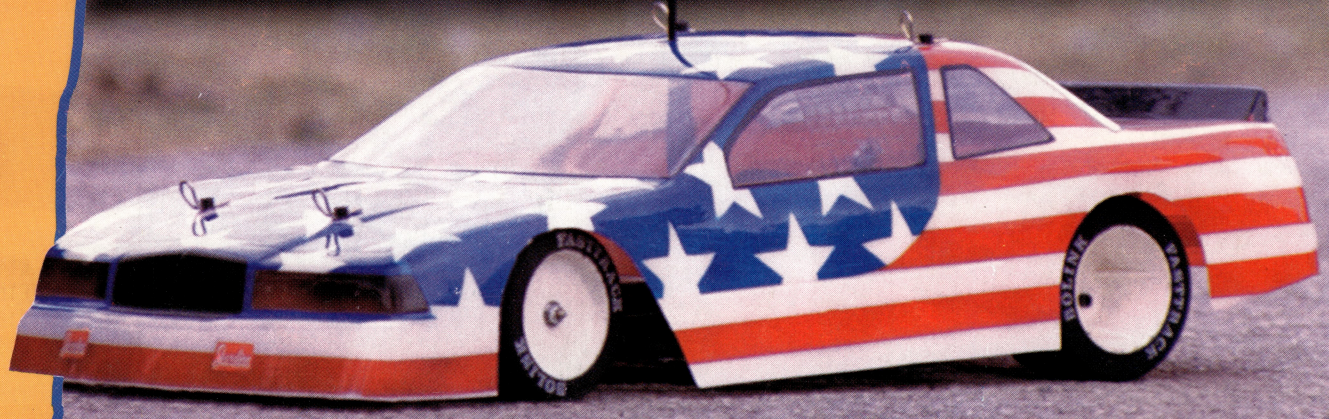

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CONTENTS

OCTOBER 1989 • ISSUE 71

MANAGING EDITOR **Tony Stephenson** | EDITOR **Dave Pearson** | ADVERTISING MANAGER **Jane Stephenson** | ADVERTISING CO-ORDINATOR **Jeanette Adams** | DESIGN MANAGER **Neil Blowers**

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Jim Davey • Bob Errington • Mike Billinton

6 ***PERSONALLY SPEAKING***
"Once more into the breach"

12 ***AUNTY JIM'S AGONY COLUMN***
Got a problem, write to Jim

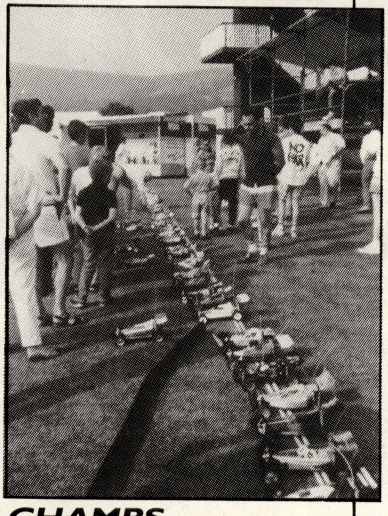
18 ***W.D.A. GRAND PRIX***
Kevin Griffin writes

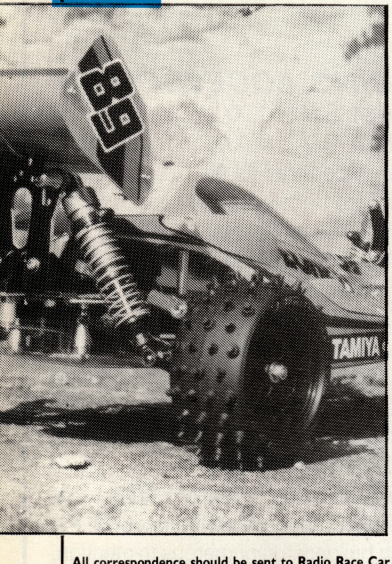
24 ***SUSPENSION***
Springs and things by Michael Beattie

28 ***SERIES RESULTS***
RRC 4WD Finalists and BRCA/RRC Top 100 Finalists

38 ***COMPETITION***
"Loadsagoodies" to win in this great free RRC/Parma Competition

39 ***RACING LINES***
Better, Faster, Stronger — it's all here





42 ***1/8th WORLD CHAMPS***
Bob Errington reports from the happening at Heemsteed

46 ***TAMIYA EGRESS***
This is it! World Class racer from Tamiya

50 ***RALLY CROSS***
No it's not what you think! 1/10th from Southend. Don't miss it.

54 ***BRIMOD'S BULLET***
Take a look at this and the price is not a misprint

65 ***BOLINK ELIMINATOR SPORT***
Then look at this one too!

70 ***STOCK 'N' OVAL***
Mike Smith 'n' the Ovalkeenies

79 ***CLASSIFIED ADVERTS***

81 ***SHOPPERS DIRECTORY***

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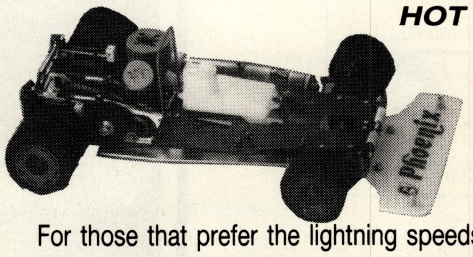

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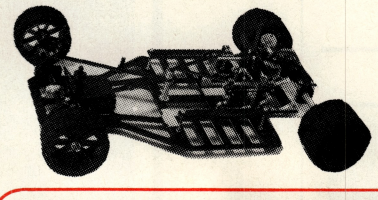

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MODELS

Access

PERSONALLY SPEAKING

My colleagues from the world of r/c flying tell me that there is no way that a beginner would be allowed to join a club and then go his own way to find out all about the perils and pitfalls of his selected hobby, it would be both dangerous and counterproductive! Well sometimes we in the r/c car world do let our raw recruits go about things their own way, we are also the first to moan when the same individual, through no fault of his own, does something unethical or stupid. The West London Racing Club are making a great deal of effort to introduce drivers into our sport properly, anyone else interested?

On 17th June I had the pleasure of attending West London Racing Centre at Northalt, Middlesex, for their 3rd Beginners Meeting.

Following Radio Race Car's suggestion back in January '88 WLRC decided to hold their first Beginners Meeting in June of that year and were amazed by filling the optimistic entry limit of 49 drivers, and having to turn a number away on the day.

The main criteria for driver elegibility was that they had not previously entered a formal Race Meeting and were of novice standard. The cars had to be 1/10 (or 1/12) off road electric vehicles, two different crystals should be available, and they should have a fast charger.

The entry fee would be £2.00 and everyone would receive a trophy.

It was intended that after a driver had attended such a meeting, they would be familiar with the race procedure most of us take for granted, and which deter most beginners from attending formal Race Meetings.

The Meeting I attended had a very nice selection of trophies and was supported by local Model Shops, who supplied a large number of car bits and gift vouchers as additional prizes.

Drivers were of both sexes, and ages varied from 7 to "over 21"! Heats were divided into 2wd and 4wd with similar cars being grouped together, this has been found to give the closest racing. Certainly the racing throughout the afternoon was very close and very entertaining for the large number of friends and spectators attending. It also makes change to see such a variety of cars at a Meeting.

Volunteer "experts" were on hand to give advice and assist with repairs should they be needed.

Seven heats of seven drivers with two qualifying rounds and finals were run.

A few problems were encountered from the drivers during the day varying from unsoldered wires through to gearbox bearings shattered, but the classic of the day was the small lad that came up to Adrian and said "my car is broken — have you got a nail!" It turned out that his car's plastic tube chassis had split and he wanted to heat weld it using the nail as reinforcement. A nail was duly found he went away to repair it himself — commendable initiative!

The final winners were: A Roddy Brown, Optima Mid Turbo. B Alistair Ball, Optima Pro. C Colin Mills, Nikko Supersprint. D Vicki Blakeman, Optima. E Jeanette Morrison, Optima Mid. F Saly Leonard, Optima Mid Turbo. G Daniel Wood, Tamiya Boomerang.

Everyone was presented with their trophy, prizes were handed out, Final Winners T-Shirts were donated from WLRC, and everyone agreed it was yet another very successful Beginners Meeting.

A number of drivers from the original Meeting are now regulars at normal Race Meetings, getting into the higher finals! I feel sure that this type of Meeting encourages drivers to take that first step into competition, knowing that help is at hand should they need it. Although I was told it does take a fair amount of organising and reliance on volunteer helpers, it is worthwhile for the Club and the sport as a whole.

My thanks to the WLRC Committee, Adrian Jacob, John Derrick and Colin Taylor for inviting me and who are themselves indebted to the support given by Harrow, Seymours, Whitton, Mid-Bucks and Phil Greeno Model Shops, and the members of RC Wheels and Cranford Clubs, plus others too numerous to mention, James Savory for donating the main trophy's and of course all the drivers who entered.

As WLRC are always trying to keep one step ahead, Adrian has asked me to mention a couple of other unique events. As well as their usual Monster Truck Race run between the heats and finals of their regular Meetings on 2nd Sunday of the month, they will be running a Monster Truck Shootout sponsored by Harrow Model Shop, with Sled Pulling, Drag Racing, Driving Test, etc. on 17 Sept. '89, plus a Retro Buggy Meeting for pre 1985 2wd Buggies, e.g. Roughrider, Scorpion, Hornet etc. sponsored by Seymour Models of Harrow on 6 Aug. '89 — limited entries for both these events.

Details and further information, contact: Adrian Jacob (Sec.) on 0895 36745.

Like It Or Not

Whilst talking to a good mate and regular columnist the other day, the subject of races and in particular race meetings came up! He asked why I began off road racing, in my case the answer was not that straightforward but high amonst many reasons was the fact that I enjoyed the sport. He then asked if I was a still enjoying it? Well, on the whole you could say that I am, regular readers of this column will know that my attitude to the brainless few who continue to ruin someones entire days racing is, that they sould be shot and eaten, preferably still semi conscious! The revered columnist in question, whilst agreeing, had another view as to why the general atmosphere and bon homie appeared to be evaporating, his opinion was this. Whilst it appeared that even in these financially depressed times, most people are still willing to spend as much as they can afford, and in some cases a little bit more on racing, they also feel that for this invest-



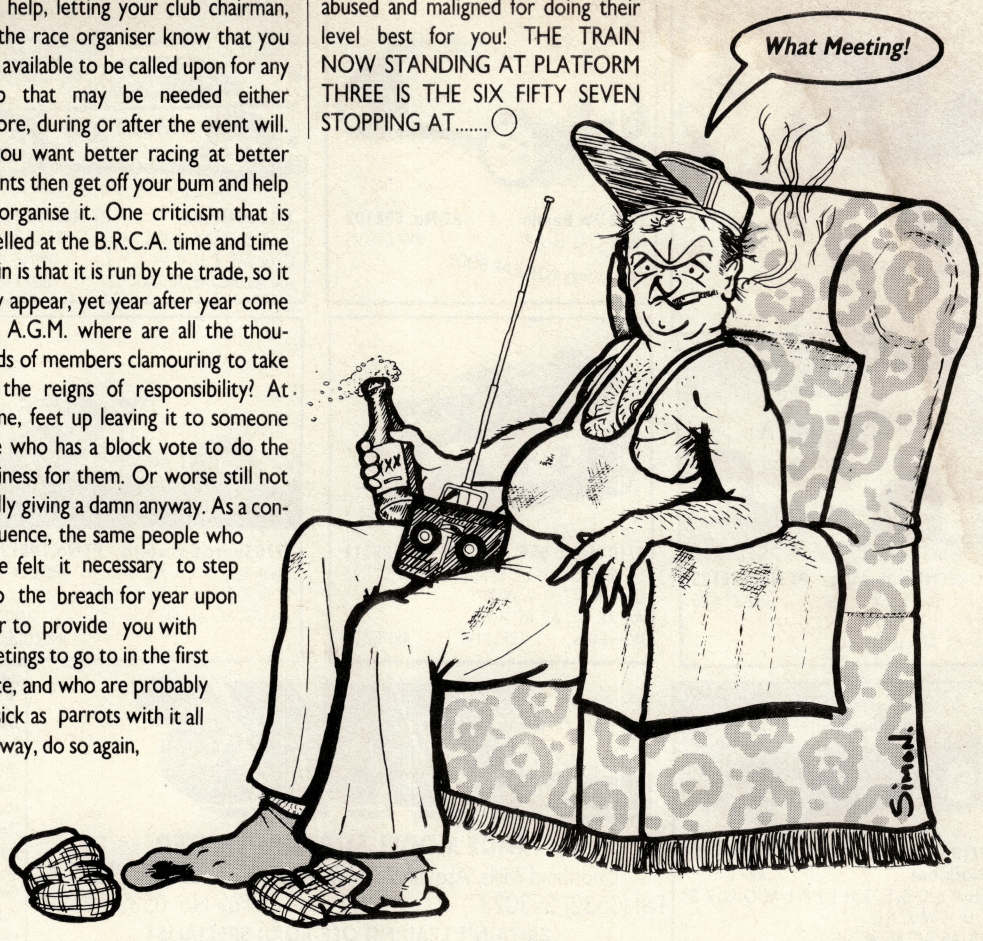
NLRC Beginners Meeting June 3rd 1989.

ment they deserve some automatic return by way of results or meetings that shall we say, could be better organised than they sometimes are!

Supposing that the above is correct then there is no hope for the future of r/c racing in the U.K., sell all your equipment, take up train spotting and argue amongst yourselves that as your pencil is more expensive than anyone else's currently standing on the platform then you and only you are entitled to take down the number of the next train in! Don't stop there though, as the train is three minutes late you must immediately pick up the telephone and contact the chairman of B.R. for an instant apology, preferably in writing, that encapsulates a full reason as to why this occurred. ON YOUR BIKE!

If you can afford to go racing at all then you are fortunate, if you are able to sink amazing amounts of money into your chosen hobby you are a little more fortunate. However, please remember that there is no rule in any rule book that states that, success or enjoyment is directly proportional to money spent.

Whilst some people would agree that this season has not been notable for well organised events at any level, moaning and jeering on the day will not help, letting your club chairman, or the race organiser know that you are available to be called upon for any help that may be needed either before, during or after the event will. If you want better racing at better events then get off your bum and help to organise it. One criticism that is levelled at the B.R.C.A. time and time again is that it is run by the trade, so it may appear, yet year after year come the A.G.M. where are all the thousands of members clamouring to take up the reigns of responsibility? At home, feet up leaving it to someone else who has a block vote to do the business for them. Or worse still not really giving a damn anyway. As a consequence, the same people who have felt it necessary to step into the breach for year upon year to provide you with meetings to go to in the first place, and who are probably as sick as parrots with it all anyway, do so again, and over the next twelve months are abused and maligned for doing their level best for you! THE TRAIN NOW STANDING AT PLATFORM THREE IS THE SIX FIFTY SEVEN STOPPING AT.....○



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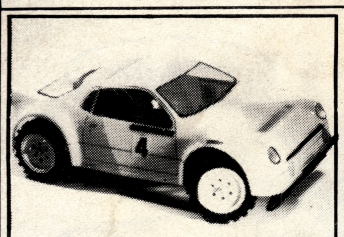

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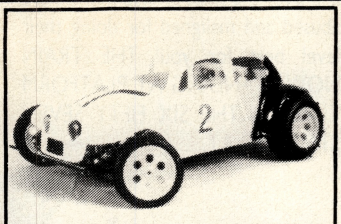

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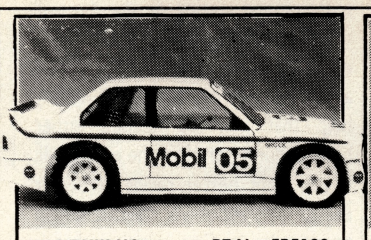

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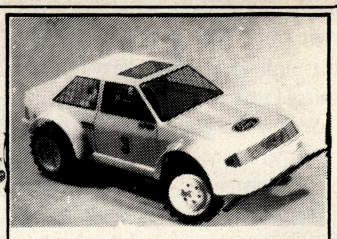

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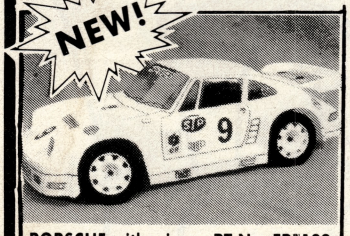

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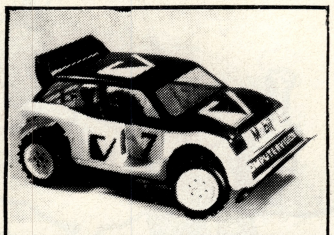

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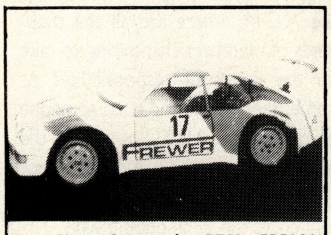

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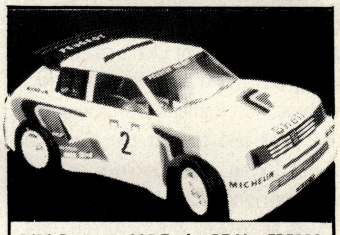

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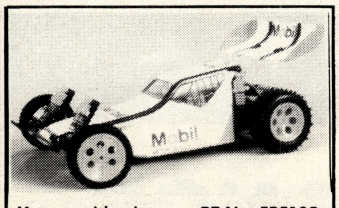

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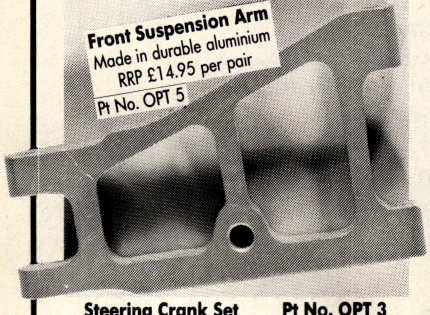

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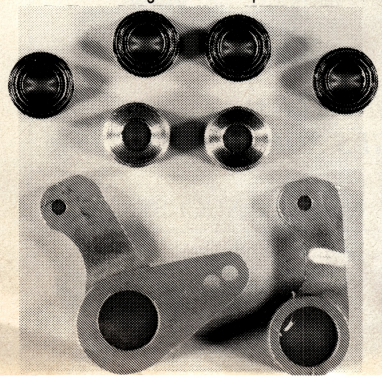

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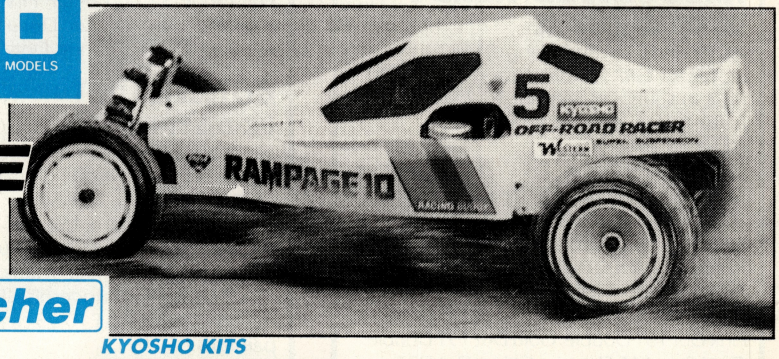

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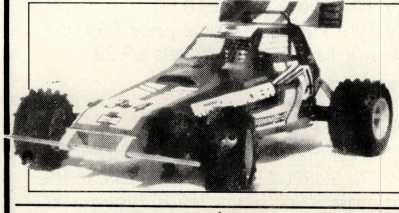

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AERO STREAK (Assembled) (4WD/540S motor)*	£89.00
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OPTIMA PRO (4WD/no motor or speed control)**	£79.00
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PEUGEOT 205 Turbo (2FWD/Le Mans .05 stock motor)*	£84.00
ULTIMA (2WD-540 Motor)*	£94.00
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BURNS 4WD with Enya 21 CXLS Engine	£349.00

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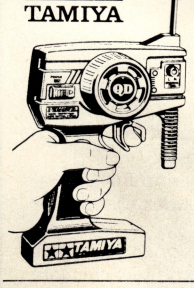

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Futaba 112B (100 amp, forward and reverse)	£49.00
Futaba MC110 (forward only)	£59.00
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Futaba 116 (210 amp, forward only)	£79.00
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Parma Matched SC 7.2v (stick pack)	£19.00
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Parma 12v Fast Charge Lead (no timer)	£6.00
Thunder Tiger 12v Quick Charger (clockwork timer)	£12.00
Riko Fast (12v supply, also trickle charges, clockwork)	£15.00
Acoms 1700 Quick (12v supply, clockwork timer)	£15.00
MFA Charging Monitor (12v supply, also trickle charges)	£17.00
JME Peak (12v supply, peak cut out)	£17.00
Nikko Mains and 12v fast	£19.00
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TMS Powertron (Mains supply)	£28.00
Schumacher PC2 (Auto peak, 12v supply)	£27.00
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MFA Mains Fast Charger (mains supply, also trickles)	£33.00
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Hi-Tec Multi Charge-a-Matic (12v supply)	£49.00
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Novak Peak (12v supply)	£58.00
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Digital Challenger (12v supply, peak cut out, DVM)	£80.00
Novak Peak Plus (12v supply, peak cut out, DVM)	£116.00

★ When purchasing a kit, any of the following items are available less 10%: Radio Control Systems, Nicads, Chargers, Motors, Electronic Speed controls, Ballrace Sets. Simply select the items you wish to buy, add their prices together, deduct 10%, and add this figure to the kit price. This gives you your custom pack deal price.

Jim Crabb's R/C AGONY COLUMN

Before I deal with some of the letters relating to more technical matters here is one that will pull the heart strings of any racer. It comes from 12 year old Alex iHoward of Kineton, Warwick, who when one reads between the lines may have a secret we would all like to know, get the handkerchiefs ready!!!

Q Dear Jim,

I saw that in a lot of your "Everybody's got to Learn Sometime" that you said "It's a nice day out for all the family" and in the September 1988 issue you said "the young driver with no backing of a parent would most probably have an inferior car to what they have at present".

At present I have a Cat XLS', Trans Am electronic speed controller, Phil Greeno matched SCE batteries, Demon 13x3 motor, Futaba Attack-R radio and loads of spares and my parents did not pay a penny towards it.

The only money I get is £1.50 a month for the Radio Race Car magazine. You then went on to say that you have noticed that with a few trophies and good results you will probably get some money from your parents. Fat chance!!

I have got two trophies one for first and some good results and they have not lent me a thing. When I go racing at Coventry Model Car Club they take me, drop me off, go home and then pick me up again, so if anything goes wrong I have to do it entirely myself, and if they do stay and watch they just moan!!

So kindly don't assume that everyone is given money towards their car and their parents are fascinated, mine aren't because they are too busy and don't like the hobby because it is too expensive but I refuse to give it up!!!

Yours sincerely,

Alex Howard (aged 12)

P.S. Is there any way to make my parents more interested? Oh! by the way I'm broke.

A I am not surprised you are broke but how can you run a Cat with all the necessary equipment, win trophies and buy RRC on only £1.50 per month, every reader myself included would like to know. I feel the hobby is becoming very expensive especially if one wishes to succeed at top level, even when drivers have the money with which they try to buy this success they complain they cannot purchase across the shop counter the same equipment as the sponsored driver. My own observations on the subject is that there are too many drivers who think they are a lot better than they really are so they pour inordinate amounts of money into the hobby in order to chase success which is beyond their natural ability. When that success is not forthcoming they get disillusioned because their initial potential has not been fulfilled and the enjoyment that they had in their early days when less money was involved is replaced by frustration due to lack of success at the higher level. The frustration is compounded by the fact that more money has been spent on better equipment without the expected corresponding success.

One racer who still gets a lot of pleasure and satisfaction out of our hobby is the driver who turns up week after week come rain or shine, will never win an 'A' final, but is happy to compete at about 'C' final level in a large club, value for money in relation to enjoyment he is the winner.

Another 12 year old Ted Knowles of Cromer, Norfolk, has more of a psychological problem than a technical one and writes:—

Q Dear Jim,

I would love to take part in a large or national meeting where the named drivers race so that I could not only see them but say to my friends at school that I have competed in the same meetings as them. I have never won an 'A' final at our local club so my question to you is "would I be allowed to take part and if I did I would be so worried about making a fool of myself in front of my parents, what should I do?"

Hope you can help.

Ted Knowles (12)

A Anyone can take part in the type of meeting you wish to compete in, the problem you will have this late in the year is gaining an entry as by now they will all be booked. My advice to any reader who is contemplating taking part in any large event or series of events is "to go for it".

There are so many spin offs, you make new friends and you learn so much. If you can stand the early morning starts and the late return home because a lot of travelling is involved it is an experience not to miss. When the finals are raced you will be competing against drivers who on the day are of a similar ability to yourself so any trophy you win whether it's in the 'A' or 'I' final will be on merit. Although you most probably have missed out this year in taking part at a large event there is always next year so make sure you get your entries in as soon as the events are announced.

So far so good, now for the spin cycle!



Various electrical problems seem to be the flavour this month, Daniel Terry of Worthing writes:—

Q Dear Jim,

I have recently bought a 7.2v SCR battery pack, I was using it today in my modified Meteor and, according to the Game, Set and Matched article (in April 1989 Radio Race Car) the cells should have a sudden drop of voltage within a few seconds at the end of discharge. This happened on the first two charges then after a trickle charge they discharged like an SC battery. Could this because I am:

1. Using the wrong chargers. I am using Acoms 7.2v quick charger and slow chargers, or
2. On the cells it says: "Sanyo Cadnica Fast Charge" does this mean they are for fast charging only, or
3. do they go flat this way because they are new etc.

Please help me as I am worried about the cells because they cost a lot of money.

Yours sincerely,
Daniel Terry

A Cells certainly cost a lot of money and can easily be ruined if not correctly looked after. My suggestion with your particular set is to do this:—

Discharge them completely after each race by connecting a car headlight bulb across the output. The easiest way to do this is to solder onto the bulb the same type of connector that goes to the car's speed controller. Always fast charge your SCR's don't bother to slow charge. This advice contradicts Tamiya for example who suggest a slow charge after every six fast charges. The reason for the complete discharge with the car bulb or, in Tamiya's case the slow charge, is to wipe out the "memory" of each cell. Charge your cells until they are warm to touch. I feel part of your problem is your charger which will not give you a full charge, it needs about another ten minutes extra on the timer which is not dissimilar to the problem of Steven Cann in July's issue.

Provided your SCR's are reasonably matched after you have cycled them a few times (10–15) the sudden drop will be back with you. A rule of thumb with SCR's is "the faster the charge the quicker they give it back".

Two letters from drivers quite new to our hobby who write about their Hornets and some of the problems which confront newcomers. C. Colledge of Coventry says the following:

Q Dear Jim,

... I have only recently found out what fun can be had with a radio-controlled car having just bought a Tamiya Hornet, become hooked and needing more information I would like to know if there are any books you could recommend. I need some way of translating all this technical jargon into basic idiot proof English. For example: what is the difference SCE, SCR, SC cell compared with my Tamiya 7.2 racing pack? Do I really need an electronic speed controller or a modified (?) motor, and does Coventry have an off road club? What kind of tyres should I use when I'm driving on road? Most importantly how do I clean my motor properly?

I would appreciate an answer to one or two questions if you can fit them in, but I do realise that you must be very busy.

Many thanks in advance,
C. Colledge

Whilst Shaun Pounder of Newthorpe, Notts makes these comments:

A Dear Jim,

I'm writing to you to stress the point that I'm fed up of people making fun of older cars.

I own a Hornet, people don't make fun of it a lot, but I just wish that it would run better.

Could you please give me some tips on how to improve the performance of my car and how to make it look better. I would also like to know if there is any way to stop the car rolling at fast turns, because it doesn't have anti-roll bars.

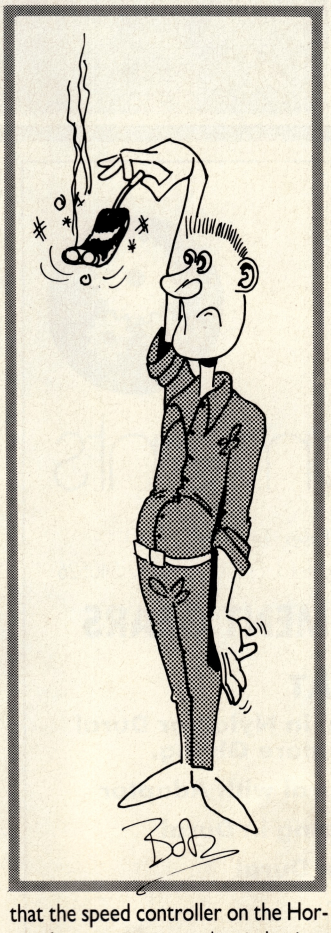
Yours sincerely,
Shaun Pounder
(a keen buggy racer!!!)

A I know the Hornet has been with us a long time but to make fun of it is not on, as the Hornet along with its less powerful relative the Grasshopper must have introduced more drivers to our hobby than any other car.

The Hornet straight out of the box is very quick in a straight line so neither a modified or an electronic speed controller is needed. When a modified is used with a standard three step controller unless it is meticulously looked after the controller soon burns up. With the lightness of the Hornet the step change of a mechanical controller and the extra power of a modified would make it very difficult to control.

There are three main areas of improvements:

1. Ballrace the car, a total of 10 are required, if you buy a kit it will cost about £12. If you do it gradually it will be more expensive but ensure the gearbox is the first area to ballrace.
2. Change the suspension spring units for coil over shock absorbers, the Tamiya replacement ones bolt straight on. For the rear you need CVA50305 at £11.99 pr, and for the front CVA Min Shocks 50332 at £9.99 pr. Once fitted you can experiment with different suspension set ups. Try lowering the back end with quite hard springing on the rear shocks and soft springing on the front, this will reduce the tendency to roll.
3. If you are using the four small batteries to power the car's receiver and servos replace them with a battry eliminating circuit. Tamiya make their own to fit their cars, it gives a substantial saving in weight (see also Karl Weston's problem in this December's RRC). The Tamiya eliminator comes with an Acoms plug and is part number SP50261 at £4.99. It should be noted



that the speed controller on the Hornet does not come ready to plug into a BEC system and a micro-pin set at 99p needs to be fitted to the controller.

I do not know of an anti-roll bar kit to fit the Hornet. For road use I would recommend a Sabaru Brat wheel set part SP1156A at £6.50 which is in fact four hubs, and then fit Ford Ranger or Brat tyres part SP1156B at £5.50 pr on both front and back wheels of the car, it is a system that works very well. If using the car on the road with this type of scale threaded tyre what better than a Ford RS200 body such as supplied by TMS part no. FRE108 at £11.95 to make it different. When a saloon body is fitted to an off road car a body mounting kit is usually required (as it is in this case) and that costs a further £2.25.

The difference between SCE, SCR and SC cells (Tamiya Racing Packs are SC's) was explained in detail in Game, Set and Matched in the April 1989 RRC. A simple explanation of the variance is not easy but basically there are discrete changes in the internal construction of the cells which give different charge and discharge characteristics. The SCR cell has a flat voltage drop during discharge with a sudden and quite dramatic voltage drop just prior to the end of discharge. The SC cell has a sudden rise in voltage at the end of its charge and it's that rise which is detected and used to stop the charger when peak charging. The SC and SCE cells have a sloping voltage discharge curve throughout their discharge. The SCE cell has a higher capacity of 1700 mAh compared with the 1200 mAh of both the SC and SCR.

The kit motor for the Hornet is a standard Mabuchi RS540 which is quite difficult to clean as the brush gear is totally enclosed. It does have the advantage that the motor is not subject to as much ingress of external debris such as dust, dirt and grass as the Yokomo type which has exposed brush gear. The best way to clean the Mabuchi type of motor is to totally immerse it in a cleaning agent.

For immersion cleaning use either a non-flammable industrial cleaning agent or a proprietory cleaner from your model shop. A second way to clean the motor is to wash it in a bowl of soapy water. Prior to immersing in the warm soapy water a better result will be obtained if you try and loosen up some of the "gunge" on the commutator by spraying it with motor cleaner. It is possible to direct the spray onto the commutator with the small flexible tube that comes with the aersol. With a little care it is also possible to reach the commutator with a cotton bud but be careful as beginners tend to leave the cotton

part of the bud in the motor — so beware. Immerse the motor in the water and move the motor backwards and forwards to get the water washing through it. Wash the soapy water off with clean water from the cold tap and then dry the motor by flicking it in your hand much the same way a nurse flicks a thermometer prior to taking someone's temperature. Once no more drops of water flick out, the motor is dry enough to run except for lubricating both bearings.

The most important thing to remember when motor cleaning is to re-oil the bearings on completion of maintenance. This is because any cleaning agent whilst cleaning the motor and commutator will also clean the oil out of the bearings be they ballraced or bush type.

Two drops of WD40 are sufficient to lubricate each bearing, I find the easiest way is to squirt the spray onto a screwdriver and then let two drops drip off the screwdriver blade onto the bearing. Many times I have seen drivers squirt aerosols directly at the bearing, this is *not* the way to do it as it not only overlubricates the bearing but puts lubricant on the commutator and you're back to square one. ◯



See, this is what happens when the water is too hot, instant shrinkage!

