

The Monthly Magazine  
for All Model  
Radio Control  
Car Enthusiasts

# Radio Race Car

*International*

March 1988 • Price £1.35 (UK) • \$3.00 (USA)

## INSIDE

### KYOSHO'S MID-ENGINE OPTIMA

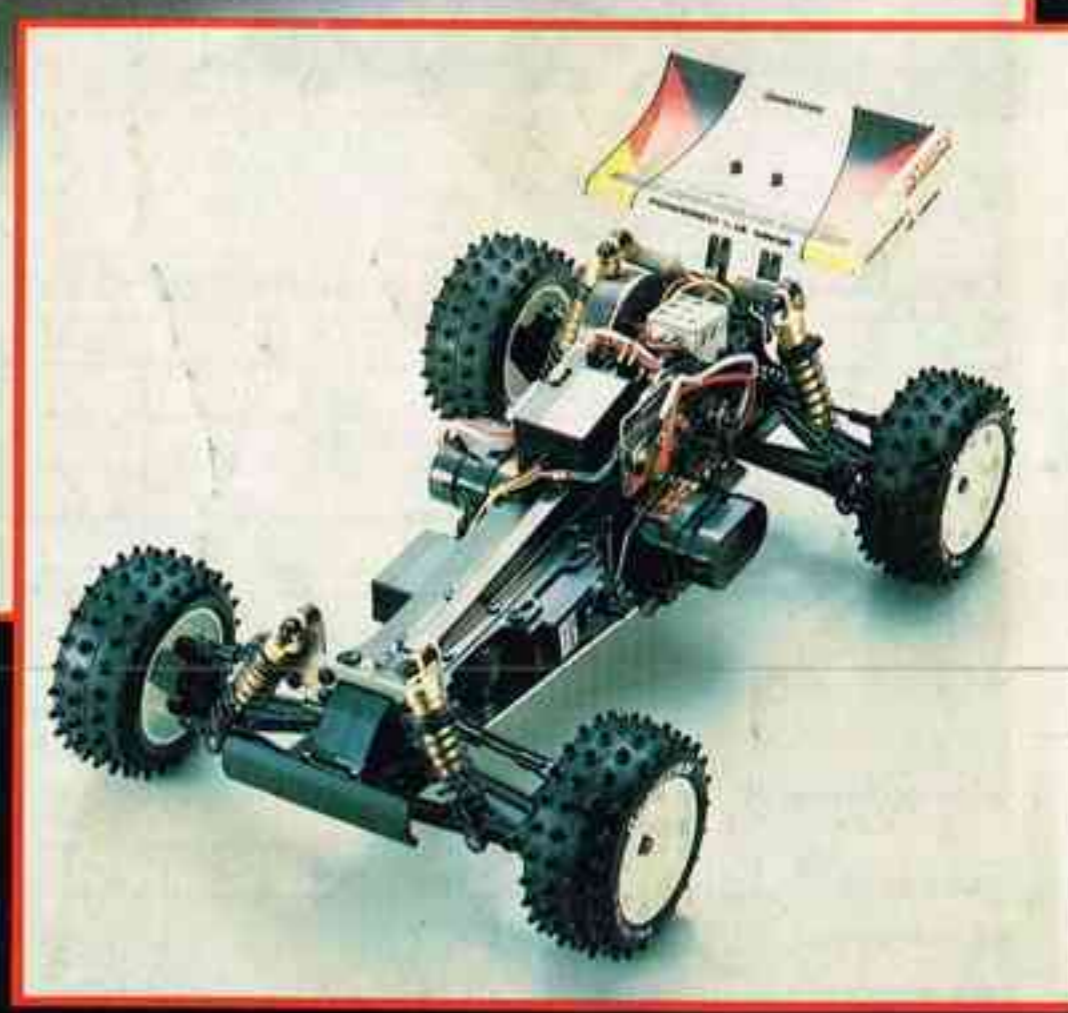
AND DETAILS OF HOW TO WIN ONE  
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### P.B. MAXIMA TRACK TEST

### TAMIYA'S THUNDERSHOT AND MARUI'S THUNDERBIRD

TWO NEW RACERS REVIEWED



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# Radio Race Car International

## C O N T E N T S

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Jim Davey • Bob Errington • Mike Billinton**

### EDITORIAL

Already response to the RRC series has been phenomenal so get your entries in early to avoid disappointment.

Whilst on the subject, may be say that where telephone contacts are concerned please be sensible, don't phone after say eight at night or before ten in the morning, already there have been several complaints from contacts saying that drivers have been phoning as late as midnight, or as early as seven in the morning. Contacts have been instructed to ignore persons phoning at these times, please be courteous!

The driver number form in last month's RRC is merely to aid you and us, last season several hiccups occurred due to drivers registering as C. Bloggs in two rounds and Charles Bloggs in others, to avoid this situation obtain your driver number early, then quote it often!

Reports will appear on a monthly basis accompanied by drivers positions for both two and four wheel drive classes, don't miss it.

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All correspondence should be sent to Radio Race Car Magazine, Masefield House, Wells Road, Malvern, Worcestershire, WR14 4PA, England. Tel: (06845) 60561/2/3. Telex: 334708 RCMAGS.

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RK27 Screw Set	£6.95
RK28 Servo Saver Set	£1.95
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Hot Shot/Wild One block fronts	£4.50
Hot Shot/Wild One block rears	£4.75
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Hot Shot/Wild One spike rears	£4.70
Mardave 5x4, 3x2 rears	pr £3.80
Mardave new wonder fronts	pr £3.80

### BOOMERANG SPARES

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B parts and bumper	£4.10
C parts	£3.10
E parts	£1.70
R parts	£2.75
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Body wing Switch cover	£10.50

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F parts	£2.30
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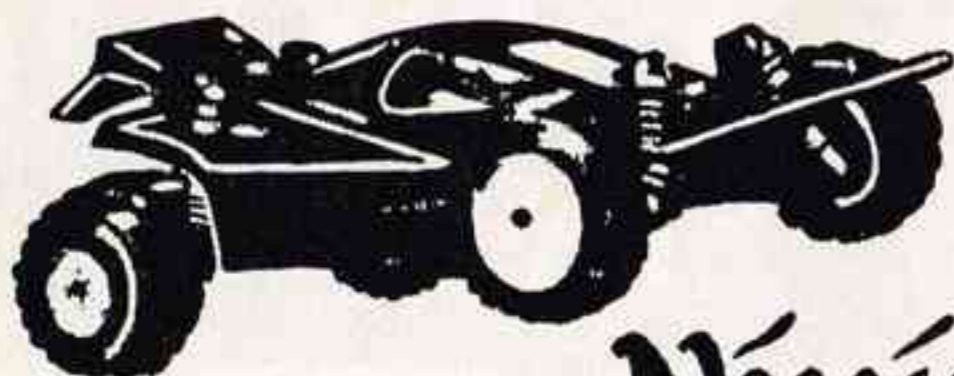


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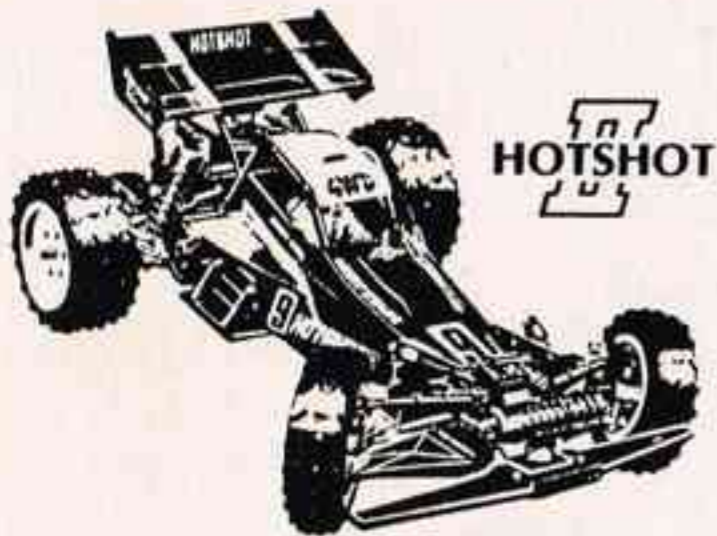
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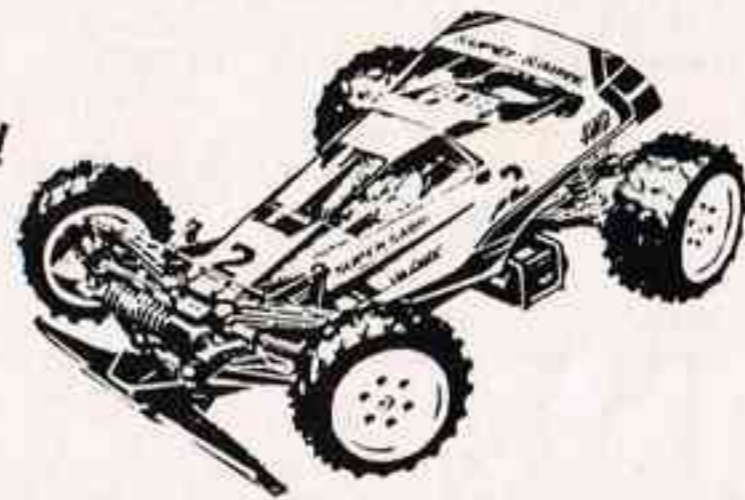
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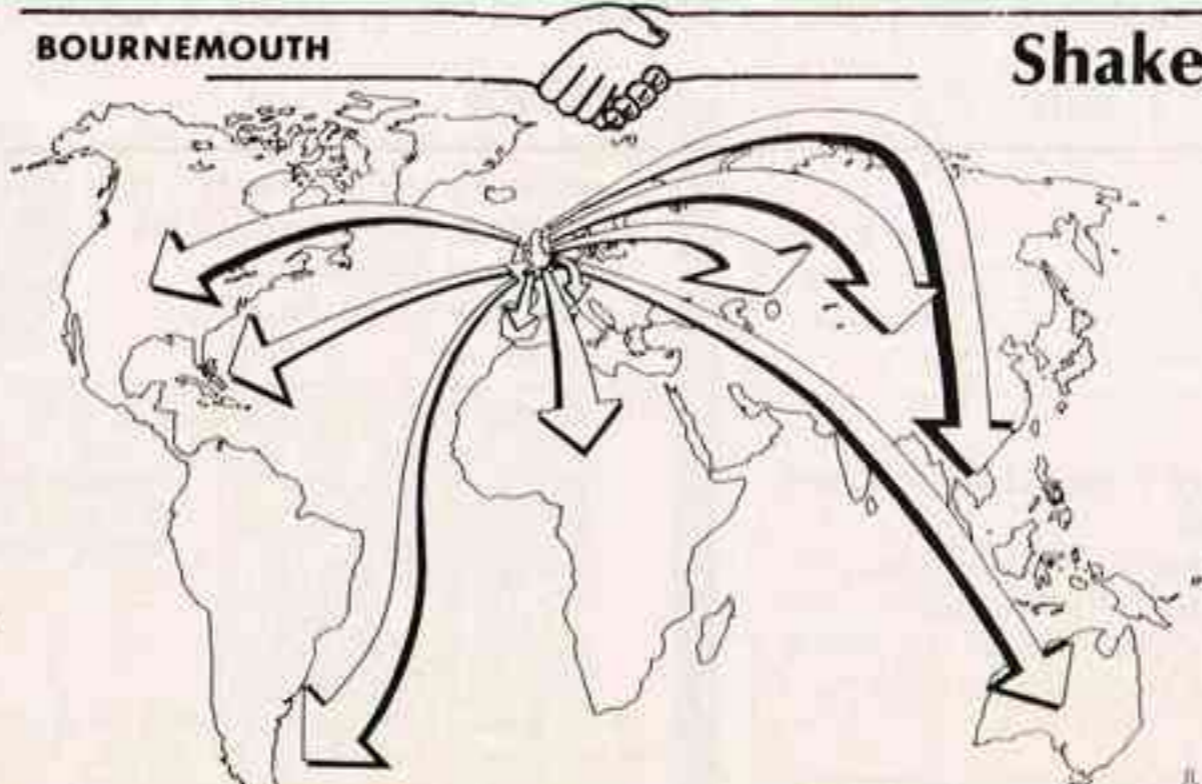


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# TRACK TALK

by Chris Evans

The weekend of the 28th/29th November saw Round Three of the National Championships taking place at the Lings Forum in Northampton. Utilising the BRCA carpet a good sized track was constructed by Race Directors Tim Walden and Rob Roy, and a large rostrum meant a clear view of the track.

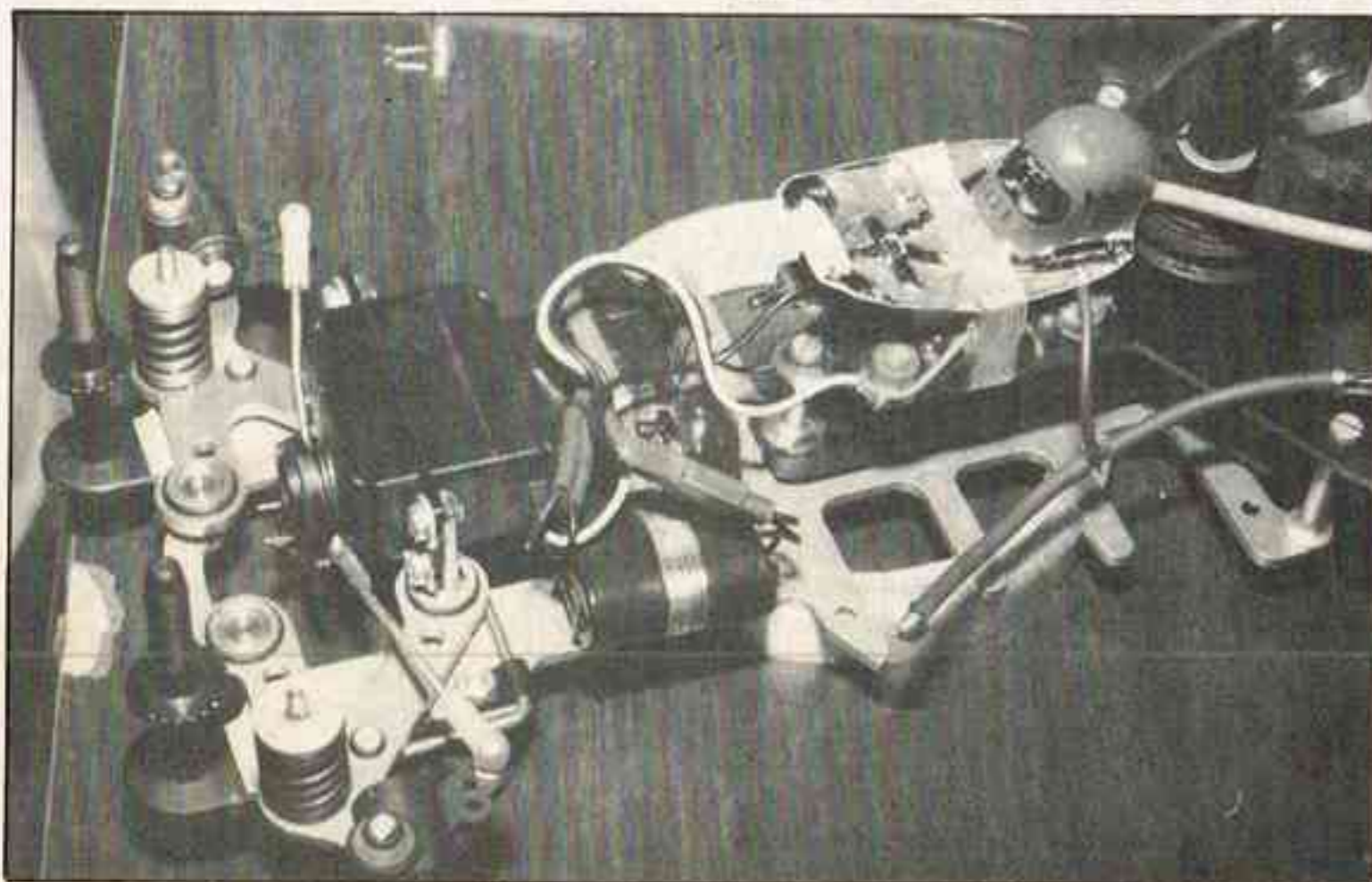
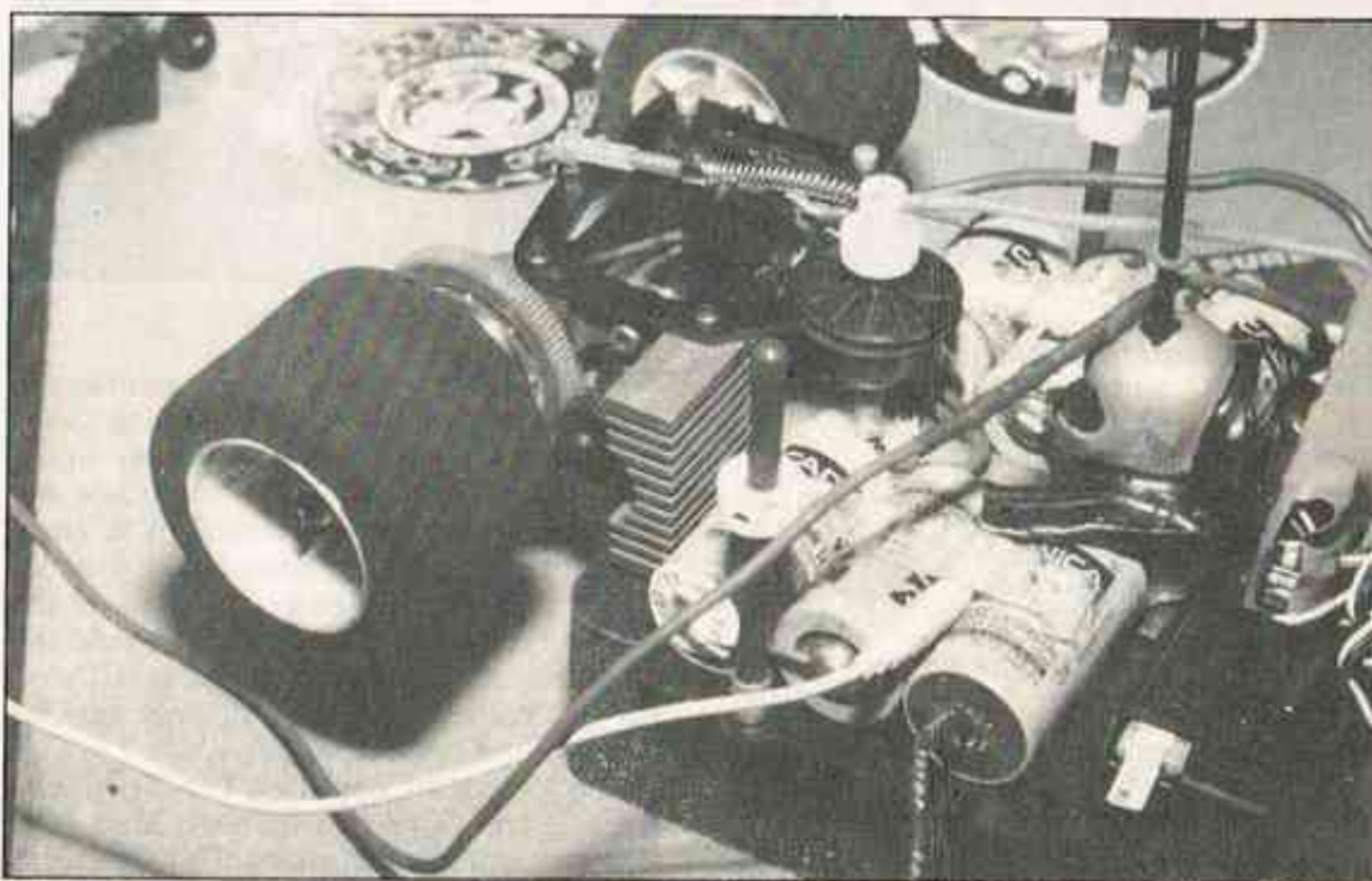
## Modified Qualifying