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Layshaft machine cut in Dural with Adaptor
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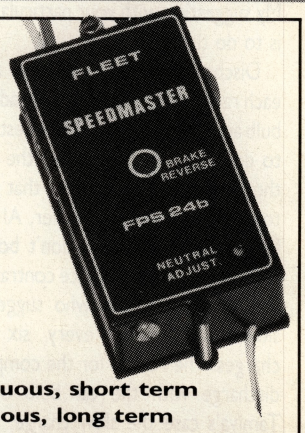
Bottom Bearing Housing in Dural

DIGIFLEET FPS-24B
MARK II
Speed Controller with Reverse



SPECIFICATION

Battery Volts	6 to 12 volts
Max Current	144 amps continuous, short term
(Forward)	32 amps continuous, long term
(Reverse)	36 amps short term only
Voltage drop	0.07 volts at 10 amps forward!
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Size	67 x 35 x 22mm
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Congratulations SIMON COOK (sponsored by Stockton Modeller) on coming second 'A' final 4WD in this year's Euro Champs in Gothenberg. He used a CAT XLS, Reedy Motors, Greeno Cells, Puma dual rate springs and many speed controllers. All his equipment is available from our magnificent shop. The only thing not available from us is Simon's great skill.

MOTORS MODIFIED

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Ultras Pink Power 15 x 2 ..... £29.50
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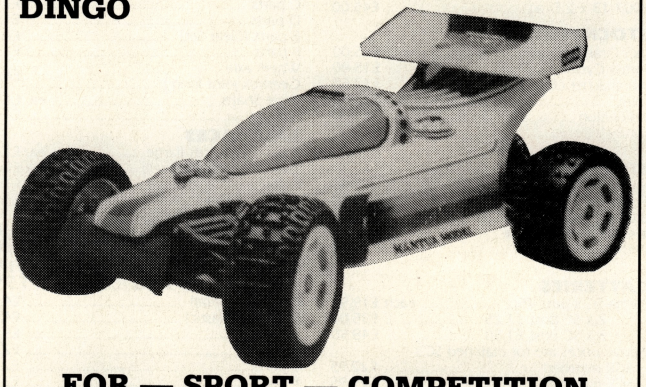

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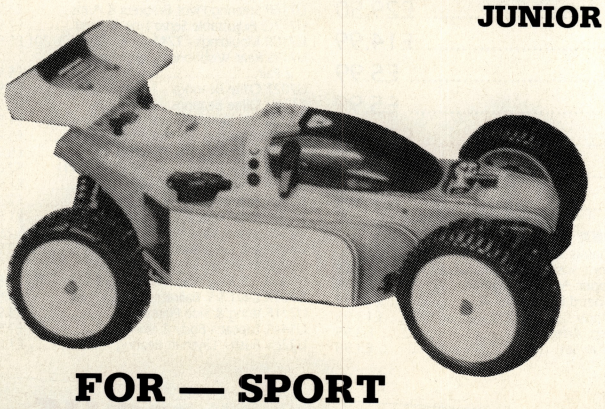

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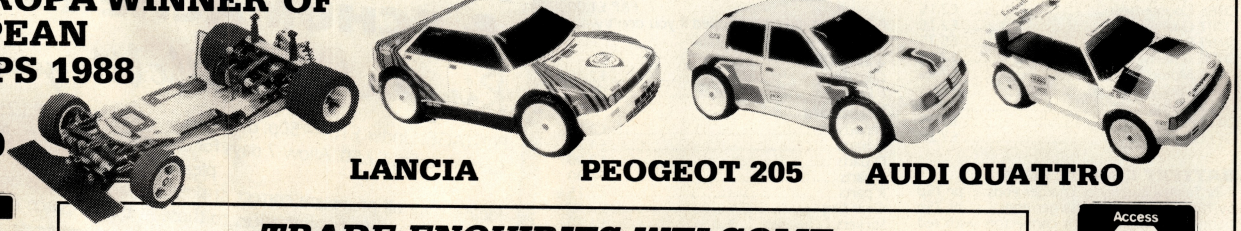

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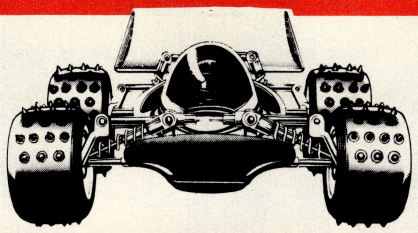

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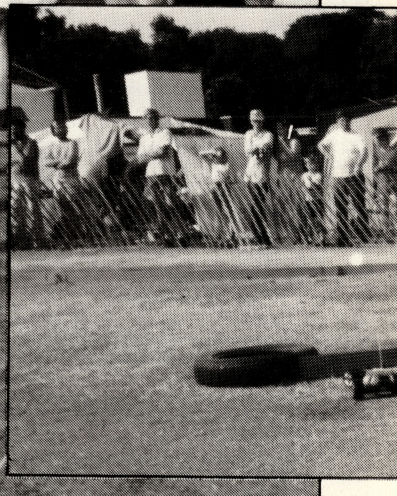
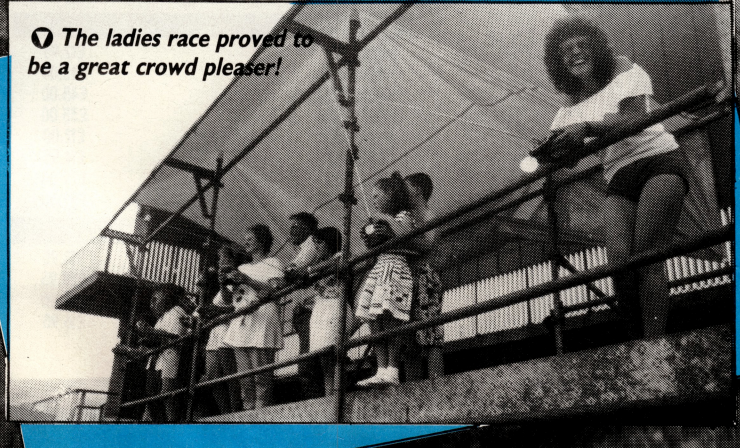
W.O.A. Welsh Grand Prix



Kevin Griffin reports from the third W.O.A. Welsh Grand Prix, a weekend of sun and great racing.

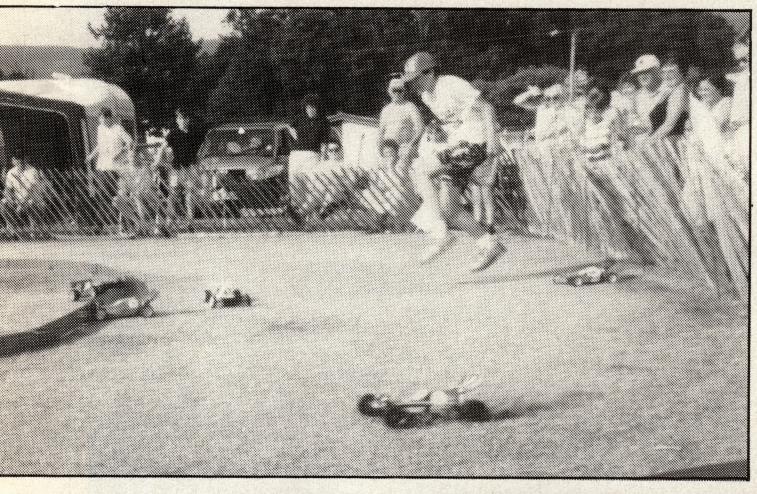


The ladies race proved to be a great crowd pleaser!

The W.D.A. Welsh G.P. is now into it's third year, and everyone knows the saying 'third time lucky', well this event was to be no exception as regards the weather. A large number of the racers travelled down on Friday evening, and with all the tents and caravans parked around the track, it looked just like a small village. Saturdays racing was held to standard rules for both 2wd and 4wd.

The organising club C.O.B.R.A. (Cardiff Off-Road Buggy Racing Association) arranged for the lap counting to be recorded by an A.M.B. system, which was run all weekend by Dave Randford from the Worcester Buggy Club.

The track was constructed by members of the C.O.B.R.A. Club, led by John Williams. It consisted of a long start straight into a wide right hander which then led on into the infield, which, if you picked a good line, was very quick. The racing got under way by 9.45. After we had the concourse d'elegance, which, on the Saturday was won by a cleanly prepared single coloured red car from the Race-tech stable.



It was soon to prove that your first round time would be the one that would count for your position at the end of the day, in the F.T.D. list, and hence into your respective final. The reason for this first round being the fastest was not that the track was cutting up, as is well known, but that because the weather has been so hot over the recent weeks, the ground was extremely dry and very hard. What happened was that the grass track became almost polished, making the track very slippery as the day progressed, making the correct tyre choice all-important.

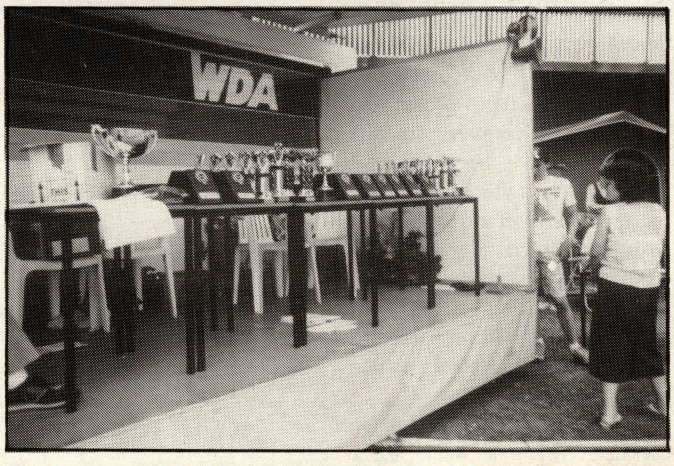
In the standard class 2wd F.T.D. was held by Gary Crowther-Green from Stafford, driving his old faithful, the R.C. 10 closely followed by the well-known, one may say, infamous, Greg Halliday, driving a very swift Mardave Meteor. Back in ninth place, a little lower than usual, Toby Isbister, driving a Top Cat. Toby hadn't had the best of days, suffering various problems, with both car and radio equipment, but when the final came he was out to prove that he wasn't beaten yet, and set off to an early lead, with Gary Crowther-Green and Michael Taylor in pursuit. Then tragedy struck and it wasn't going to be Toby's lucky day. This time it was transmitter batteries, giving him momentary loss of signal on the further sections of the track and losing him the lead. He kept his cool and managed to hang on to second place, letting Gary through to win the A final and also hold F.T.D.

The 4wd lads, on Saturday again (standard class) were frantically searching for grip, with Andy Langdon seemingly finding it, and showing the other drivers how to do it. He qualified some 17 seconds clear of the second place driver. When it came to the finals, thing were very tense. Could someone beat Andy (driving a Yokomo Dogfighter) for the first time competitively? There was drama on the line, when seconds away from the start, Colin Steele shouted that his speedo had blown, and could they hold while he changed it for his spare, but despite frantic efforts from his race crew, they found that the leads on their spare Silverstar were just too short. Because of this, Colin had to make do with 10th place and watch the race from the sidelines. From the start signal, Andy Langdon got away clean, and dominated the race from the front, showing everyone a clean pair of wheels, with a display of driving which was a joy to watch. His Yoko never wasted an inch, kissing the apex of the corners, as he whisked his way to a first place.

Well, that was the racing over for the day, everyone enjoying themselves to the full. But the entertainment wasn't over yet, for at Aberdare the racing takes place at the Sobell Sports and Leisure Centre, and for this weekend, the W.D.A. organised with the Centre to allow all the racers and their families free use of the facilities. What more could one ask for after a very hot days racing, than a nice swim in the swimming pool, and a shower afterwards, followed by a pint of one's favourite beverage.

On Sunday morning, people were up and about very early. Stall-holders were there putting out their wares by 6.30 a.m. By 7.30 the racers were up and about looking at the new track. For while the racers were eating and drinking and sleeping, John Williams had creeped in and altered the track so as to make it fair on those who had only come for the Sunday. By 9 o'clock, the sun was already baking hot, and shorts were the favourite form of dress for the day.

An interesting shot this, note marshall doing a great J. Cleese impression whilst avoiding everyones racing line?



Racing was under way again by 9.45. All the racing would be to modified rules for both 2wd and 4wd. A number of fresh faces were in evidence today, one being Mark Mainey, who set an absolutely blistering pace in the 2wd heats. He took F.T.D. with no one else being able to catch him at all. Second fastest was Andy Grahams and third was Nick Cochrane. Also in the 2wd class today was a well-known character from Zummerzet (down in cider apple country), a real street racer, Roy Parsons. It seemed like he was considering giving up racing, and taking out a recording contract with his new record 'Three wheels on my wagon, and I'm still rolling along'. One or two people could hear him singing the song up there on the rostrum, in his designer shorts. Only joking Roy! Actually, congratulations on taking your car to a creditable fifth in one heat, with just the three wheels, proving how well a J.R.X. will handle, and then on to a devastating win in the B Final.

The heat today was absolutely tremendous and at one stage, the temperature at the side of the race track was recorded at 111 degrees F. Everyone was trying desperately to keep their batteries cool. Motors and speedos were coming off after a race at a higher temperature than one would like, but there were very few actual problems, other than the A.M.B. system finally collapsing under the strain of it all. However Dave Randford was quick to the rescue and in came a microphone, and we were soon onto a manual count and back to the racing.

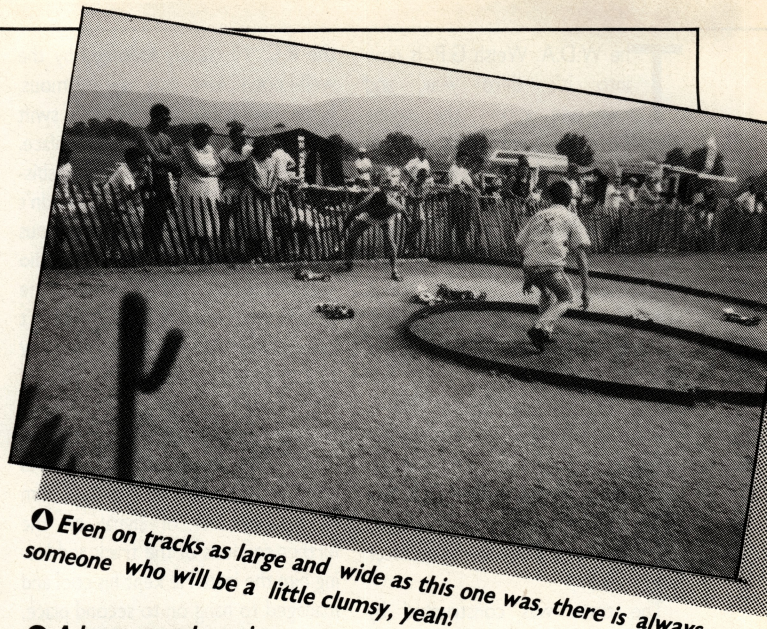
The 4wd lads were having a great day again. Andy Langdon, who won the Saturday event was dominating the racing, with his new-found friend, the Yokomo Dogfighter. Nobody was able to match his time. Second and third were the two brothers from Wales, Greg and Steve Lane, both racing Cats, and in fact in the final, that is exactly how they finished.

As usual a superb selection of trophies were on offer.

The big race for the Grand Prix Trophy presented by the W.D.A., was a run off between 2wd and 4wd from both days, run to modified rules, the only difference being that the 4wd drivers were given a one lap handicap, meaning that in effect, the 2wd lads had a one lap start. Well! What a race! Mark Mainey, the winner of the 2wd trophy, nearly drove the wheels off his J.R.X. in a fantastic display of driving skill, to fight off the

Drivers Name	Position Qualifying	Position Final	Club Or Sponsor	Make Of Car	Motor	Cells	Speedo	Servo	Tyres	
									Front	Rear
Toby Isbister	9	2	Private	Topcat	Brown Dot	Prime Time SCR	Novac	131SH	CAT	CAT
Gary Crow'r-Green	1	1	Stafford	RC10	Assoc.	Trackwise	Nosram	KOFET	CAT	CAT
Michael Taylor	6	3	Cardiff Red Dragon	RC10	Revtek	Corally	Novac	131SH	CAT	CAT
Michael Thomas	7	6	Jim (MPS) Davis	Topcat	MG	Laser	Nosram	131S	CAT	CAT
Eddie Williams	8	8	Racetech	Topcat	Revtek	Johnspeed SC	Nosram	Kofet	CAT	CAT
Richard Hopkins	4	7	Self	Topcat	MG Orange dot	MG SCR	Novak	Kofet	Proline	CAT
Andrew Grahamsley	5	4	Private	RC10	Reedy	Laser SCR	Kofet	Kofet	CAT	CAT
Greg Halliday	2	10	Cardiff Red Dragons	Meteor	MG Orange dot	Technicad	Demon Pro King	131SH	Mardave	Mardave
Roy Rogers	3	5	Hereford Models	Lossi JRX2	Demon	Hereford Models SCE	Novak	131SH	Proline	Kyosho
Nathan Rogers	10	9	Hereford Models	RC10	MG Orange dot	Hereford Models SCE	Speed Master	131SH	Mini Spike	Mini Spike

Drivers Name	Position Qualifying	Position Final	Club Or Sponsor	Make Of Car	Motor	Cells	Speedo	Servo	Tyres	
									Front	Rear
Mark Mainey	2	1	Central Models	JRX-2	Rev. Killer	Primetime SCE	Nosram	KO FET	Hotlaps TR9	TR9
Nick Cochrane	3	4	Central Nosram	JRX-2	Revo Wet 4	Primetime SCE	Nosram	KO FET	TR9	TR9
Duncan Wood	1	3	Dowty CMC	JRX-2	Twister 14S	Nosram SCE	Nosram	131SH	TF9	TR9
Andy Duncan	9	7	Dowty CMC	JRX-2	Twister 14S	Nosram SCE	Nosram	KO FET	TF9	TR9
Colin Walker	7	6	Dowty CMC	JRX-2	Twister 15dbl	Greeno SCE	Nosram	131S	Cat Ribspike	Cat 6x20
Philip Agg	6	10	Dowty CMC	JRX-2	Reedy 17dbl	Nosram SCE	Nosram	131SH	Cat Ribspike	Cat TR9
Andy Grahamsley	4	2	Private	RC-10	Twister 14TRI	Twister SCE	KO CX-1	KO FET	Cat Ribspike	Cat 4-Row
Matthew Williams	5	5	Johnspeed Racetech	JRX-2	Revtech 15S	Johnspeed SCR	Intronics	131SH	Schu Ribspike	Hot Laps
Greg Halliday	8	8	Cardiff Red Dragons	Mardave Meteor	MG 18S	Tamiya SCE	Demon Pro King	131SH	Mardave ISF	Cat Cut
Paul Grovell	10	9	C.O.B.R.A.	Cat 2wd	MG MD	Schu SCE	Nosram	131S	CAT	CAT



Even on tracks as large and wide as this one was, there is always someone who will be a little clumsy, yeah!

A large crowd was in evidence throughout the whole weekend.



challenge from Andy Langdon, who had to un-lap himself. With less than a minute to go, it was still Mark leading, but Andy had got the bit between his teeth and was hauling him in at an alarming rate. With about 30 seconds to go, he was on Mark's bumper. With the conditions being very slippery, Andy was soon past and away. By the end of the race he was about 25 yards in front with Mark dropping to third overall after being passed on the last lap by another 4wd.

Before the Grand Prix there was a ladies invitation race, open to all the wives and girlfriends and mums of the racers, who had not officially competed and were basically non-drivers. Well! I think this was the best race of the day. They had more marshalls than they knew what to do with. One or two raced with no reverse and in some ways that was a good thing, at least they couldn't ram someone while travelling in the wrong direction! Anyway, the race at the front was very hotly contested between, wait for it, yes, Doreen Grovell who was the chief organiser of the weekend, and her daughter Samantha. Well, after the bumping and jostling on the track, and the hair-pulling and eye-scratching on the rostrum, Samantha came out the winner, with her mum close second. Congratulations girls! What happened to the other eight competitors no one else seems to know!

Well, that's about it, except for one thing. If anyone would like a W.D.A. tie then make sure you enter early next year, or alternatively I think Nicki Barrett has a couple to spare. Last, but by no means least, a big thank you must go to the W.D.A., and of course C.O.B.R.A. Doreen Grovell and accomplice put on an absolutely splendid and first class meeting. Thanks again Doreen and lets hope we see you again next year.◯

Drivers Name	Position Qualifying	Position Final	Club Or Sponsor	Make Of Car	Motor	Cells	Speedo	Servo	Tyres	
									Front	Rear
Jez Pole	9	7	Leicester Jaguars	CAT	Trinity	Phil Greeno	Nosram	131SH	CAT	CAT
Tony Bretton	4	2	Basledon	CAT	Orange Dot	Terry Chapman	Radio Active Om	131SH	CAT	CAT
Colin Steele	3	8	RCP	CAT	Demon	MG	RCP XS	131SH	CAT	CAT
Jonathan Tucker	5	6	JS Racing Racing	CAT	Trinity	Johnspeed	KO CX/1	131S	CAT	CAT
Carl Harford	6	9	Neath	CAT	Trinity	Instronics	Black Box	148SH	CAT	CAT
Greg Lane	2	3	Johnspeed	CAT	Demon	Johnspeed	Sanwa Vortex	Kofet	CAT	CAT
Jason Bohin	10	4	Bristol	CAT	MG Brown dot	Johnspeed	Demon Proking	131SH	CAT	CAT
Andy Pierce	8	10	RCP	Dog Fighter	Trinity	Lazer SCE SCE	RCP XS	Kofet	CAT	CAT
Alan Blakeman	7	5	Leicester Jaguar	CAT	Schumacher	PK SCR	Intronics	JR 4005	CAT	CAT
Andrew Langedon	1	1	MG Nosram Central Models Yokomo	Yokomo	MG Orange	Nosram	Nosram	Kofet	Hot Laps	Hot Laps

Drivers Name	Position Qualifying	Position Final	Club Or Sponsor	Make Of Car	Motor	Cells	Speedo	Servo	Tyres	
									Front	Rear
Andrew Landon	1	1	MG/Nosram	Yokomo Dogfighter	MG 16 Triple	Kiel/ Primetime	Nosram Inter Pro	KO FET	Yokomo	Yokomo
Greg Lane	3	3	Johnspeed and Mum	Cat	Trinity 15S	Johnspeed SCE	Sanwa Vortex	KO FET	Cat Mon Tr	as front
Steve Lane	2	2	Johnspeed and Dad	Cat	Revolution Brutus	Johnspeed SCE	KO CX-1	KO FET	Cat Balloons	Cat Balloons
Gary Crow'r-Green	6	4	Trackwise	Cat	Losi 15TRI	Trackwise SCE	Intronics	KO FET	CAT	Yoko
Tony Bretton	7	6	Basildon Buggy Club	Cat	MG 16dbl	SCE	Radioactive Omega	131S	Cat	Cat
Jonathan Tucker	10	8	JS Racing	Cat	Trinity 14dbl	Johnspeed SCE	KO CX-1	131SH	Cat	Cat
Trevor Deakin	5	5	MPS	Yokomo Dogfighter	Parma 16TRI	MPS SCE	MPS Bullt'o 600	131SH	Hot Laps	Hot Laps
Wayne Davis	4	7	MPS	Cat	Parma 16TRI	MPS SCE	MPS Bullt'o 600	131SH	Cat	Hot Laps
Colin Steele	8	9	RCP	Cat	TMS 15dbl	MG SCE	RCP XS	131SH	Cat	Cat
Steve Jones	9	8	Racetech	Cat	MG 15D	Intronics SCE	Intronics Internat	131SH	Cat Blocks	Cat cut Spike

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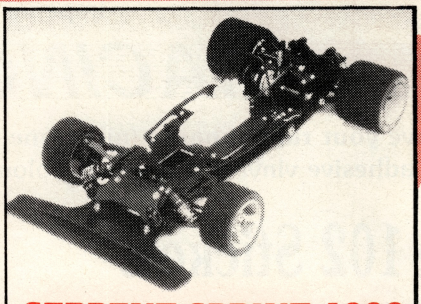

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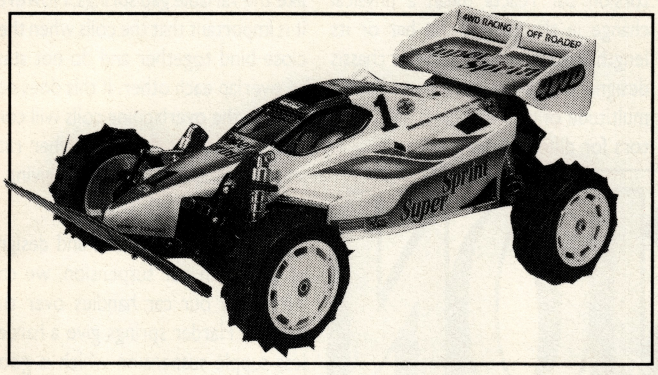

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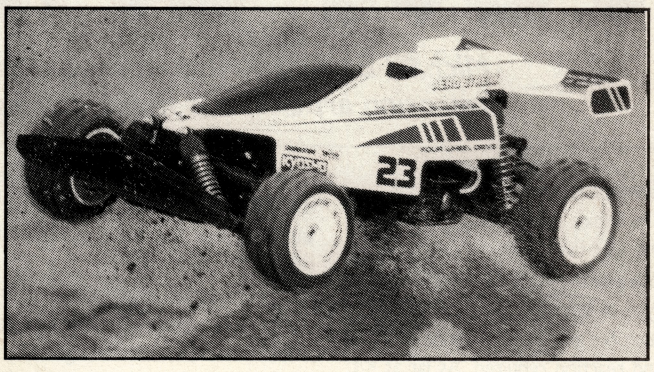

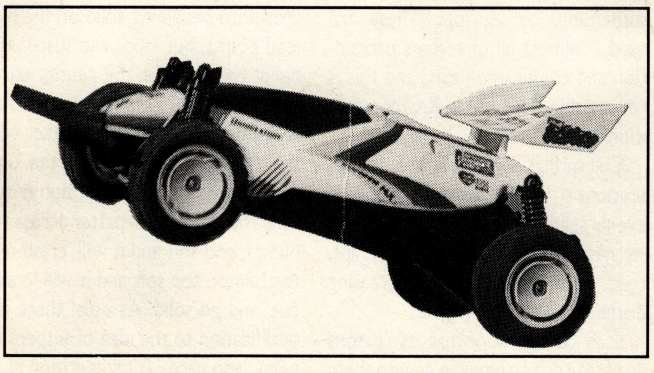

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SUSPENSION

Michael Beattie continues his superb series of suspension articles, this month springs 'n' things

The aim of this series of articles has been to explain in laymans' terms the basic principles of suspension. Hopefully some of you have found it interesting and useful, and maybe even inspired a few home builders/modifiers to see if they can improve on their 'stock' chassis.

As I stated in the first article there is never a single solution which will solve all your handling problems, and as we now move from suspension geometry to the control systems, the range of possible changes increases one hundred fold.

In my first article I hopefully convinced you that suspension is necessary to give optimum handling and driveability, it is now time to look at the three elements that control the wheel movement; namely the suspension medium, damping and stabilisation.

Suspension Medium

The choice of suspension medium, i.e. the part that holds the chassis up relative to the wheels, is decided by the type of terrain to be covered, and as such the amount of suspension travel and reaction required. As far as R/C cars are concerned coil springs and torsion bars are the two main systems used, but do not be tempted to think these are the only ones worth considering. Coming up with another solution has been a trademark of club drivers in full-size motorsport and R/C racing for many a year. Usually due to unavailability of parts or simply the shortage of cash, has led to all sorts of unlikely items being used sucessfully in motorsport. In terms of suspension rubber blocks and bands have all been used to provide a system of suspension, the Mini being the most famous user of rubber suspension.

Rubber blocks have turned up on go-kart chassis to provide a suspension to meet R.A.C. regulations for hill-climb and sprint machines, where they are then classed as motor cars and compete alongside more conventional machinery. These kart/cars work very well on smooth tracks, but their (very) limited suspension travel means that on bumpier courses they are rather erratic, and as such cannot compete with the more conventional chassis. 'So what is this to do with R/C racing?' I hear cries of. Well I think it illustrates several points, which should be considered by R/C car owners.

Firstly that the weight saving obtained by doing away with suspension members helps these light, nimble machines to work effectively, until their suspension cannot cope with the size of bumps met. (1. lightness). Because their suspension has lack of travel and is hard in relation to their weight, when a bump is encountered the suspension 'crashes out', causing a sudden swerve or slide (2. travel, and 3. suspension rate). The lightness aspect we have talked about before and will do again, but suspension travel and rate directly effect the choice of suspension medium.

The amount of travel depends on useage, off-roaders requiring large amounts to cope with the large bumps encountered. Smoother race tracks need less movement. Conversely off-roaders need softer (low rate) springs, while track cars harder (higher rate) systems.

Ideally the sprung or suspended part of the car should be still, as it moves along the track the suspension moving up and down over the bumps i.e. like a swan swimming along, up top all grace and calm, while down below action and power.

Torsion Bars

So having covered the basic ideals of the suspension medium, let us now look at the coil springs and torsion bars which are actually used. Coil springs are relatively common items and should need no introduction. Torsion bars on the other hand are not so common and need some explanation. If you clamp one end of a metal bar and then twist or rotate the other end, the bar will then push back in the opposite direction. So , if the bar is clamped onto a chassis and the other end is fixed to a suspension arm, the bar will act like a spring and so suspension is achieved (Fig. 1).

The strength of suspension or rate is varied in a torsion bar by two ways. Firstly by siimply increasing the diameter of the bar the suspension will be stiffer, decreasing makes it softer. Also by decreasing the length between the fixed end and the suspension arm will increase the suspension rate, making it longer gives a softer suspension. Because these changes in how a torsion bar reacts mean a physical change in the size of the bar or its length, this causes problems for chassis designers, as any chassis must have a multitude of pick up points and adaptors for different diameters.

However, torsion bars because they are carried in-board out of the air stream and on the sprung chassis can give advantages and should never be dismissed out of hand.

Coil Spring

So on to the most popular method of suspension, coil springs. These are used in almost all of today's production and competition cars, and this is reflected in their use in R/C competition cars.

Coil springs come in various configurations — simple straight coils with evenly spaced gaps between the coils, straight coils with decreasing gaps, coils with reducing and increasing diameter and so on (Fig. 2).

Each configuration has its reasons and I shall not attempt to go into them all but here are some of the main points to look out for. A straight evenly spaced coil will not act like a standard spring as used in that well known physics experiment. In our case the spring will decrease in length the same amount for a given load it has the same spring rate throughout its length. Though two springs may look the same, they may not act identically. This is because by increasing the diameter of wire used to make the coil or by heating the spring while making it, the rate, i.e. the amount of force required to give the same decrease in length, is increased.

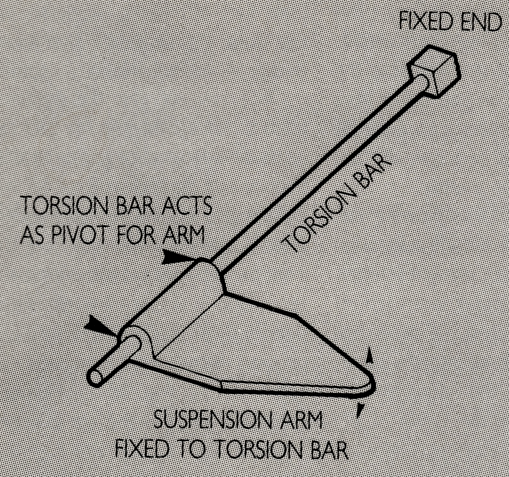
By making the gaps between the coils decrease in size as you go along the spring gives an increase in spring rate as the coils are compressed. The smaller gaps closing first effectively shortening the spring length and hence increasing the rate. Finally increasing the spring diameter along its length, will give a dual rate spring as the larger coils will close first much like the variable gap springs. However it is important that the coils when they close bind together and do not start to overlap each other. If this does not happen the overlapping coils will continue to deflect and the higher rate smaller coils will not close giving a single lower rated spring.

So by varying the size and designs of springs in our suspension, we can alter how our car handles over the ground. Harder springs give a harder less supple suspension which is good for flat tracks. Off-roaders will use softer springs to help ride over the rough terrain.

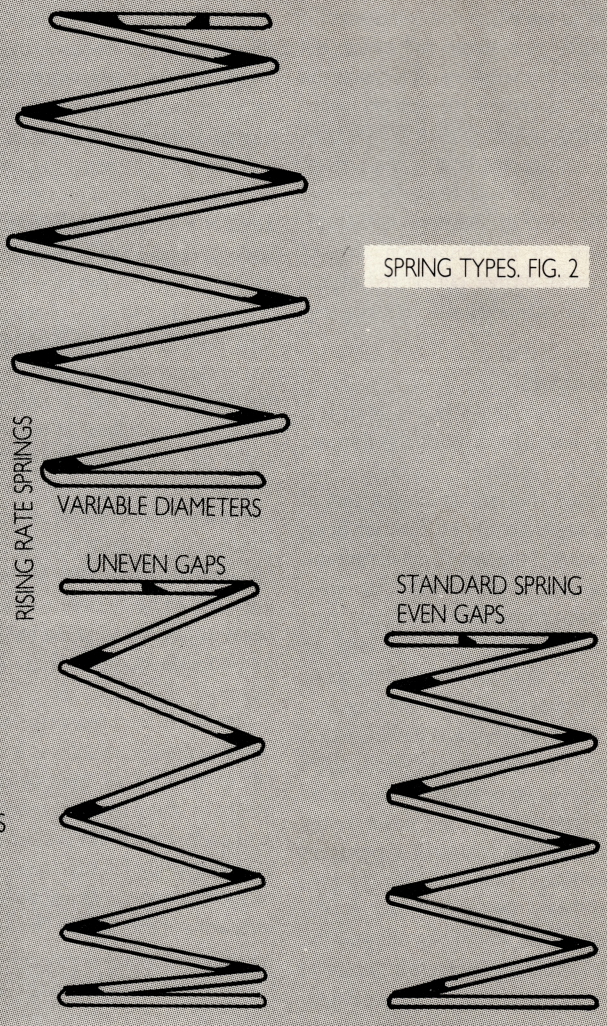
Variable rate springs can be used where there may be some points, which place heavy load on the suspension, around the circuit.

Here the chassis will cope with the normal roughness of the track with the lower rate springing and then the high rate spring part is used, e.g. at a corner which is immediately after a drop in the track. This is necessary to stop the suspension 'crashing out' and therefore becoming solid on the high load points, but stops the suspension being too hard for the gentler parts. Remember the aim of the suspension is to keep the wheels in contact with the ground for as much of the time as possible. If your suspension is too hard the wheels will patter across the bumps, too soft and it will 'crash-out' the bumps, too soft and it will 'crash-out' and go solid. As usual there is a qualification to the idea of suspension being 'too hard'. A competition chassis driven round a bumpy track at a slow speed will bump and jiggle its way round. The reason for this being that the forces met at slow speeds are not enough to get the springs working. Where as at full racing speeds the forces encountered being far greater need stronger springs to stop the suspension going solid. So it

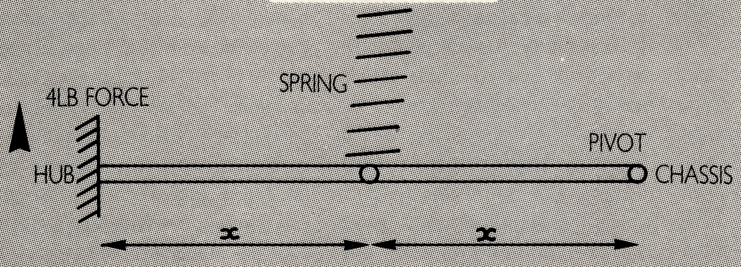
TORSION BAR. FIG. 1



SPRING TYPES. FIG. 2

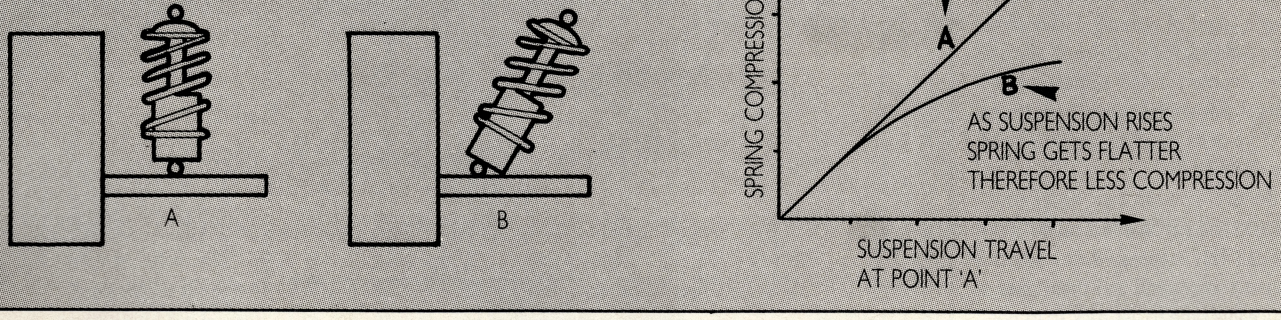


SPRING RATES. FIG. 3



LEVERAGE OF WHEEL = 2:1
IF HUB MOVES 1CM
SPRING MOVES ½CM = 2:1
SPRING RATE = 4LBS x 2 x 2 = 16LBS

EFFECT OF INCLINED SUSPENSION. FIG. 4



is only at full racing speeds that spring rates can be properly evaluated.

Spring Angles

Having discussed the various types of springs, let's now look at how they are installed on your chassis, and what changes you can make. Firstly the position of the spring on the suspension arm. Each manufacturer has his own ideas about the placing of springs, some are joined to the wish-bone at the wheel end, some half way between and Schumacher have now installed theirs in-board operated by rods and cranks. If you could mount these three different types of spring location on the one wheel, each would require a different spring to give the same result.

The spring mounted close to the hub, we will say, has a rate of 4lbs per inch (i.e. a four-pound weight will compress it one inch), the spring required to do the same job mounted half way along the suspension arm will need to be 16lbs per inch because it will have twice the force on it and it will only move half the distance (Fig. 3).

The in-board spring may be stronger still, depending on the size of the bell crank. So you can stiffen and soften your suspension by moving the spring mounting point up and down your suspension arm.

Having stated a rate I must now immediately qualify it and introduce another factor of design. The suspension will alter as I have stated provided the spring stays at the same angle, i.e. if you move the suspension arm point out by 5mm, you must move the chassis spring point out by 5mm also. If you do not move the upper (chassis) point out the spring will be less vertical than before, meaning that it will have to move less for the same amount of suspension travel, hence reducing the effective coil rate.

On some so called competition models springs are laid over at ridiculous angles, especially on the front sus-

pensions. Though it may look very smooth and aerodynamic, it means that as the suspension compresses, it actually gets softer and hence will compress even more. This causes the front suspension to bottom under braking or hitting minor bumps causing damage and drag in the process (Fig. 4). It would be better to have stiffer springs mounted further inboard on the suspension arm or mounted further out on the chassis. So take care when altering spring angles!

Dampers

When we consider how a spring acts we must also think of the dampers (shock absorbers, shockers or shocks). they are an integral part of the suspension set up, their job being to control the springs movement and stop them performing that well-known phenemena — simple harmonic motion (Fig. 5). The ideal set up is to allow the spring to do about 1¼ bumps as shown in the diagram.

As you will know in the R/C world shock absorbers are oil filled chambers of aluminium or plastic, with a sealed plunger going up and down inside. How stiff the damper is depends on two things. Firstly how big the gaps and holes are around and in the plunger, the more holes and gaps the less damping action there is. Secondly, the thickness of the oil in the damper, a thicker oil is slower to pass through and around the plunger and hence make it stiffer.

It is often thought a good ploy to stiffen dampers, it is a well known tweek for your local GTi owner, however a word of warning. I have often seen paddock buffs pick up an off-road racer, compress the suspension and marvel as it creeps slowly back to the bottom of its travel, saying how good the damping is.

Beware, you can over damp a suspension and get an effect called 'jacking up'. This happens when a suspension is compressed and then takes a noticeable time to get back to its normal position. This can cause problems if the suspension hits another bump or enters another corner before it has returned to its standard ride height.

As I have said before if your car is like a swan on a lake, with its body still and the suspension working like mad below, then you should be optimising your suspension.

Stabilisers

Not the little wheels to stick on the side of your bike, but a system to stop your car chassis leaning over during cornering. Why do we want to stop it? It looks spectacular. Well may be it does, but it stops the chassis being able to deliver all its power by taking weight off the inside wheels as well as unsettling the chassis if a quick change of direction is required.

Stability is achieved by anti-roll bars. Items which often seem to be stuck on R/C cars to make them look flashy as opposed to being of any real value. Along with dampers they are the most adjusted piece of equipment on a racing car being used to fine tune the chassis to the track. An anti-roll bar consists of a rod or tube which has its two ends bent at near right-angles to form identical length levers at each end (Fig. 6).

It should be mounted on secure chassis supports being free to rotate but have little free play. These supports should be as close to the two bends as possible so as the bar is not free to slide from one side to the other.

The bar is then connected to the supsension arms, sometimes it forms one of the arms, i.e. front tie rod or otherwise it is connected to the suspension by rods which ave ball joints at each end. On full-size racers these rods can be moved up and down the lever arms of the roll bar. This has the effect of making the bars harder (i.e. more resistive to roll) or softer (less resistive). However on R/C cars this system has not yet been perfected as the ball joints are screwed onto the ends of the bars. So you either have to have a set of bars with different length lever arms or screw the ball joint out and in on the bar.

The bar works in the following way. As a car turns the outside suspension is compressed, due to weight transfer. This pushes the outer lever arm of the anti-roll bar up at the same time putting a lifting force into the other, inner, lever arm. this lefting force is firstly resisted by the spring of the inside wheel, therefore putting some downwards force on the outside wheel and reducing roll. Secondly the lifting force on the inside wheel will eventually raise it slightly, also reducing roll.

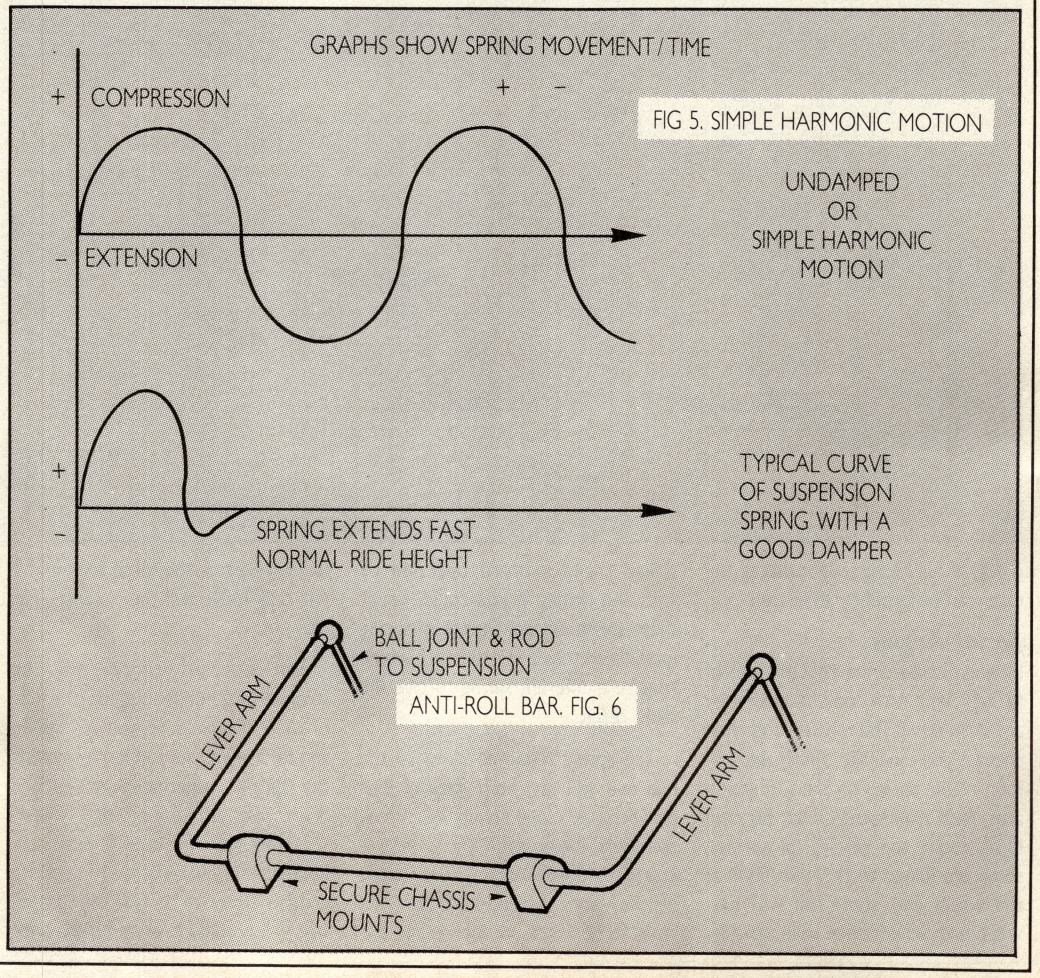
The forces transmitted between the two wheels is reliant on the leverage that can be transmitted through the anti-roll bar. As I have said by moving the connecting point of the suspension on the lever arm we can alter the leverage, moving it towards the bend in the bar reduces the leverage on the bar and makes it harder away from the bend gives softer resistance.

If your chassis cannot allow for moving the suspension link then by using bars of differing diameters we can make the necessary alterations, thicker — harder, thinner — softer.

Once you get past the optimum point of roll against grip the bars can be hardened to reduce grip on an axle. Stiffening up the back axle roll bar will make it grip less and help cure understeer. Conversely you may have the front bar too hard and softening it will also work. In slippery low grip situations, anti-roll bars should be softened or even disconnected completely so as to maintain grip. As usual experience will always give the best solution.

So to sum up, by altering your springs, dampers and anti-roll bars you can adjust your handling characteristics. Stiffening springs, dampers or ARBs can enhance the grip on an axle, over stiffening can result in less grip. So by softening and hardening we can balance a chassis to give the handling we require. As with all suspension set ups there are no hard and fast rules, only guidelines, so experience and experimentation have no substitutes.

Next month i shall conclude this forray into suspension with some general points about setting up a chassis and a few afterthoughts on design. ◯



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G. Peglar	391	M. Edleston	276	B. Gilyatt	200	T. Donavan	135
J. Davis	390	M. Hewit	274	J. Jarratt	195	K. Philbin	134
P. Stephens	388	P. Winton	268	C. Evans	192	A. Svensson	132
R. Roy	381	K. Plested	266	P. Greeno	187	S. Lucas	130
G. Creasey	380	M. Plested	261	J. Winter	172	P. Ockaden	126
M. Barford	380	T. Walden	259	C. Whitwam	171	A. Green	125
P. Smith	369	I. Whitbread	253	M. Page	170	D. Harley	124
R. Hammet	357	K. Piggott	250	R. Turner	168	B. Hooper	124
J. Dearden	356	S. Bessant	249	M. Nichols	168	M. Taylor	123
P. Craxton	355	T. Sturdy	247	B. Jones	167	J. Fowl	122
G. Land	351	S. Smiley	244	G. Brice	164	M. Woodcock (JJ)	121
I. Oddie	350	D. Nevey	243	E. Brawley	164	A. Bottoms	115
A. Whenman	348	M. Langridge	230	O. Wilkinson	164	J. Warren	114
S. Brace	347	R. Ellis	225	B. Kingett	159	G. Hansen	112
W. Mitcham	333	C. Ellis	224	J. Fenton	156	D. Tomlinson Snr	109
N. Stringfellow	332	G. Underwood	221	M. Thurston	155	K. Brown	109
R. Marshall	327	D. Raine	218	N. Hunt	154	R. Heath	105
D. Taylor	325	K. Belson	216	J. Collins	149	C. Drescher	98
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T. Edleston	306	J. Hammonds	205	M. Lovelock	139	A. Barber	93
C. Jenks	291	P. Green	203	S. Bunting	137	C. Betteridge	92

RADIO RACE CAR 4WD OFF ROAD FINALS 17 SEPTEMBER 1989

The following is a list of drivers who are eligible to enter for the RRC 4WD Off Road Finals at Stafford. Should your name not appear on this list you may still be able to apply to race on finals day as some drivers who are automatically eligible may not wish to enter. ALL DRIVERS, whether your name appears or not, who wish to take part in the 4WD finals at Stafford should apply for an entry form, without delay, to Mr John Robson, 1 Aldersleigh Drive, Wildwood, Stafford, ST1 7AR.

PREFERENCE WILL BE GIVEN TO ALL DRIVERS WHO APPEAR ON THE LIST

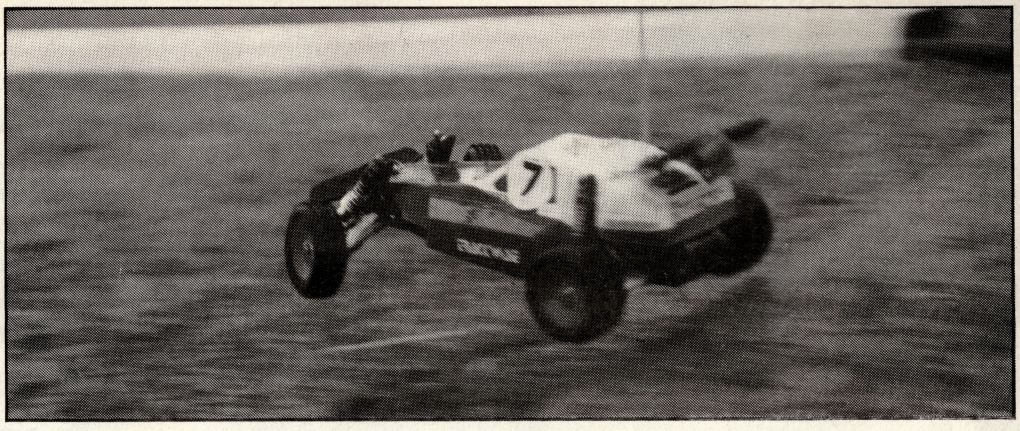
MODIFIED

1. Mark Chaplin
2. Alex Page
3. Duncan Wood
4. Les Warren
5. Anthony Webster
6. Roy Rogers
7. Kevin Griffin
   Mark Cave
9. Colin Steele
10. John Broadhurst
11. Andy Griffiths
12. Mark Hewitt
13. Steve Boyd
14. Andy Pierce
15. Colin Walker
16. Barry Jones
    John Fryer
18. Les Hewitt
19. Alan Garrington
    Paul Jorgenson
21. Neil Gregory
22. Andrew Robson
23. Sam Durbin
24. Andy Dunan
    Bob Harris
26. Toby Isbistor
27. Andrew Beesley
    Harvey Burrell
29. James Whyley
30. Joel Beardsmore
31. Mark Hewitt
32. Edward Walden
33. Chris Harris
34. Darren Brown
    Mark Cox
36. John Robson
37. Andrew Griffiths
38. Peter Fox
39. Tony Hickson
40. Steve Fabray
41. Mark Young
42. Lee Batten
43. Mark Mainey
    Matthew Hammon
45. Mark Billett
46. Paul Lissiter
47. Steve Jones
48. Jason Fowler
49. Dave Clutterbuck
50. Alan Buckley
51. Simon McCrae
    Richard Meredith
53. Philip Agg
54. B. Ley
55. Macer Jewitt
56. Matthew Christie
57. Steve Lucas
58. Graham Malings
59. Graham Malings
60. James Christie

STANDARD

1. Matthew Williams
2. Steve Harris
3. Matthew Pearse
4. Karl Jarvis
5. Chris Heath
6. James Partridge
7. Matthew Harrison
8. Dood Pearse
9. Meirion Evans

10. Richard Hollngworth
11. Anthony Hill
12. Kieron Hill
13. Phil Heath
14. Robin Morewood
15. Paul Smith
16. Giles Rycraft
17. Chris Rawlings
18. Paul Broyd
19. Stuart Davison
20. Richard Webster
21. Matthnew Woodland
22. Tony Bretton
23. Stuart Jeffrey
24. Jonathon Tucker
25. Jonathon Cooke
26. Arthur Workman
27. Andre Metcalf
28. David Woods
29. David Clay
30. Simon Walker
31. John Dalton
    Stuart McDonald
33. Ian Watkins
34. David Marsh
35. Phil Walden
36. Robert Wilmot
37. Jack Beesley
38. Nicholas Dalton
39. Michael Wray
40. Michael Weston



DIARY DATES

G.E.C. Stafford Mini Nats

Entries are being accepted now for the Stafford Mini Nats. This year's Nats are taking place on 8 October, 12 November and 10 December and are being run for 1/12, 1/10 and Buggies.

For further information on this superb series contact John Robson, 1 Aldersleigh Drive, Wildwood, Stafford ST17 4R.

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	November	5
	December	3
	January	7
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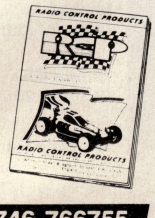

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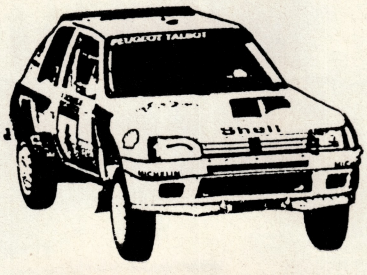

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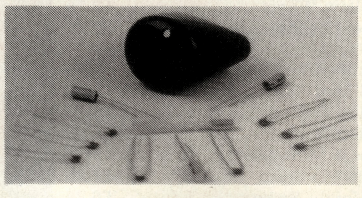

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50349 Unitized Diff Gear Set £11.50
50350 Universal Shaft (2) £15.50
50351 Joint Cup Set £9.99
50352 830 Bearing Set (2 pcs) £5.60
50353 1680 Bearing Set (4 pcs) £9.99
50354 16T, 17T Pinions £2.99
50355 18T, 19T Pinions £2.99
50356 20T, 21T Pinions £2.99
50357 22T, 23T Pinions £2.99
50358 8mm Ball End Set (4) £7.99
50359 Inner Rear Tyre (2) £1.99
0005330 E parts £6.50
0005338 C parts £3.99
0115065 P Parts £1.99
0115066 Q Parts £0.99
0225046 Z Parts £1.20
2595048 Front Propeller Joint £0.90
2595049 Rear Propeller Joint £1.40
2595050 Rear Wheel Axle £4.50
3455200 Double Ball Shaft £0.70
3455204 Front Damper Cylinder £6.60
3455205 Rear Damper Cylinder £6.60
3455212 Wheel Hub £1.10
3455213 Pressure Plate £1.99
3485025 Propeller Shaft £1.05
4025010 Lower Deck £6.99
4025011 Upper Deck £18.99
4135027 Rear Drive Shaft £3.99
4305026 Wrench £0.40
4305230 Steering Plate £1.20
4305231 Cross Member £0.40
4305232 Steering Arm £0.65
5005036 Front Coil Spring £0.40
5005037 Rear Coil Spring £0.50
5485009 Rocker Arm £0.55
6805001 Spring Removing Tool £1.80
6805002 Brush Spreader £1.10
9005271 A parts £4.99
9005272 B parts £7.99
9005275 G parts £2.15
9005277 H parts £3.60
9005282 D parts £5.20
9335053 Gear Bag £3.20
9405425 Ball Connector Bag £5.65
9405427 Press Parts Bag £3.60
9405428 Tool Bag £10.50
9405430 Metal Parts Bag £5.99
9405431 Differential Gear Bag £9.50
9405432 Differential Parts Bag £4.20
9405451 Link Pin Bag £1.99
9465278 Screw Bag A £1.20
9465279 Screw Bag B £2.40
9465280 Screw Bag C £1.20
9465282 Screw Bag E £2.99
9465283 Screw Bag D £1.90
9495093 Avante Sticker £1.25

SPBG9 4mm Adjuster £0.99
SPHBW5 5mm Adjuster £0.99
SPHG6 3mm O-Ring £0.55
SPHBF3 5mm Ball Connector £0.55
SPB94 Steering Rod £0.80
SPCK12 Box Wrench £0.60
SPM55 Allen Key £0.70
50363 Vanquish Body £12.99
0005343 D parts (V) £2.10
9005287 E parts (V) £4.50
0115068 K parts (V) 3.15
0115069 J parts (V) £3.15
0335093 Chassis (V) £6.50
3455233 Wheel Hub (V) £0.99
4505041 Speed Controller (V) £12.50
50294 Resistor (V) £1.70
9405477 Damper Bag (V) £5.75
9405478 Ball Connector Bag (V) £2.99
9405479 Link Pin Bag (V) £6.50
9405480 Press Parts Bag (V) £6.50
9405481 Tool Bag (V) £5.25
9465314 Screw Bag A (V) £2.15
9465315 Screw Bag B (V) £2.15
9465316 Screw Bag C (V) £0.99
9465317 Screw Bag D (V) £1.10
9465318 Screw Bag E (V) £1.99
9495096 Sticker (V) £1.50
50073 Ball Bearing Set (4) (V) £13.40
0225019 T Parts (V) £2.20
0225035 Y Parts (V) £1.75
0225040 V Parts (V) £0.99
0225041 W Parts (V) £1.20
..... £44.95
53002 Dynatech Rotor £10.99
53003 Brush Set for Dynatech £3.60
53004 Soft Rear Spring £4.75
53008 4 x 1150 Sealed Bearings £10.99
53009 Titanium Rod Set £7.60
53010 Titanium Screw Set £49.99
53011 10 PCS 3x6mm Titanium Screw . £4.70
53012 10 PCS 3x10mm Titanium Screw £4.99
53013 10 PCS 3x15mm Titanium R Screw £5.99
53014 10 PCS 3x20mm Titanium Screw £5.99
53015 10 PCS 3x8mm Titanium Tap/Screw £4.99
53016 10 PCS 3x12mm Titanium Tap/Screw £4.99
53017 10 PCS 3x15mm Titanium Tap/Screw £5.99
53018 10 PCS 3x10mm Titanium C/sunk Screw £4.99
53019 10 PCS Titanium C/sunk Screw £5.99
53020 10 PCS 3x8mm Titanium C/sunk Screw £4.99
53021 20x3mm Aluminium Nut £2.50
53022 10x3mm Aluminium Lock Nut ... £4.99
53023 20x4mm Aluminium Lock Nut ... £2.50
53024 10x4mm Aluminium Lock Nut ... £5.60
53025 Silicone Damper Oil Soft £5.99
53026 Silicone Damper Oil Medium £5.99
53027 Silicone Damper Oil Hard £5.99
53028 Universal Shaft and Cup Set ... £19.50
53029 11 x 5 Ball races (2) £5.99
53030 8 x 5 Ball races (4) £13.50
53031 New Style F. Drive shaft £32.50
53032 New Style R. Drive shaft £32.50
53033 Ball Race Steering £29.99
53034 New Centre Diff (please phone for details)
..... £8.50
53035 Ball Joint Covers £7.99
53036 Hi-Cap Dampers Mini ..... £17.95 pr
53037 Hi Cap Dampers Short ..... £17.95 pr
53005 6 Spoke Lite Wheels (F) £4.70
53006 6 Spoke Lite Wheels (R) £4.70
53038 Carbon Graphite Chassis £99.99

SCHUMACHER

XLS Kit £175.00
Built Cars from £200.00

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A103 'E' clip 1/8" x .012"	(Pack 10)	£1.50
A154 Disc Spring 1/8"	(Pack 10)	£1.50
A180 'O' Ring 1/8"	(Pack 10)	£1.50
A188 Tension Band	5	£1.00
A510 Ballrace 1/8" x 1/4" NF	2	£4.99
A520 Thrust Race 1/8" x 5/16"	1	£2.99
A532 Ball Race 8 x 12 FL	2	£5.99
A533 Ballrace 8 x 16 x 5 NF seal/shield	2	£5.99
A541 One Way Clutch 6 x 10 x 12	2	£5.50
C058 Nicad Clamps and Screws	2	£1.50
G301 Silicone Grease	1	£1.00
G303 Epoxy Bubble Pack	3	£1.50
G305 Servo Tape (roll)	1	£1.50
G212-218 Motor-Pinion 12-18T 32DP	1	each £2.00
T006 Pivot Bracket front	2	£2.50
T012 Rear Wheels — Chrome	2	£2.99
T013 Front Wheels — Chrome	2	£2.99
T045 Pivot Ball	4	£1.50
T052 Hub Carrier - Front	2	£3.99
T055 Front Transmission Housing	2	£2.50
T058 Arm - Front Suspension	2	£1.50
T062 Piston Rod 16mm stroke	2	£2.00
T063 Piston Rod 32mm stroke	2	£2.00
T070 Rear Trans. Housing (inner)	1	£2.50
T071 Rear Trans. Housing (outer)	1	£2.50
T074 Chassis Plate - Lower (short W/B not XL)	1	£6.99
T075 Chassis Plate - Upper (short W/B not XL)	1	£4.99
T084 Rear Axle	1	£1.50
T085 Differential Shaft	1	£1.50
T086 Front Axle (Non Diff Cars)	1	£2.99
T102 Rod End Ball	4	£1.50
T104 Hub Carrier - rear	2	£3.99
T106 Fibreglass Rear Shock Bkt	1	£1.50
T119 Aerial Tube	1	50p
T122 Velcro 50 x 20mm	4	£1.50
T123 Differential Gear 55TH	1	£1.50
T124 Differential Gear 58TH	1	£1.50
T125 Differential Gear 60TH	1	£1.50
T128 Drive Belt 80/298/4 - long (not XL)	1	£3.99
T129 Drive Belt 80/072/4 - short	2	£4.99
T132 Suspension Springs 045 x 8 x 1.5 front	2	£1.00
T133 Suspension Springs 045 x 11 x 2.5 rear	2	£1.00
T624 Rear Susp. Pivots		£2.50
T626 Front Anti Roll Bar Pins & Wingwire		£2.00
T627 Servo Saver Asstd.		£2.50
T628 Front Shocks less seals		£6.99
T629 Rear Shocks less seals		£7.50
T630 Drive Shafts		£3.99
T631 Universal Joints Bag		£5.99
T632 Diff/Int. Repair Kit		£3.99
T633 Front Shocks Complete pair (assembled		£12.50
T634 Rear Shocks Complete pair (assembled)		£15.00
T635 Front Diff. Repair Kit		£2.50
T636 M3 Joints 4 Pivot & Sockets		£2.00
T637 Shock Absorber Pistons (set of 4)		£1.00
T638 Steering Pivot Set		£2.50
T640 One Way Drive Shafts pair		£17.50
T641 Front Trans Long Screws & Nuts 4		£1.50
T642 'XL' Conversion		£25.00
T644 Front Susp. Geometry Mod. Kit (250mm Track)		£3.99
T646 Rear Susp. Geometry Mod. Kit (250mm Track)		£2.50
T648 SPXL CAT Chassis Conversion (Saddle pack Nicads)		£12.76
T146 XL Chassis Plate - Lower (+25mm)	1	£6.99
T147 XL Chassis Plate - Upper (+25mm)	1	£4.99
T152 XL Drive Belt 323 x 4	1	£3.35
T153 CAT Wide Bumper	1	£2.50
T154 Wide Low Rear Susp. Bracket	1	£1.50
T170 XLS Centre Track Rod		£0.86
T513 Screw Bags	1	£9.99
T516 Joints Bag	1	£7.99
T517 Bearing Housing Moulding	1	£2.50
T518 Bracket Moulding		£2.50
NEW T194 Hi-Torque Drive Belt		£5.99
NEW T272 Lower Belt Guard		£3.99
NEW T561 Hi-Torque Drive Set		29.49
NEW T606 Drum Diff Set		£14.98
NEW T603 Hi-Torque Pulley MLG		£5.99
T526 Front Differential Ass.	1	£7.50
T529 XL Body moulding	1	£7.99
T530 XL Undertray	1	£7.99
T613 Spr. Stops & Spacers	set	£2.50
T614 Shock Absorber Seals	set	£5.99
T616 Half Wishbone Set		£2.50
T617 Pulley moulding 50-51T		£3.99
T618 Pulley moulding 21T & Ball Cage		£3.99
T620 Screw Bag A Self Taps		£2.99
T621 Screw Bag B M3-M4		£3.99
T622 Screw Bag C Asst		£1.50
T623 Ali Side Plates		£4.99

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Honda NSR 500 Suzuki 500
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Complete Deals £139.00 inc. p&p

NEW KYOSHO BAJA BUGS

Optima, Salute, Ultima (1/20)
Complete Deals Phone for Best Price
(Deals include special R/C,
Nicads and Fast Charger)
Tune up parts available.

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50204 S Parts £2.20
50290 Technigold Motor £39.99
50294 Resistor £1.70
50332 Mini Shocks £9.99
50333 Thundershot Body £11.99
50334 Tyre & Wheel £5.99
50335 Joint Cup Set £6.99
50336 Drive Shaft (2) £3.99
50337 Gear Set £4.99
50338 Rear Stabilizer £2.99
50339 Thundershot Rear Wing £4.50
50343 Gold Wheels (2) £2.99
50344 Pin Spikes (2) £3.50
50345 Thunder Dragon Body £15.99
0005300 A Parts £6.20
0005301 B Parts £2.20
0005303 D Parts £1.40
0005313 F Parts £1.40
0225034 X Parts £0.80
0225035 Y Parts £1.75
0335086 T/Shot/T/Scorcher Chassis £3.25
0445109 T/Shot/T/Scorcher Bumper £1.70
1835030 Chassis Cover £1.60
2595042 Propeller Joint £0.85
2595043 Counter Shaft £1.10
3455169 5mm Ball £0.30
4305107 Resistor Plate £0.35
4305125 Motor Plate £0.40
4305166 Resistor Cover £0.45
4505038 Speed Controller £8.10
5005020 Coil Spring £0.65
5325006 Tie Rod £0.30
4305219 Motor Mount £0.60
5395016 Propeller Shaft £0.99
5395018 Front Stabilizer Rod £0.60
8000034 Rubber Tubing 3.5x20mm £0.25
90005256 C Parts £2.75
9405379 Damper Bag T/Shot £5.25
9405380 Thrust Washer Bag (T/Shot) £1.40
9405381 Screw Pin Bag £3.40
9465266 Screw Bag A £1.25
9465267 Screw Bag B £1.15
9465268 Screw Bag C £0.90
9465269 Screw Bag D £4.60
9495087 Thundershot Sticker £0.95
9495092 Thunder Dragon Sticker £1.50
SPHB45 5mm Adjuster £0.99
SPAF6 Speed Controller Rod £2.99
SPCK12 Box Wrench £0.60
SPG17 Antenna Pipe £0.40
SPM55 Allen Key £0.70
50284 T/Shot Ball Thrust Bearing 2 pcs £3.85
50361 Terra Scorcher Body £12.99
0005347 D Parts (T/Sc) £1.50
0115065 P Parts (T/Sc) £1.99
0225041 W Parts (T/Sc) £1.20
0445132 6mm Adjuster (T/Sc) £2.20
2595039 Wheel Axle £2.60
2995006 12x3mm O-rings £0.30
5005019 Coil Spring £0.60
5005043 Front Coil Spring £0.30
9005284 G Parts (T/Sc T/Sh) £3.39
9005288 C Parts (T/Sc) £2.99
9405466 Ball Thrust Bearing Bag (T/Sc) £3.99
9405467 Ball Connector Bag (T/Sc) £5.25
9405468 Damper Bag (T/Sc) £5.99
9465310 Screw Bag A (T/Sc) £1.50
9465311 Screw Bag B (T/Sc) £1.50
9465312 Screw Bag C (T/Sc) £1.15
9465313 Screw Bag D (T/Sc) £2.15
9495095 Sticker £1.30
53001 Dynatech Motor £44.95

NEW HOP-UP ITEMS FOR OCT/NOV.