In Formula Three it was John Jones leading the rest of the field by a good two laps with a 25 laps, 11.25 seconds, ahead of Darryl Mellor and Chris Price on 22 0.73 and 22 2.04 respectively. The second round saw a large jump in lap times as Chris moved ahead of John and Darryl with a 29 11.83. The last round saw John turn a 29 12.81 but was still a second off Chris' second round score and took second place on the grid, while Kevin Appleby took third spot from Darryl with a 27 10.85.

*Right, Northampton National. Craig Drescher's RC12L, sporting an all in one motor mount with cooling fins to keep the motor as cool as possible.*

*Below, Northampton National. Matt Ford's standard class A final winning car, also carrying an additional battery pack to power the radio gear.*

After round one in Formula Two it was all very close at the top with Graham Rais-trick topping the list with 28 9.76, closely pursued by Paul Ash on 28 10.04 and Alex Thomason on 28 14.16. The next round saw



these three unable to make a significant improvement on their times which allowed Bill Boldison to the top with 30 5.36, followed by Craig Drescher on 30 15.91 with Alex holding third spot. Bill was unable to improve on his 30 5.36 in his last run, as did Craig and this allowed Terry Evans and Mike Farrell to take second and third place respectively with 30 8.26 and 30 15.15.

In Formula One it was Rob Roy fastest after Round One with 30 0.63, almost a lap clear of Keith Helmke on 30 15.96 and Jamie Booth with 16.93. Of these three, Keith was the only one to improve on his time but his 31 6.3 was only good enough for fifth spot as the three Team Schumacher drivers topped the field, headed by Phil Davies with 32 5.88, Mark Barford second on 32 15.0 and Pete Farmer third with 31 1.48. The last round saw everyone pushing hard and lap times improved as Phil held on to FTD with 33 15.13, from mark on 32 0.13, while Dave Gale took third spot with 32 5.01.

## modified Finals

In the Formula Three A Final, John was unable to trouble Chris as he had done in the heats, leaving Chris to romp home with 29 16.39, almost two laps clear of Kevin on 27 15.23 with John having to settle for third place with 26 11.43.

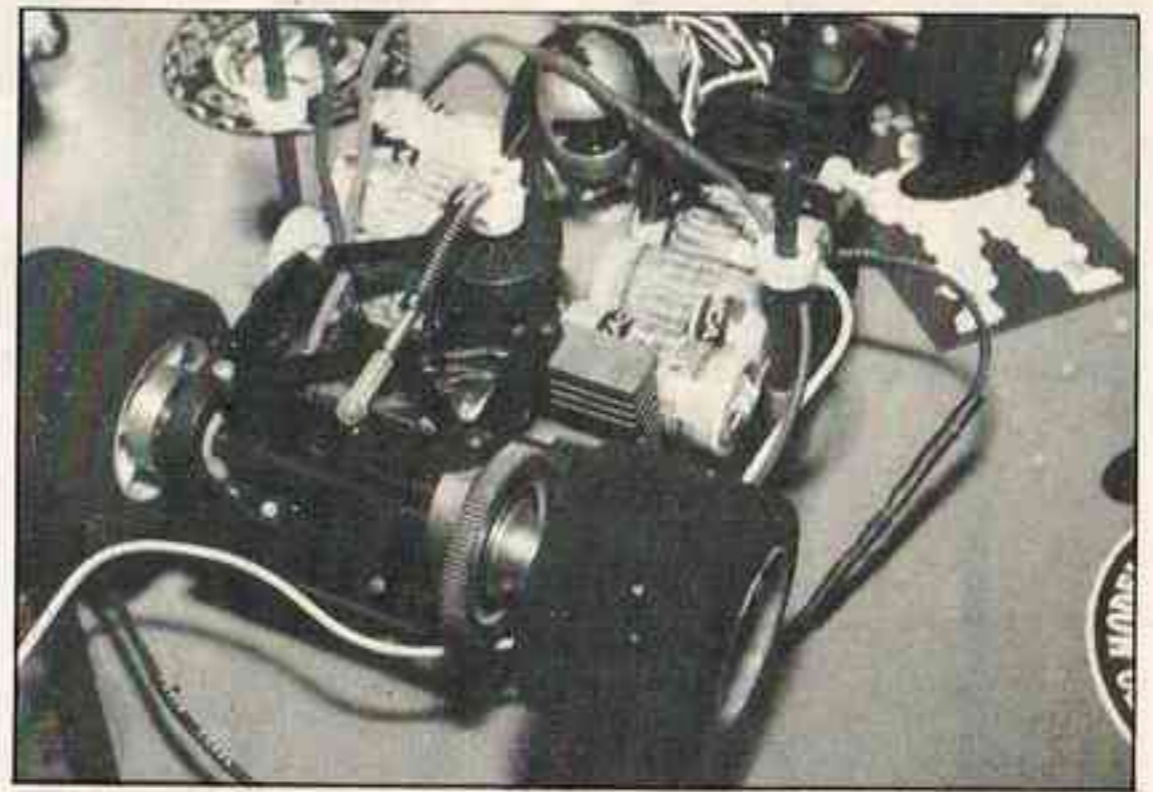
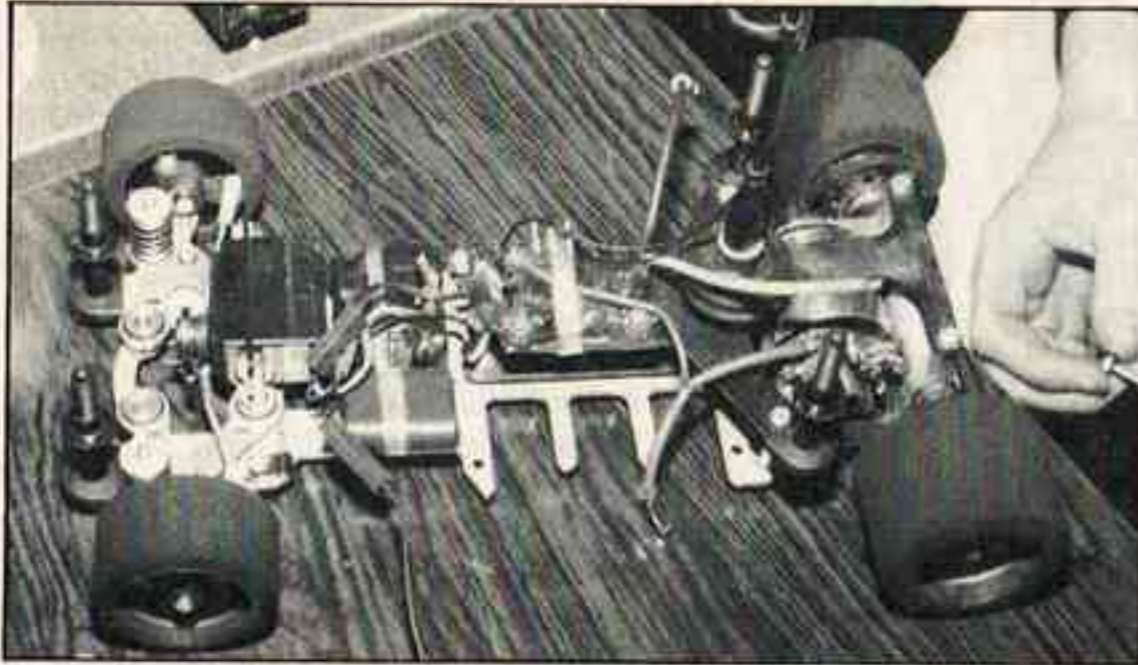
The Formula Two A Final saw a tremend-

ous struggle for the honours but in the end it was Terry who lead the field home with a 30 0.81, just ahead of Mike on 30 3.13, with Bill coming in third on 30 12.15.

The Formula One A Final went very much the same as the qualifying once the cars had sorted themselves out after the first lap with Phil narrowly failing to improve on his FTD with a 33 16.36, ten seconds in front of Mark on 32 6.46, while Dave Gale just managed to hold off Chris Evans on the last corner for third place, the two of them turning 32 10.25 and 32 10.53 respectively.

The weekend of the 12th/13th December saw the concluding rounds of the Watford Carpet League on the Saturday and the Stafford Mini National series on the Sunday.

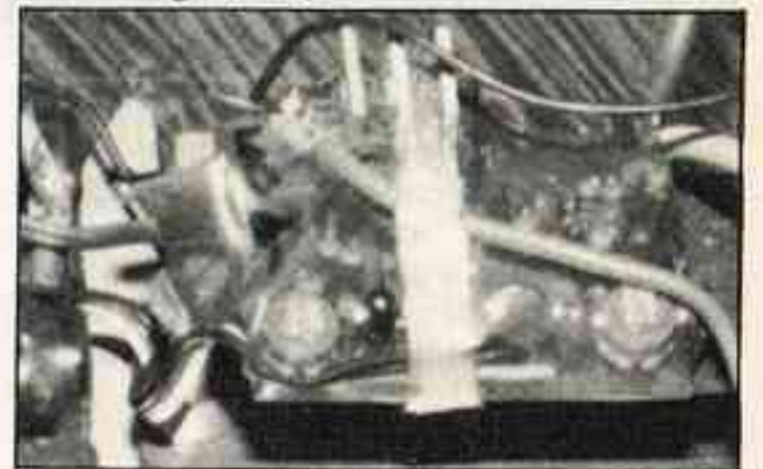
At Watford, two classes are run, Formula One and Formula Two. In Formula Two, Paul Ash took the honours with Mike Haswell second and Pete Margetts third. In the Formula One class, Rob Roy was the eventual winner, with Andy Smith second and Matt Ford third. A word of thanks to Radio



Above, Matt Ford's Corally saddlepack car, notice the prototype Intronics speed controller only utilising two FETs for forwards and one for braking.

Above Craig Drescher's RC12L.

Left, Stafford Carpet League Winners. Centre, 1st, Tim Dakin. Left, 2nd, Chris Evans. Right, 3rd, Matt Ford.



Above, could this be the way to go, a three FET speed controller? Intronics have produced some superb electronics in the past — looks like they may do it again!

STANDARD FORMULA ONE				
Pos.	No.	Name	Laps	Time
1.	55	Matthew Ford	33	20.34
2.	57	Phil Davies	32	5.58
3.	50	Rob Roy	32	8.34
4.	7	Tim Dakin	32	11.06
5.	52	David Gale	32	12.3
6.	59	Pete Farmer	32	25
7.	58	Mark Barford	32	.13
8.	89	John Reid	31	4.79

STANDARD FORMULA TWO				
Pos.	No.	Name	Laps	Time
1.	72	Pete Goodyear	30	7.68
2.	24	Bill Boldison	30	7.68
3.	49	Terry Evans	30	8.69
4.	15	Graham Raistrick	29	4.38
5.	13	Bob Brailey	29	8.18
6.	1	C. Price	29	10.88
7.	64	Graham Oxford	29	13.71
8.	21	Mike Farrell	27	25

STANDARD FORMULA THREE				
Pos.	No.	Name	Laps	Time
1.	3	John Jones	29	4.09
2.	65	S. Evans	27	7.98
3.	18	N. Piper	27	11.06
4.	83	J. Zottl	25	2.61
5.	12	Barry Wood	25	8.46
6.	82	Roy Aitkin	24	6.01
7.	34	G. Ward	20	9.09

STANDARD TEAM RESULTS			
Pos.	No.	Team	Points
1.	13	Schumacher	438
2.	16	Trak Tite	427
3.	3	Race Store	421
4.	14	Intronics B	418
5.	9	SRM A	413
6.	11	GEG Stychfields	407
7.	8	Intronics A	397
8.	2	Ashby	397
9.	1	Heathrow	397
10.	10	SRM B	388
11.	6	GEG Stychfields B	381
12.	5	Viper B	374
13.	4	L & M Euro	373
14.	12	Galaxy	372
15.	7	RC Model Cars	348
16.	15	Viper A	0

Controlled Model Cars who sponsored the league. Next year there is a meeting every month, with sponsorship coming again from RCMC and L and M Euro Models, the latter supplying a set of Grand Prix 'C' compound tyres to the winner of each final instead of a trophy. Before we leave the Watford meeting, Matt Ford must hold the record for the smallest number of FET's on his Intronic's speed control, only two for forward and one for brake.

At Stafford, the day after, Tim Dakin took the title from Chris Evans with Matt Ford also managing third place. The GEC club will also be holding a new series in 1988 and to all the defending champions, good luck.

On the equipment front there were a few new ideas. Matt Ford was running, similar to Phil Davies, an additional battery pack to power his radio gear. Still with the Corally's, Jason Dearden had produced a Do-It-Yourself saddlepack conversion for his stickcell Corally which performed well. One particularly nice item was the anodised aluminium motor mount on Craig Drescher's RC12L which has built-in fins to act as a heatsink for the motor and is BRCA legal.

Once again thanks to all the organisers, not forgetting Pete Jones on scrutineering, aided and abetted by Barry Wood and Mike Haswell. Once again we had another full entry, and the couple of heats of buggies on the Sunday, although welcome, were not required. As a footnote, the next National isn't until Nantwich in February so why not get your entries in early for once.