NEW BALL DIFF.
NEW UNDERTRAY
NEW HYBRID TYRES
NEW DAYGLOW WHEELS

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Optima Pro 4WD .....
Big Brute 2WD .....
Double Date 4WD .....
High Rider Corvette 2WD ..
Ultima 2WD .....
Turbo Ultima 2WD .....
Ultima Pro 2WD .....
Maxxum Front W/D .....
Optima Mid Custom .....
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Honda CRX FF Racer .....
Peugeot 205 Turbo 16 .....
Raider .....

PHONE FOR BEST PRICES

LOSI

JR-X2 2WD £179.00

MARDAVE

Mini £39.00
Meteor £54.00
Meteor Comp £52.00

CONGRATULATIONS

MARK CHAPLIN — YOKOMO —
Belgian Grand Prix
7th A Final
JOHN PRIDHAM — AVANTE —
Belgian Grand Prix
Quarter Finals

SCHUMACHER TYRES

G644 Hook Up Wire (1m Red/1m Black) ... £1.50
T650 Rear Tyres 4 x 20 Spike (Soft) £6.30
T651 Rear Tyres 4 x 20 Spike (Hard) £6.30
T652 Front Tyres 3 x 20 Spike (Soft) £5.80
T653 Front Tyres 3 x 20 Spike (Hard) £5.80
T654 Front Tyres 2 x 20 Stud (Soft) £5.80
T655 Front Tyres 2 x 20 Stud (Hard) £5.80
T658 Rear Tyres 5 x 24 Minispike (Soft) £6.30
T659 Rear Tyres 5 x 24 Minispike (Hard) ... £6.30
T660 Front Tyres 4 x 24 Minispike (Soft) £5.80
T661 Front Tyres 4 x 24 Minispike (Hard) .. £5.80
T662 Front Tyres 5 x 20 Blocktread (Soft) . £6.30
T663 Rear Tyres 6 x 20 Blocktread (Hard) . £6.30
T664 Front Tyres 4 x 20 Blocktread (Soft) . £5.80
T665 Front Tyres 4 x 20 Blocktread (Hard) . £5.80
T666 Rear Tyres 6 x 20 Cut Spike (Soft) ... £6.30
T667 Rear Tyres 6 x 20 Cut Spike (Hard) .. £6.30
T668 Front Tyres 1 x 20 Rib Spike (Soft) ... £5.80
T669 Front Tyres 1 x 20 Rib Spike (Hard) .. £5.80
T670 Front Tyres Sponge T & G On Wheel . £7.99
T671 Rear Tyres Sponge T & G On Wheel . £8.99
T672 Rear Tyres 4 x 20 Cut Spike (Soft) ... £6.30
T673 Rear Tyres 4 x 20 Cut Spike (Hard) .. £6.30
T674 Front Tyres 3 x 20 Cut Spike (Soft) ... £5.80
T675 Front Tyres 3 x 20 Cut Spike (Hard) . £5.80
T676 Front Tyres Double Rib (Soft) £5.80
T676 Front Tyres Double Rib (Hard) £5.80

TAMIYA

Sonic Fighter £56.95
Grasshopper II £44.95
Hornet £51.95
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Boomerang £88.95
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Kyosho Ford RS200 ..... £199.95
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ON ROAD CARS

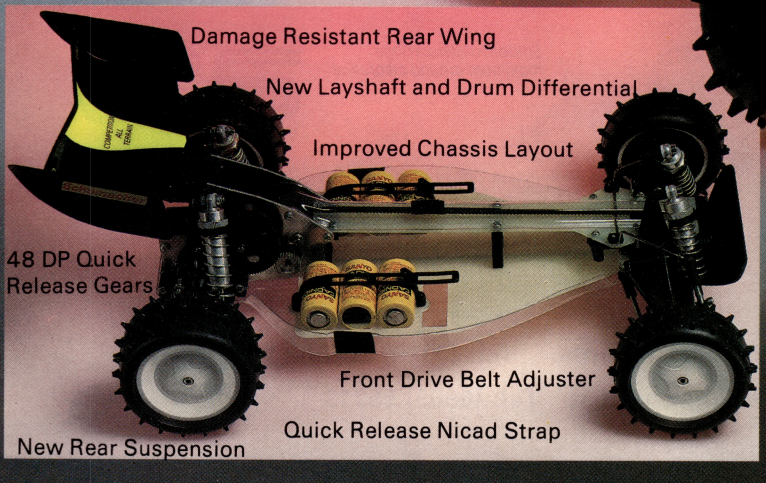
TRC Pro Ten £169.95
Parma Panther £119.95

PRO-CAT™

Advancing the Sport - Improving the Breed

Into the spotlight comes the Schumacher Pro-Cat. From the same team that developed the World Championship winning 4WD Cat and innovative 2WD Topcat, the Pro-Cat has been designed for all levels of competitor to be the ultimate in 4WD 1/10 scale off road racers straight from the box.





ANOTHER

RACING PRODUCT FROM **Schumacher**

Manufactured and Distributed by:
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Performance and technology that *YOU CAN BUY!*

TEAM ASSOCIATED RC10

IFMAR WORLD CHAMPION
ROAR 1:10 NATIONAL CHAMPION
ORRCA NATIONAL CHAMPION



THE TEAM DOES IT IN THE DIRT.

Race the car that beat the imports in the toughest kind of off-road competition.

The All-American Associated RC10 took home the gold in both the ROAR and ORRCA National Championships.

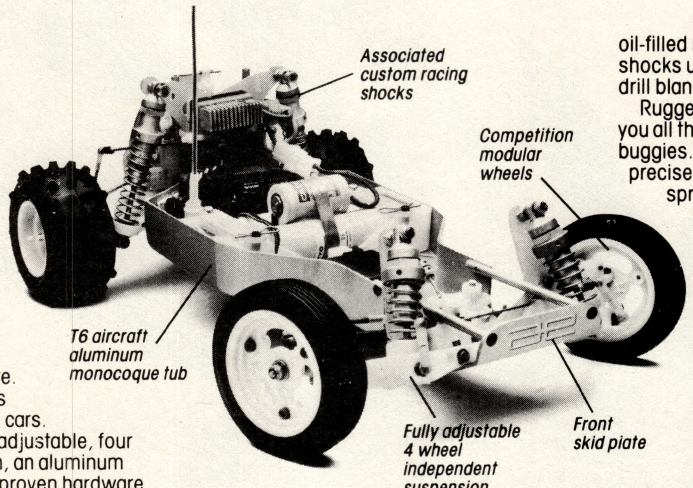
Our RC10 turned back the foreign car invasion with the same racecar technology that has kept Team Associated on top of the RC car racing world for over 15 years.

A RACE CAR, NOT A TOY.

Sure, you've heard that before.

But Team Associated designs and engineers only model RACE cars.

The new RC10 features fully adjustable, four wheel independent suspension, an aluminum alloy monocoque tub and race-proven hardware throughout.



oil-filled racing shocks. These custom shocks use machined alloy cylinders and drill blank shafts for silky smooth action.

Rugged, yet light, the suspension gives you all the adjustability of full size, full race buggies. The A-arm/Ball joint design allows precise camber, caster, ride height and spring rate tuning. Even anti-roll bars and a VariLok dif are included.

Exceptional ground clearance and low center of gravity also contribute to the superb balance and performance of the RC10 over all types of terrain.

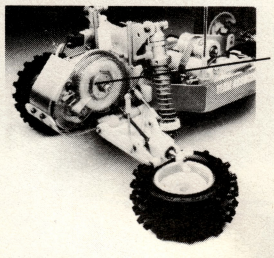
GET THE JUMP ON THE COMPETITION.

Go RC off-road racing with the leaders. The National Champion RC10 is available now and legal for ROAR and ORRCA nationally sanctioned competition.

Complete RC10 kits, replacement parts and spares are readily available through model car racing's most extensive dealer network.

Take the challenge and build yourself a winner. Team Associated's RC10.

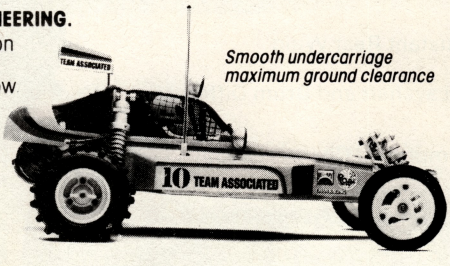
And the RC10 doesn't need expensive accessories and modifications to handle the roughest tracks. The strength and durability is standard equipment.



Sealed gearbox VariLok differential

RACE-WINNING ENGINEERING.

For maximum traction the RC10 suspension is damped by long throw



Smooth undercarriage maximum ground clearance

Full race rear suspension includes bulletproof half shaft and u-joints with tapered and keyed modular wheels. Quick release knock off design for fast pit work and tuning.

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TEAM ASSOCIATED
6 TIMES WORLD CHAMPION

Model cars for Real racers.

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Costa Mesa, CA 92626
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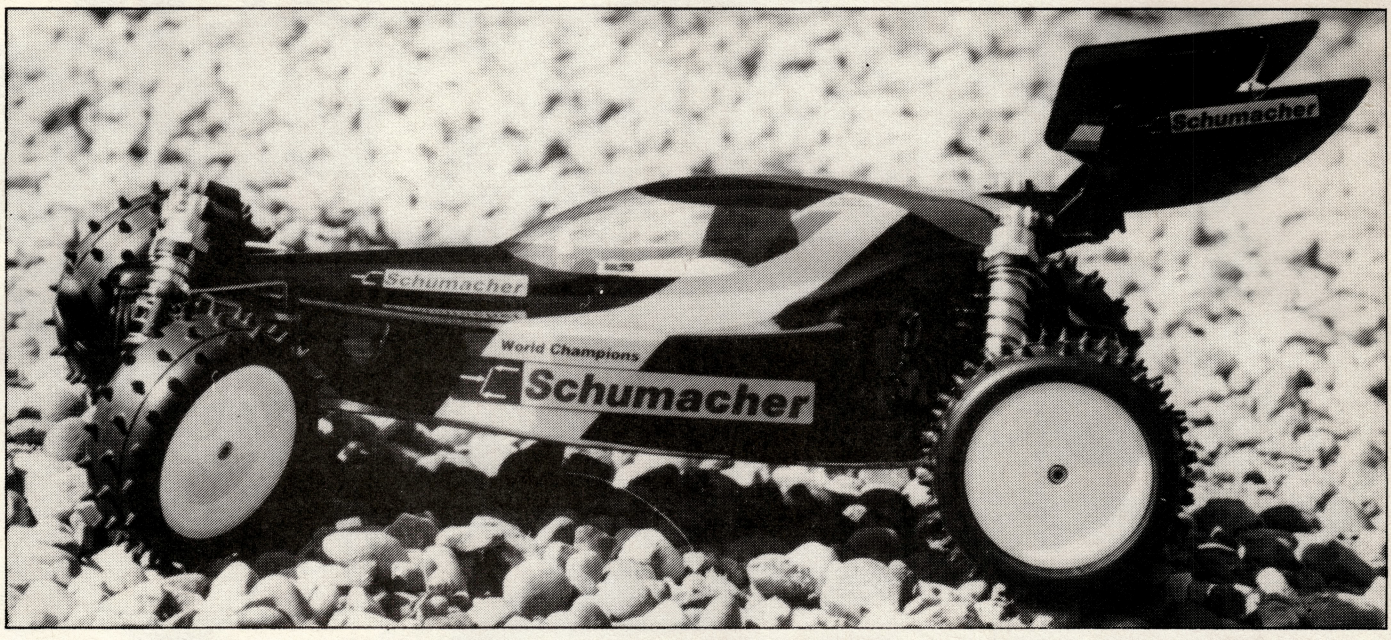
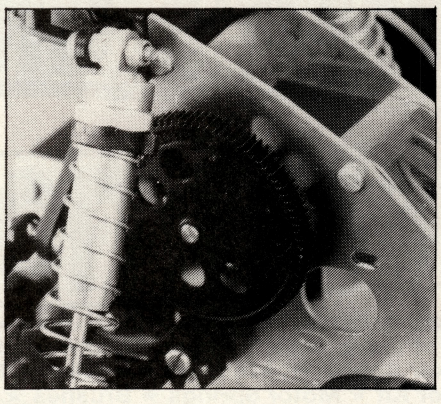
WORLD EXCLUSIVE!



WIN A SCHUMACHER PRO CAT IN OUR FREE TO ENTER COMPETITION

Radio Race Car is delighted to be the first magazine in the world to bring you news and photographs of Schumacher's new Pro Cat! Developed to the same exacting standards as the now legendary Cat, the Pro Cat is the off-road car for the 1990's now!



What secrets lie behind this new rear gearbox? Find out in next month's bumper 100 page issue.

FULL REVIEW AND YOUR CHANCE TO WIN A PRO CAT!

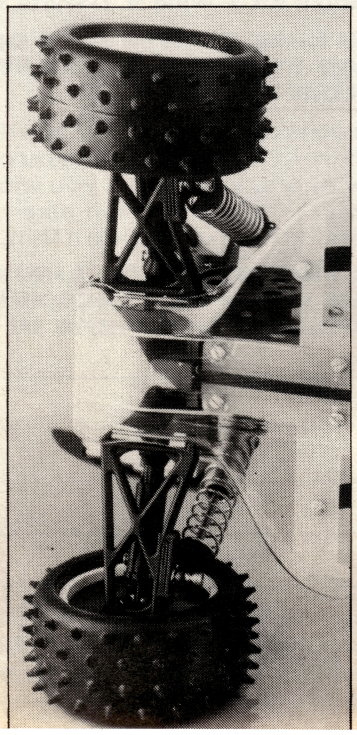
ALSO FEATURED IN NEXT MONTH'S R.R.C.

P.B.'s all new Ace 4-WD one tenth off-road racer.

S.G.'s superb new 4-WD one eighth circuit car.

R.R.C. 2-WD Final Lists.

ALL IN NEXT MONTH'S BIGGER, BRIGHTER, SAME PRICE, 100 PAGE ISSUE



All new rear end. The Cat is the bench mark for all 4-WD cars. is the new Pro Cat in the same league? Find out in the next bumper issue of Radio Race Car. Don't miss out on your copy— order it now!

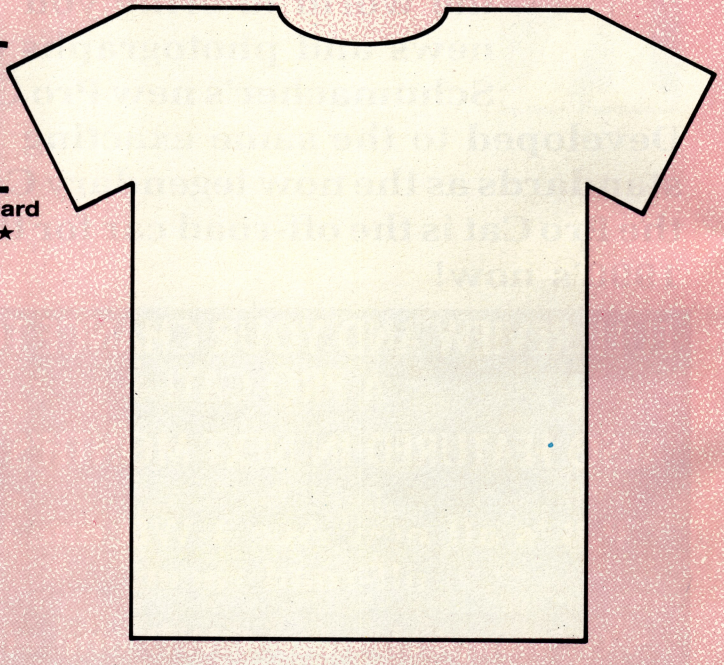
FREE TO ENTER PARMA COMPETITION

ALL THESE ITEMS MUST GO



PARMA'S GREAT GIVEAWAY

COMPETITION



PARMA PRIZES TO BE WON: 2 Modified Motors ★ 1 Standard Motor ★1 pack of Lazer Cells ★ Pinion Case ★ Dust Cover ★ Decal and Sticker Sheets ★ Aerial Tube ★ Oiler ★ Silicone Wire ★ Capacitor Kit ★ Motor Springs ★ Brushes ★ Body Clips ★ Body Mount Kit ★ Wing ★ T-Shirts ★ Hats ★

WOULD YOU LIKE TO WIN ANY OF THESE GREAT TUNE-UP, GO FASTER GOODIES FROM PARMA?

All you have to do is design a T-shirt bearing Parma's name somewhere in the design and you could be one of three prizewinners. You may, if you wish, send along with your official entry form a full size paper mock up of your design to help us decide if things are close!

REMEMBER THERE ARE NO LIMITATIONS, OTHER THAN YOU MUST INCORPORATE PARMA'S NAME SOMEWHERE IN YOUR DESIGN.

Name ..... Age.....

Address .....

.....

.....

The thing I like most about RRC is .....

.....

The thing I like least about RRC is .....

.....

This competition is not open to members of staff of Traplet Publications or Parma U.K.

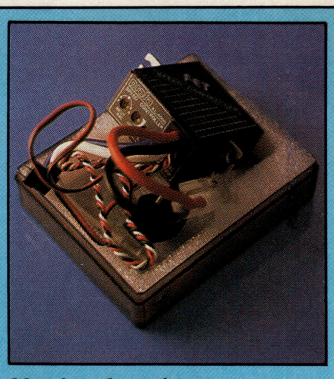
Fill in your details and send all entries to: PARMA T-SHIRT COMPETITION, RADIO RACE CAR MAGAZINE, MASEFIELD HOUSE, WELLS ROAD, MALVERN, WORCS. WR14 4PA.

Windsor Models

There is a current growth in the number of drivers racing one eighth circuit cars. If you are about to take a look at this formula and are considering buying a car then take a long, hard look at this, the new S.G. Europa. Before you old hands out there start shouting "it's a Space, it's a Space", hang on a second, although the box says Space, what it contains is in fact the nearly all new Europa. This quality piece of Italian engineering is the next highly developed stage on from the car that swept all aside in the 1988 Euro Champs. Early independent reports would confirm the fact that the new Europa is indeed a chip off the old block and runs like a dream. We can confirm that the importers, Windsor Models, are bursting at the seams with spares so no problems on that front, we can also confirm that any driver, be he an existing eighth addict or a newcomer to the formula will also appreciate one more amazing thing about the Europa, the price tag of £175.00 — now that is a bargain!

Available from Windsor Models, 45 Albany Road, Windsor, Berks.





Harden Associates

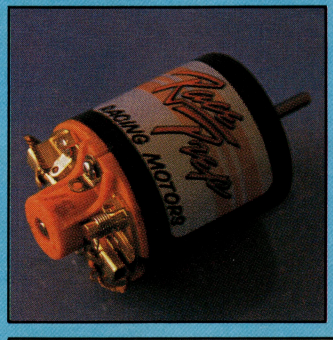
We will be featuring several new and exciting products from this forward looking company but this month just to whet your appetite have a look at this new speed controller, servo sized to fit anywhere, simple to adjust and not expensive on the pocket. The price is still to be announced but we can tell you that you're all in for a very pleasant surprise. The FET speed controller is fully adjustable, includes reverse and brakes and comes with Tamiya type leads fitted, ready to go!

By the time we go to press this speed controller should be available from Harden Associates, Millet Street, Bury, Lancs.

Associated Products

Associated have released several new or uprated products lately, first on the list is Associated's own version of the Yokomo Super Dogfighter the YZ-10. This version of the Yokomo has taken first, second and third places at both the Florida Winter Championships and the Reedy Race of Champions. Perhaps one of the ingredients of Associated's success are the Reedy matched power packs, each cell is individually tested using specially designed equipment to give you, the racer, a choice of either factory, racer, or team grade packs from which to choose. Used in conjunction with Associated Reedy motors you have a winning combination.

Available from your nearest Associated stockist.



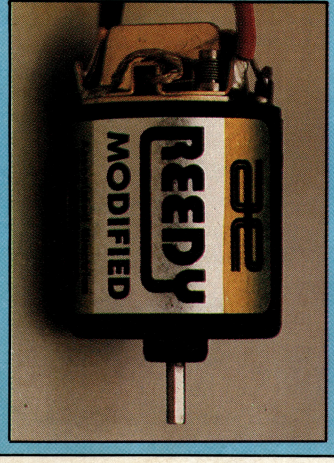
Missile Products

Race Prep motors are now also available from Missile Products. These durable, fast and reliable motors are available in a variety of winds including 12, 13, 14, 15, 16 and 17 turn doubles. Race Prep SCE cells are also available from the same source.

For further information contact Missile Products, P.O. Box 384, Croydon, Surrey, England.

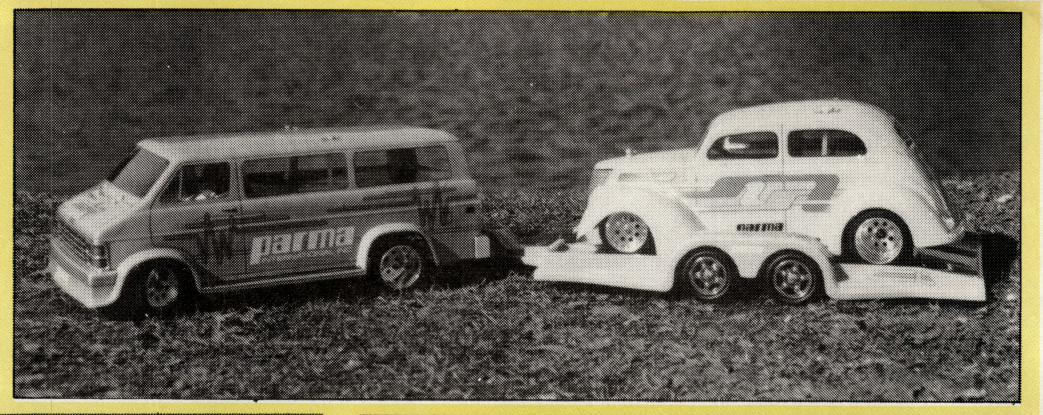






Parma Products

Yet again Parma have released a number of goodies and go faster parts to make your car go or look better. First for monster owners the perfect touch, direct replacement chrome wheels to give you that sparkling edge. Two new shells, an 84 Corvette Z.R. 1 and the classic 74 Nova, both in tenth scale and both in stunning detail. To make any bodyshell complete Parma's great decal range is getting ever better, just four among





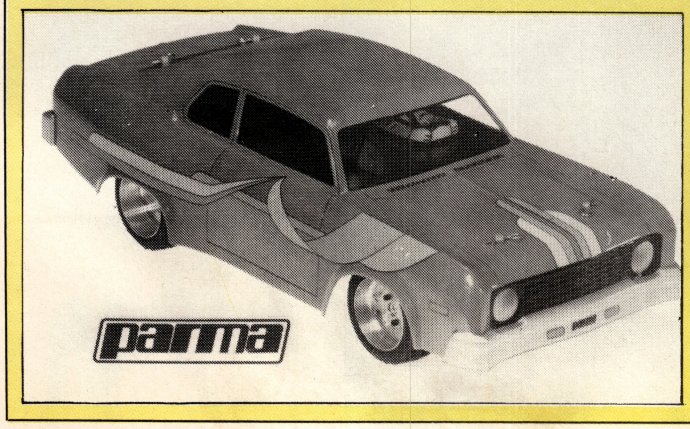


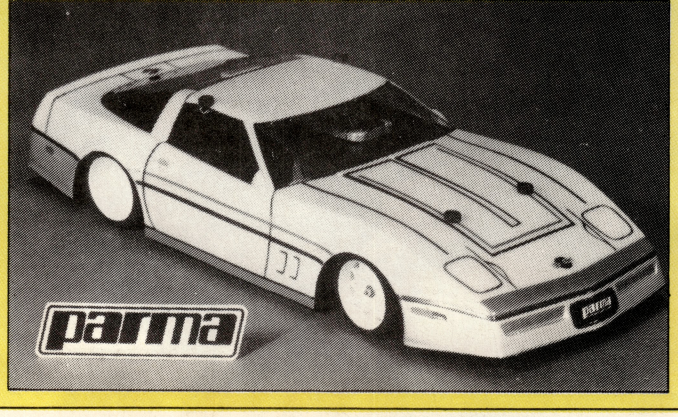
many new sheets are these, Shell Oils, Mobil 1, Coke, and California Raisins, all silk screened in bright, bold colours to make your car look like a million dollars! Now you've made your car look better, make it go better. All racers should seriously consider this great new deal from Parma, buy your S.C.E.'s bulk. Now you can buy your perfectly matched S.C.E.'s in bulk lots of 24 at a time, each box perfectly matched and signed by the technician who rated them, it makes sense and saves money!

Finally, what about this beautiful combination of Dodge van, trailer and 37 Ford Sedan, stand out from the crowd with this great combination. All for you to finish and style as you wish.

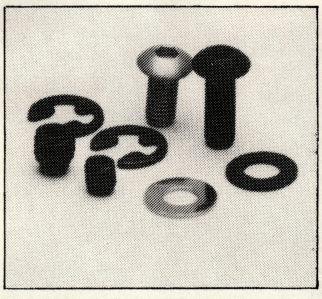
For all these and a great deal more Parma products see your local Parma agent or dealer. ○





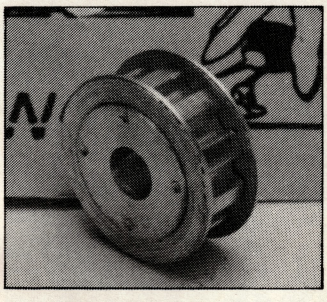






Wasp Racing

Could you turn tighter than a cat? A formidable task in anyone's books. It seems that certain people of repute are making the claim that if you own a Yokomo and fit one of Wasp's overdrive pulleys you can, well it's one of the reasons that a cat turns in so well. The second advantage using Wasps



new pulley is that you can dispense with the belt tensioner and lose all that drag.

Change all of those annoying button head screws straightaway and use Wasp's new Allen head screws in conjunction with Wasp's extra long Allen keys, these are especially useful for any Yokomo or Mid driver. Also for the Mid driver are the E clips, extra springy! Finally for all of you who take your modified motors apart in the middle of fields and lose all of the metal and fibre washers, a pack from Wasp is available just for you. For further details see Wasp's advert in this issue of R.R.C.

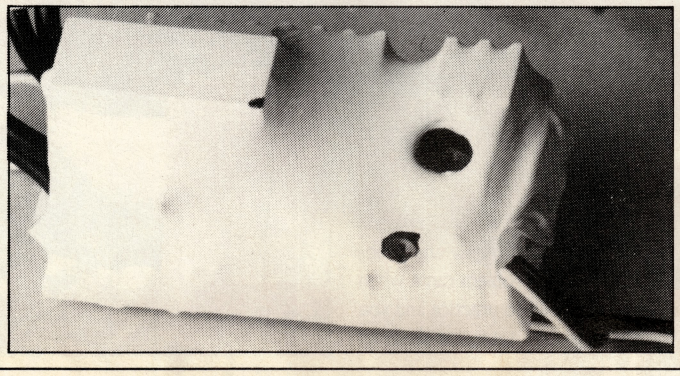


Dremel Freewheeler

Without doubt the name that most people think of first when it comes to power tools for model use is Dremel, now the Moto Tool is on the U.K. market having undergone a major face lift.

Weighing in at just 630 grms, measuring less than 22cm x 6cm and now able to use 125 watts of input power, the Moto Tool can now turn speeds of up to 30,000 R.P.M. allowing the toughest grinding and drilling jobs to be undertaken.

For more information on any tools in the current Dremel range contact Microflame Ltd., Vinces Road, Diss, Norfolk. Telephone 0379 644813.



Lesro

May we take this opportunity to correct the text that accompanied the last photographs of this motorspray, due to reasons beyond anyones control our spray didn't, we are now pleased to say that this spray does, and at a high pressure. Blast out that dirt with Lesro's Motortek spray!

For further details of Lesro products see Lesro's advertisement in this issue.



Worcester Models

A name that may be unfamiliar to some but already producing a superb speed controller of their own. The Worcester Models speed controller has eight high spec F.E.T.'s can handle instantaneous current of 1280 Amps, reverse and pull back brakes.

We have tested this speed controller under various conditions in both off road and circuit cars and find it to be extremely good value for money, giving an excellent performance in both formulas. A forward only version should also be available by the time you read this column.

11 F.E.T. — £85.

8 F.E.T. — £70.

8 F.E.T. fwd only — T.B.A.

All of the above products are available from Worcester Models, 26 Barbourne Road, Worcester, WR1 HT. Telephone 0905 613484. ◯

HAPPENING A

Bob Errington reports from Heemstede in Holland on the 1/8 circuit World Championships

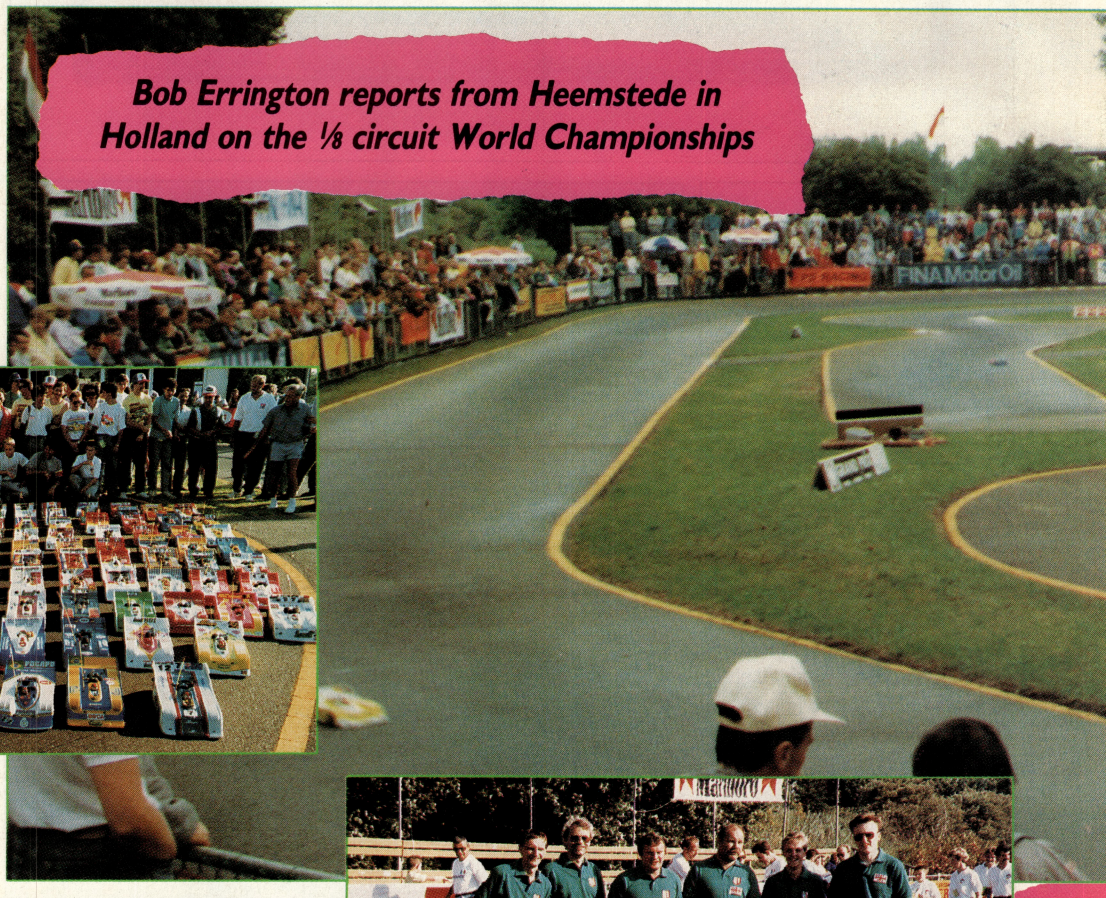
Most drivers had arrived at the Heemstede circuit in Holland by Saturday 1st July, just over a week before the final, whereas others had arrived up to a week prior to this. Free practice had been available on the circuit from Wednesday the 28th June till the Friday evening.