Entries are also out for the Washington National to be hosted by the Oxclose Radio

MODIFIED FORMULA ONE				
Pos.	No.	Name	Laps	Time
1.	57	Phil Davies	33	16.36
2.	58	Mark Barford	32	6.45
3.	52	David Gale	32	10.25
4.	48	Chris Evans	32	10.53
5.	59	Pete Farmer	32	15.06
6.	73	John Reid	31	4.93
7.	50	Rob Roy	31	5.16
8.	22	Keith Helmke	15	17.01

MODIFIED FORMULA TWO				
Pos.	No.	Name	Laps	Time
1.	49	Terry Evans	30	.81
2.	21	Mike Farrell	30	3.13
3.	24	Bill Boldison	30	12.15
4.	15	Graham Raistrick	30	15.81
5.	13	Bob Brailey	29	.93
6.	2	Alex Thomason	29	7.41
7.	42	Mark Jewitt	27	25
8.	8	Craig Drescher	5	25

MODIFIED FORMULA THREE				
Pos.	No.	Name	Laps	Time
1.	1	C. Price	29	16.39
2.	32	Kevin Appleby	27	15.23
3.	3	John Jones	26	11.43
4.	70	B. Symons	25	7.06
5.	33	Darryl Mellor	24	24.61
6.	34	Ian Leach	22	25
7.	46	A. Brunt	21	25
8.	45	Mark Holloway	10	25
9.	18	N. Piper	9	25

MODIFIED TEAM RESULTS			
Pos.	No.	Team	Points
1.	13	Schumacher	445
2.	9	SRM A	434
3.	14	Trak Tite	430
4.	5	Viper B	428
5.	3	Race Store	424
6.	15	VGM	413
7.	11	GEG Stychfields	413
8.	1	Heathrow	410
9.	10	SRM B	408
10.	16	Intronics B	405
11.	2	Ashby	404
12.	8	Intronics A	401
13.	4	L & M Euro	394
14.	6	GEG Stychfields B	383
15.	7	RC Model Cars	246
16.	12	Galaxy	0

Standard 'A' Final Equipment Chart Formula One											
Final Pos.	Driver	Car	Nicad	Motor	Rear Tyre	Front Tyre	Speed Controller	Body	Radio	Servo	Gear Ratio mm per rev
1	Matt Ford	Corally Saddlepack Boldison Conversion	Intronics SCR	Intronics Yokomo	Grand Prix 'C'	Grand Prix 'C'	Intronics International FO	TOJ	Futaba 2LGX	Futaba 132H	49.0
2	Phil Davies	Schumacher SPC Graphite Chassis	Schumacher Custom Pack SCR	Schumacher Yokomo	Grand Prix 'C'	Grand Prix 'C'	Schumacher FO	Schumacher TOJ	JR FM	Futaba 132H	49.0
3	Rob Roy	Associated RC12L	SRM Laser SCR	SRM Stunner Yokomo	Grand Prix 'C'	Grand Prix 'C'	Lazer FTD FO	Frewer TOJ	JR Beat 2 Pro	Futaba 132H	45.0
4	Tim Dakin	Schumacher 'C' Car	Laser SCR	Demon Sagami	Grand Prix 'C'	Grand Prix 'C'	Laser FO	Sarik TOJ	Futaba 3EGX	Futaba 132H	45.0
5	David Gale	Associated RC12L	Laser SRM SCR	SRM Stunner Yokomo	Grand Prix 'C'	Grand Prix 'C'	Laser FTD FO	Fewer TOJ	Apex	Futaba 132H	46.0
6	Pete Farmer	Schumacher 'C' Car	Schumacher Custom Pack SCR & Laser SCR	Intronics Yokomo	Grand Prix 'C'	Grand Prix 'C'	Schumacher FO	Schumacher TOJ	Apex	Futaba 132H	49.0
7	Mark Barford	Schumacher 'C' Car	Schumacher Custom Pack SCR	Jerobee Yokomo	Grand Prix 'C'	Grand Prix 'C'	Schumacher FO	Schumacher TOJ	JR Beat 2 Pro	Futaba 132H	45.9
8	John Reid	Schumacher 'C' Car	Laser SCR	Schumacher Yokomo	Grand Prix 'C'	Grand Prix 'C'	Laser FTD FO	Schumacher TOJ	Futaba 2LGX	Futaba 132H	48.9

Modified 'A' Final Equipment Chart Formula One											
Final Pos.	Driver	Car	Nicad	Motor	Rear Tyre	Front Tyre	Speed Controller	Body	Radio	Servo	Gear Ratio mm per rev
1	Phil Davies	Schumacher SPC Graphite Chassis	Schumacher Custom Pack SCR	Reedy	Grand Prix Brown Dot	Grand Prix 'C'	Schumacher 'C'	Schumacher FO	JR FM TOJ	35.3	132H
2	Mark Barford	Schumacher 'C' Car	Schumacher Custom Pack SCR	Reedy Yellow	Grand Prix 'C'	Grand Prix 'C'	Schumacher FO	Schumacher TOJ	JR Beat 2 Pro	Futaba 132H	36.5
3	David Gale	Associated RC12L	Laser SRM SCR	Twister 26 x 2	Grand Prix 'C'	Grand Prix 'C'	Laser FTD FO	Frewer TOJ	JR Apex	Futaba 132H	34.5
4	Chris Evans	Associated RC12L	Laser SRM SCR	Twister 27 x 4	Grand Prix 'C'	Grand Prix 'C'	TransAm FO	Sarik TOJ	Multiplex Car Plus	Futaba 132H	39.6
5	Pete Farmer	Schumacher 'C' Car	Schumacher Custom Pack SCR	Reedy Brown Dot	Grand Prix 'C'	Grand Prix 'C'	Schumacher FO	Schumacher TOJ	JR Apex	Futaba 132H	35.0
6	John Reid	Schumacher 'C' Car	Laser SCR	Reedy Blue Dot	Grand Prix 'C'	Grand Prix 'C'	Laser FTD FO	Schumacher TOJ	Futaba 2LGX	Futaba 132H	35.6
7	Rob Roy	Associated RC12L	Laser SRM SCR	Twister 27 x 4	Parma Green	Parma Green	Laser FTD FO	Frewer TOJ	JR Beat 2 PBro	Futaba 132H	35.7
8	Keith Helmke	Corally Saddlepack Boldison Conversion	Demon SC	Twister 27 x 4	Parma Green	Parma Green	Intronics FO	Frewer TOJ	Futaba 2LGX	Futaba 132H	36.5



Left, Watford Carpet League Formula One Champions. Centre, 1st, Rob Roy. Right, 2nd, Andy Smith. Left, 3rd, Matt Ford.

Car Club on the 26th/27th March. Individual entry is £5.50 a day or £17 for a team, with the closing date for entries being 27th February. Entries should be forwarded to Vince Formosa, 2 Buttermere Road, North Shields, Tyne and Wear NE30 3AS. Tel. 091 2583367. Cheques/PO made payable to Oxclose Radio Control Car Club.

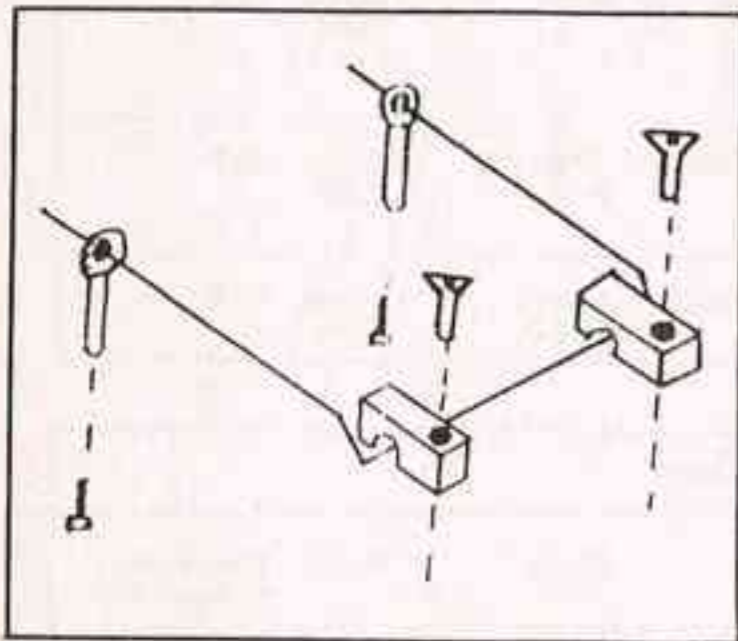
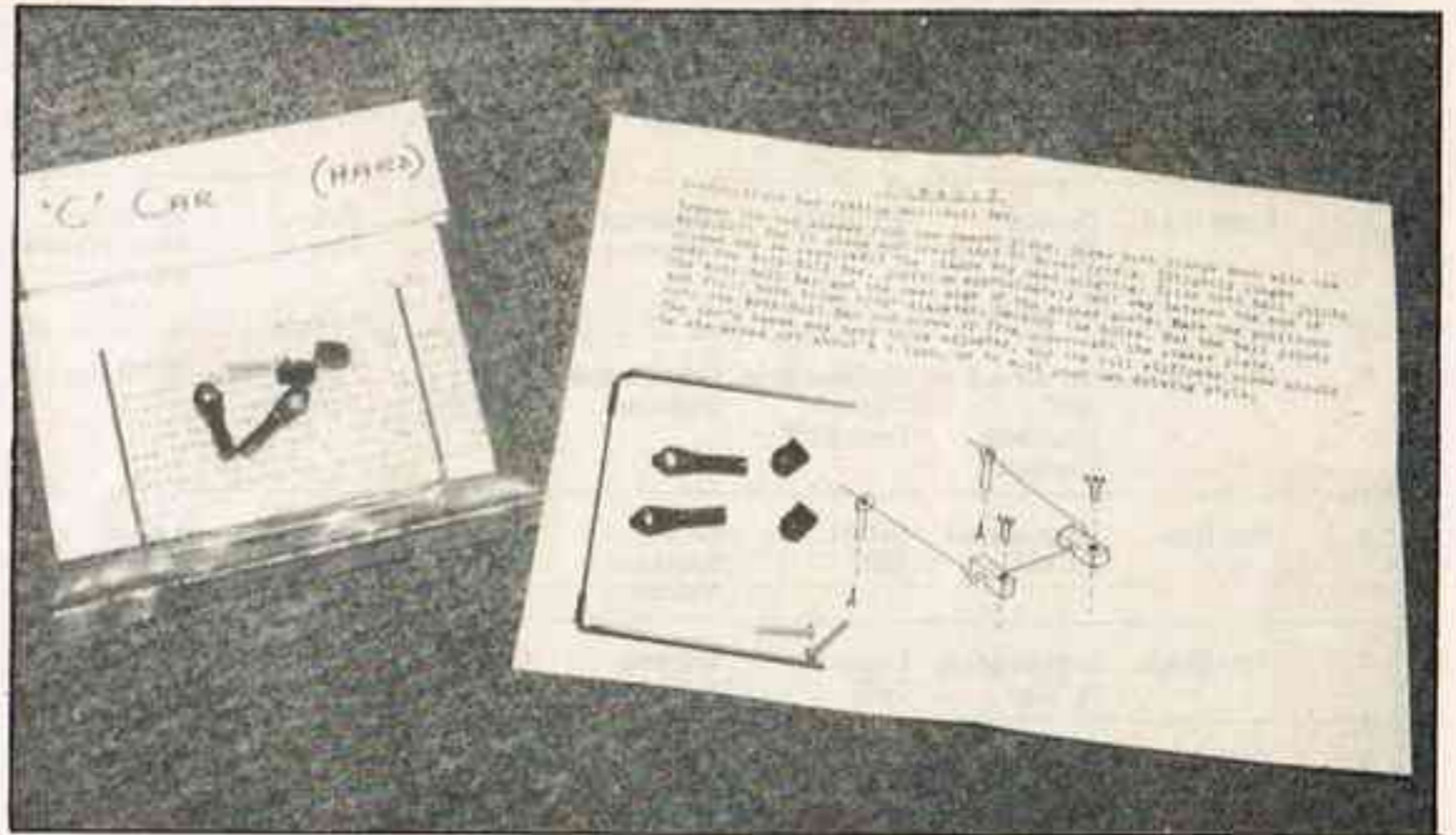
A new item currently being produced by Andy Sawyer is a rear anti-roll bar for

Schumacher 'C' cars and Corally cars, available in a hard or soft mode.

**Instructions for fitting Anti-Roll Bar**

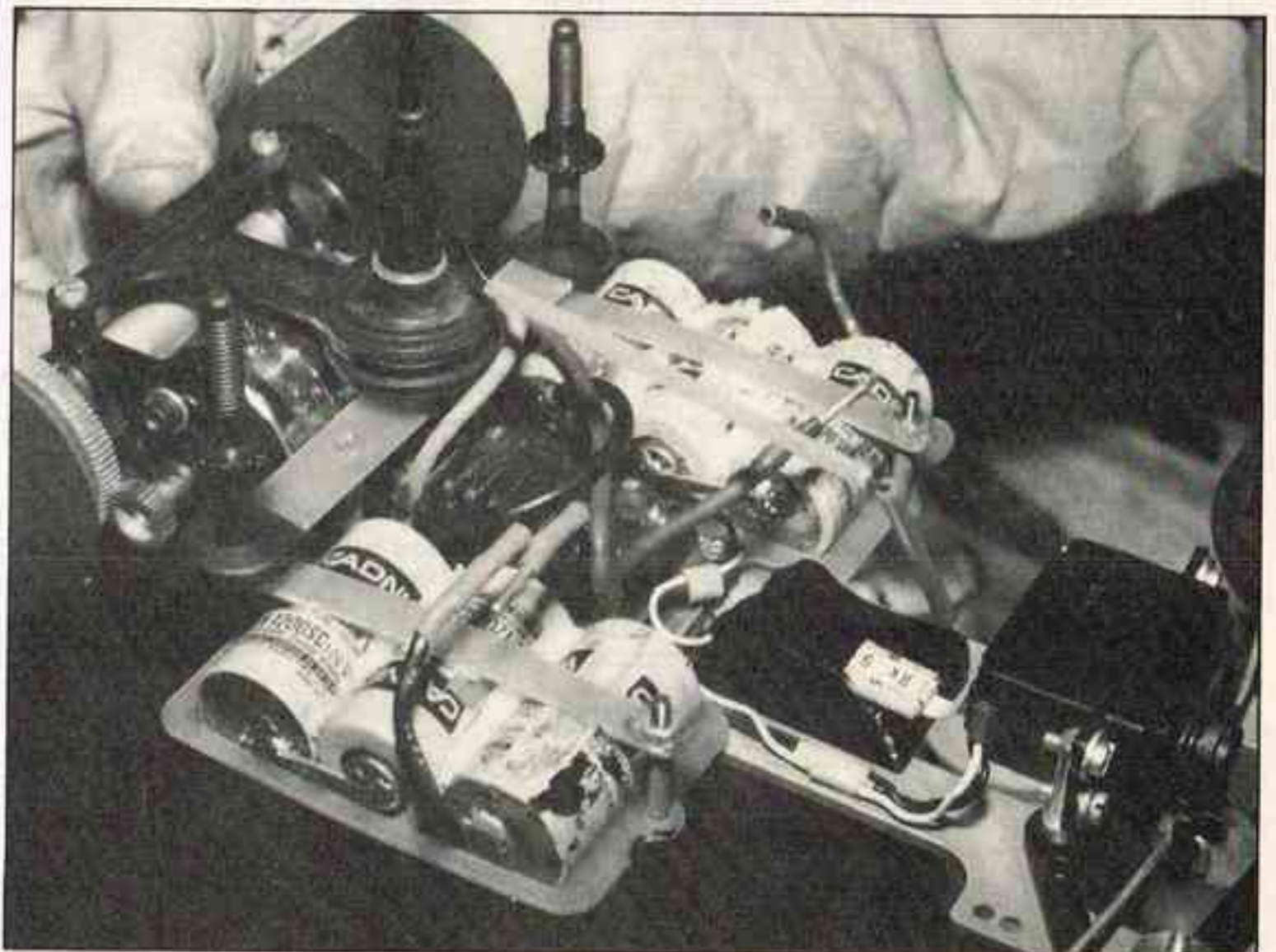
Remove the two screws from the damper plate. Screw both clamps down with the Anti-Roll Bar in place and check that it moves freely. (Slightly longer screws may be required.) The clamps may need aligning. Slide both ball joints onto the Anti-Roll Bar, position approximately half way between the end of the Anti-Roll Bar and the rear edge of the shaker plate. Mark the positions and drill both holes 1/16in. diameter. De-burr the holes. Put the ball joints onto the Anti-Roll Bar and screw up from underneath the shaker plate. The car's tweak may need to be adjusted, and the roll stiffness screw should be slackened off about half a turn, or to suit your own driving style.

The anti roll bars cost £3.99 and are available from Andy at 29 Yew Tree Close, Alveston, Derby DE2 0PZ. Tel. 0332 753585.



Top right, rear anti-roll bars available from Andy Sawyer for the Schumacher 'C' car and Corally cars.

Right, Northampton National. Jason Darden's "Do it yourself" saddlepack conversion for his Corally car.



**European Championships**

This year's event is taking place in Herning, Denmark which was the venue for the 1984 World Championships. Britain has been allocated 16 places and the team has been

Below, Watford Carpet League Formula Two Champions. 1st, centre, Paul Ash. 2nd, right, Mike Haswell. 3rd, left, Pete Margetts.



selected on last season's modified championship handicaps.

The team is thus:

- Phil Davies
- Tim Dakin
- Matt Ford
- Glyn Pegler
- Pete Farmer
- Pete Riley
- Pete Winton
- Mark Barford
- Greg Cutler
- David Gale
- Rob Roy
- Andy Smith
- Chris Evans
- Keith Helmke
- Pat Hodge
- Dave Foster

The meeting is taking place on 4th, 5th and 6th March so hopefully all your entries are in. If anyone would like to attend you should get in touch with Rob Roy as some of the above do not wish to attend and we usually pick up some extra places. At present Nigel Piltz is arranging a coach for everyone to travel over together, including three nights accommodation, the total price should be around £160.

1/10  
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 PORSCHE 959 4WD .....  
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 Bata Pulse, Peak Deteg ..... £39.95  
 Tekin BC200 Pro ..... £120.00  
 Noxak Peak Plus (volt-amp) ..... £120.00  
 Challenger Pro Peak Detect, Pulse 1-5.5 amp adj. amps - volts read out ..... £45.00  
 Challenger Pro - Ex Spec as above but with Nicad and Meter ..... approx. £69.95

## KYOSHO KOLLECTION

New Arrival - Mid engine belt drive Optima - phone for price and availability  
 Kic ..... £175.00  
 Mid-Four Optima ..... £90.00  
 Optima Pro ..... £155.00  
 Turbo Optima ..... £145.00  
 Salute ..... £90.00  
 Rocky ..... £110.00  
 Rocky Turbo ..... £85.00  
 Ultima 2WD .....  
 (Phone for the best deals)  
 + Option House Motors & Accessories. Coming soon, Kyosho Belt Drive Conversion for Optima

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Quattro S RE ..... £325.00  
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 S-Power Engine (Car) ..... £125.00  
 S-Power Engine (Buggy) ..... £125.00

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Stock Motors by Demon, Revolution, Trinity, Rocket, Kyosho, Parma, Demon Ballraced. Modified Motors by Demon, HPI, Revolution, Trinity, Rocket, Kyosho, Parma, Schumacher.

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 Tamiya Thundershot ..... £89.00  
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 Kyosho Mid-Four Optima belt drive ..... £165.00  
 Checkpoint Modifieds ..... £40.00  
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Tamiya Super Sabre				
Tamiya Clod Buster 4WD				
Tamiya Toyota Celica 4WD 1/12				
Tamiya Vanessa's Lunch Box				
Tamiya Striker				
Tamiya Monster Beetle				
Tamiya Porsche 959, 4WD 1/12th				
Tamiya Blackfoot				
Tamiya Big Wig 4WD				
Tamiya Falcon				
Tamiya Boomerang 4WD				
Tamiya Hotshot II 4WD				
Tamiya Hornet				
Tamiya Grasshopper				
Marui Ninja 4WD	£94.95	£155.95	£155.95	£155.95
Marui Samurai 4WD	£94.95	£161.95	£155.95	£161.95
Marui Big Bear 1/12th	£49.95	£109.95	£109.95	
Marui Toyota Land Cruiser	£45.95	£106.95	£106.95	
Kyosho Big Brute	£89.95	£148.95	£148.95	
Kyosho Raider 2WD	£47.95	£107.95	£107.95	£107.95
Kyosho Turbo Rocky 4WD	£132.95	£205.95	£205.95	£205.95
Kyosho Optima Pro 4WD		£110.95		
Kyosho Salute 4WD	£177.95	£249.95	£249.95	£249.95
Kyosho Rocky 4WD	£99.95	£162.95	£162.95	£162.95
Kyosho Optima Turbo 4WD	£189.95	£250.95	£250.95	£250.95
Kyosho Optima 4WD	£123.95	£184.95	£184.95	£184.95
Kyosho Ultima	£102.95	£162.95	£162.95	£162.95
Mardave Meteor	£53.95	£113.95	£113.95	

**PHONE FOR PRICE**

All deals include the car/buggy, 2ch radio control, 7.2v Tamiya/Sanyo racing rechargeable drive battery and either mains slow charger or 12v fast charge lead (please state which charger you require). Some buggies will also accept the 8.4v racing battery, Saft £7 extra, Tamiya £12 extra.

BEC = Receiver battery eliminator circuit.

The drive battery will run a buggy for approximately 5-10 minutes.

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Tamiya Boomerang/Super Sabre	£23.99
Tamiya Fox	£3.96
Tamiya Hotshot	£19.99
Tamiya Monster Beetle, Blackfoot & Wild One	£10.92
Tamiya Frog	£7.92
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3/16" x 5/16" O.D. S	3mm I.D. x 6mm O.D. F&S
3/16" x 9/16" O.D. F&S	4mm I.D. x 8mm O.D. S
1/4" x 3/8" O.D. S	4mm I.D. x 8mm O.D. F&S
1/4" x 3/8" O.D. F&S	5mm I.D. x 8mm O.D. S
1/4" x 1/2" O.D. F&S	5mm I.D. x 10mm O.D. S
	5mm I.D. x 11mm O.D. S
	6mm I.D. x 10mm O.D. S
	6mm I.D. x 10mm O.D. F&S
	6mm I.D. x 12mm O.D. S

S = Shielded  
F&S = Flanged and shielded.

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2105 BMW GTP	£27.95
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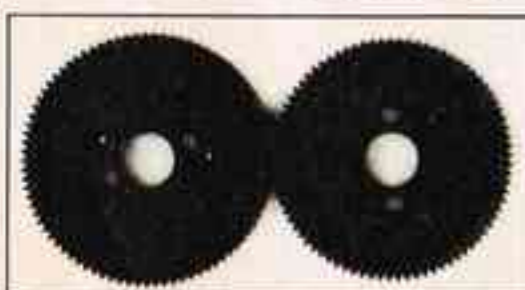
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# EIGHTH ANNUAL U.S. 1/12 INDOOR CHAMPIONSHIPS

**GENE HUSTING**

*reports from  
Cleveland on the 1/12  
U.S. Champs*

Explaining the unbelievable is probably the most difficult thing in the world to do. It's a bit like trying to tell someone you've had a ride in a flying saucer, if it were true, no one would believe you! If then you turned up to a race meeting which happened to be a National event, the drivers briefing took place at 6 a.m., followed by qualifying which lasted until 2 a.m. the following morning, there was a period of six hours when nothing happened until qualifying started again at 8 a.m. until 4.30 a.m., are you with me so far? A one and a half hour break was followed by controlled practice again at 6 a.m.! It is true, honestly, and it's been this way for eight years.

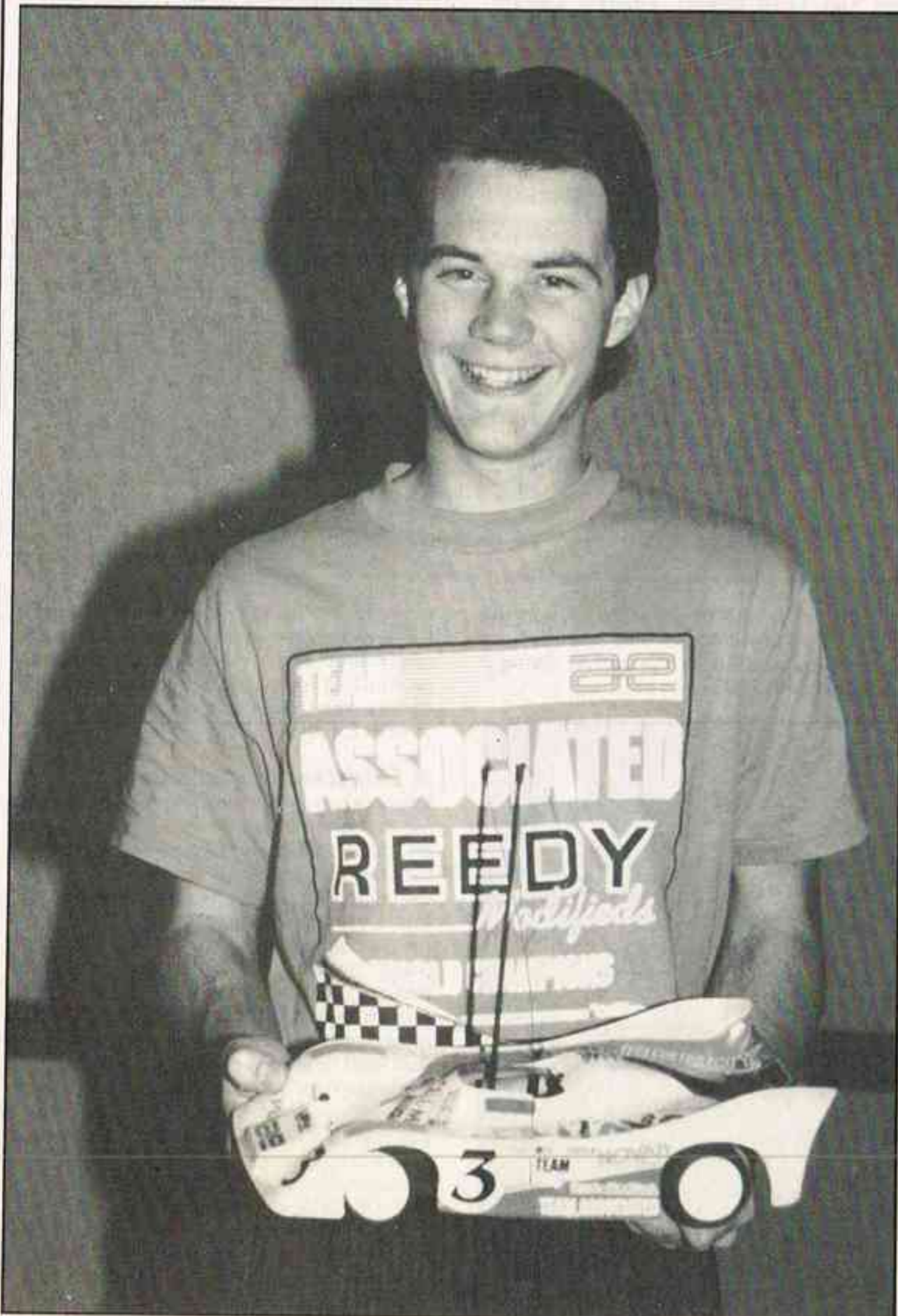
Last year's race saw 350 entrants, that proved to be too many so 300 was settled upon, as it was 325 racers turned up.

Racing was split into two classes, sportman and modified, drivers were only allowed to enter one class. Practice, as already mentioned was at times a nightmare, there was a one and a half hour wait to practice, caused mainly by the queue that wound its way around the circuit.

As practice developed it was easy to spot the drivers who raced regularly on carpet, the drivers from the West coast were hurting, they hadn't seen a carpet for a year, except to relax on, and it showed. By the same token Chris Doseck, Dave Hechler, Ron Schuur and Bud Bartos looked as if they were at home, and were flying around the track.

As far as we, Associated, were concerned halfway stage saw us struggling, then we found out what our problem was. Mike Reedy had developed a new brush that worked superbly in off road motors, so in

*The fastest from 325. Christian Kiel proudly shows his winning car, an Associated 12L, Reedy motor and Kiel pushed Sanyo's were the other half of the formulae, Novak speedo and Futaba radio finished the ensemble.*





Bud Bartos drove a superb race until the final incident with Hohwart's car dropped him to second place. Bud's TRC car uses CAM motor, Gonzo batteries and Bud's own accessories.

they went to the 1/12 motors too. Unfortunately for us, the brushes were made to carry a lot more current than the four cell motors we use indoors.

The same night Christian Kiel from Germany also started to sort his problems out. He was using a European speed controller and having problems. Then he purchased a Novak controller and a new pistol grip radio. Most drivers will realise how bad



A finalists left to right: Jim Hoffman, Christian Keil, Chris Doseck, Andrew Comrie, Terry Rott, Rich Hohwart, Ron Schuur, Dave Hechler, Bud Bartos and Joel Johnson.

it can be changing speedos mid race, but radios as well, now that's nearly impossible. However, Christian gritted his teeth and managed to keep the car on the circuit

the first time out, soon he was driving as if he'd been using the wheel for years.

The final qualifying race started at 4.15 a.m., Christian had won himself a front row spot by now and as the race started he was gone, showing a clean pair of wheels to everyone else. At the end of eight minutes he was the new top qualifier turning 38-8.09.9. Technical Inspection saw the first controversy, when Christian's body was re-

**Modified "A" Main Results**

	Laps	Time	Car	Motor
1. Christian Kiel	38	8.05.9	Associated	Reedy
2. Bud Bartos	38	8.11.8	TRC	CAM
3. Dave Hechler	38	8.13.2	TRC	CAM
4. Terry Rott	37	8.01.4	Associated	Reedy
5. Andrew Comrie	37	8.09.3	Associated	Reedy
6. Chris Doseck	37	8.11.0	TRC	CAM
7. Joel Johnson	36	8.01.0	Associated	Trinity
8. Ron Schuur	36	8.06.9	TRC	CAM
9. Jim Hoffmann	36	8.07.0	Bolink	Revtech
10. Rich Hohwart	34	7.30.9	Delta	Peak P.

All agreed that this Cleveland track was the best yet, plywood sheet was laid over the dance floor and under the carpet giving a really smooth surface to race on.

moved from his car it was discovered that there were three yellow wrapped cells and one white one, this gave some people grounds to imply, not quite fair, which of course was rubbish, Christian was warned to rewrap all cells in the same heatshrink.

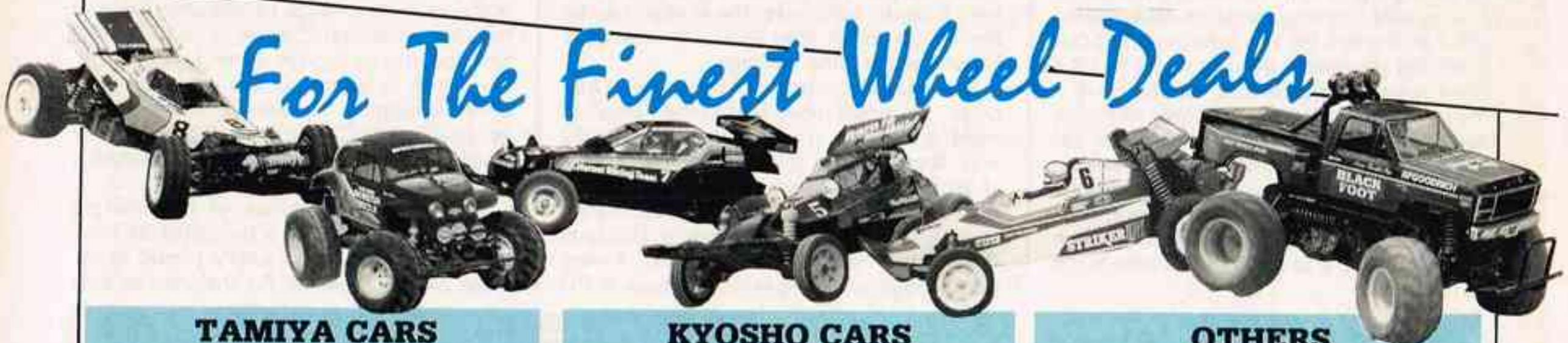
**A Modified Main Final**

Every driver in the meeting was in the hall for this one, the room was packed. At the off Christian Kiel and Bud Bartos shot down the straight together, at the first corner Christian was bumped and pushed into the boards, then a five car pile up really shuffled the field and Terry Rott emerged in second place, followed by Christian and Rick Hohwart. At the three minute mark the situation had changed again and Christian was once again in second place and closing on Bud fast! Eventually after a long chase with Christian happy to sit on Bud's tail then Rick Hohwart seemed to take out the leader's car, pushing Bud onto the boards. Christian took full advantage and shot into first place, successfully retaining that position until the end. One final smart move by Christian was to announce through Bill Jeric, he was giving away his batteries in a draw, this more successfully stifled any cheating complaints that may have arisen.