Saturday 1st July was scheduled to be the first of the organised practice and this would be the case up to Monday lunchtime, however, there was such a deluge of rain on Saturday that the organised practice was cancelled and the track open for free practice from when it stopped raining until 8 p.m.

Sunday was the start of the better weather and by mid morning, shorts were the order of the day. By now the organised practice was working well. Here then, you collected your name-card from Race Control, wrote on it your practice frequency, then handed it to the practice organiser who would put you in the first available practice slot. These slots were of ten minutes duration and allowed fifteen drivers on the rostrum at a time. Sounds a lot, but on the long and fast circuit, there were hardly any problems at all. Only problem came when everyone wanted to practice and you were then given a time slot about an



▲ *120 cars and drivers line up.*



▼ *That beautiful Australian Lancia.*

▲ *The Heemstede circuit in Sundays damp conditions.*





▲ *The British team.*

▼ *Ron Paris was always working on someones car.*

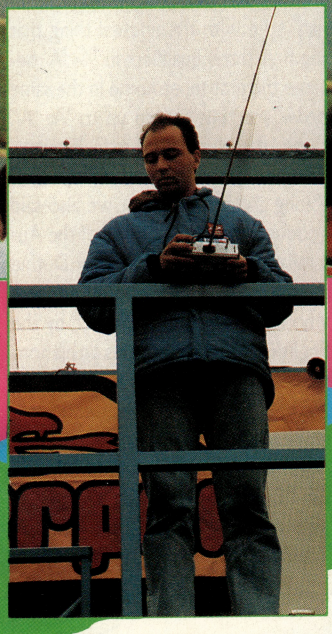


T HEEMSTEDE





▼ *Re-Pete Fusco was seeking advice from the much quicker Italian Associated of Stephano Columbini.*



◀ *Stefano Columbini.*

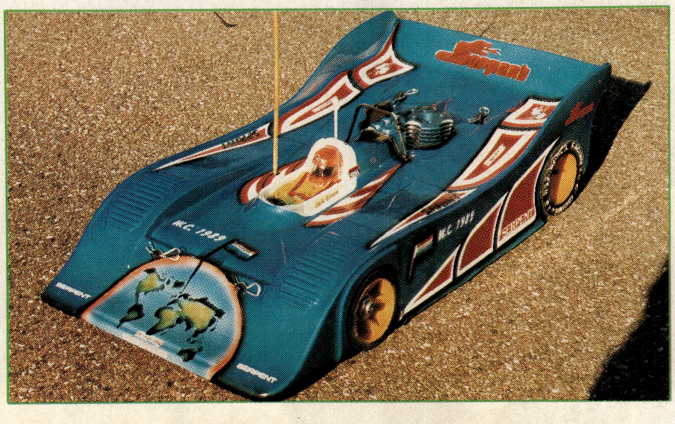
glueing up tyres for the Americans, prior to the event — no — the two couldn't be related — could they?

The official opening ceremony took place on Monday, after the timed practice and it was an impressive affair with all 120 entrants plus mechanics and helpers parading round, country by country. For the first time ever the British were all dressed the same, in dark green casual tops with B.R.C.A. and Union Jack badges (mostly). Gary Culver had supplied the tops at a good discount which was appreciated even if it wasn't realised!

The sight of all 120 cars on the track at once was really quite impressive and some of those paint jobs were terrific. After the usual opening speeches, there was a concours event which produced three winners from



▲ *Garofoli, Collari, Caronello, designer, driver, developer. A winning combination.*



◀ *Jacky Ermes world theme paint job.*

hour hence.

Monday afternoon saw the timed practice which was headed by Michele Baruzzi from Italy with his OPS powered Blitz going round to record a lap time of 36 laps in ten minutes 0.54 seconds. Yes the heats were of ten minutes duration and needed a definite fuel stop, more of that though later. Ten minutes also meant that there was a high probability that you had to pass a lot of cars during your heat, and in some heats that would prove quite difficult.

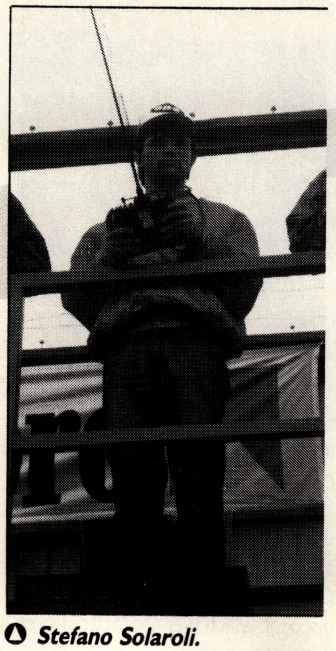
Many drivers were not concerned with running the whole ten minutes, being more interested in the extra practice but what was becoming apparent was that none of the Americans were running well at all! There was a problem in the American camps (yes, they had an 'in' and an 'out' crowd as well). Tyres were coming off the rims. It was also known that a certain Colin Leake had been spending a lot of time

three different categories. One for the artwork, one for the most realistic and one for absolute scale, which went to that superb Lancia group 'C' body based on a Serpent chassis, by doctor Jock from Australia, here guising as Stuart Grant. The most realistic award went to Leonardo Leite from Brazil, and the best artwork to Jacky Ermen from Holland.

At this stage, the only taint on the horizon was the issue regarding a 'new' Serpent tuned pipe model no 2295. This pipe was banned by IFMAR for this event after a lot of controversy. The American version says that they developed a new pipe, sent it for homologation, whereupon Serpent got hold of it and copied it! The Dutch version is that they just happened to develop a pipe of extremely similar sizes at a time just after the American pipe! Mmm, all seems doubtful to me, but the end result is that the EFRA homologation procedure is only for checking noise levels and is not a patent on design!

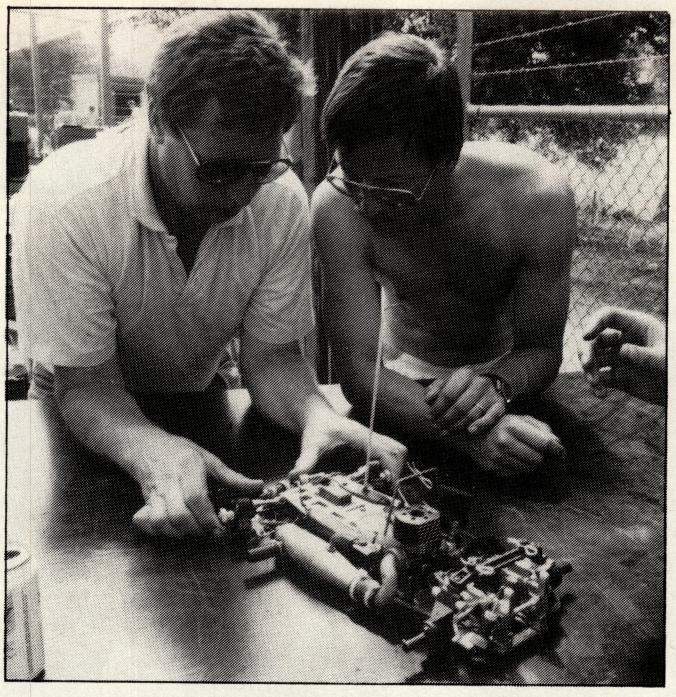
Look out for the new 'Fat' pipe in your model shop soon, it certainly works well and is economical!

Tuesday then was the start of qualifying with each driver allocated six heats in which to try and get a good time. The twelve heats were split into morning and afternoon sessions, these



Stefano Solaroli.

being reversed for the second day. Two heats for each driver, for each of the three days, meant a lot of time doing nothing, and not really enough time to go sightseeing. At the end of Tuesday it was Lamberto Collari driving a Rex powered Blitz who was quickest with 37 laps in ten minutes 12.86 seconds. Jacky Ermen from Holland was second with Michael Salven third and Stefano Colombini fourth. At this stage Ralphie Burch was lying in 89th place having run out of fuel!



The Blitz caused much interest, especially this all alloy version by Picco.

Wednesday brought another two heats and lots more sunshine and it was beginning to show that the circuit got slower in the afternoon sessions. Juergen Bahr moved his OPS powered Serpent up into fourth spot and even Ralphie Burch was now up to 13th, even with two pit stops. Ralph senior was doing his usual fast pit work and the speed with which he fuelled the car was really quite amazing, losing only three seconds as a result of the two stops! Rody Roem should have made a good time but trouble with passing dominico Calce certainly cost him dearly. Looking further down the qualifying list we find in 114th place, Re-Pete Fusco, the reigning World Champion obviously in deep trouble.

Strangely now the IFMAR officials let the track open for practice on Wendesday after qualifying. Why? Most of the afternoon drivers had departed and certainly the morning session were nowhere to be seen. The argument was given that those that practiced Wednesday evening, would not be allowed in the similar new session on Thursday morning! So how would those not there hear about this? Only 28 practiced on Wednesday leaving 92 to practice on Thursday in the same time period! Hardly fair I think. Also, what would happen if it rained?

With all of the above happening it was hardly strange to find the Americans suddenly on the pace for Thursday's final qualifying sessions. Ralphie Burch finally went Top Qualifier after an incredible run of 37 laps in 10:10.74 after his two fuel stops, and even Kevin Mercadante moved up from 108th to 9th. Re-Pete Fusco got his 36 score to jump up to 21st as well! Collari was still second quickest but Stefano Columbini had moved up to third, (his sixth qualifying run had been even quicker but was disallowed because his fuel tank was 3cc over). Rody Roem finally got some luck and came home fourth, albeit just 0.7 sec ahead of Jacky Ermen who was thus relegated to the semis.

Steve White was quickest of the English with now a Rex engine installed, finishing up as 20th qualifier, just out of the semis' 18th place cut off. Next came Gary Culver in 25th spot with OPS power, he did try a Rex but please don't tell anyone. Then came Bob Errington in 33rd spot, also Rex powered, (had been hanging on to the last spot in the quarters till the final round when last year's European Top Qualifier Daniele Cantanella, suddenly got a time to oust Bob by 0.03 of a second — drat and all that). Nigel Sayles placed 35th, Chris White 37th and Dave Dixon 41st to make the 'odd' 1/8th final, look a bit like an English open meeting. Dave Ashton had qualified 57th and thus was in the 'odd' 1/16th final, perhaps he could join up with the others later on?

Friday had been scheduled as the main day for running heats cancelled by rain earlier in the week, but as there had been no rain, the day became a practice day for setting the cars up for the longer twenty minute sub finals, and then later on for running the 1/128 and 1/256 finals which brought the final six up to Saturdays 1/64 final onwards. Peter Fusco, father of Re-Pete for those that haven't yet worked it out, was the top of those that didn't make it bowing out on 57 laps.

Saturday morning then, saw the start of the main progress up the 'finals' tree with the unusual thing that the first three qualifiers in 1/64 'A' became the first three home in the same order and thus moved up to 1/32 'A', these three being Butch Kloeber, Kazuhiro Tsunoda and Choy Chi-Keung and it meant that we also said goodbye not only to three of the Australians, but also to Selwyn Duthie the lone entry from New Zealand, who had been sort of adopted by the English contingent, and this on his honeymoon as well!

The 1/64 'B' saw Michael Pesek, Morita Tadashi and Chuck Moon move

"Come on you guys — gimme sum traction" calls out Cliff Lett.



up whilst our Spanish friend Carlos Ducay Carrasco and Brasil's Peter Gogarten packed their race gear away. 1/32 'A' raised Peter Warfuinge (remember him from the Euros in Aberdeen?), Mikael Kjellson and Etienne Guiette to the 1/16ths whilst Australia's Steve Burgess and the U.S.'s Butch Kloeber were no longer. Likewise in 1/32 'B' for Michael Pesek, Tomonori Kasagawa and Lee Kai-Fai up to 1/16 'B' and Rick Davis to join the rest on the watching benches. And to think that I used to say that Rick was large, but now, compared to Ron Paris, Rick is a mere midget!

The first of the 1/16th finals saw 14-year-old Oliver Mack from Germany score 70 laps to rise to the 1/8 'A' together with Mikael Fransson and Han Hippe from Holland, the other 1/16 lifted Guy Dejean, Herge Valliet and Lars Sonnerud, and also said goodbye to former European Champion, Jacob Buehler, and also to England's Dave Ashton. The last two remaining Japanese drivers, Takashi Ishijama and Tomonori Hasegawa also bowed out (sorry about the pun!)

Oliver Mack made a repeat performance in 1/8th 'A' by scoring 71 laps this time, to gain himself a place to the quarters, followed once again by Mikael Fransson and America's Mike Swauger after an earlier cut had looked like costing him dearly. Out now were Switzerland's Albert Grot (another former European Champion) and Eric Vandereyt from Belgium.

The English final, otherwise known as the 1/8 'B', had looked promising for Bob Errington up to the eight minute mark, where he was nearly a full lap up on the rest of the field till a case of understeer pushed the car a little higher on the sweeper, onto the loose rubber, and into the fencing, damaging the rear end. Dave Dixon on the other hand, got a bad start amongst the traffic, went well in the mid part of the race and then slowed near the end with a bent chassis, still had enough laps to finish second to the flying Venezualan Maurizio Busnardo, with Guy Dejean from France third. Thus neither Bob or Chris White or Nigel Sayles were destined to go any further and would join Curtis Hustings for the sit out.

Sunday then, was finals day, starting off with the quarter finals and progressing upwards from there, weather permitting.

The first quarter features Steve White on pole position and Germany's Michael Mielke in second spot. Mielke jumps the start a little and is awarded a one lap penalty so although he is leading the pack round, it is Steve White in the lead. Even within a couple of laps, young Oliver Mack has moved up into second spot with Stefano Calpista third and Fabio Domanin fourth.

As we approach the first fuel stop at five minutes Oliver Mach has taken the lead with Calpista in second having just passed Steve White. Domanin is charging in fourth spot and certainly has a power advantage over Steve. A mistake now by Calpista drops him down to fourth, but Domanin has crept in front of Steve who therefore stays in third spot with the race leader not far off from lapping them all! Michael Mielke has now overcome his lap penalty and is closing slowly on Steve having passed a now ailing Calpista. But it is not to be, just as he gets close enough to challenge, a problem sidelines him in the last mi-

Andrea Machler.



nutes leaving Oliver Mach winning on 72 laps, Fabio Domanin second on 71 and Steve White on 70 which are thus the three to go forward to the prestigious semi-finals.

The second quarter final started with a lot of confusion as cars got caught up in the opening moves with Gary Culver finding himself at the back. It was Rene Schar from Switzerland in front just ahead of Stefan Habbecke from Germany with France's Christopher Aygon a close third. Habbecke takes the lead only loose it back to Schar who then disappears off the circuit with a major problem. As the cars come in for their first five minute stop it is starting to spot rain, but not enough to slow anyone. Now Maurizio Buznardo has moved up to second with Aygon third and Dave Dixon in fourth. It is now raining a



The massive AMB lap counting display.

little harder, the lap times are starting to lengthen. Habbecke now finds a problem at the second fuel stop, all the cars are slowing above the official lap time for a wet race, but it is another two minutes before the race is stopped on what is now a sodden track.

Nothing happens for a long time now whilst drivers and officials wait to see what the weather will do. Eventually the decision is taken that the second quarter final and both semis will be run regardless of weather, starting at 2.15 p.m. so that all have a chance to prepare for the wet.

Frenzied pit activity is one way of putting what happens next, as the European drivers used to running in the rain (e.g. the English), help those that have never run in the rain. The American drivers are really into the swing of things and seem to be looking forward to a completely new experience.

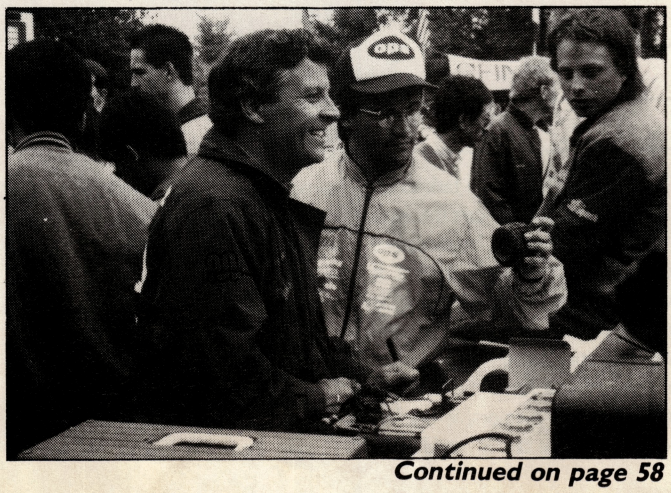
At the start of the 1/4 'B' there is some confusion at the front while positions chop and change, whilst Gary Culver is a lap down before he even gets started.

Christopher Aygon from France settles into the lead followed by Stefan Habbecke, Guy Dejean and Re-Pete Fusco. After the first fuel stop, Aygon still leads from Habbecke but it is America's Cliff Lett now up to third spot really enjoying his wet weather debut. Dave Dixon is holding fourth whilst Gary Culver has moved up to fifth. Dave Dixon goes off at the end of the straight and there after seems to have had handling problems thus letting Gary up to fourth spot. Now it's Aygons turn to slow, letting Mabbecke through to the lead with Cliff Lett second.

Re-Pete Fusco's chances of a repeat win are finally buried as his silencer parts company from the manifold forcing him into the pits. So with just one minute to run it is Habbecke in the lead from Cliff Lett, both on the same lap, with Gary Culver just in third spot with Guy Dejean close behind and now we have Maurizio Busnardo catching fast. Into the last lap as the sounder goes, Gary only has to stay in front to qualify, but suddenly he spins out, Dejean nips through to grab that third spot and Gary is left wondering what has happened.

Disaster at the start of the first semi-final for Michael Salven as his motor cuts on the opening cap leaving Thierry Guillemien from France in the lead from Andrea Machler second and Oliver Mach third, just ahead of Steve White. Salven still keeps getting engine cuts and so far has not turned even one lap! Then Oliver Mach gets an engine cut, he restarts but the time is 4½ minutes into the race, he is several laps down and keen to try and make these up. In his haste he tangles with Steve White, spinning him and letting Domenico Calce up into third spot. But his haste is in vain as his engine cuts again shortly after. Calce spins, letting Steve back up to third and Michele Baruzzi now in fourth.

An "unknown" English driver helps an Italian comrade during the wet semis/quarters.



Continued on page 58

TAMIYA EGI



Will Tamiya's Egress make them the next World Champions? It could well do!

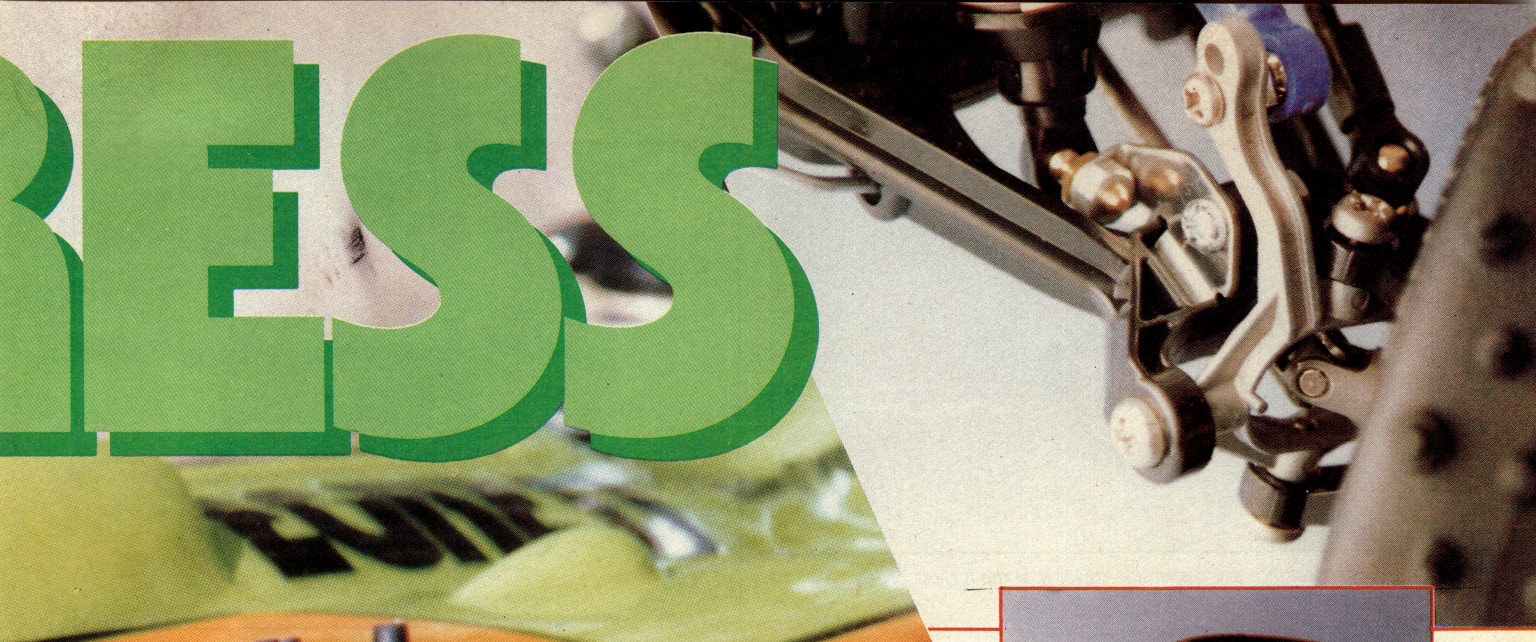
It would be a mammoth task to list the exact number of cars that have throughout the years, been released into the r/c car consumer market. It would be a lot easier to recall the number of cars that could be described as pure racing cars, it would be easier still to name the few cars that fit into the memorable bracket and what a simple task it would be to name the one or two legendary cars that have swept all and sundry aside and gone on to prove that they are indeed a true champion, season after season! Well it's time to get the hammer and chisel out again and carve another name into the space reserved for legends, Egress! Tamiya's latest 4WD racer is a surefire winner straight from the box, it has every conceivable uprate part supplied ready to fit, not for the sake of gimmickry but solely in an attempt to provide you with the fastest, most surefooted car yet.

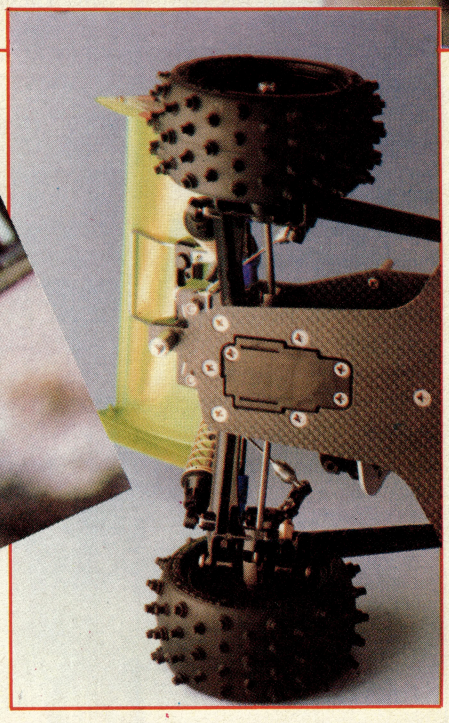
Moving Out, to Exit

The word Egress means to move out or to exit, if that is a statement of things to come from Tamiya then the 1990's is going to be a time to look forward to.

Presentation, packaging and instructions are as usual up to Tamiya's extremely high standard, the best salesman for Tamiya products have always been the boxes themselves, emblazoned with tremendous pieces of art work as well as schematic, colour coded systems diagrams. I am al-

ESS





Front upright showing universal jointed drive shaft.

Rear gearbox inspection cover, note all screws are countersunk for extra ground clearance.



ways amazed that you don't see more box tops of this quality framed and hung on the walls of workshops and bedrooms, maybe I am just a sentimental old fool.

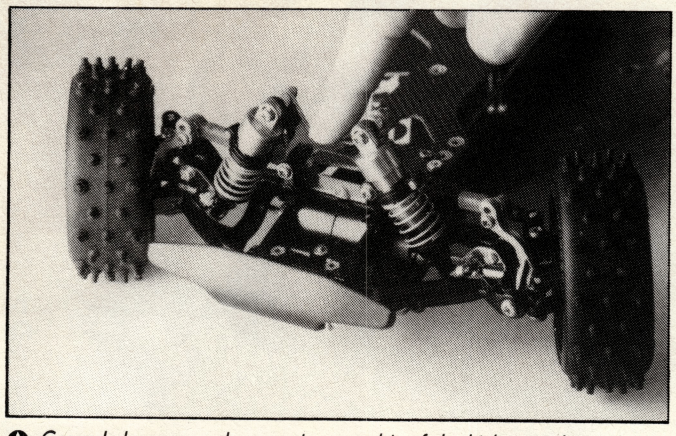
It's all Differentials to me

The first stage of construction deals with both the front and rear differential assembly, take a little time and care here as both front and rear diff housings are almost identical, a longer than average squint at the instructions will save you disassembly time later. Both front and rear diffs are of the ball type and need to be assembled with care following the instructions precisely, we did and found no problems here at all.

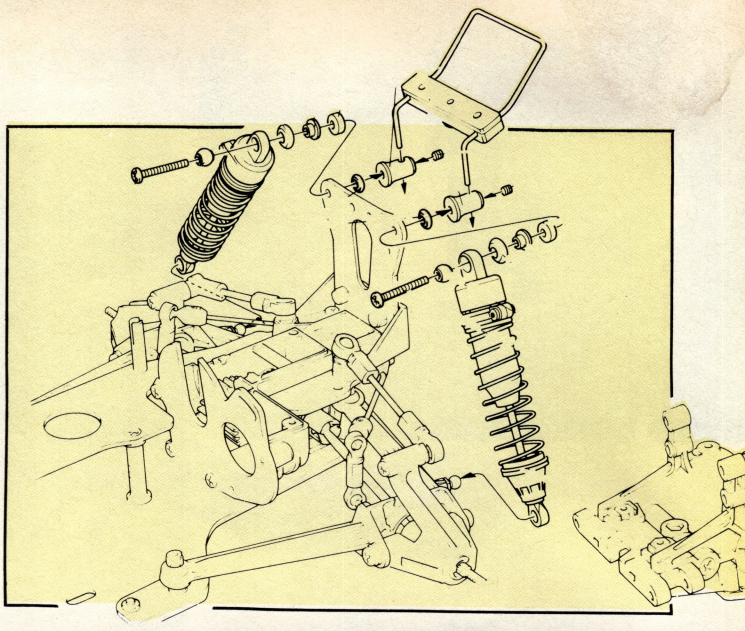
Gearboxes, both front and rear are now moulded in reinforced plastic and are fully ballraced throughout, it seems that the basic rule with the Egress was "if it moves, ballrace it" everything right down to the steering bellcranks are fully ballraced, in fact no fewer than thirty ballraces are used throughout the car, every one is supplied in the kit. One final noteworthy point before we move away from the gearboxes is that each one is fitted with an inspection hatch allowing the owner driver to carry out inspection and regular maintenance easily.

Just like the Real Thing

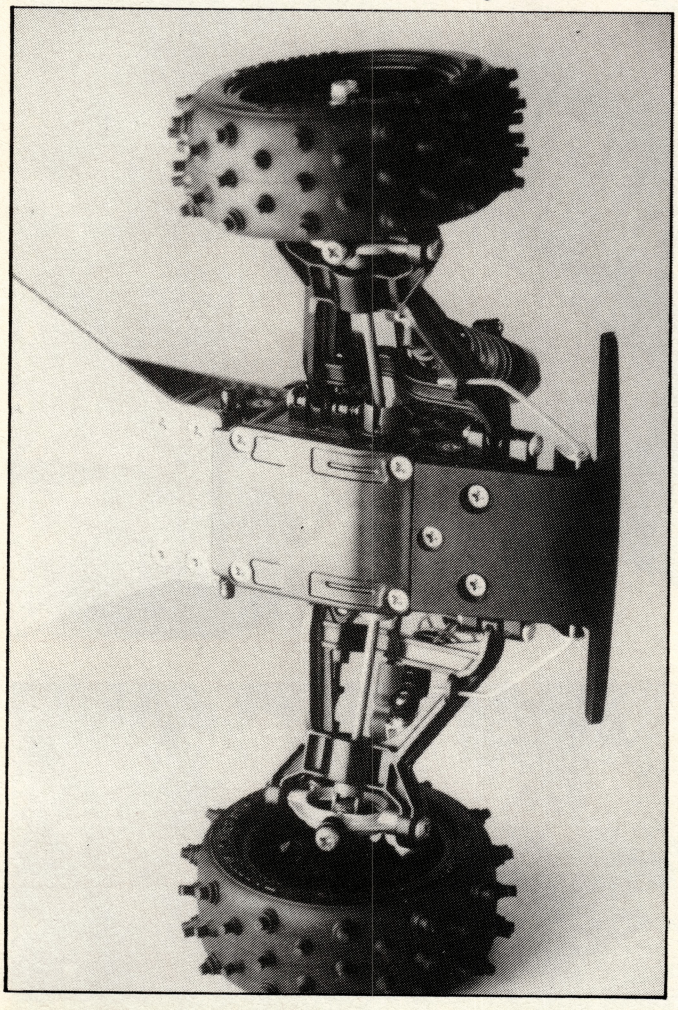
Carbon fibre is a material that full size racing car constructors took to their hearts straight away, it is first and foremost very, very strong, a guy cal-

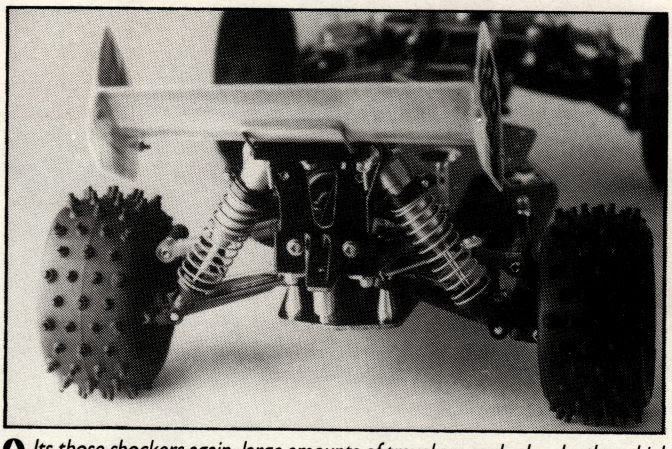


▲ *Ground clearance and suspension travel is of the highest order.*

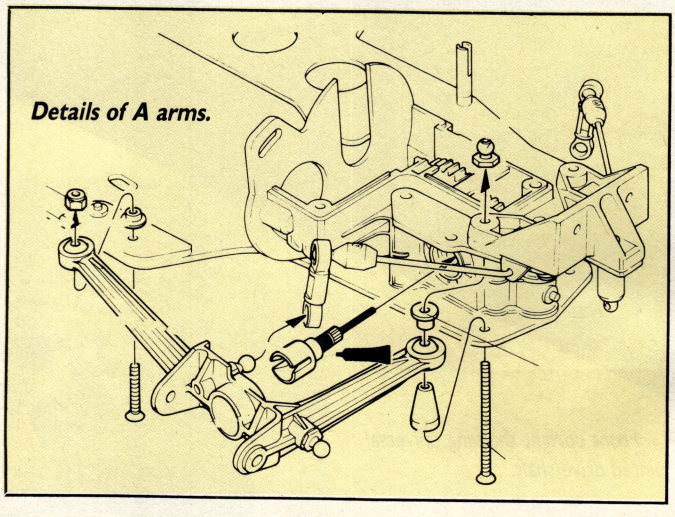


▼ *Egress front showing inspection cover for forward gearbox.*





▲ *Its those shockers again, large amounts of travel are soaked up by these high volume shocks.*



led Gerhardt Berger can testify to that! Carbon fibre is also extremely lightweight, another great plus point if you are building racing cars. Just like the real thing the Egress is supplied with carbon fibre chassis and top deck, this allows the car to be strong, light and torsionally very stiff, all of these three elements make for a great base to build a car around. All fixings used throughout the build phase are also aluminium or aluminium alloy in order to keep weight to a minimum and the centre of gravity low.

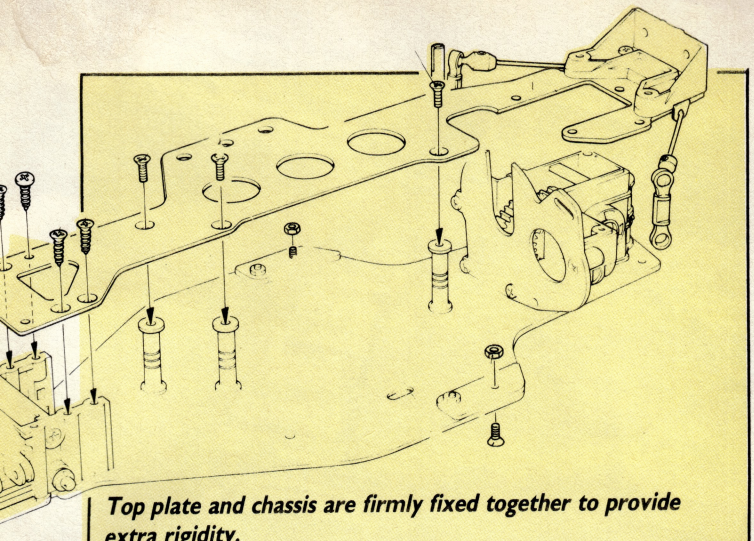
Suspension, Anti Roll Bars and all

Front suspension is supplied using lower wishbone and top adjustable tie rod, Tamiya have wisely stuck with the time tested plastic that they have used very successfully for several years now, it is strong and very durable. Tie pins and circlips are used either side of the wishbone in order to secure it firmly to the gearbox, two are less likely to bend in the event of a collision. Both front uprights are manufactured from an alloy and are secured to the wishbone using threaded pivot pins and to the tie bar using a ball joint.