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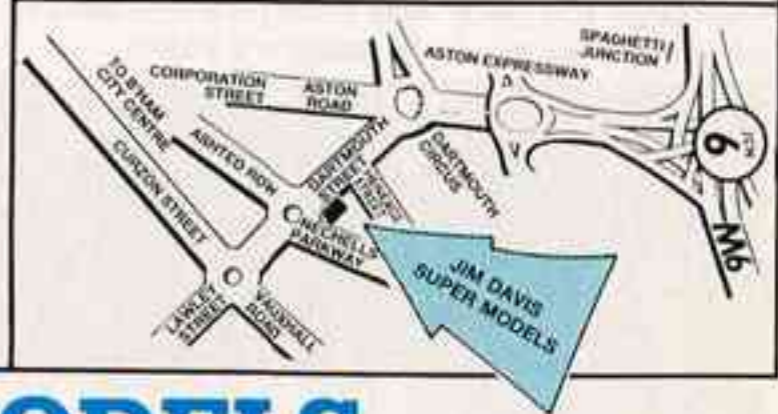
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The best car with the best motor and hours of preparation will not perform with a poor set of cells or a good set of cells which are not fully charged. Most drivers agree that "matched" cells perform best and that the actual matching should be left to the experts. It is possible for a person to test his cells by comparing one pack against another, it won't tell you how good it is but it will tell you which of your packs has the most capacity. The test is simple, have a means of discharging the pack through some form of resistance (I use two 40w car headlight bulbs soldered together with a 7.2v plug). Charge each pack using the same method, connect the bulbs and then time how long it takes to discharge each pack. The pack that takes the longest is the best.

cars. There are also unvented types which have a different voltage/charge characteristic when they become fully charged. The phenomenon is that when the cell is being charged the cell voltage rises slowly until the point of full charge when it suddenly increases rapidly. If charging is monitored with a digital volt meter the change can be seen quite clearly (see fig.1). The change is known as the 'step' voltage.

Like a lot of things there is good and bad news, the good news is that the "step" in voltage can be monitored automatically and then switch the charger to trickle charge, the bad news is that each pack of cells has a different "step" voltage. If your charger automatically changes to trickle at this "step" voltage it is foolproof. A very good foolproof charger of this type is the

to a race by monitoring the voltage rise. I use what is called an "expanded voltmeter" which only measures the voltage after it reaches 7.2 volts. I will published the circuit at a later date in the full article on charging (see photo).

The most popular and "in" method at the moment is to charge to temperature and for this a thermal charger is required. All thermal chargers have a temperature sensor which is slipped under the packs heat shrink wrapping. The sensor is factory preset to either 37°C or 40°C and when the pack reaches that temperature automatically switches the charger off.

One of the best types of this charger around at the moment is the Intronics Thermal which although factory preset at 40° does have the facility for the user to alter

# Everybody's Got To Learn Sometime

Part 5



There are three main methods of charging, Time, Peak and Thermal.

The time method is certainly the cheapest, potentially the most dangerous and unless the timing is correct can be ineffective. It comprises a 1 ohm charging resistor and a fixed time of charge. I do not recommend this for beginners and young persons as you only have to forget the time and your cells could be ruined (see photo). The initial cost is low but one ruined set of cells could make it very expensive in the long run. A much better time charge is the type with a clockwork timer which switches off after a preset time, different makes have a different choice of preset times. As long as the cell pack is fully discharged prior to charging this type of charger is foolproof and ideal for the beginner although they do err on the safe side and only give about 70-85% of a full charge.

Peak charging makes use of a phenomenon that occurs when charging a vented Nickel Cadmium cell. I have mentioned vented cells as they are the type used in model

Lambda Quick Charger from Kyosho which switches off automatically at the 'step' voltage. The charging leads are then switched to trickle charging outputs to finally top up the cell pack.

Some chargers only change to trickle at a set voltage and if you have the value set too high you could overcharge as a particular cell pack may not reach that "step" voltage, the result will be a ruined set the same as in the photo. It is important with this type of charger that you know the "step" voltage for each pack of cells, this voltage can only be accurately measured with a digital voltmeter, an analogue (the type with a dial) is not suitable as the scale is not large enough to see the change. It is important that the "step" value is checked periodically (say every 25 charges) as the step value gradually increases as a pack gets older.

I have one of these chargers and have it set at the lowest "step" value for my different packs of cells. My packs vary from 9.2v up to 10.1v. For the packs with the higher values I top them up to the step value prior

*This is the result of overcharging, easily done if you do not insert the temperature probe on a thermal charger or forget the time when using a charging resistor and timing.*



the cut off temperature should he so wish (see photo). This facility was made available as some drivers like to charge hotter, for example the "pushed" cells at 46°C whereas some drivers charge their SC cells cooler at 30°. Thermal charging is suitable for both SC and SCR cells.

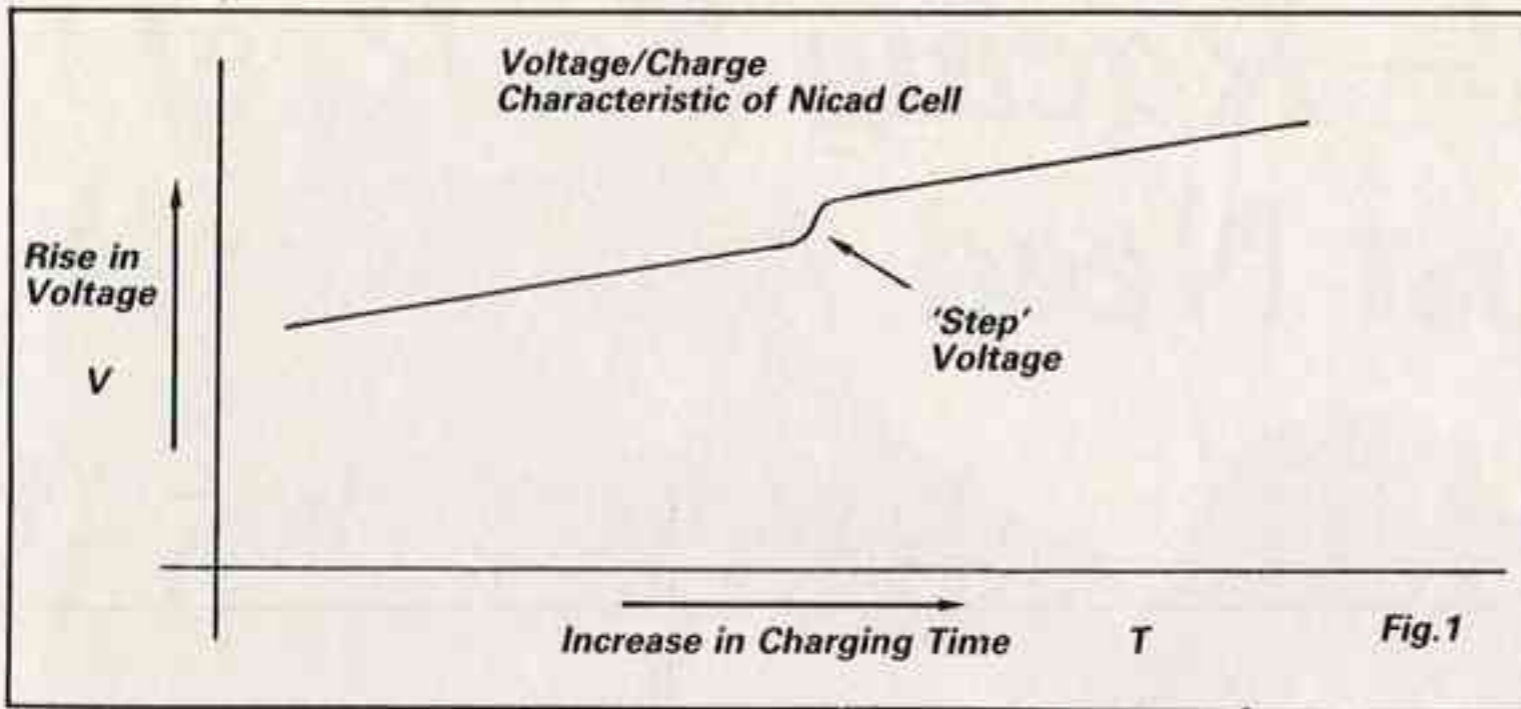
The thermal charger cannot be used with the cell packs encased in a thick plastic shell as there is nowhere to insert the sensor probe. An example of this type of pack is the Grey Tamiya Hump.

Although this section deals with fast charging a few words on slow charging. Some experts will say never slow charge whilst others insist after every six fast charges the pack should be given a slow charge. The idea of a periodic slow charge is to wipe out the packs "memory" and individually balance each cell, more of the "memory" in the later article but accept that Ni-Cads have one and it has to be erased periodically. Discharging the pack fully with a discharger also wipes the "memory" and individually balances each cell so we have two different methods of achieving the same effect. Tamiya recommend the slow charge method.

*Above right, two 40w headlight bulbs soldered together serves two purposes. 1. Will discharge the pack fully to wipe out memory. 2. Time how long it takes to discharge each of your packs so as to compare them.*



*One of the best thermal chargers available, the Intronics variety is very flexible in use and stands up to racing stresses well.*



A word of warning about "experts", there are real ones whose advice can be trusted and relied upon and self-appointed ones who think they know but do not. If you remember my definition of an expert as the "ex" stands for "has been" and the "spert" a drip under pressure, it may help you to put some of the self-appointed ones advice into perspective.

Having discussed a little theory and methods I must state the obvious and say that even with the best cells and best charger if you use an old half charged car battery that has been discarded from your family saloon you will not get a successful charge in your cell packs. Best results will be obtained if your power source is a fully charged high capacity 12v car battery. A voltage differential of at least 1.5v is needed between the power source (car battery) and your cell pack. My pack which has a "step"

voltage of 10.1v therefore needs the power source voltage to be in excess of 11.6 volts. A useful tip is to take a voltage reading across the power source with the charger working to see if there is a differential voltage as it may not be that your cell packs are over the hill but your battery.

SCR's or SC cells? Different drivers swear by either and I will sit on the fence and say I have both.

Some top drivers prefer SC's because they do not need to be cycled (charged or discharged) so many times before they are at their best. Your new set of cells, be they SC's or SCR's will get better the more times you use them.

To confuse you a little more SCR cells tend to dominate the market in the UK but have found very little favour in the USA or on the continent.

Experts agree that SCR's give a slightly higher voltage during discharge and it is easier to match a set of SCR's more closely than a set of SC's but when SCR's dump they do it dramatically. A well matched pack of SCR's will go from top speed down to stop in less than a lap so it is essential to get your gearing correct.

I always feel pleased when the car starts to dump on the slowing down lap after the race and a split time has been obtained, but have chewed many nails when I have not

Right, three sets of cells. 1. The top one is a "homemade" pack of unselected cells (this pack was seen being used at a local meeting). 2. The middle pack is a "matched" set of SCR's. 3. Bottom pack is a Tamiya Racing Pack which are SC cells.



Below, a normal clockwork fast charger with an "expanded voltmeter" to read voltage very accurately above 7.2v.



quite got it right and it starts to slow before the split time has been achieved.

I have heard it said use SCR's when running modified and SC's when running standard, but my observations of racing around the country do not support either theory. Whichever type of pack you have I think cycling them is the name of the game so do not save your "good" or your "best" pack for the big event of the year. You will be far better off using them regularly and if you are not going to a meeting for several weeks, cycle the cells before the next meeting they are going to be used in, by a charge and discharge once a week or on the evening prior to the meeting.

My final advice on cells is to treat them with a little respect, don't drop them, when soldering on the leads try not to overheat the cell with the iron and don't put a fully charged cell pack in your tool box (it could short out, ruin the cell pack and start a fire) on completion of your day's racing always discharge them.

By following this advice you will hopefully have cells which will give uniform performance each time you use them and also a long life with many charges per pack.

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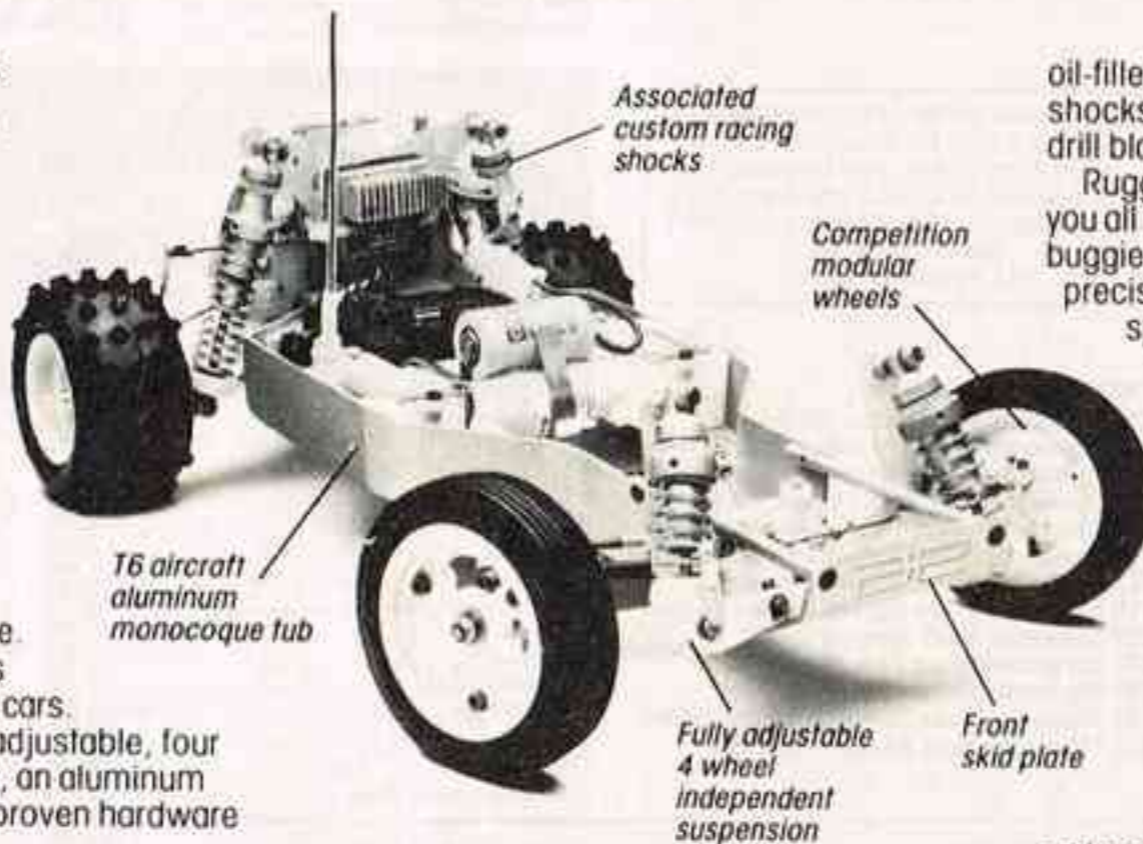
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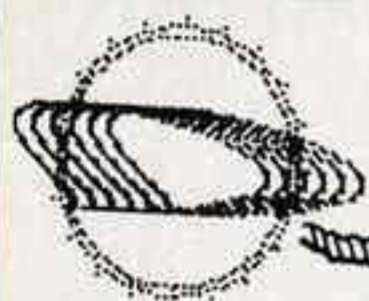
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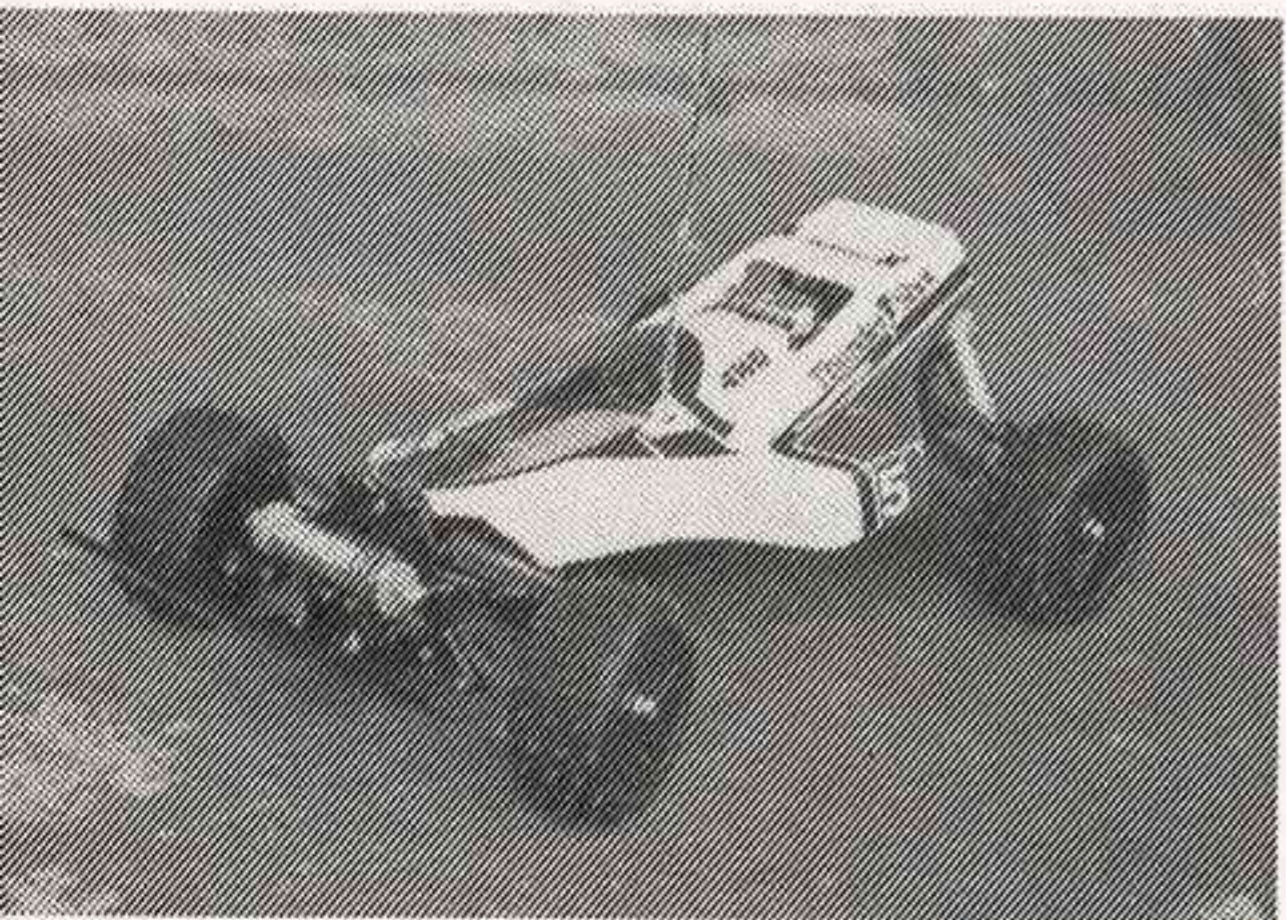
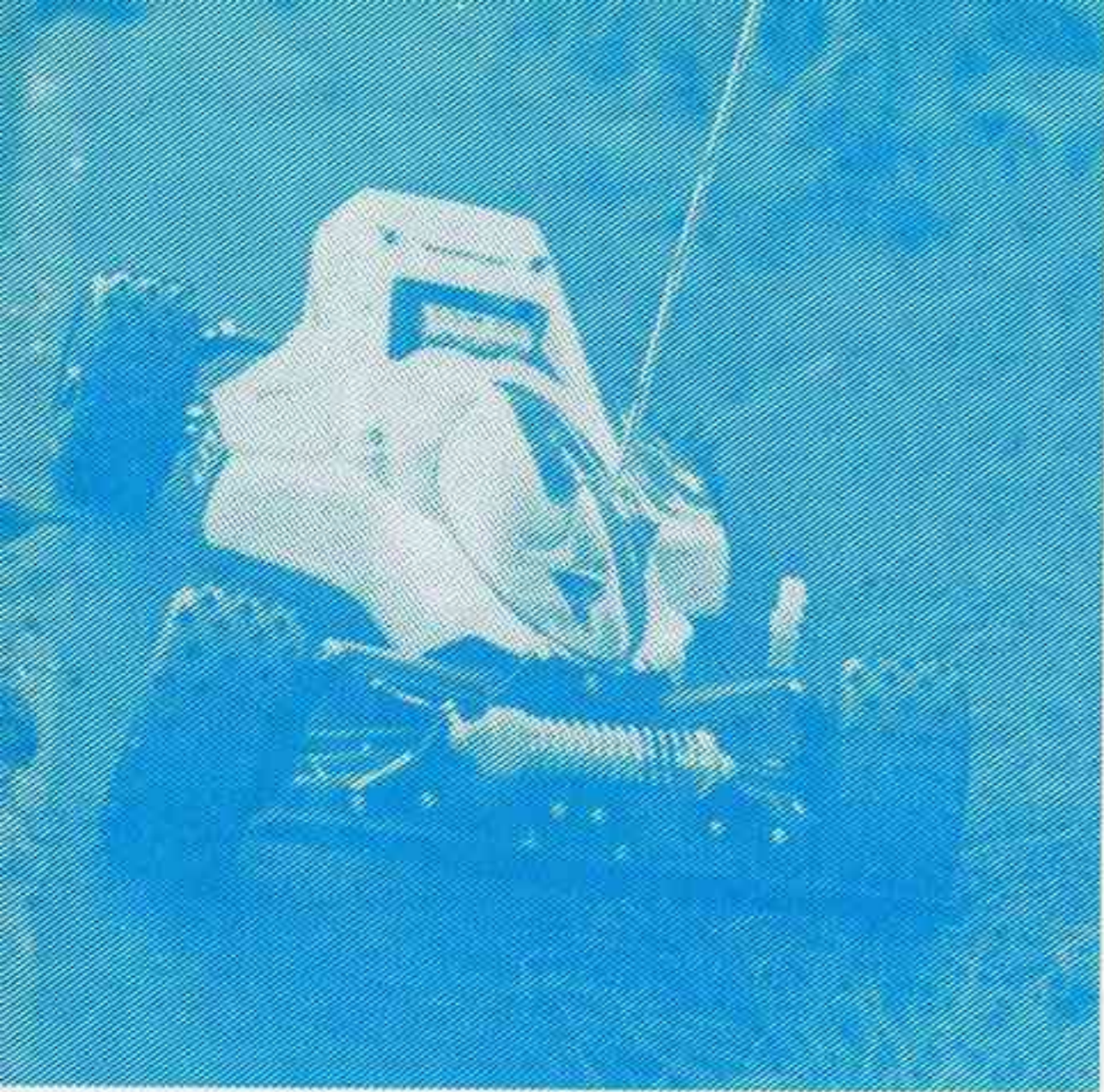
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## DAVE PEARSON looks at Tamiya's new 4WD 1/10 racer the Thundershot

One of the leading lights in 1/10 racing has always been Tamiya, Tamiya were there at the start building strong, reliable cars. As the 1/10 market exploded beyond the passing phase stage into the solid market of today, certain manufacturers have come and gone, seeded by a consumer evolutionary process where only the best survive, Tamiya gladly have more than proved their worth, not only surviving, but growing into one of the world's leaders in 1/10 car production.

It is against this background that we must then ask "Why have Tamiya not produced an all conquering 1/10 racing car for at least two seasons?" That statement was probably tantamount to heresy in some quarters, however results will bear it out. Mark

# THUNDERSHOT

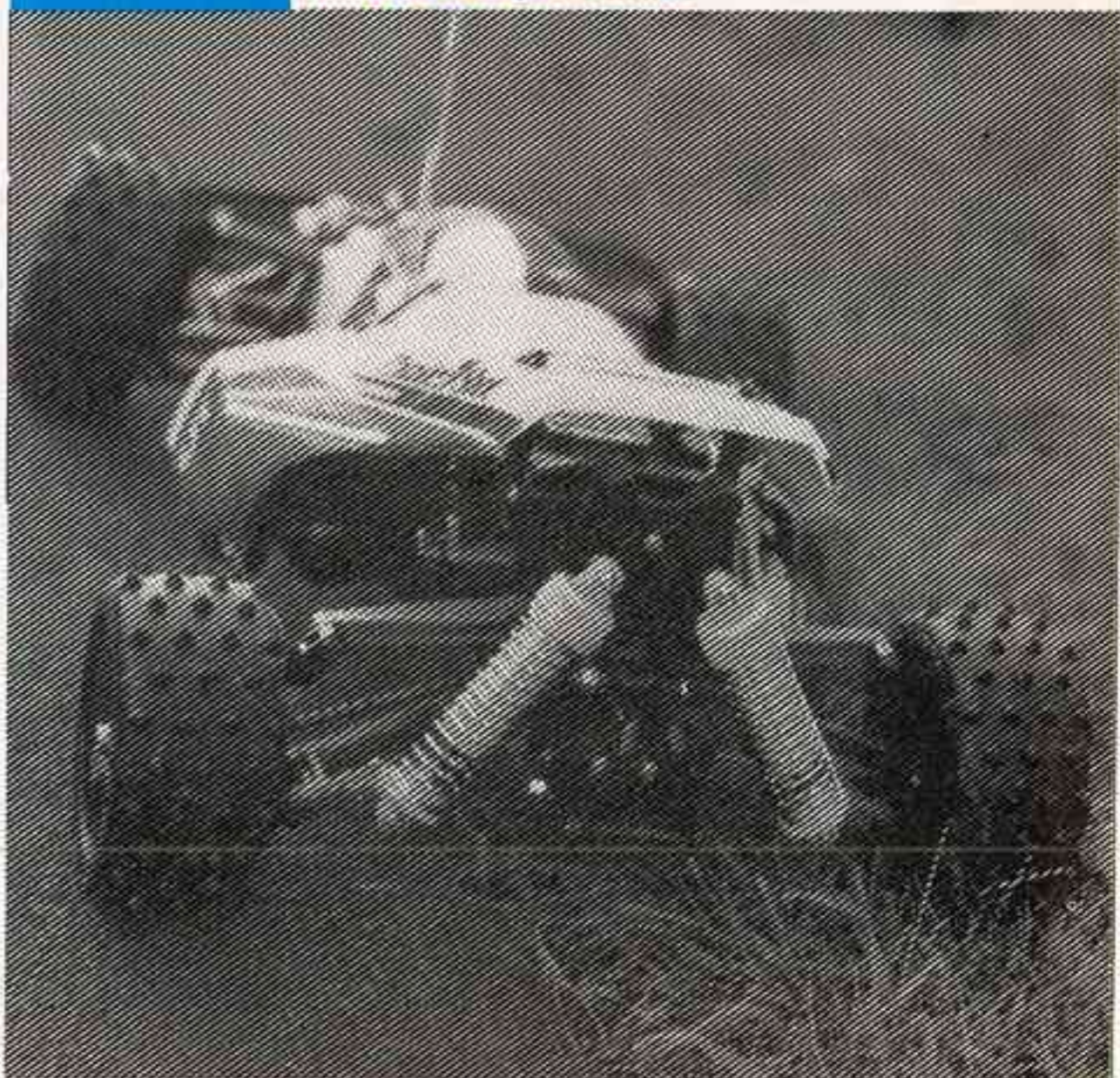
Chaplin has, last season at least, shown that a Tamiya car can deliver the goods against any opposition. During the 1987 Radio Race Car series his Bigwig was untouchable, as anyone who was unfortunate to come up against Mark and his car soon found out! Maybe the question should have been "Why don't more top drivers use Tamiya cars?" This again is difficult to answer, a suggestion and only a suggestion may be that Tamiya's racing image may not be quite right, after all what driver would be seen without his CAT last season, or his Mid Optima this? There is a lot of, dare we say it, pose-ability in owning the latest 1/10 fashion car.

Having said that, how many times have you seen a driver with the latest 1/10 four wheel drive fashion accessory making a complete fool of himself because he doesn't understand how to make it go, stop, move left, right or in a straight line properly, run out of fingers yet? Maybe what we're trying to say is this, in the hands of a driver who understands his car, that car always goes quicker, if the car in question is a strong, fast, reliable car in the first place, then you probably have a winning combination on your hands.

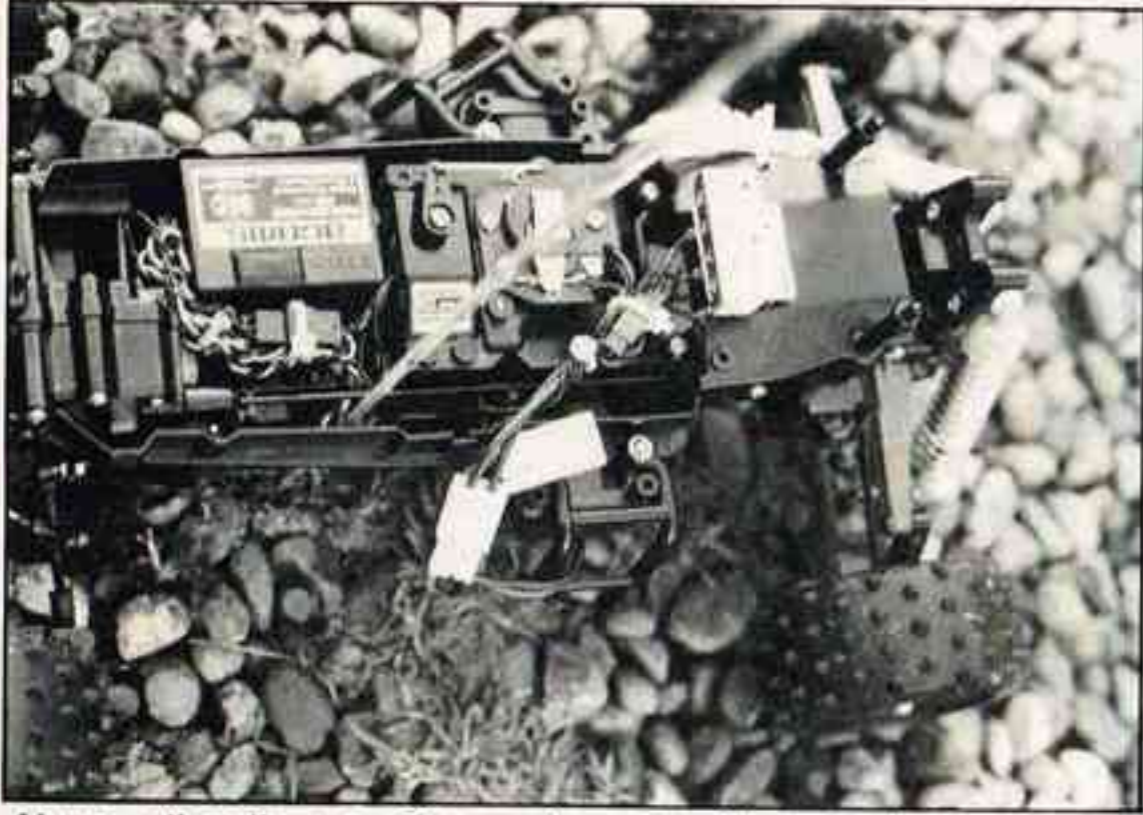
### New Bits

The Tamiya Thundershot is in most respects a new car, although it is based around Tamiya's tried and tested principles. The Thundershot is a shaft driven 4WD 1/10 racer that is built around a bathtub or monocoque chassis, this then is the tried and tested part, a formulae that from experience we all know works. New steering linkages are added, gone is the ball and socket link and surprisingly enough the rack and pinion system a la Bigwig, in its place a parallel motion tie rod arrangement is used, this is both friction free, quick and very strong in use.