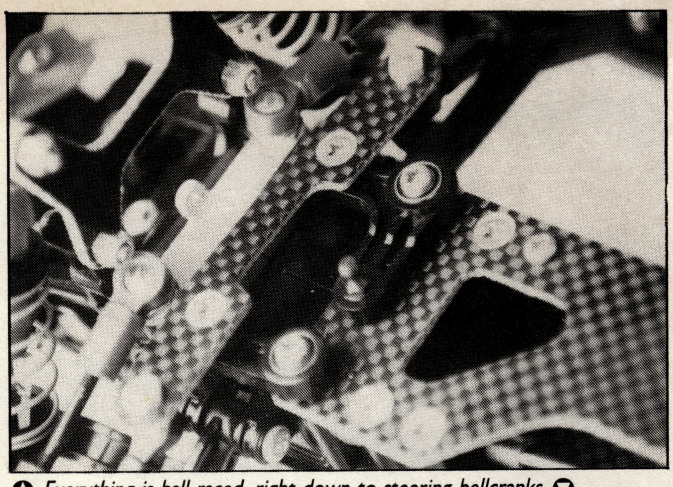
Rear suspension is provided using two A arms, these are once again manufactured using the same plastic type material already mentioned. Both rear arms pivot around a ball and socket type arrangement that gives all the suspension travel you could wish for.

Drive shafts are employed front and rear to transmit power to the road wheels, standard dog bone type shafts are used at the rear of the car and universal shafts are used at the front, this ensures that a large amount of lock is available for use in those tight infield sections of the track. Anti roll bars are fitted to the front and rear of the Egress, they both work and are not just for show, but oddly enough they are not adjustable although this would be an easy matter to remedy.

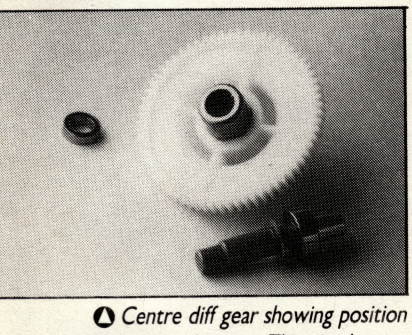
It must be stated right here and now that the dampers supplied with the Egress are the smoothest that this writer has yet come across, they handle uneven surfaces, ruts, bumps, dips, stones, anything that you wish



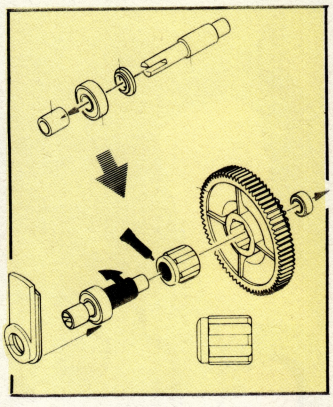
Top plate and chassis are firmly fixed together to provide extra rigidity.

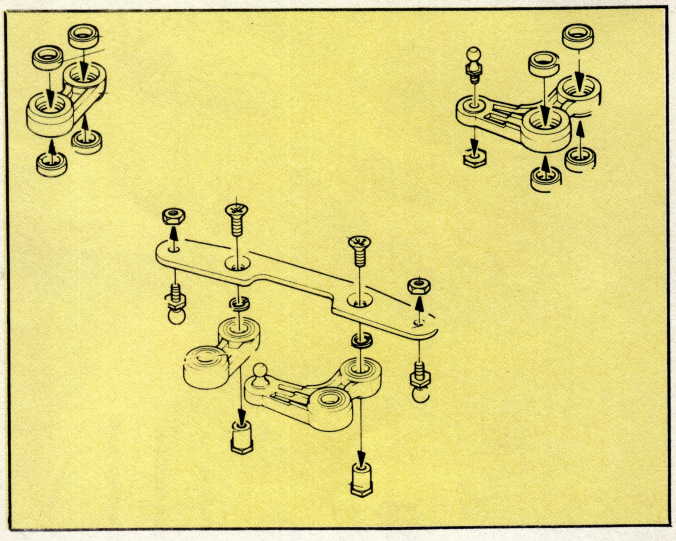


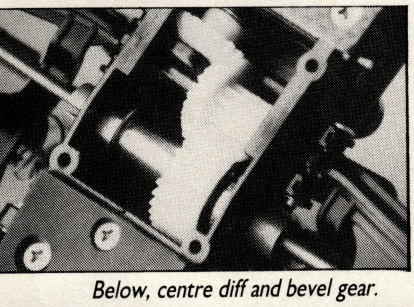
▲ *Everything is ball raced, right down to steering bellcranks.* ▼



▲ *Centre diff gear showing position of one way bearing. This simple idea gives the Egress amazing handling characteristics.* ▼

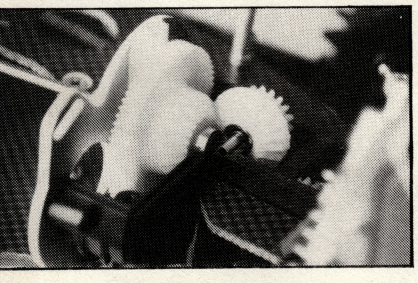


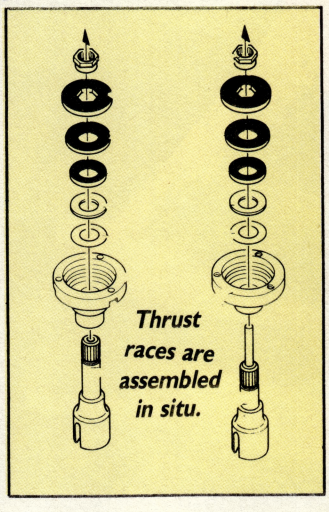


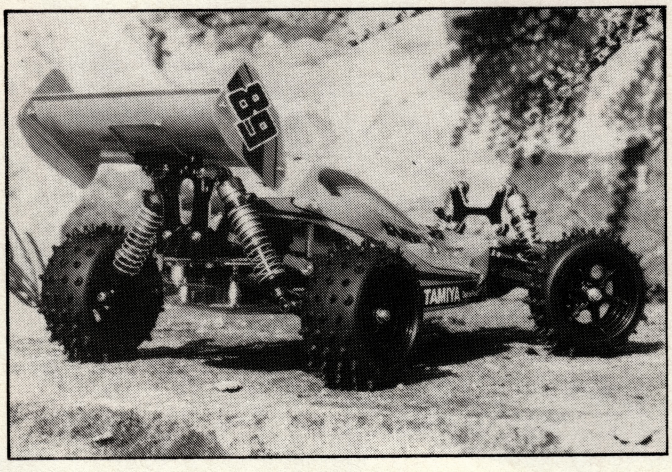


Below, centre diff and bevel gear.

◀ *With the hatch off it's easy to get to the whirry bits.*







to throw at the car with remarkable ease, ironing out the surface to give you the easiest of drives across the roughest of terrain.

To Lock or not to Lock? That is the Question

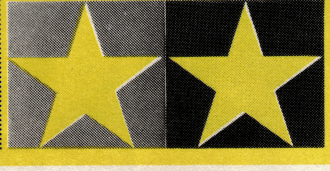
Supplied with the Egress is the choice of using the car either in permanent 4WD mode or fitting a one way bearing into the shaft drive unit, only you can decide which is best for your driving style. Permanent 4WD will give you a little bit more turn in but with the amount of lock and the high bite tyre that you are already supplied with you may find that on grass tracks enough is enough. Fitting the one way bearing, in theory, gives the Egress the best characteristics of both a 2 and 4WD car and enables the car to be very fast in a straight line, whilst providing good 4WD characteristics as well as sending power to the wheel that needs it most. What more do you want? A motor is not supplied with the Egress but a choice of pinions from 17 to 20 teeth are.

And the Rest

Tyres are a new design and should give excellent performance levels under all conditions, a hexagonal locking nut keeps the wheel firmly attached to the hub. An undertray is also provided to keep all the usual track debris out.

You should now have the radio installed, the body and wing cut out, sprayed and ready to go and go you will. Without meaning any disrespect it has been said in the past, that as the company responsible for starting the whole one tenth ball rolling, it seems such a shame that Tamiya do not have a top class, international level, competitive racing car! The news is now they do, it's called the Egress!

Tamiya products are available from your nearest Tamiya agent. ○



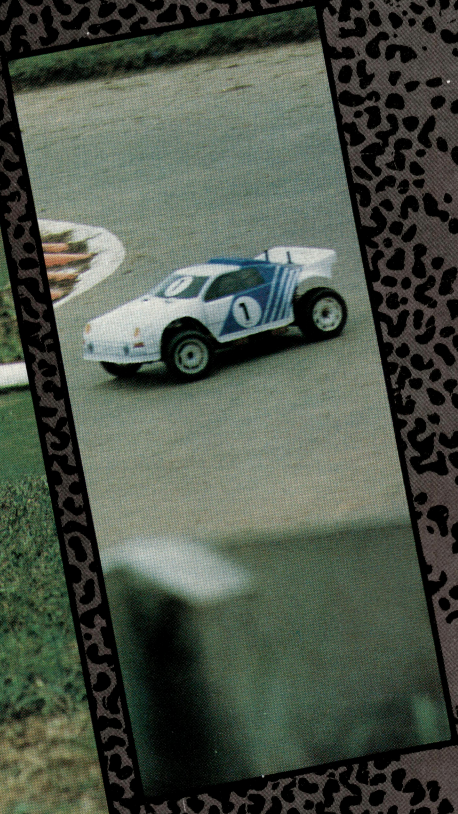
Rallycross at Southend

What a line up.





Tight into the esses.



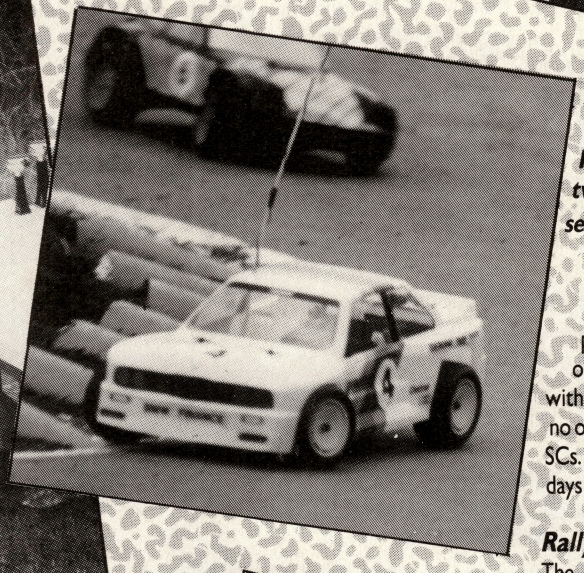
To look in American magazines you could see that for every full size class of racing there is a scale counterpart. As well as buggies there are countless oval classes, flat track circuit, sled pulling monster racing and of course not forgetting drag racing.

In this country we are perhaps a little more conservative, with less people prepared to try out new classes although we race plenty in full size. When Steve Brace and Terry Wright's head collided over the thought of one tenth scale rallycross the only question was could Terry



2WD A finalists line up ready to go.





A BMW leads a Porsche 944 through the twisting, flat infield section of the southend track.

Nigel Dangar, 2WD Winner, dirty Dancing!

convince Southend Club to put on a meeting. The answer was yes and although success was never a certainty, interest was very high from the start.

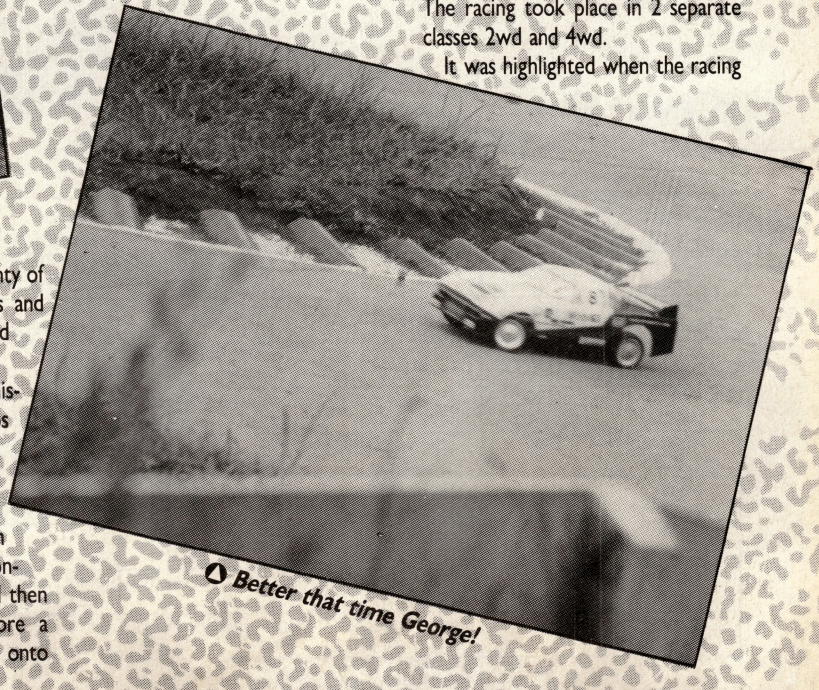
The format was as per full size, five and half lap sprints with points scored for overall position at the end of each round. Points won during the day put the top seven drivers straight into the A final, the other three moving up from the C final and then the B. A list of approved bodyshells was issued, the favourite seeming to be the RS200 although there were plenty of Escorts, Metro 6R4s, Peugeots and Sierras and a yuppie even turned up with the 944 Porsche.

The circuit was shortened, missing out the worst of the bumps leaving three types of surface, tarmac, grass and astroturf all of them quite flat. Tyre choice was difficult driving from no grip on the sand covered concrete, over grass, concrete and then onto high grip astroturf before a short time on grass and back onto concrete. Batteries were no problem, races were on average only 100 seconds long so even with most people running hot winds no one dumped, even the ones using SCs. With the emphasis over the two days on driving more than equipment.

Rallycross

The racing took place in 2 separate classes 2wd and 4wd.

It was highlighted when the racing



Better that time George!

started that with the shorter race duration of 5 laps, batteries and motors were not important.

All specs of motor were used from 12 and 13 turn motors being used with SC and SCE batteries to 17 and 18 turn motors being used with SCR's.

In the 2wd class it was very interesting to see the difference between the 2wd cars such as the Top Cats and the Ultimas, and the converted 4wd cars, with the 2wd cars having the edge. The handling of the cars proved to be a lot different with saloon bodies on top, the cars body roll was a lot more noticeable.

The converted 4wd cars proved to be a little cumbersome with their mid motors and all the extra weight at the front.

As the day progressed a new name gradually forced its way to the front, Nigel Dangar a driver who was obviously relishing this type of racing and he proved it by going on to win the A final.

On Sunday the 4wd class was a lot better supported as was to be expected. The cars proved to be extremely fast with the shorter duration races and no one having battery problems. The racing was close with Nigel again proving to be a front runner.

It was a lot harder with drivers of the calibre of Ellis Stafford and Ryan Georgakis pushing for top honours with Ryan coming out on top.

The A final proved to be an extremely good race with Ryan backing up his pole position by running out the winner of the A final in an extremely fast time.

Overall the day was of an extremely high standard with a lot of very close races taking place over the 2 days. The effort that had been put into the finish of the bodyshells, and the spectator appeal created by seeing cars that people could relate to, proved the Southend Club and their chairman Terry Wright to be correct when they went out on a limb to promote the event with the backing of Parma International.

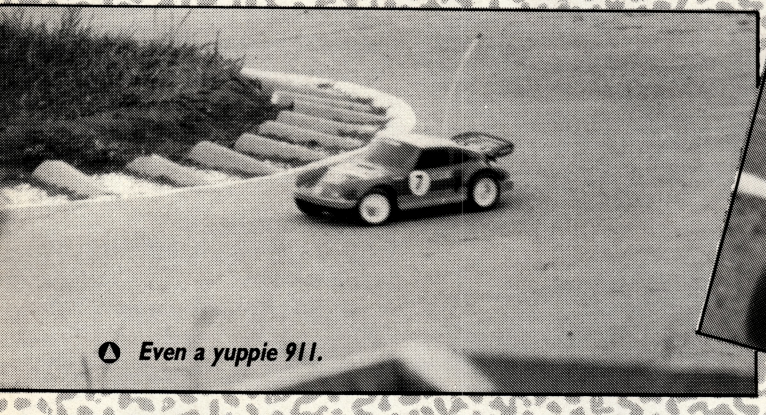
The drivers comments about the fact that although the races were shorter, not having to worry about speed and duration and having at least 9 races in a day made it a very successful meeting.

With luck the success of this meeting will lead to other clubs pursuing ideas. Already this event appears to be starting a new series with a number of clubs wanting to hold rounds. Lets hope so!

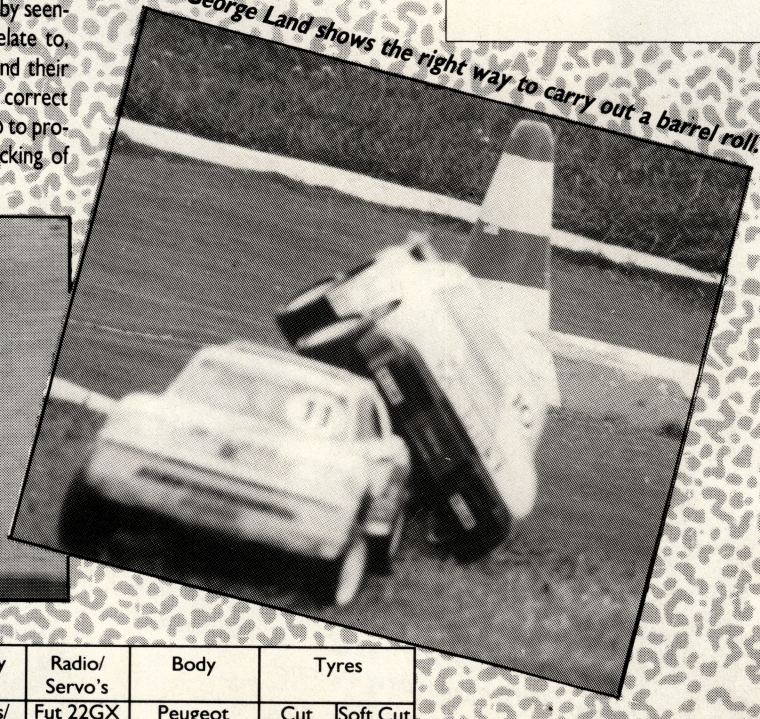
Drivers Name	Car	Motor	Speedo	Battery	Radio/ Servo's	Body	Tyres	
Terry Wright	R.C.10	Parma 17D	Radio Act Photon	Nosram SCR	131S	Frewer 911 Porsche	Cat hard Spikes	Cat hard Blocks
L. Wright	G. (W)right	Parma 16D	Photon Radio Act	Laser R's	Sanwa 131SH	BMW	Dy'mite	Hotlap
John Lockett	Losi JRX2	Twister 17Dbl	Black Box	Parma SCR	3LGX 148	Peugeot 205	Cat 2 Row	Cat Soft blks
Andrew Wright	Mardave Meteor	Parma Cyclone Standard 27T	Acoms AT-1	Parma SCR	Acoms Techniplus	Frewer BMW M3	Mardave Spikes	Cat Blocks
Leonard Sheldon	Assoc RC 10	Checkpoint 17T	Sp'master Silver Star	Parma Match SCR	Futaba Attack R	Frewer RS200		
Steve Brace	2wd Cat	Cyclone 19 Double	Intronics Firefly	Parma SC's	RJ Apex Rad Futuba	Parma Cosworth	Parma	Parma
Ryan Georgakis	Top Cat	15x2	Black Box	SCR	Apex 132S	Parma Porsche	Rib	Hot Laps
George Land	Cat LWB No fr't shaft	Parma Cyclone Cyclone 17Dbl	Nosram	Parma SCR	Futaba/ Futaba	Parma Porsche 944	Parma	Parma
Ellis Stafford	Ultima Pro	Reedy Red 17x4	Black Box	SCR	Gemini 131S	Parma Escort	Cat 2 Row	Cat 6x20
Nigel Dangar	Ultima	Parma 19x3 Demon Can	Photon	Laser	Futaba	Ford RS200	Cat Mini Sp Soft	Cat Bl Hard

2WD A FINAL

1st Nigel Dangar.
2nd Ellis Stafford.
3rd Steve Brace.
4th Ryan Georgakis.
5th Glenn Wright.
6th George Land.
7th John Lockett.
8th Terry Wright.
9th Sheldon Leonard.
10th Lee Wright.



Even a yuppie 911.



George Land shows the right way to carry out a barrel roll.

Drivers Name	Car	Motor	Speedo	Battery	Radio/ Servo's	Body	Tyres	
Dave Kendall	Cat	19x1	Demon Pro King	Stevens/ Peglar SCR	Fut 22GX 131SH	Peugeot 205 T/6	Cut Spike	Soft Cut Spike
Neil Mottram	Cat	Parma 17x2	Hurricane 12 Fet	Parma Sce	Futaba 131S	BMW M3	Sch Blocks	Sch Blocks
L. Wright	Cat	19x4 Parma	Photon RA Models	Laser Es	2LGX 131SH	Porsche 911	Cat Spike	Cat Block
Nigel Dangar	Mid Optima	Parma 19x2 Demon Can	Nosram Ext'minator	Laser 1200	Futaba	Ford RS200	Hard Spikes	Blocks
Ellis Stafford	Cat	Laser Lite	Black Box	P.K.	3EGX KO Fet	Escort Parma	2 Row Cat	Cut 4 Row
Ryan Georgakis	Cat	Parma 14x2	Black Box	SCR's Lazer	Apex KO Fet	Porsche 944	Cat 3 Row	Cat 4 Row
John Lockett	Cat	Twister 17x2	Black Box	Parma SCE's	3LGX/ 131SH	Peugeot 205	Cat 2 Row	Cat Blocks
Glenn Wright	Cat	Lazer Lite 16x2	KOCXI	Laser SC	Sanwa Dash 131SH	Cosworth	Cat Bl'ks Hard	Cat Bl'ks Hard
Danny Conway	Cat	Reedy Pink Dot 15x2	Nosram Ex Pro	Primetime SCE	Sanwa Ex 131S	Sierra Cosworth	Blocks Hard	Blocks Hard

4WD A FINAL

		Laps	Jiffies
1st	Ryan Georgakis	10	9693
2nd	Glen Wright	10	10093
3rd	Nigel Dangar	10	10120
4th	Ellis Stafford	10	10167
5th	Neil Mottram	10	10281
6th	George Land	10	10560
7th	John Lockett	10	10679
8th	Lee Wright	10	10752
9th	Dave Kendell	10	10830
10th	Dany Conway	10	10928

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OT8 Front Side Plate	£2.10
OT9 Shock Stay	£2.75
OT10 Bushing Set	£2.35
OT11 Suspension Shaft	£2.75
OT12 Radio Plate	£4.65
OT13 Suspension Arm Set	£2.75
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OT105 Rod Set (Mid)	£0.95
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OT107 Wing (Mid)	£3.50
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OT109 Screw Set (Mid)	£7.25
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UM10 Collar Set	£1.75
UM11 Upright Set	£1.95
UM12 Bulk Head Set	£3.25
UM13 Suspension Arm Set	£3.15
UM14 Servo Saver Set	£1.95
UM15 Radio Plate	£1.75
UM16 Body Set	£3.25
UM17 Wheel Set	£3.75
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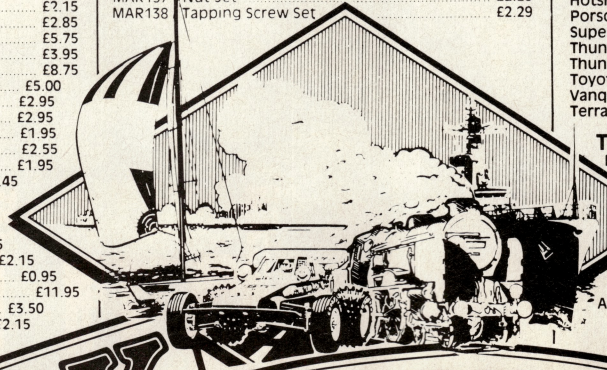

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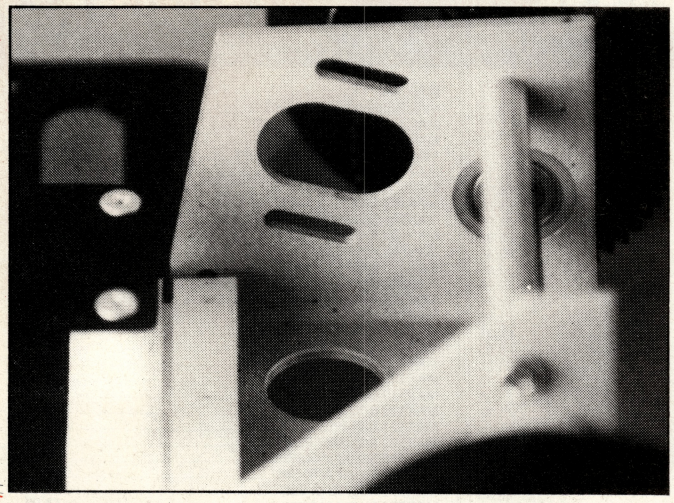
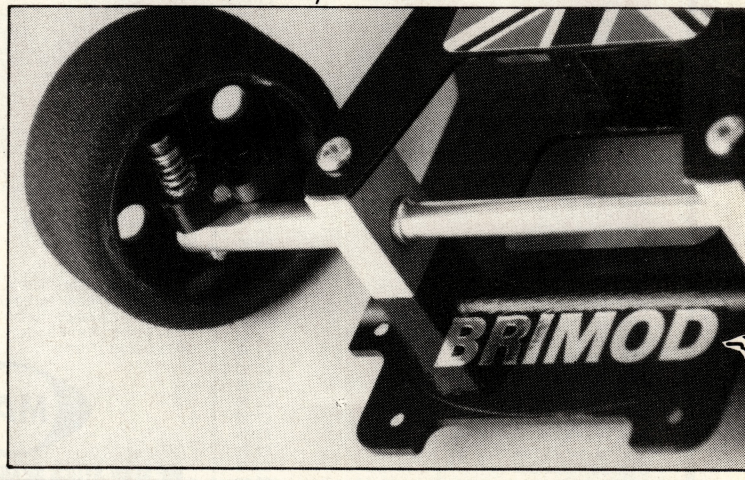
brimod bullet



The very different end note cut out in Nylon 66 block.



Front axle is carried on two aluminium blocks, springs at front are hard and are post mounted.

You may have already noticed that this issue contains reviews of two very special cars, they are special for one very good reason. You can purchase them both for a very sensible price, we will not use the word cheap as it's very mention implies inferior. One thing that you can say without any fear of contradiction is that Brimod's new Bullet is not in any way inferior!

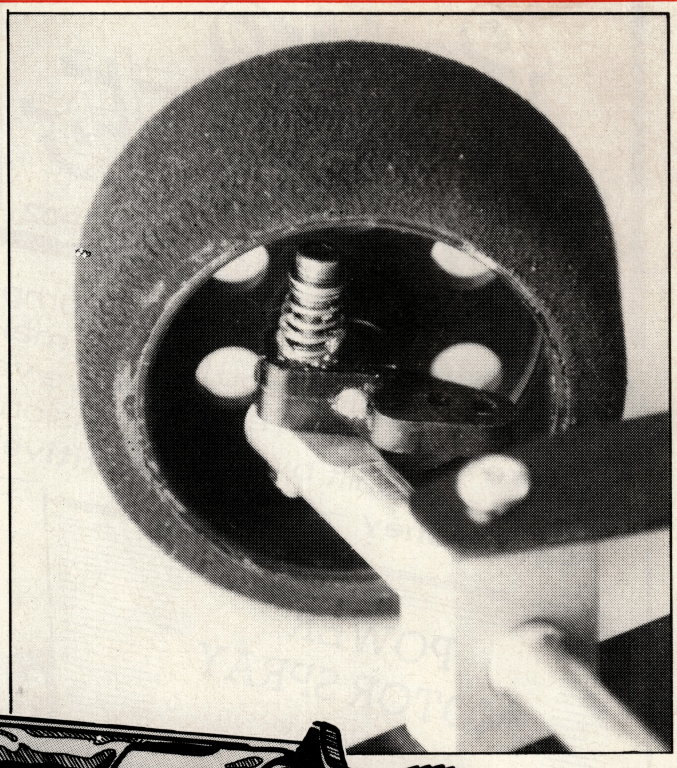
Because of the already, some would say inflated price of the current crop of circuit cars, reports now coming back from certain quarters would indicate that although the initial impact on the car buying public has been very good indeed, it could have been better. Two main reasons appear to be responsible, with only ten usable full time circuits in the U.K. they are a little difficult to reach if you havn't access to the family car each weekend! Secondly and equally importantly, it must be said that the cost of most cars is relatively high in proportion to what you actually get in the box. Let's face facts, we all buy much the same as we eat, with our eyes, that is to say that we equate what we are about to part with in the way of hard earned cash, with what we are about to receive in return and in the case of nearly all circuit cars,

You want to get a shock with this car, or at its price.

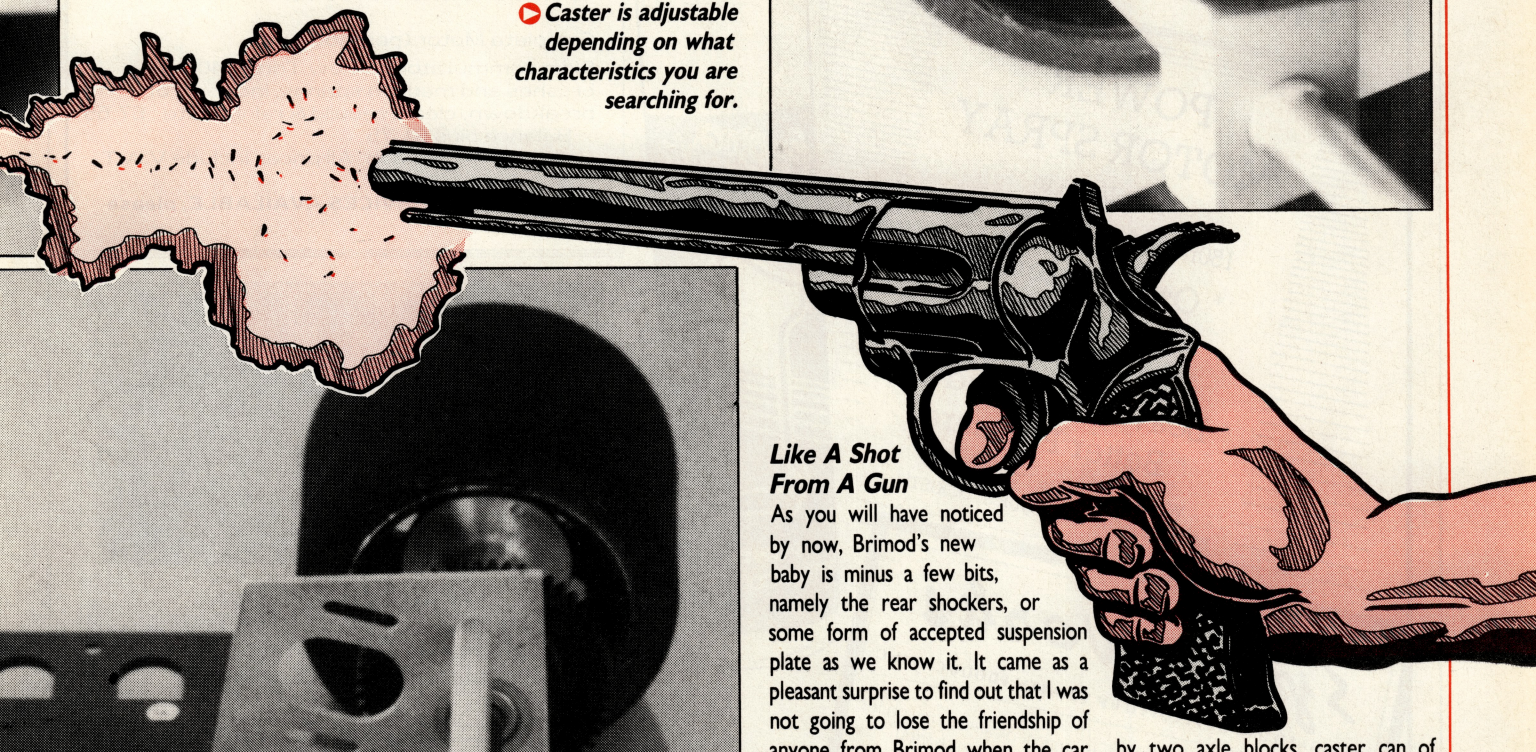
R.R.C. takes the lid off of Brimod's new edition to their arsenal, the Bullet.