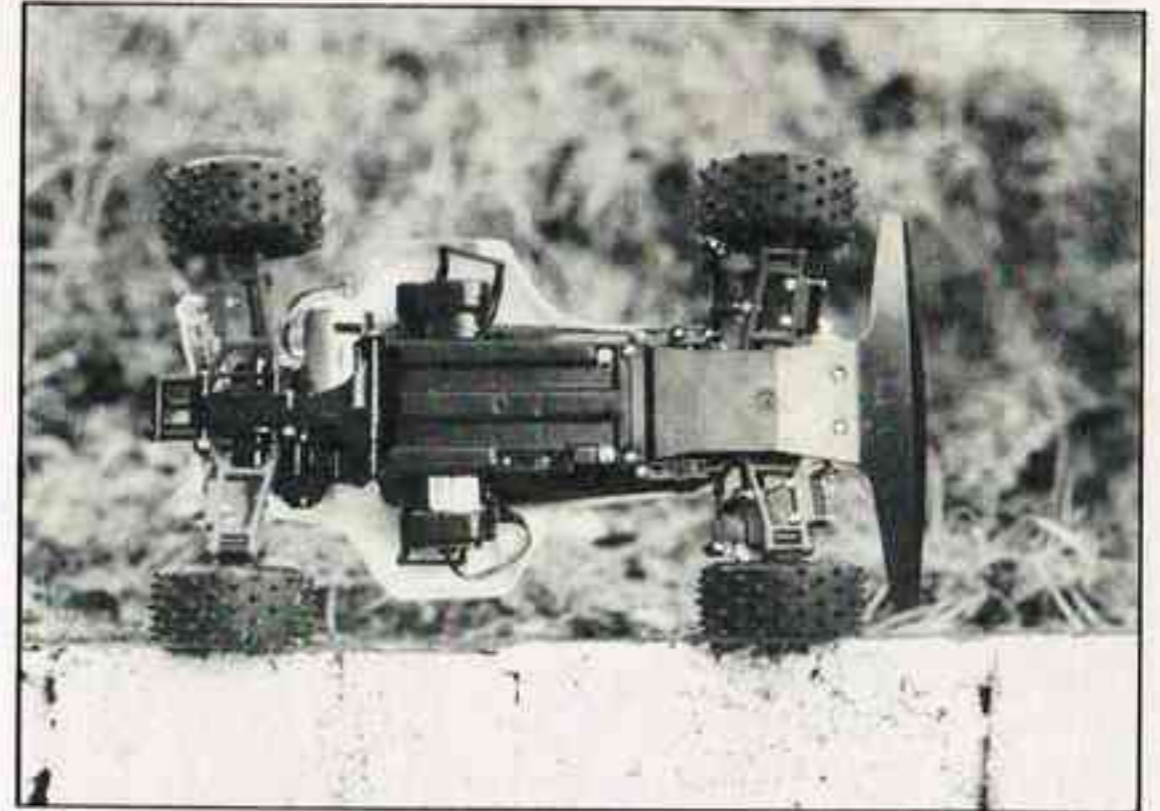
*Rear suspension gives ample travel and is four-way adjustable to suit different track conditions. It appears that the Tamiya supplied damper oil is now much thinner, a great improvement.*



# TAMIYA

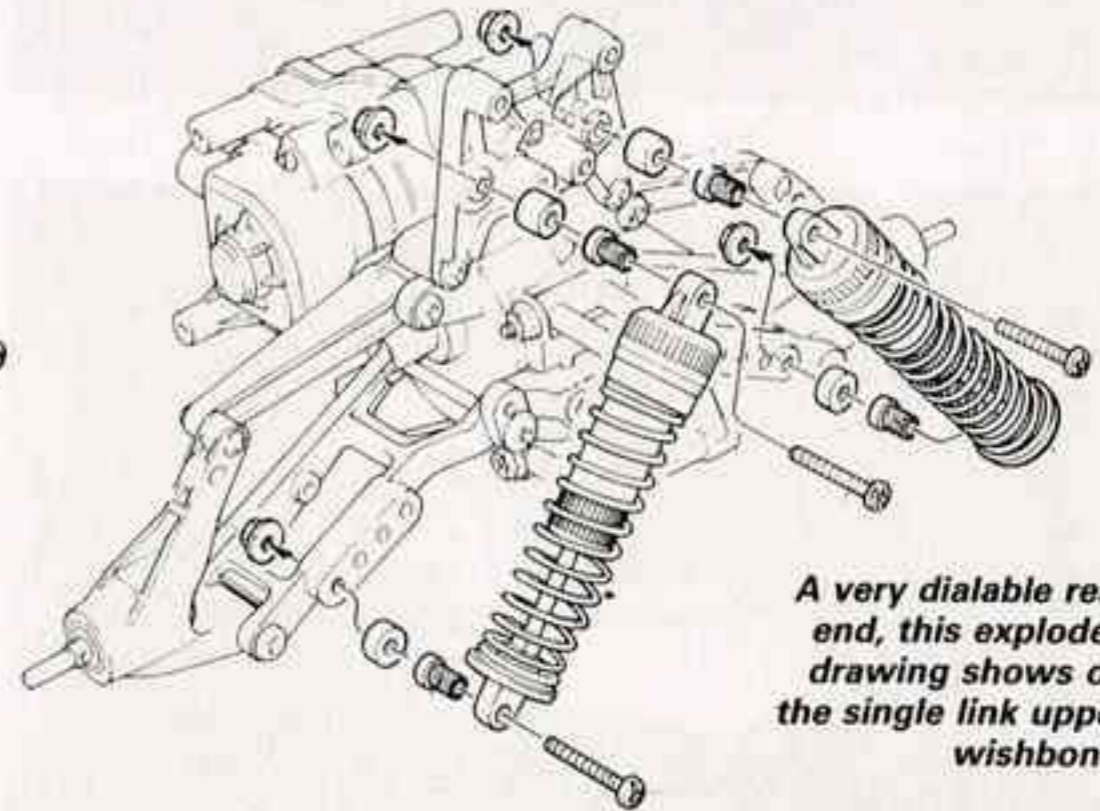
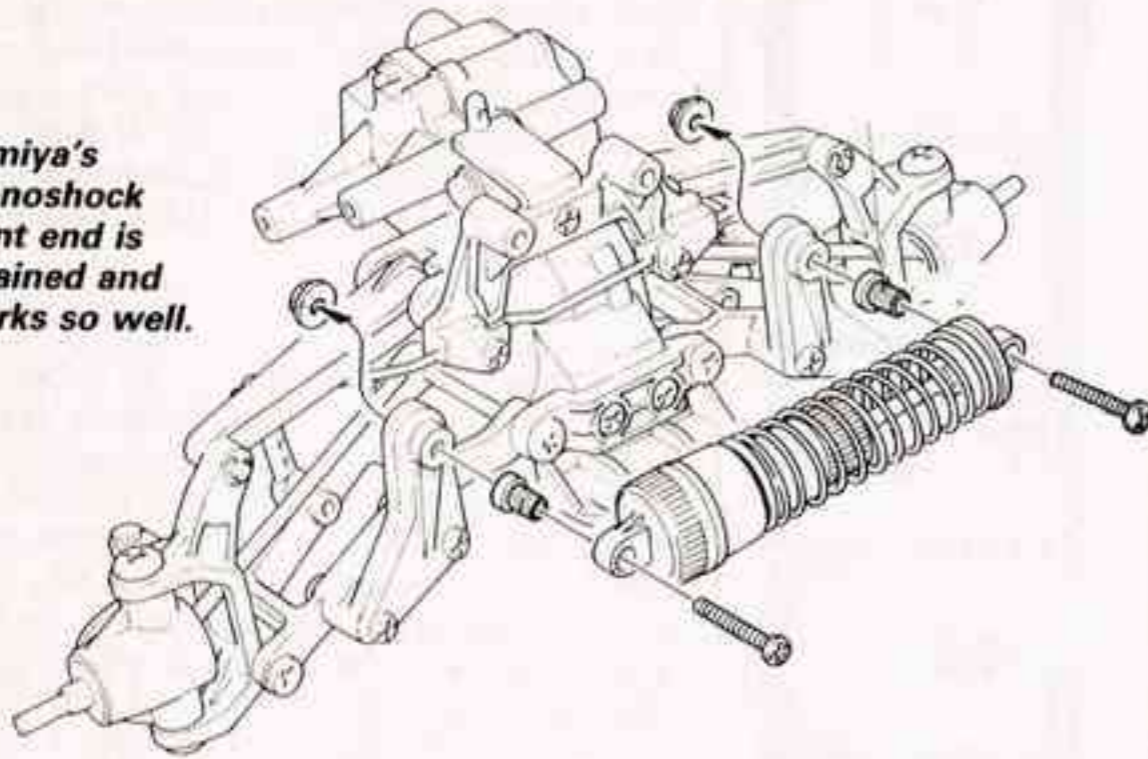


**Above, all radio gear fits snugly and safely into the monocoque chassis.**



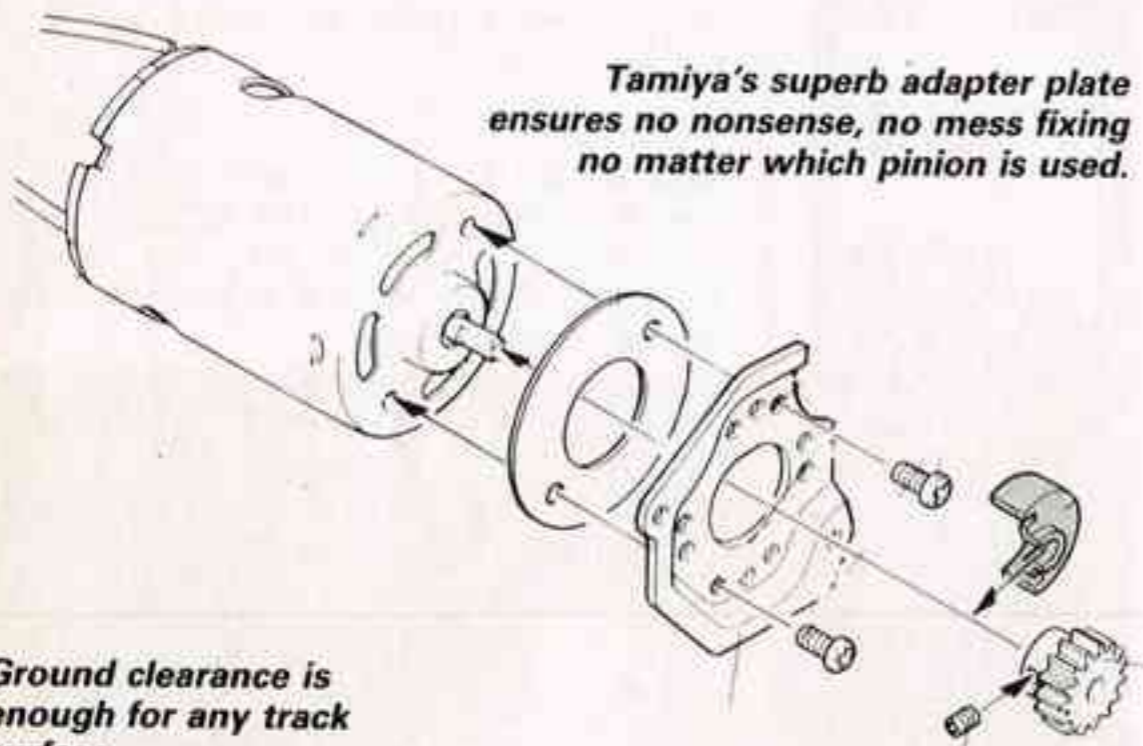
**Above, full length underside protection ensures that "grounding out" does no damage to anything vital.**

**Tamiya's monoshock front end is retained and works so well.**



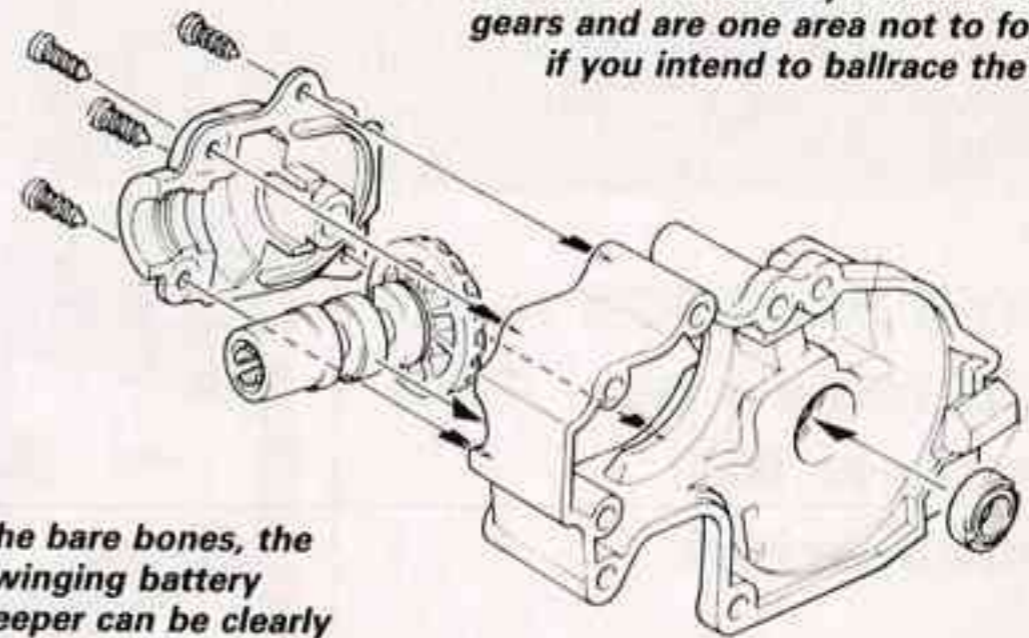
**A very dialable rear end, this exploded drawing shows off the single link upper wishbone.**