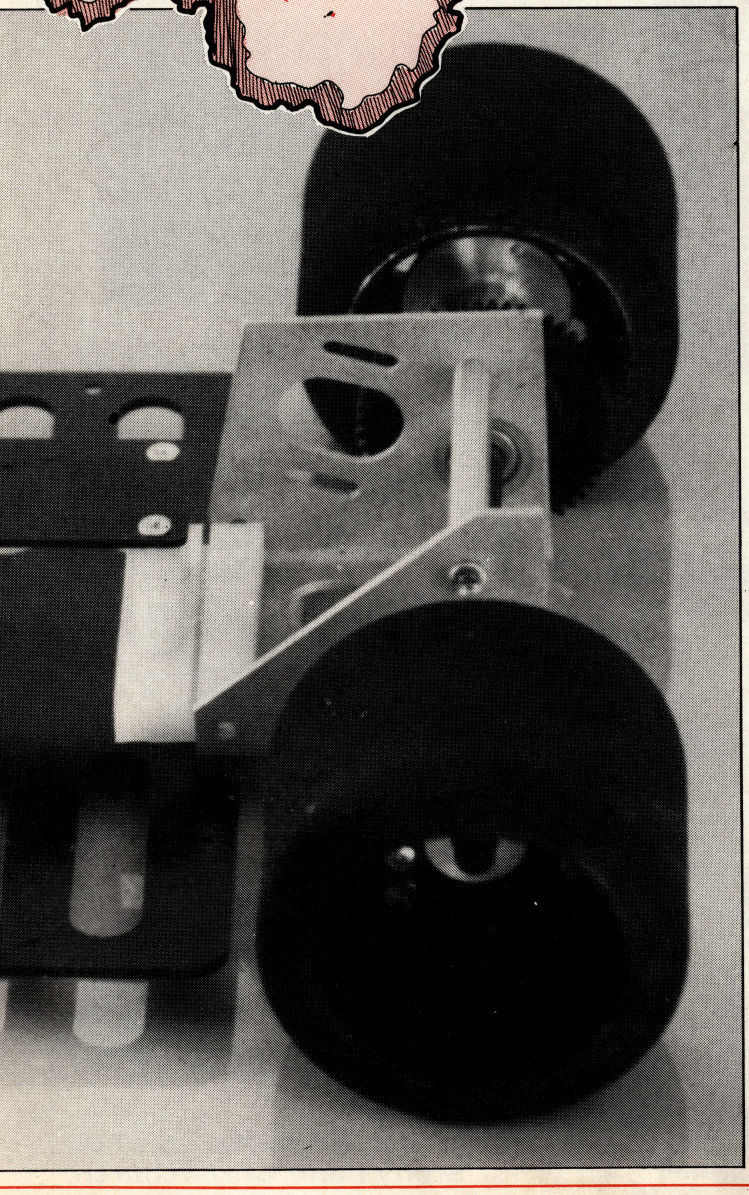
that aint a lot in actual bits and pieces! What you can't see or touch or feel when you are standing dithering in the local model shop, your hand wavering to and fro from your cheque book to the relative safety of your pocket is the sheer thrill of driving one of these little beasts, the brilliant atmosphere of race days or the feeling of sheer elation as you finally get it right and the car begins to work how you want it too and go in the approximate directions that you are trying to guide it in. Someday, some boffin will find out how to bag tangibility and the sales and marketing boys will have a field day.

Having dispensed with my deep thought for the month there are two things that can be done to alter the above situation, Brimod have already done one of them and that is to offer a sensible product at a sensible price, the other and possibly more important is to provide more racing. This is not as difficult as it first sounds, take a trip to any new superstore or D.I.Y. pleasure palace and you will find a car park that is of the same quality and finish as the best circuit we currently use, alright I grant you that it won't be as clean or beautifully kept but the surface does provide a superb area to race upon. One more thing, ask the manager first!



Caster is adjustable depending on what characteristics you are searching for.





Like A Shot From A Gun

As you will have noticed by now, Brimod's new baby is minus a few bits, namely the rear shockers, or some form of accepted suspension plate as we know it. It came as a pleasant surprise to find out that I was not going to lose the friendship of anyone from Brimod when the car was tested as it handled like a dream, we know it shouldn't but it does so there! The Bullet is constructed from G.R.P. and aluminium and can be built and made ready to race in well under an evenings work. Everything is kept in place by a stiffening brace that runs along the centre of the car and bolts to the aluminium front axle carriers at the front, and to two nylon 66 posts at the rear. This arrangement keeps the Bullets chassis very stiff indeed. The motor is held in situ by an aluminium pod attached to the rest of the car by a block of nylon 66, this block has a machined groove cut across it's width in order to provide a degree of longitudinal damping under acceleration, or when the car comes into contact with an uneven join in the circuit surface. The front of the Bullet is of conventional construction and employs a beam axle held firmly by two axle blocks, caster can of course be adjusted to suit independent driving styles. Although the Bullet is set up to use saddle pack cells, stick packs can be used with ease.

A Flash In The Pan

No not at all, the loss of rear shockers is no gimmick, in effect the car is rigid as any formula car or group C car would. This effectively allows the car to be cornered much faster as body roll is kept to the absolute minimum and little weight is transferred across the car. Considering that what you have is a car that comes fully ballraced, handles straight from the box, is virtually tweak free and requires a lot less maintenance than most, then the price tag of £70.00 is an extra bonus. Don't just take my word for it, go and see for yourself. For further details contact Modelstyle on 0989 66933, Sole Brimod agents. ○

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Access VISA

Continued from page 45

After the second fuel stop Guillemier is still in the lead on 35 laps from Hachler on the same lap with Baruzzi, White and Calce very close together. Half way through, at fifteen minutes, Guillermier's engine cuts, Steve White is starting to get radio trouble and others too are running into difficulties such that with 18½ minutes of the race gone, there are only three cars actually on the circuit!

The remaining ten minutes sees little change at the front with Hachler, Baruzzi and Calce circulating in close proximity knowing that because it is raining the first three places will go through.

The second semi-final starts in wet rainy conditions although full wet tyres are not in use. The Blitz cars are equipped with BP Aquaflow tyres, (remember them?), and are clearly streets ahead of anyone else with Massimo Fantini and Stefano Solaroli who in turn has a three lap lead over third placed Jacky Ermen. The huge electronic display scoreboard was now playing up in these wet conditions and there was some confusion as to who was third, the decision going to Roger Sahli who loked like he had lost a lap.

So the Final formation was known and the drivers lined up so:

Five Rex engines, four OPS, one S Power; five Blitz cars, three Serpents and two Associateds; six Italians, two Swiss, one Dutch and one American. These are the facts and figures then.

There is still a problem though as to whether the final will run or not, much interpretation is given to the rules as published. The race must start dry, lap times should be under 19 seconds. The crowd gets inpatient and calls for a race, there is even some suggestion that a race be put on, even if it's not the final! Suddenly the race is on and we have all ten drivers on the rostrum, the track certainly looks dry enough now!

They are off! Ralph Burch leads the field round, he spins, gets hit and finds himself upside down, result — Ralphie is now last. Collari takes over the lead from Colombini, Roem, Calce, Solaroli and Machler. Collari pulls out a lead and within three minutes he is starting to lap the back markers. Baruzzi suffers what looks like an engine cut but it must be something more because he is not seen again for some time, and then only for a few laps, so his race is run.

Five minutes and Collari is in the pits for his first tank of fuel, a quick stop but he is now third behind Colombini and Roem. It doesn't take long for Collari to catch Roem and Roem moves off line to let the faster car through to second. Colombini fuels, but it is much slower. Roem is in for fuel at 5:45, a schedule that will save him one fuel stop, as he exits the pits it is six minutes into the race and the order is: Collari, Roem, Colombini, Hachler, Fantini, Sahli, Burch, Solaroli, Calce with Baruzzi, still off the circuit.

Collari has now lapped everyone up to and including fourth spot, with about half a lap lead ahead of second placed Roem. Fifth placed Fantini cuts dropping him down. It's now eight minutes into the race and Roem is slowly catching Collari. The gap is shortening 4.8 seconds, then a minute later it is 4.3 seconds. Collari pits again dead on ten minutes, and Roem goes through. A few laps later Roem fuels and collari re-takes the lead. Rody's car slides on the banking as he exits the pits, perhaps his mechanics have got fuel on the tyres!

Twelve minutes now and the order is Collari on 42 laps, Roem (42 laps), Colombini (41), Colombini (41), Sahli (40), Burch (40), Machler (39), Calce (39), Fantini (38) and Solaroli (35).

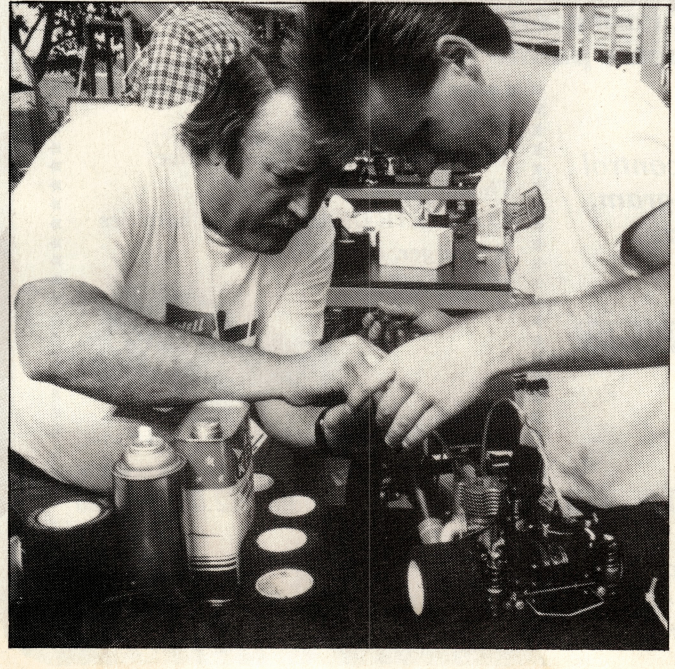
Ralphie Burch now passes Roger Sahli, moving himself back up to fourth place whilst at the front, Roem is once again slowly catching Collari. Fifteen minutes and Collari has a rapid fuel stop, letting Roem pass as he, Collari, exits the pits.

The two of them are now circulating just inches apart with Rody just holding the lead. Calce has an engine cut and Rody is in for fuel so as he rejoins the circuit at seventeen minutes the order is once again: Collari (61 laps), Roem (61), Colombini (60), Burch (58), Machler (57), Fantini (57), Sahli (56), Calce (53), Solaroli (53).

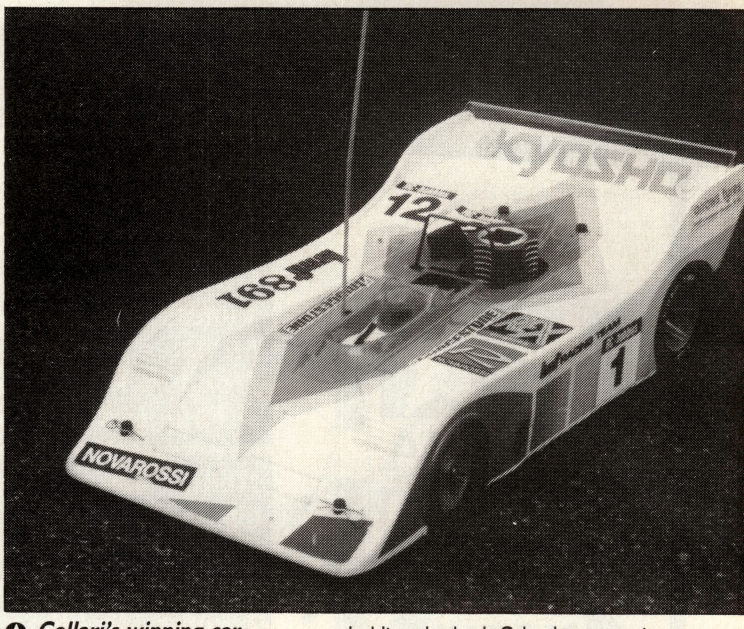
Solaroli is together with rom on the circuit now and perhaps is a little too close for Rody's comfort, but there is no problem. Similarly Machler is blocking Collari for several laps until he gets a warning from the referees whereupon he instantly moves over.

Nineteen minutes and fifty five seconds, Collari is in for fuel, it is now on third distance, but it's a long stop, they have changed the rear tyres. Roem now has a half lap lead. Three m inutes later Rody is in for fuel and also has a tyre change, looks like they changed the fronts as well so as we approach twenty-seven minutes, the

1	Ralph Burch Jnr	USA	Associated/Paris Rex
2	Lamberto Collari	Italy	Blitz/Rex
3	Stefano Colombini	Italy	Associated/Rex
4	Rody Roem	Holland	Serpent/S Power
5	Massimo Fantini	Italy	Blitz/Rex
6	Domenico Calce	Italy	Blitz/Rex
7	Stefano Solaroli	Italy	Blitz/OPS
8	Andrea Hachler	Swiss	Serpent/OPS
9	Roger Sahli	Swiss	Serpent/OPS
10	Michele Baruzzi	Italy	Blitz/OPS



Rich Lee working with Re-Pete Fusco on his wayward car.



Collari's winning car.



Ralphie Burch Jnr.



Massimo Fantini.

order is once again: Collari (94 laps), Colombini (93), Roem (93), Burch (91), Machler (91), Fantini (99), Sahli (86), Solaroli, with Calce and Barruzzi off the circuit.

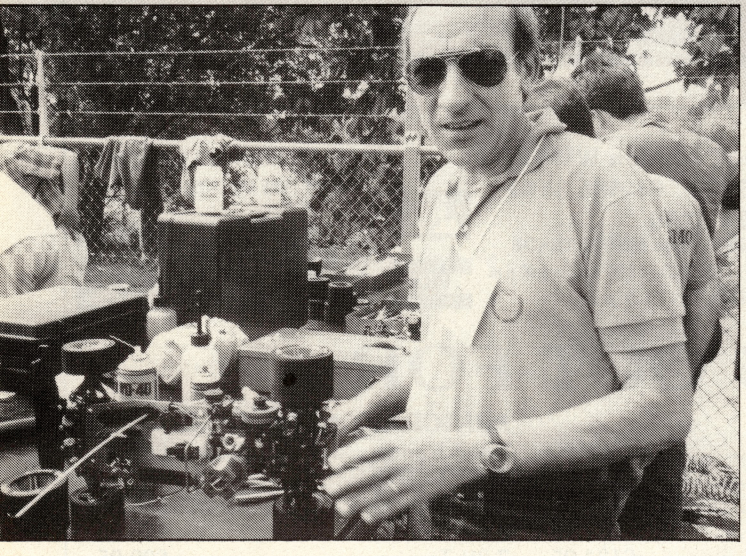
Collari is going very quickly and still even after about half an hour's racing, he is turning laps under sixteen seconds. Rody is in again for fuel and two laps later Collari fuels and changes front tyres. Colombini also pits but for a long two minutes plus, to rectify a noisy silencer. But it is still Rody leading but only by two and a half seconds!

Thirty-four minutes and Rody fuels, so the positions once again: now it is Collari (123 laps), Roem (123), Burch (122), Machler (117), Colombini (116), Fantini (116), Sahli, Solaroli, Calce and Baruzzi holding up the rear. Ralphie now changes his tyres which costs him about three laps.

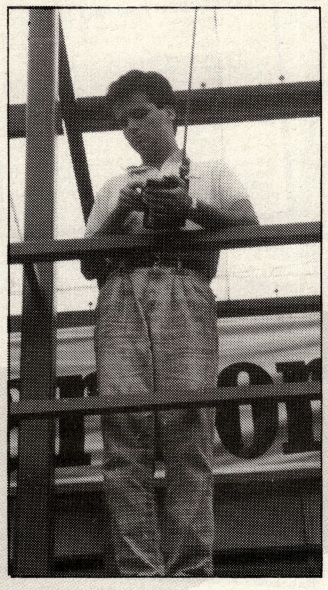
Rody is once again slowly catching Collari and the gap is only 2.5 secs. Collari fueled — Roem fuels, still the positions remain. Ralphie Burch's fuel stop is 20.6 seconds for the lap plus stop — quite incredible, so at two thirds distance, 40 minutes, the positions are: Collari (142 laps), Roem (142), Burch (138), Colombini (135), Machler (135), followed by Sahli, Fantini and Solaroli. Fantini, Calce and Baruzzi having now all retired, Fantini only just though.

Five minutes later Collari fuels but manages to re-join still ahead of Roem. Machler is obviously having some problems also and is now dropping laps. Now Rody is fuelling and changing tyres again — it is a long stop and so as he exits the pits, Collari is right behind him on the circuit, ready to take a third lap out of him, but makes no moves to do so, letting the gap open then closing it back again at will. His pit crew call him for the fifty minutes stop but he sails on by. Will he run out of fuel? No — he enters the pits, fuels and exits, his tyres are getting smaller but there is just ten minutes left to run. Rody fuels and again his car spins as he exits onto the banking. Now Collari is with Roem again, he passes easily at the end of the straight but then lets Roem back through. This manoeuvre he does on several laps!

Collari senior working on son Lambertos Blitz.



Roger Sahli.



Perhaps it was designed to show Rody that he had something in hand, perhaps he was winding Rody up, either way it did him no good as far as some of the crowd was concerned.

Five minutes left and Collari takes on his final load of fuel, he is still two laps plus up on second place and so is now backing off the throttle down the straight. Three minutes left and suddenly Rody's car is upside down on the straight, no-one hits him so he continues, but suddenly his engine stops with just two minutes remaining. Has he run out of fuel? Did they spill some of the fuel in that last pit stop? Did he lose fuel while he was upside down, or even did that damage the motor? Either way Rody does not return to the track and so lets Ralphie Burch up to second and Colombini third, two laps later.

The final seconds tick away, the horn blows and collari finishes his lap. There is jubilation from the Italians and the crowd applauds a genuine World Champion. The other drivers congratulate him, but he seems a little distant, hardly surprising, after an hours concentration though!

The unofficial prize giving is made and it is somewhat unjust that Rody Roem should not have placed in the first three, but a Blitz first and Associateds second and third is no consolation to Rody or Serpent.

Technical inspection was to find no problems so the results stand. Final placings being:

1	**Lamberto Collari**	**209 laps**	**Blitz/Rex**
2	Ralph Burch Jnr	205 laps	Associated/Paris Rex
3	Stefano Colombini	203 laps	Associated/Rex
4	Rody Roem	199 laps	Serpent/Spowe
5	Andrea Machler	195 laps	Serpent/OPS
6	Roger Sahli	193 laps	Serpent/OPS
7	Stefano Solaroli	144 laps (rtd)	Blitz/OPS
8	Massimo Fantini	128 laps (rtd)	Blitz/Rex
9	Domenico Calce	53 laps (rtd)	Blitz/Rex
10	Michele Baruzzi	21 laps (rtd)	Blitz/OPS

Team Associated. Pete Fusco and Gene Hustings pose while Re-Pete and Rich Lee work on.



An excellent meeting, well organised. Italy at last has a true World Champion.

Forthcoming Events

Please note that the B.R.C.A. meeting scheduled for West Burton on September 9th/10th has been moved to Tibshelf. Entries to Dennis Jones, 22 Tarn Drive, Poole, Dorset, (cheques made payable to Mr E. White).

A reminder for the Bournemouth meeting on 23/24 September. There is *no* camping allowed on site, however, the circuit is extremly flat!

See you there! ◯

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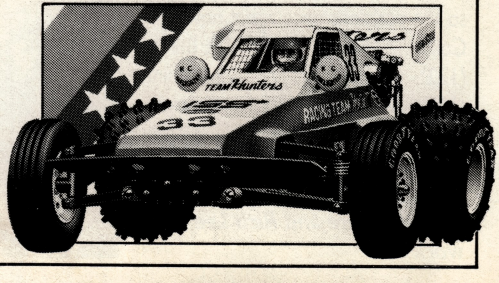

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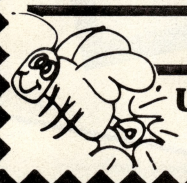

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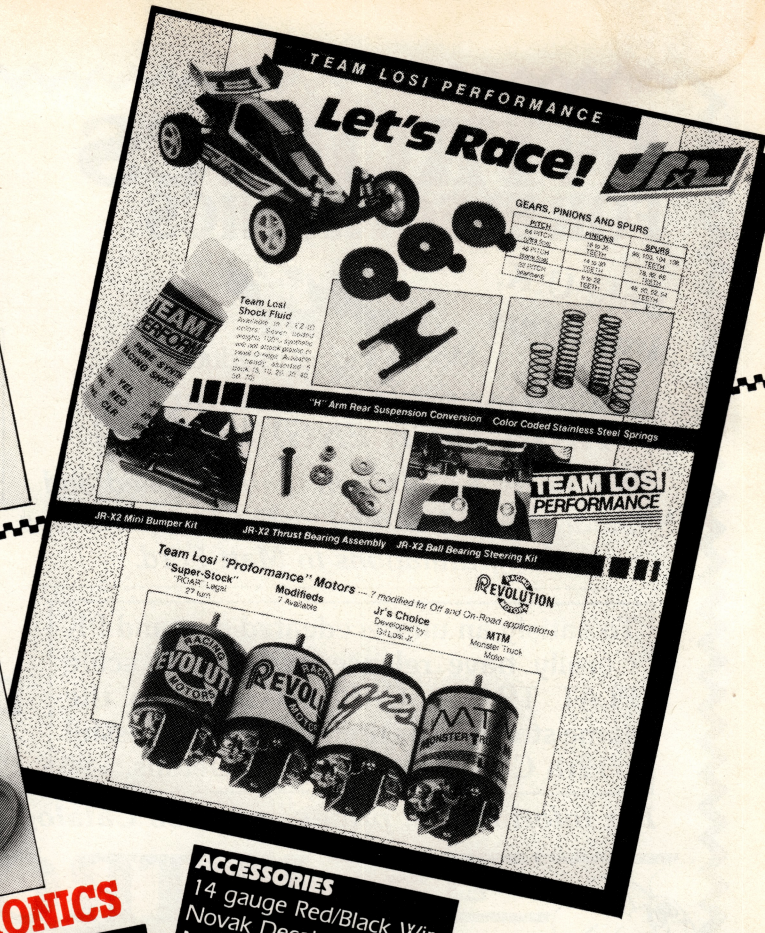

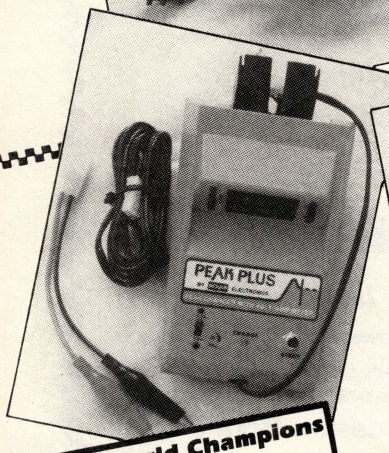

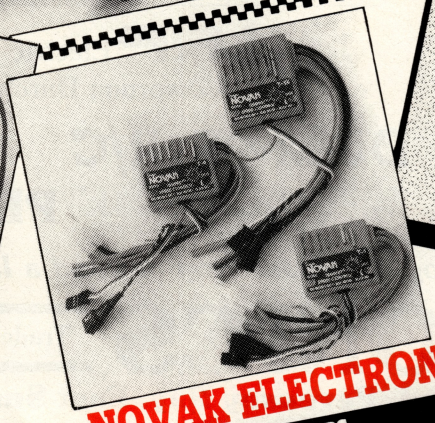

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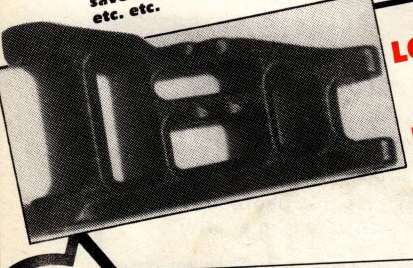

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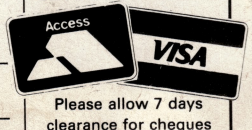

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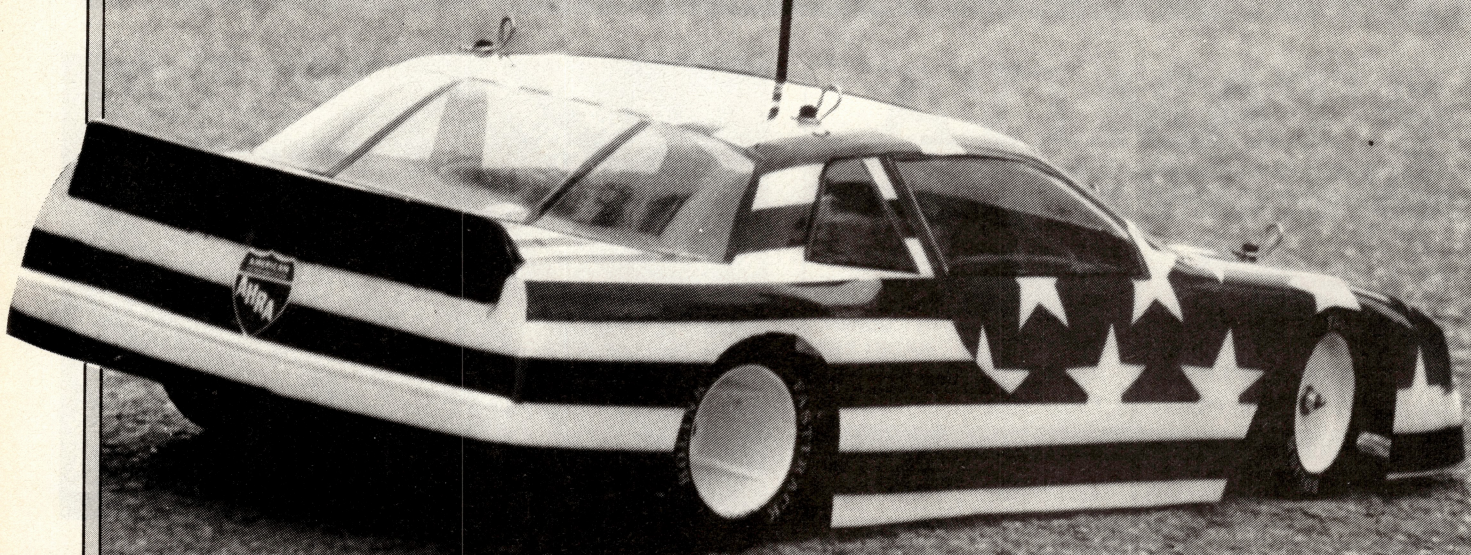
BOLINK ELIMINATOR SPORT

The second of our budget 1/10 circuit cars this month is the Sport from Bolink.



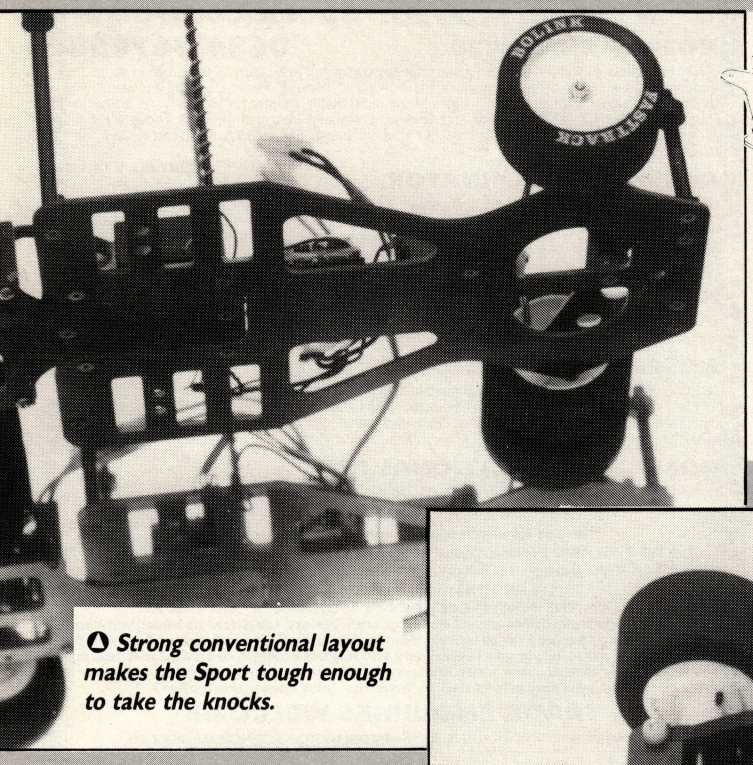


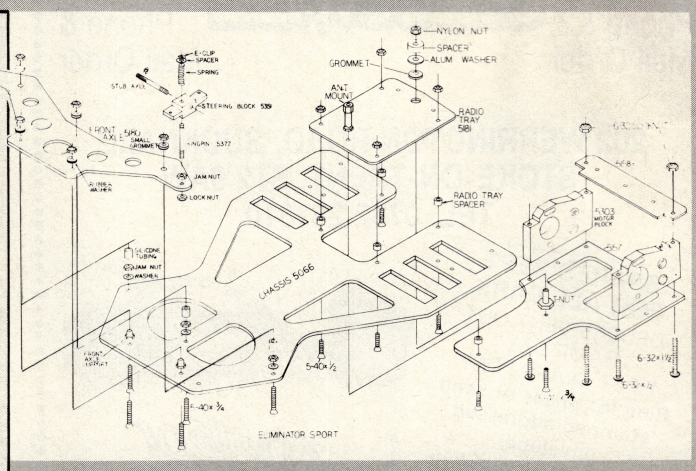
The second car that fits the bill in the budget stakes this month is the new Eliminator Sport from Bolink. The Sport is built around the car that holds several major U.S. titles at present and that should be pedigree enough in itself. The Sport is undoubtedly a quality item intended for the on the edge racer who wishes to try his or her hand at circuit racing, but can't or won't spend extra cash just like that. You can if you wish uprate the Sport to full race blown Bolink spec either in stages, as your pocket allows, or in one fell swoop if your budget can take it. Bolink make available each and every one of the extra special competition parts such as ballraces, aluminium motor mounts, competition suspension, graphite axle, etc on an individual basis.

One Evening Building Time!

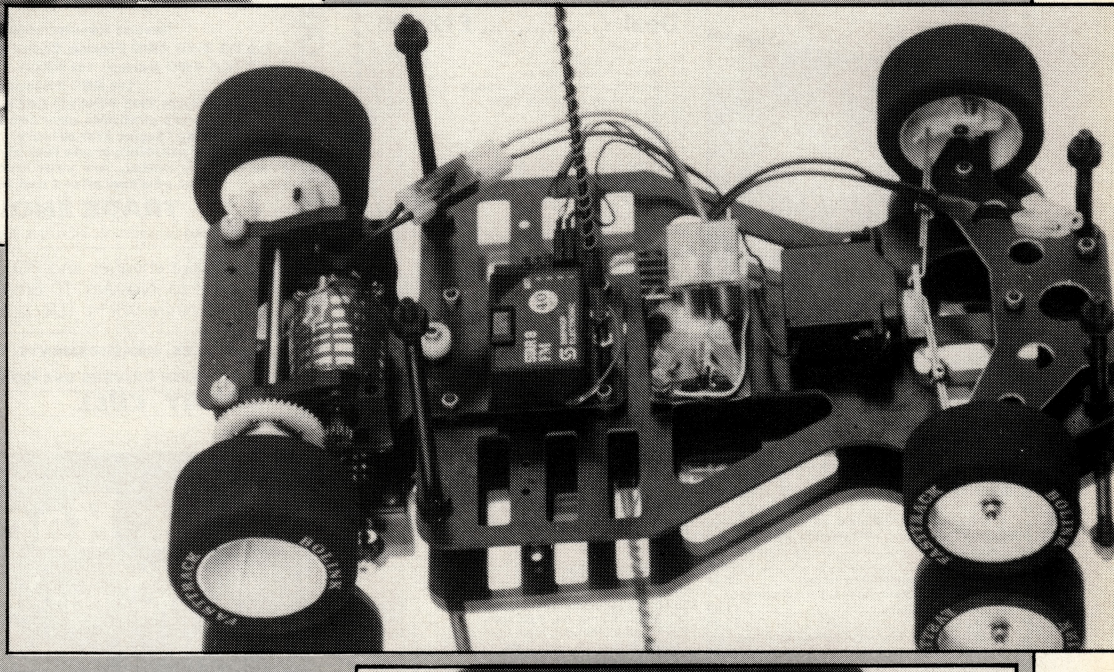
Assembly begins with the chassis and front axle, the axle is of the beam type and bolts to the chassis floor. Provision is made for the caster angle to be adjusted using silicone O rings as a pressure pad against which adjuster bolts are tightened or loosened to suit. Steering blocks are attached to the end of the axle using steering posts bolted firmly in place. Springs are supplied in order to give an amount of suspension travel.

The radio tray is fixed in place next and to this is bolted the rear end assembly, T bar, motor mounts and all, again all this assembly moves





Strong conventional layout makes the Sport tough enough to take the knocks.



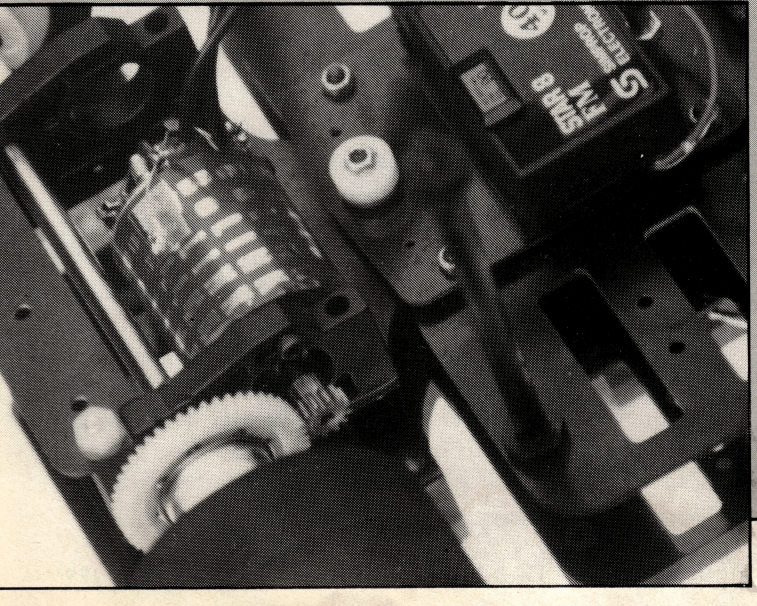
around a silicone grommet which will need greasing in order to provide the correct action, simple but very effective!

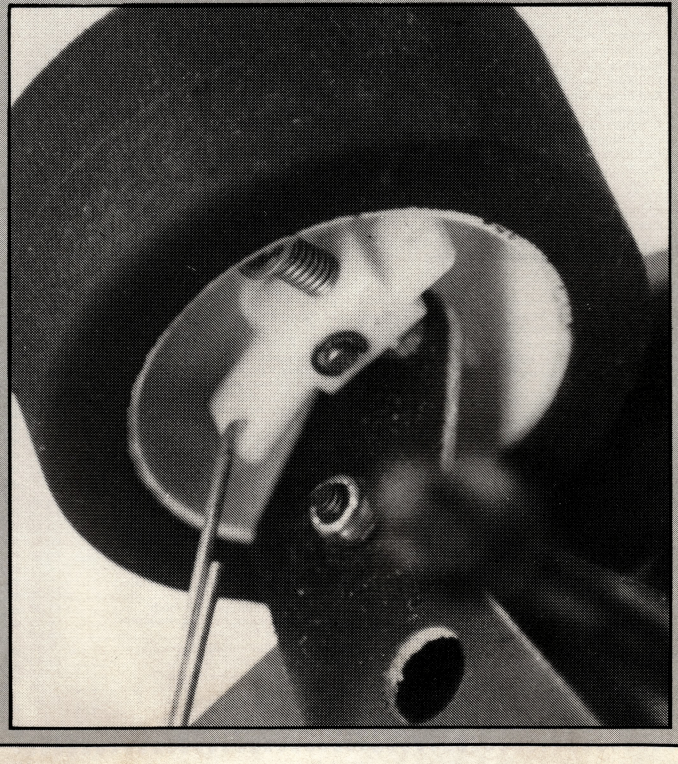
Next the differential is constructed, just follow the instruction to the letter and you will not go wrong. For those of you who have not built a ball diff before, just remember that everything revolves around the balls and you won't go far wrong, oh and just one more tip don't overtighen the diff, it works a lot looser than you think. All that is now left to do is mechanical speed controller and radio, paint the bodyshell and away you go. All you have to supply from the above list is the radio, now that's got to be good. The price although yet to be confirmed should be under the £100 barrier. ○

Lots of room for any radio equipment.

Axle blocks are tough nylon, springs are hard to give maximum traction.

A motor, wheels and tyres are all supplied in the kit.





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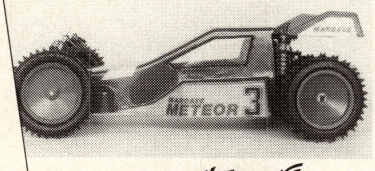
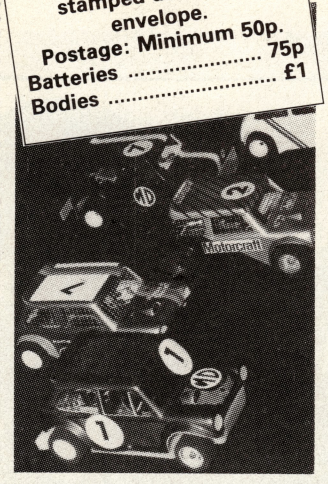


meteor

Kit £57.00
Deal £121.00



T1 Chassis £3.50
T2 Front Bumper £0.50
T3 Battery holder moulding £0.50
T4 Rear Bumper mounting bracket £0.50
T5 Front body mounting pillar £0.35
T6 Aerial Plate £0.50
T7 Rear Bumper £0.85
T11 Front Wheel £0.85
T12 Rear Wheel £0.95
T13 Front tyre, 3 x 2 spikes £1.60
T14 Rear tyre, 5 x 4 spikes £1.90
T16 Servo saver bellcrank set £1.30
T17 Outer track rod link — £0.25
T18 Centre track rod link — £0.25
T19 Large nylon ball joint with alum. ball, washer and nut ..... Pack of 4 £1.90
T20 Large nylon ball joint with steel ball and self tap screw ..... Pack of 4 £1.90
T21 Small nylon ball joint with steel ball and nut ..... Pack of 4 £0.85
T23 Front suspension mounting bracket L.H...£0.50
T24 Front suspension mounting bracket R.H...£0.50
T25 Front suspension wishbone £0.50
T26 Steering uprights, L & RH ..... Pair £0.50
T27 Steering L & RH ..... Pair £0.50
T28 Front stub axle £0.17
T29 King pin £0.09
T30 Inner hinge pin (42mm long) £0.17
T31 Outer hinge pin (32mm long) £0.17
T32 Front upper threaded link £0.17
T33 Servo linkage £0.17
T40 Gearbox mouldings (pair) £1.30
T41 Gearbox cover mouldings £0.50
T42 Rear suspension wishbone £0.50
T43 Rear suspension upright £0.50
T44 Rear stub axle £1.00
T45 Bearing, rear stub axle £0.40
T46 Drive pin, rear wheel £0.17
T47 Rear upper threaded link £0.17
T48 Rear inner hinge pin £0.17
T49 Rear outer hinge pin £0.17
T50 Differential unit, complete £6.50
T51 Diff. gear wheel £0.40
T52 Set of 3.5mm dia. steel balls £0.85
T53 Set of 1.5mm dia. steel balls £0.85
T54 Diff. cap screw, washer and locking screw set £0.40
T55 2.5mm key £0.17
T56 1.5mm key £0.17
T57 Diff. ball race £2.25
T58 Drive Shaft £1.00
T60 1st (large) intermediate gear £0.85
T61 2nd (small) intermediate gear £0.40
T62 2nd int. gear pin £0.17
T63 Motor pinion gear 12 teeth £1.30
T70 M3 x 16mm screw £0.09
T71 M3 steel nut, pack of 10 ..... £0.35
T72 Self tap screw 9mm, pack of 10 ..... £0.35
T73 Self tap screw 12.5mm pack of 10 ..... £0.35
T74 Self tap screw 16mm pack of 10 ..... £0.35
T75 Self tap screw 19mm pack of 10 ..... £0.35
T76 'E' clip, for 3mm shaft pack of 10 ..... £0.35
T77 'E' clip, for 4mm shaft pack of 10 ..... £0.35
T78 'E' clip, for 5mm shaft pack of 10 ..... £0.35
T80 Front coil spring and oil filled damper unit (pair) £4.00
T81 Rear coil spring and oil filled damper unit (pair) £4.00
T82 Front damper shaft £0.50
T83 Front coil spring £0.35
T84 Rear damper shaft £0.50
T85 Rear coil spring £0.35
T86 'O' Ring (pack of 4) £0.40
T90 Bodyshell and wing £3.45
T91 Driver figure £0.65
T92 Body fixing clip (pack of 4) £0.40
T94 Speed controller complete £7.20
T95 Voltage dropper diodes for Rx power ... £1.00
T96 Speed control wiper disc £0.35
T97 Speed control wiper contact £0.25
T98 Printed circuit board £1.30
T99 Double sided adhesive tape £0.20
T101 RS 540 motor with supressor £4.95
T103 6 cell rechargeable battery pack with connector £14.95
T105 Fast charge lead £5.95
T107 Connector for battery £0.65
T108 Connector for charge lead £0.65
T110 Assembly instructions £0.50

Accessories

T45/B Replacement ball race, rear stub axle £2.25
T64 Motor pinion gear 14 teeth £1.30
T90/L Lexan bodyshell (Lightweight) £6.50
Replacement Stub Axles £5.50
Ballraced Intermediate Gear £5.00
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Form Tyres set £3.00
Long wheel base chassis £5.50
New Wheels
New Tyres

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K2 Front axle beam with steering arms and king pins £1.05
K3 King Pin £0.09
K4 Front stub axle with nyloc nut £0.40
K5 Steering bellcrank/servo saver, complete £1.05
K6 Track rod £0.21
K7 Rear axle bearing blocks without bearings, pr £1.05
K8 Nylon bearings, pair £0.36
K9 Front wheel £0.35
K10 Rear wheel, with grub screws £0.85
K11 Front tyre £0.60
K12 Rear tyre £0.85
K13 Rear axle, high tensile steel £0.50
K14 Pinion drive gear, 12 tooth steel with grub screws £1.35
K15 Battery pack, 4 cells re-chargeable with connector £10.95
K20 Speed controller, complete £7.20
K21 Speed controller, printed circuit board only £1.30
K22 Speed controller, plastic wiper disc ... £0.35
K23 Speed controller, wiper contact, copper £0.25
K25 Servo linkage rod with snap on ball connector £0.25
K26 Fast charge lead for 4 cell battery £5.95
K27 Front bumper £0.35
K28 Rear bumper £0.35
K30 Front bumper mounting bracket £0.85
K31 Rear bumper mounting bracket £0.85
K33 Bodyshell, white ABS plastic £2.40
K34 Windscreen mesh £0.65
K36 Swing keepers, pack of 4 ..... £0.35
K37 1.5mm key (for motor pinion grub screw) £0.17
K38 2.0mm key (for rear wheel grub screws) £0.17
K39 Self tap screws, M3 x 9mm long, pk 10 ..... £0.35
K40 M3 Machine screw x 6mm long, pk 10 . £0.40
K4 M3 steel nuts, pack of 10 ..... £0.40
K42 M3 Machine screw x 8mm long (Motor fixing screw) Pack of 10 ..... £0.40
K43 M3 Nyloc nut (front wheel retainer) each £0.09
K45 Double sided adhesive tape, per strip . £0.20
K46 Body fixing clip, pack of 4 ..... £0.40
K47 Front body mounting pillar, plastic ... £0.21
K48 Rear body mounting stud, steel £0.25
K50 Aerial plate £0.50
K51 Aerial mounting pillar £0.21
K55 Motor RS 540 with suppressor £4.95
K60 Alternative mor pinion gear, D4 teeth . £1.30
K8/B Alternative ball raced bearing for rear axle, each £2.25
K70 Bodyshell, slightly different shape, allowing clearance for 6-cell battery pack £2.40
K71 6-cell battery pack with connector ... £14.95

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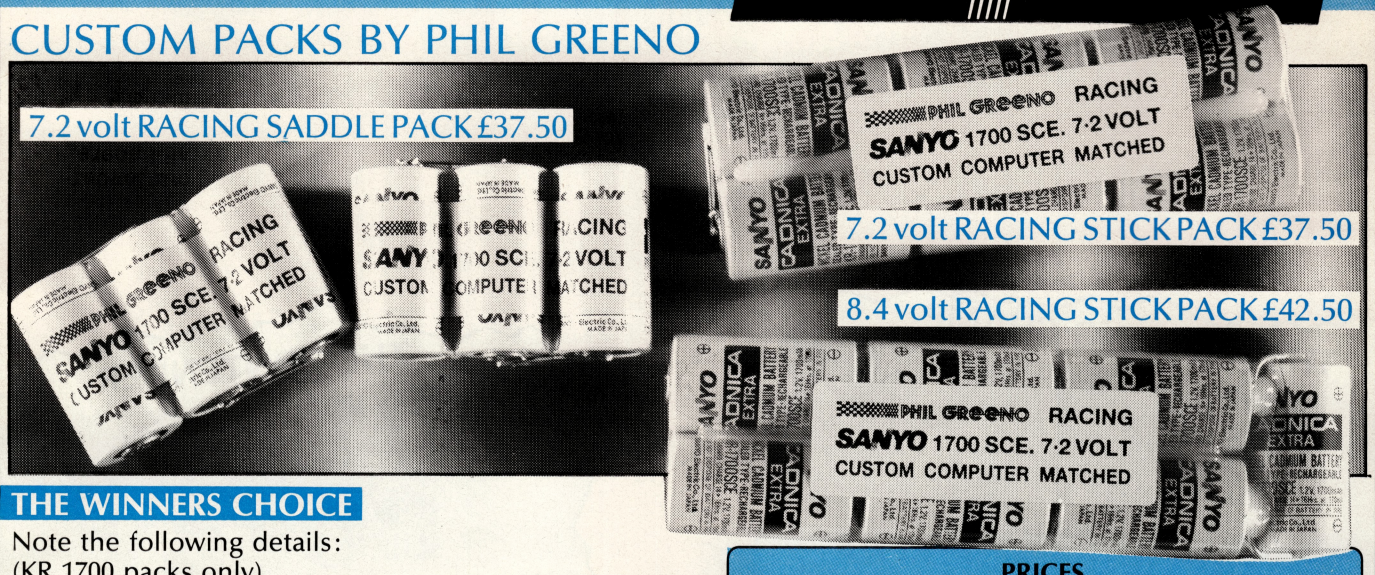

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SRM Scorcher 'Plus' £14.95
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Parma 'Cyclone' £14.95
Trinity 'Monster Stock' £14.95
Schumacher 'Ultra' Stock £14.95
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Twister 27 turn (inc. Pro kit) £14.95
Tamiya 'Johnson' 540S (inc. leads) £10.45
Mabuchi 540S £6.45
Reedy 27T 'Ultra' £14.95

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SRM idler gear - Mid £3.50
SRM final drive gear — mid £3.95
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CAT sealed ballraces - grade 5 ..... (4) £7.95
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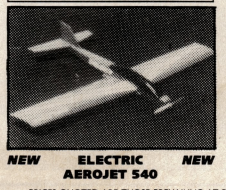

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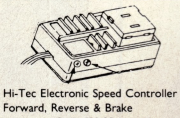

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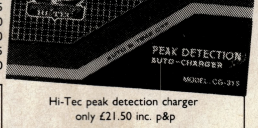

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STOCK AND OVAL

by Mike Smith.

As the title suggests we start the Oval action with a point on safety, I don't want to bore people with this subject but it is important. I have received a letter on safety from the B.R.A.C. written by the Oval Keeni Chairman Terry Dickinson, 'very glad to see the powers that be trying to close the stable door before the horse kicks hell out of it.' As one who recently had his nose rearranged by what we term as a flyer, thats a stock car flying at a low altitude normally knee cap height and witnessed a marshall break a toe and a spectator taken to hospital for being in the wrong place. I must support the recommendations in the letter and would also like to see the appointment of a safety officer for all sections of the B.R.C.A., with the power to stop meetings or ban drivers who as the law would say drive without due care and attention, or act with conduct likely to cause a sore ankle. Speaking for stock car racing I realise that this formula is a contact sport but I'm sure the contact is related to one car hitting another, not the car hitting a spectator. Have you ever run over a marshall as he went about his duty? Did you stop racing to ensure that he was alright or did you just frown with dissapproval that your way was impeded by Jake the Peg diddle diddle dum with the broken leg diddle diddle dum, anyway drive within your limits and read the letter of the law.

Dear Secretary,

The B.R.C.A. Committee has recently been discussing the question of safety at tracks in this country. This has come about largely due to the concern currently being expressed in numerous quarters that the increasing speeds of cars (plus increases in weight in the case of Stock-cars) is resulting in more instances of cars leaving the raceway, and either causing injury or near misses.

As a result of this, Robin Smith, the B.R.C.A. Chairman has asked me to produce some guidelines on the whole subject of safety for the benefit of clubs, but let me stress at the outset that this is definitely not an attempt by the B.R.C.A. to play big brother since none of these guidelines are enforcable at this stage.

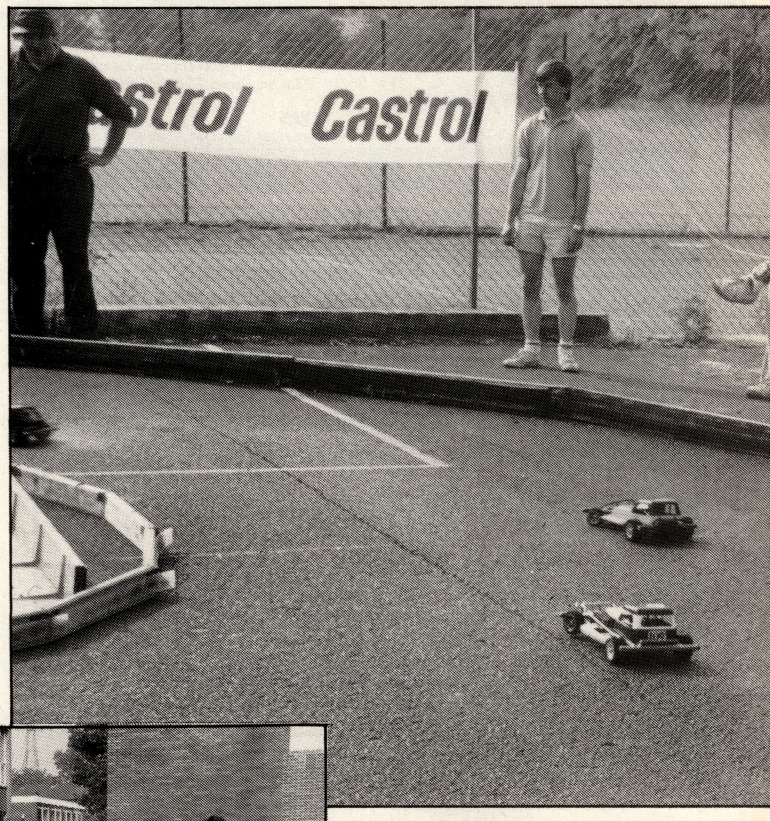
What they are designed hopefully to do is to get race committees thinking about and discussing possible ways of improving safety at their track for the benefit of drivers, marshalls and spectators alike.

It is worth remembering at this point that whilst all clubs must, by law be insured against injury, both the outsiders as well as club members, the insurance companies are quite likely to investigate a clubs safety precautions if an accident does occur (and they are likely to have to make a pay-out). In cases such as this, as Mike Smith recetly pointed out in Radio Race Car; if they decide that precautions are not adequate but costs or damages are awarded by the courts anyway, it is likely that the membership would find themselves having to foot the bill!

Looking then at the clubs of which I have personal experience, I would say that the main problems are occurring as a result of five factors, and whereas temporary tracks are more likely to have difficulties in these areas, those clubs with permanent sites should also have a look at their facilities and procedures and see if there is any way in which they can be improved. I'll deal with these aspects of the sport as they come and in no specific order.

Working on Cars

The B.R.C.A. rules state that no work to cars should be carried out on the track or centre green/infield at any time. Having witnessd one particularly nasty incident in the not to distant past where injury was caused, I would go further than this and recommend to all drivers, mechanics and marshalls that they do not carry out any work on their cars at any point adjacent to the track. If another car leaves the track whilst you are contemplating your drive-belt or whatever, its extremely unlikely you will see it coming, so great care is needed in this area. My advice would be that however much of a hurry you are in to get the car back on the





In the final Mike Powell with elevated view.

track, it really is worthwhile taking a couple of steps back before trying to remedy the problem.

I suppose that in the heat of the moment a driver may condemn you for doing this (assuming you are marshalling) at least initially, but that is surely a question of attitude which can change over a period of time with a sensible approach.

Safety fences

In the E.M.S.A. handbook, the recommended minimum height for a safety fence in 4". In the B.R.C.A. handbook, no mention is made at all of this very important statistic, something which I hope will be remedied at the next A.G.M.

Personally, I feel that although E.M.S.A. have at least included this recommendation in their track dimensions, it is too low to be of much practical use with the speed of the cars increasing the way it has been in the past two seasons, and my recommendations would be that clubs copy



Leicester (and others) who have an outer safety fence which is at least 9" high.

Catchment fencing

Most of our permanent circuits have some form of catch-fencing, at least on the bends but this is an area where dramatic improvements can be made, particularly at temporary tracks.

When cars do leave the track, more often than not it is on the corners and an area segregated by catchment fencing, which need not be very high or even especially sturdy would help prevent injury to anyone stood nearby. Naturally enough only marshalls and possibly mechanics should be inside this fencing at any time to render assistance to the drivers. Where a fence exists this is very easy to police.

Pit areas

At several tracks in this country, I have noticed drivers setting up pit boxes right round the circuit. In some cases these drivers are very close indeed to the safety fence, and again I have witnessed several incidents where cars have left the circuit and collided with pits equipment. This one is particularly difficult to fathom, since I would doubt very much that any driver would want any valuable racing equipment damaged even if they are prepared to risk having themselves damaged. Yet still they are there!

In the final six counters were responsible for one car each.

All that is required to solve this one is for the track area to be cordoned off with tape or similar, and drivers advised that no pitting will be allowed to take place within the taped area.

Spectators

All club members should accept a responsibility for ensuring that the safety of spectators becomes of paramount importance. Apart from the improvements which can be made in this area as listed above, it is important that all drivers are constantly on the lookout for encroachment by spectators and are prepared to take the responsibility for ensuring that they move to a safer place, ie. further away from the track.

This is of particular importance where childern are concerned since they are unlikely to realise the potential danger or be able to react quickly enough should a car come their way. In addition to this, when cars do leave the track they tend to travel at about child-head height! Worth thinking about isn't it?

Well there you are. As I say please don't think we are trying to lay down the law or force clubs to tow the line or else. These guidelines are simply to protect our interests and safety and the interests and safety of those who come to watch us race, I dread to think what would happen if a court were ever to award damages to an injured party which were well in excess of our current insurance coverage limitations, as happened in one recent case. So lets tighten up and try to avoid it happening.

Terry Dickinson,
1/8th Oval Section Chairman.

R.R.C. British Champs

The good weather and a reasonable turn out of class drivers made the well organised RRC British Championships a big success, the host club N.O.R.A. had constructed an inner barrier for their portable oval, this eliminated corner cutting.

The news that the Middleton chassis or should I say the manufacturing of it had been transferred to Kingsway was a talking point, now instead of a 5 week wait there will be a 3 month one, 'joke, joke' also the new split Mardave chassis was on display most couldn't quite believe that it was a Mardave, others probably wished it wasn't.

The Circuit

The Pendle Oval was somewhat shorter than usual, due to the fact that they had robbed a couple of lengths of straight to construct the inner barrier, this robbing Peter to pay Paul was due to the fact that work should be starting soon on the permanent circuit so the club are making the best of what will be a redundant circuit next season.

With the sun beating down for both the practice day on Saturday and the racing on Sunday the oval produced a good surface on which to race, the inner barrier was a great help, although some drivers kept clipping the barrier at the start of the bend, Mike Powell ensured that he would not fall victim to this problem by standing on a suitcase as a portable rostrum, this elevated position had him looking down on the competition.

Tyres

It would appear that Associated have regained the domination of the oval, as they did back in the old days with the famed 2402 these were used for many years as the rear driving force, now the 5313 Greens and the 5312 Yellows seem to be the winning combination, the Middleton chassis's seem to excel with the green on the offside rear and the softer yellow on the nearside. Up front anything goes on the nearside but the Jap 40's like the feel of the offside front. Supplies of Jap tyres appear to be drying up but according to Tony Middleton the Ufra 36 works just as well, unfortunately the price for the Ufra is £8.95 per pair as was the Jap's.

The Associated tyres are Grand Prix tyres and arrive in what is termed donut fashion they cost £7.95 per pair, but by joining the cut rings you can easily get three tyres from one set, you have to cut them to size and true them on the wheel which does waste a lot of rubber, they are also prone to chunking but they certainly grip.

Dave Stell has been testing some new rubbers from MMD, it would appear that they have a direct replacement for the Ass yellow but with a better wear rate, they are still working on the green but tests are looking promising and a new range of stock car tyres will be launched later in the year.

Engines

The OS still looks the dominant power mill for the I.C. stocker, it's smooth powerful response makes it a winner, although having said that some drivers are re-working their motors. The O.S. is used by Tony Middleton, Kev Straw, Dave Stell, and the like. Steve Talbot and Roy Crowson are currently using the 'S' Power engine from Elite, this engine shows promise. Ian Drake still looks to the O.P.S. for that extra zapp but the combintation of Ian Drake and Middleton chassis and O.P.S. run a little

The start of the final with Mike Powell missing the start.



The finalists from left to right: Mark Woolner, Tony Middleton, Dave Stell, Kev Straw, Ivan Congreve and Mike Powell.

hot and cold.

The test Leo engine is still going strong and at half the price of the rest, it shows real promise.

Most drivers who were asked still say they only use 5% to 10% nitro fuel mix, although it is known that neat nitro is poured direct in the fuel tank, giving anywhere between 40% and 60% for that extra zapp in a final, it has long been the practice to run on 25% kept in a 5% container, but I suspect that 40% mix is not uncommon.

Racing

The heats were of 4 min, each competitor in true stock car fashion had four races to accumulate the necessary laps for the final.

In the first set it was Steve Talbot who set the pace with 47 laps. Steve in my opinion is still the best stock car driver on the circuit, he anticipates whats ahead and tries to avoid stupid contact, unfortunately some cars with great power are driven by drivers of little skill.

In the second heats Steve still did a 47 but others were now finding form, me and my almost standard Mardave powered by the test Leo engine managed a 47 also Tony Middleton was up to par with 47, Kev Straw and Norman Wheeler also notched 47 but Dave Stell did 49, Dave has to be the most likeable driver the sport has, he keeps so cool it's unbelievable.

In the third round your truly did 47 whilst Tony and Kev matched Dave Stell's 49.

The consolation consisted of: Derek Bird, Ivan Congreve, Bob Thorpe, Mike Powell, Steve Talbot and Malcolm Paterson.

The drivers to the final were: Tony Middleton, Kev Straw, Dave Stell and Mark Woolner, the two from the consolation were Ivan Congreve and Mike Powell.

The final was as expected very fast but fraught with misfortune for Mike Powell who made a couple of visits to the pits as did Tony Middleton with tyre problems. Mark Woolner also suffered mechanical problems leaving Dave Stell, Ivan Congreve and Kev Straw to make a real race for the top three places.

Final places were: 1st Kev Straw British Champion 1989. 2nd Ivan Congreve. 3rd Dave Stell. 4th Mike Powell. 5th Mark Woolner. 6th Tony Middleton.

The Sponsors

Of course a meeting like this relies on the band of behind the scenes workers who sponsor such events with either time and effort or in prizes and trophies, thanks must be given to N.O.R.A. organisers Alan Gratton and Paul Heywood with the help of Terry Dickinson and all the lap counters, also Mardave Racing, Motile Developments, Pendle Models and ASL Models for their kind donations and not forgetting Race Car and Walter C. Brigg, for the trophies. ◯

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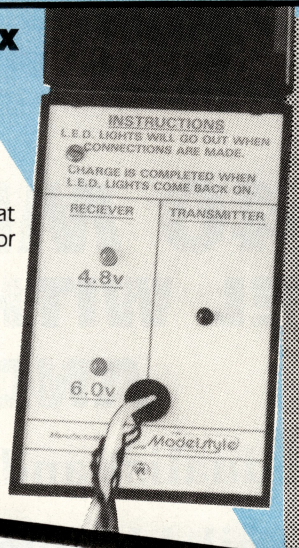

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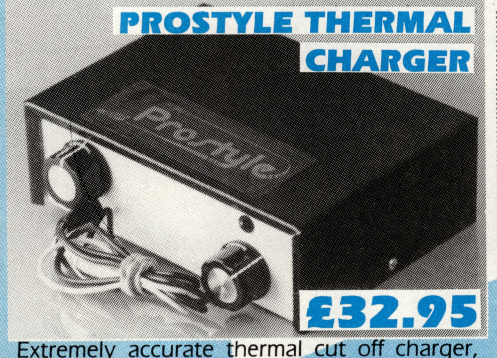

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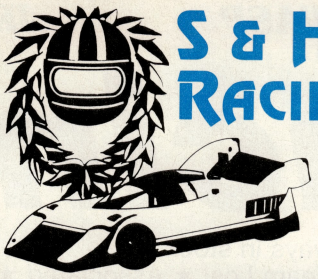

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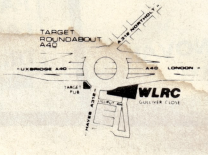

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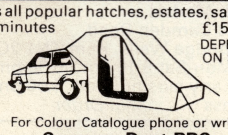
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Avon Models 63
Bagnall's Models 30, 31
Brampton 77
CML Distribution 62
Calypso Models 69
Central Models 60
Cheltenham Model Centre 78
Circuit Promotions 21
Classic Models 23
Daniel, W.J. 78
Elite Models 22
Fleet Control Systems 14
Fratton Bargain Shop 27
GK Models 53
Harwood 2
Helger Racing 32
Hobby Marketing 63
Holcomac Marketing 7
Howes Models 33
Intronics 61
Irvine Engines 83
J.S. Racing 76
Lesro 56
MJS Models 17
McGregor Industries 73
Model Car Centre 66
Modelstyle 74
Model World (Shrops) 75
Nodis Racing 14
Nosram 66
Orton Models 34
Otley Modelsport 10, 11
PB Racing 4
P & S Models & Hobbies . 78
Penn Models 68
Phil Greeno 67
Phill's Models 5
Puma Racing 63
RC Products 29
Racecraft 69
Radio Active 61
Ralls Racing Products 66
Riko Ltd 84
RRC Back Issues 82
RRC Subscriptions 61
Sarik Vacform 63
Schumacher 35
Sevenoaks Model Centre 57
Stockton Modeller 15
Surrey & Hants Models .. 75
TMS 8
TOP Models 77
Ted Longshaw 9
Thor Racing 76
Tru Tyres 78
WLRC 75
W & H Models 60
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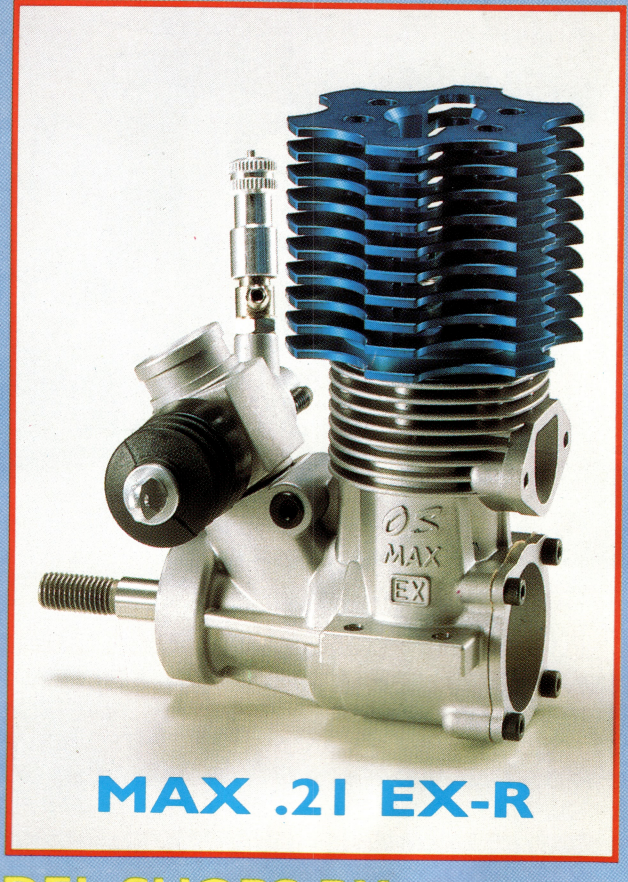

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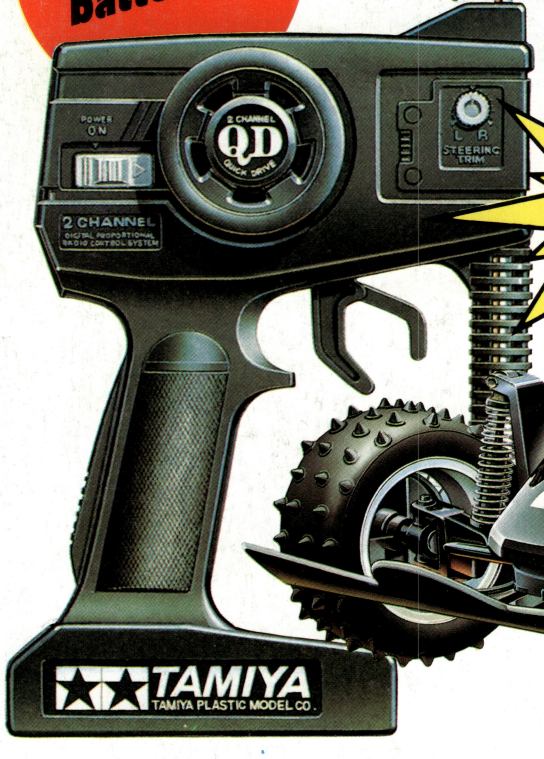

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