**Tamiya's superb adapter plate ensures no nonsense, no mess fixing no matter which pinion is used.**

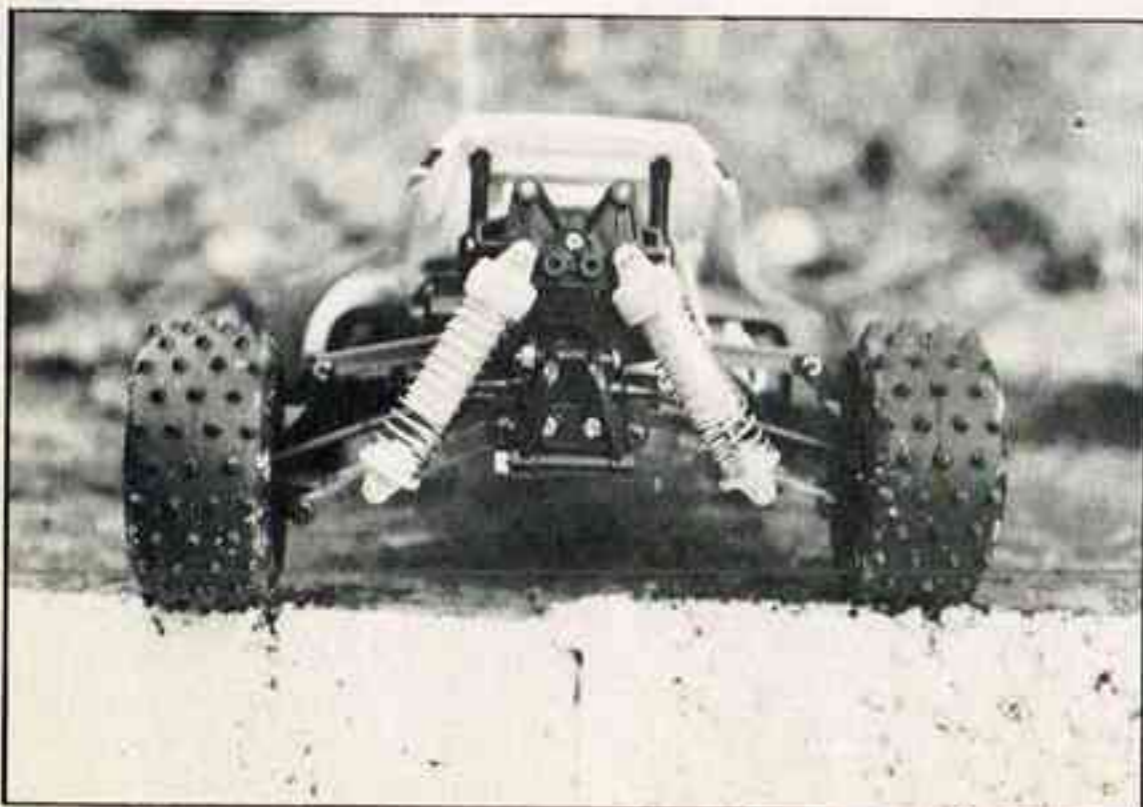


**Ground clearance is enough for any track surface.**

**Power take offs are by means of bevel gears and are one area not to forget if you intend to ballrace the car.**



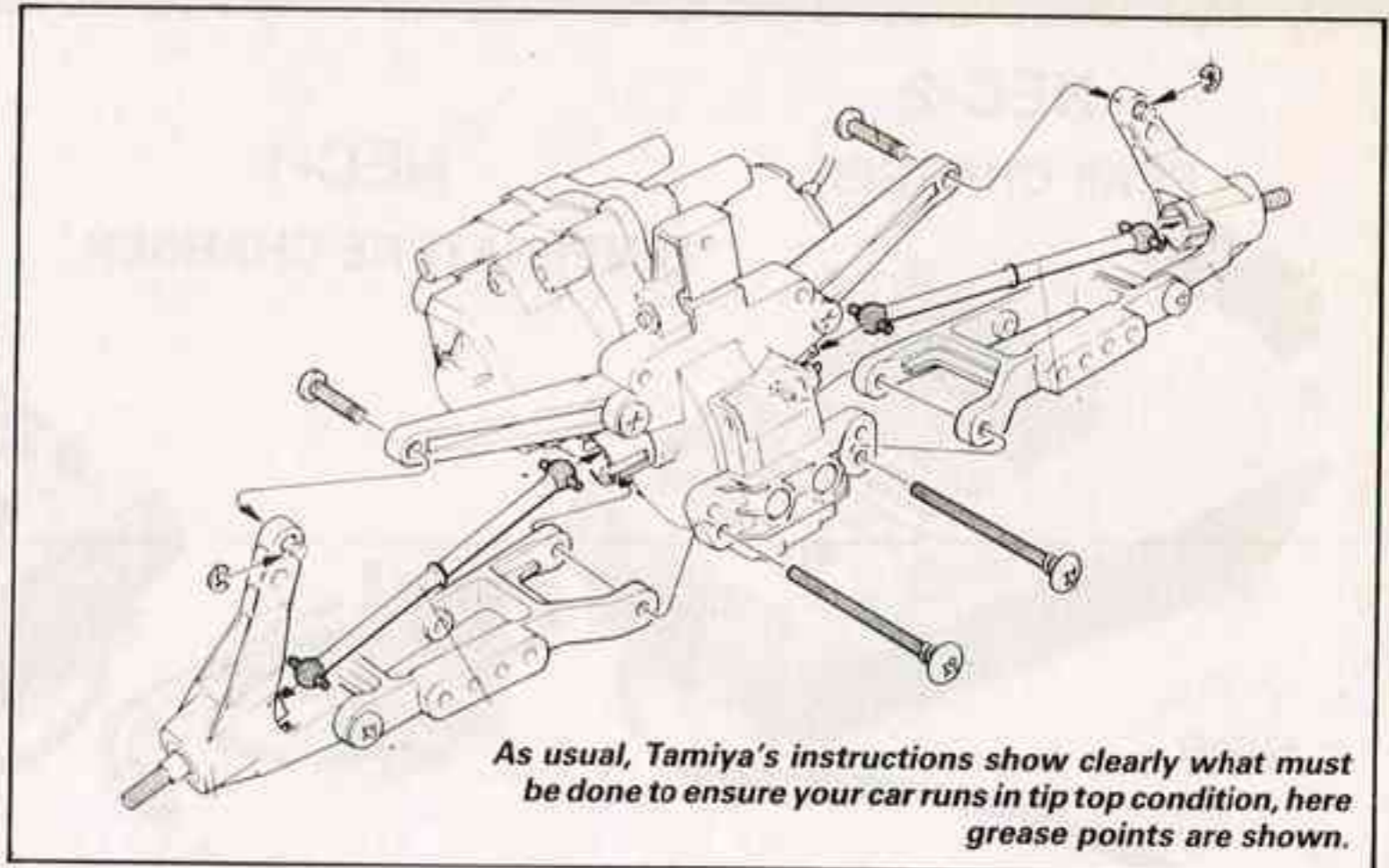
**The bare bones, the swinging battery keeper can be clearly seen in this shot.**



**New Bits II**

The second major item of interest are the new differentials fitted to the Thundershot. Front and rear differentials are now totally enclosed using a star shaft, three small bevel gears and two large bevel gears. This arrangement does give a much smoother differential effect at both ends of the car, the Thundershot instructions show liberal amounts of grease used here, experience and evesdropping over the years however, proves that literally packing high speed grease into the differential works best and provides a small amount of limited slip effect. Gearbox construction is straightforward from here on in, nylon on bronze bearings are used throughout the Thundershot, if you seriously intend to race the car then these should be replaced with ball-races now, it's easier than building, stripping and then rebuilding the car. 4WD is provided by a prop shaft linking front and rear boxes. Finally a rather clever and easy to use adapter plate for use with 13, 14, 15, 16 or 17 tooth pinion gears is employed, this makes life easy when fixing motor to gearbox.

Thundershot also shows some new design thinking in the suspension department. Single top and double bottom wishbones are employed at all four corners, no adjustment is provided on the front other than that of adjuster collars on the single monoshock. The rear of the car is another story as both rear shocks are four way adjustable. An anti-roll bar is also fitted to the front of the car and does go some way towards keeping the inside wheel on the floor during tight corners.



*As usual, Tamiya's instructions show clearly what must be done to ensure your car runs in tip top condition, here grease points are shown.*

**Construction**

Construction throughout was straightforward as long as all instructions were followed, unusually for Tamiya one point of confusion may occur if the instructions are followed to the letter. The case in point is the fitting of the anti-roll bar, this appears to pass straight through the mounting bracket for the monoshock, for the first time builders among us this is not the case, the roll bar actually passes behind these. Take note!

**Exciting bit**

The Thundershot is a real Tamiya racing

car and if someone such as Mr Chaplin gets his hands on it then a few people are in for more surprises again this year. Straight from the box using its monoshock system the Thundershot handles superbly well, showing signs of just a little oversteer, overall the car is stable and very predictable and does nothing to surprise the driver over the roughest ground. With the standard 540 fitted and using the 17 tooth pinion the Thundershot does make a superb introduction to serious competition work. For the more experienced driver? well take a leaf out of Mark Chaplin's book, try it you'll like it!

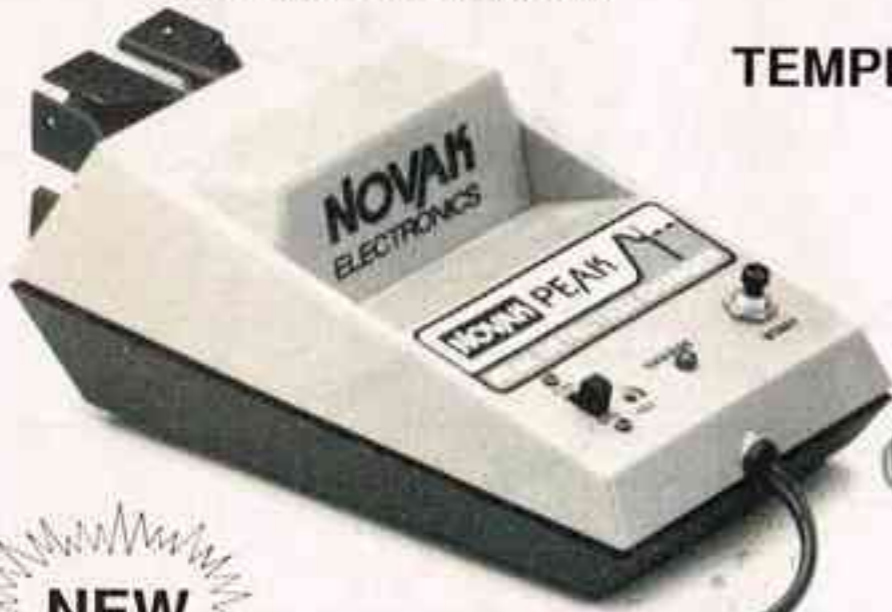
Tamiya Thundershot available from your nearest Tamiya dealer.



## CHARGERS

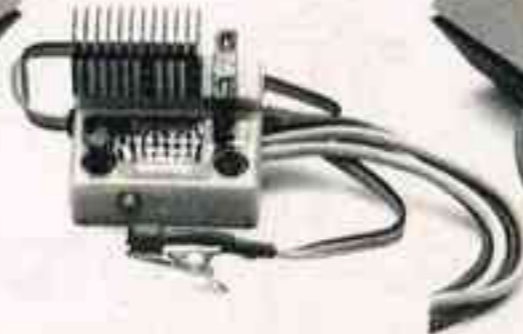
### NEC-2

PEAK CHARGER



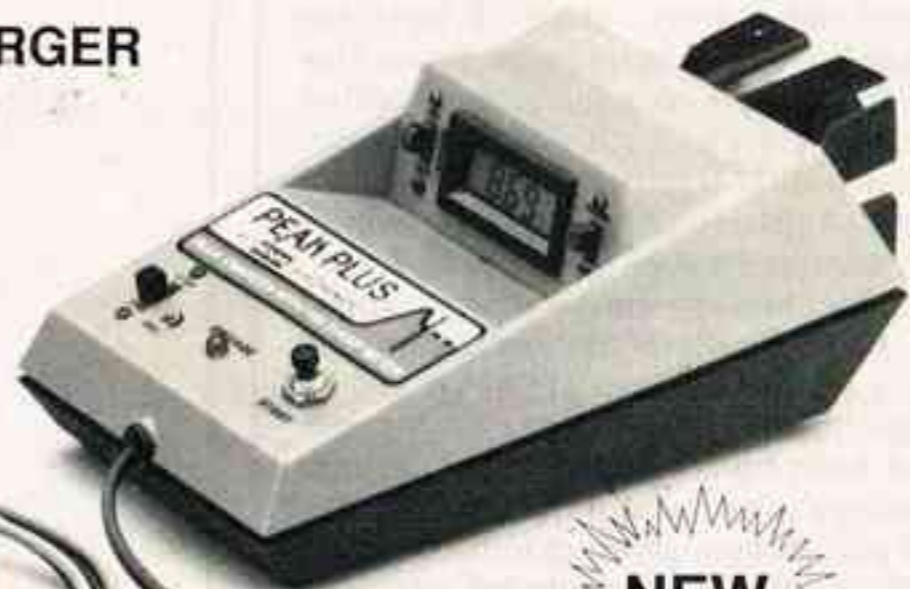
### NEC-1

TEMPERATURE CHARGER



### NEC-3

PEAK PLUS



## SPEED CONTROLS

### NESC-1X



ELIMINATOR

### NESC-4



ECONO - II

### NESC-1



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### NER-2S



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VOLTAGE INPUT	4-10 CELLS	4-10 CELLS	4-10 CELLS
POWER CONSUMPTION	20mA at 7.2V	20mA at 7.2V	20mA at 7.2V
PLUGS INSTALLED	FUT.G, FUT.J, KO, AIRTR	FUT.G, FUT.J, KO, AIRTR	FUT.G, FUT.J, KO, AIRTR

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### NES-1A



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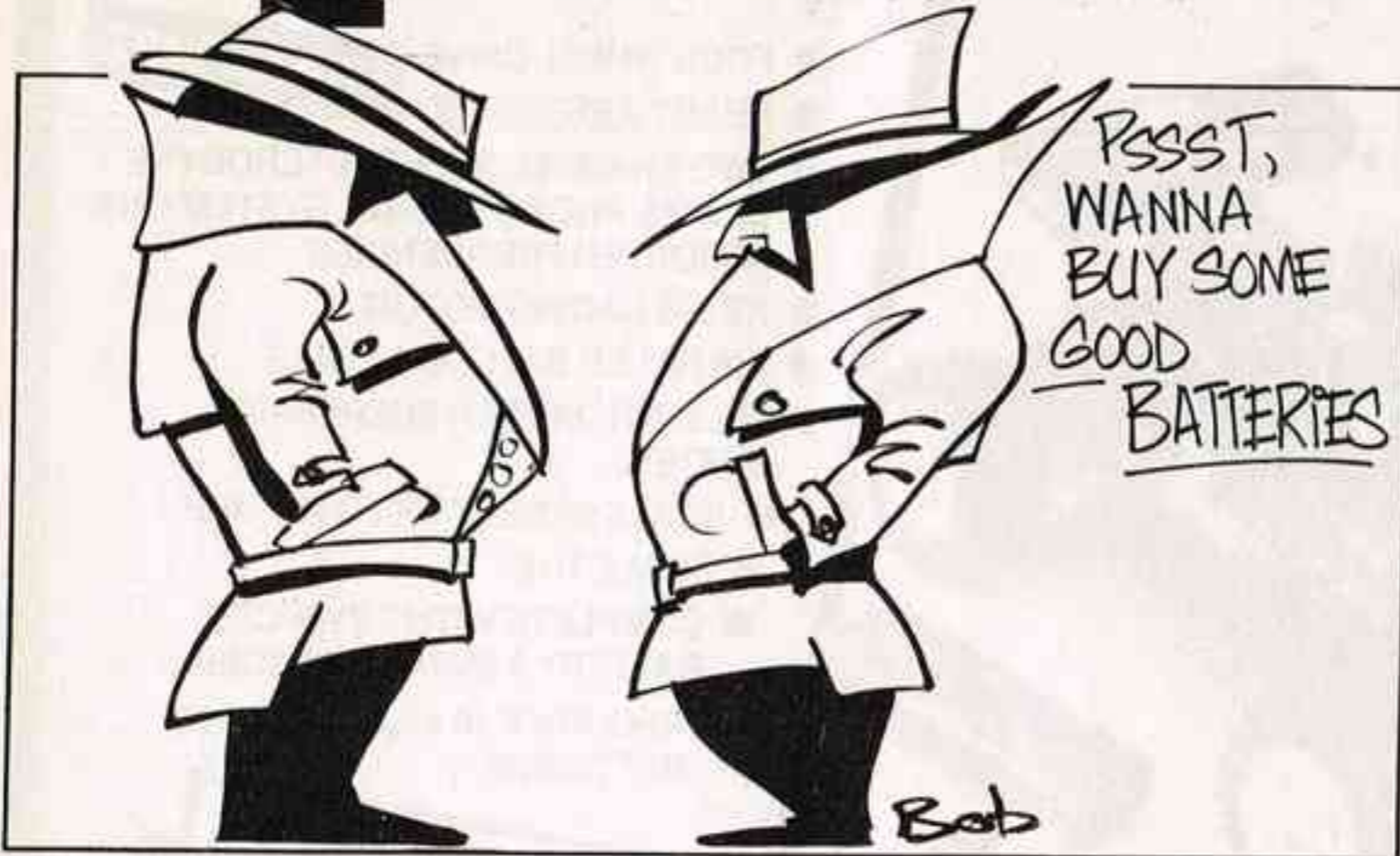
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# Personally Speaking



It seems incredible to me that after an open invitation to sound off with comments of your own, or answers to my ramblings that only one person bothered to phone in, to that nameless soul thank you! Having said that if you do feel moved to comment please write, if you do not wish names and addresses used just say so O.K.?

### Celling your soul

It has been rumoured of late that a new cell is about to hit our shores, it is exactly the same size and shape as the 1200 mAH cell we use at present, however this new aid to cheating, whoops, should have said winning there, is rated at 1700 mAH. Confused? You will be.

Take simplified look at how batteries are rated. The abbreviation mAH stands for milli amp hour, now imagine your battery case as a bucket, or a fuel tank, this bucket or fuel tank holds 1200 mAH of fuel, all of a sudden your opponent starts to use a bucket or fuel tank which holds 1700 mAH of fuel, or in other words a bigger bucket or tank. Now imagine both buckets or tanks are fitted with outlet taps rated at a flow value of 7.2 volts. If both taps are opened identically and at the same time who will run out of volts the quickest? the guy with the smaller bucket of course! In essence that's what you're going to be up against should the new cells reach the UK. Your opponent will be able to run longer and faster than you. You may say that surely the cells will be stamped — wrong. The shrink wrap will be wrapped and anyone can re-wrap a cell pack now can't they? So adjudicators beware, let's see some authority being brandished this season, if you see a car that's going better than most modifieds in the standard class then do something about it, it stands to reason that something's afoot so take a good look. A case in point, during last year's RRC series it was noticed that one driver's car was flying. On further inspection it was found to be using

seven cells. A silly point I know but it actually happened.

What can we say about motors that hasn't been said before, how about this. "Can you supply me with a standard motor please?," "Certainly, how legal do you want it?"

This conversation reputedly took place, now it's not so funny is it.

### B.D.A.

What's that stand for? British Drivers Association, now there's a name to conjure

with. What is the B.D.A.? At present no one really knows, however it seems a group of people are seriously looking at an alternative association offering new reasons and incentives to join. At present this is just an idea, but one which will be followed so that you can be kept in touch as things happen.

### Pregnant pause

After a slight delay it seems that the new Yokomo car, the prototype of which was first seen at the 1/10 Worlds last year, is finally on its way. Sole importers of the New Yokomo, reputedly to be known as the YZ-870C, will be Central Models. Radio Race Car will of course bring you full review on the YZ-870C as soon as possible. Central Models expect the Yokomo to be in stock towards the middle end of February.

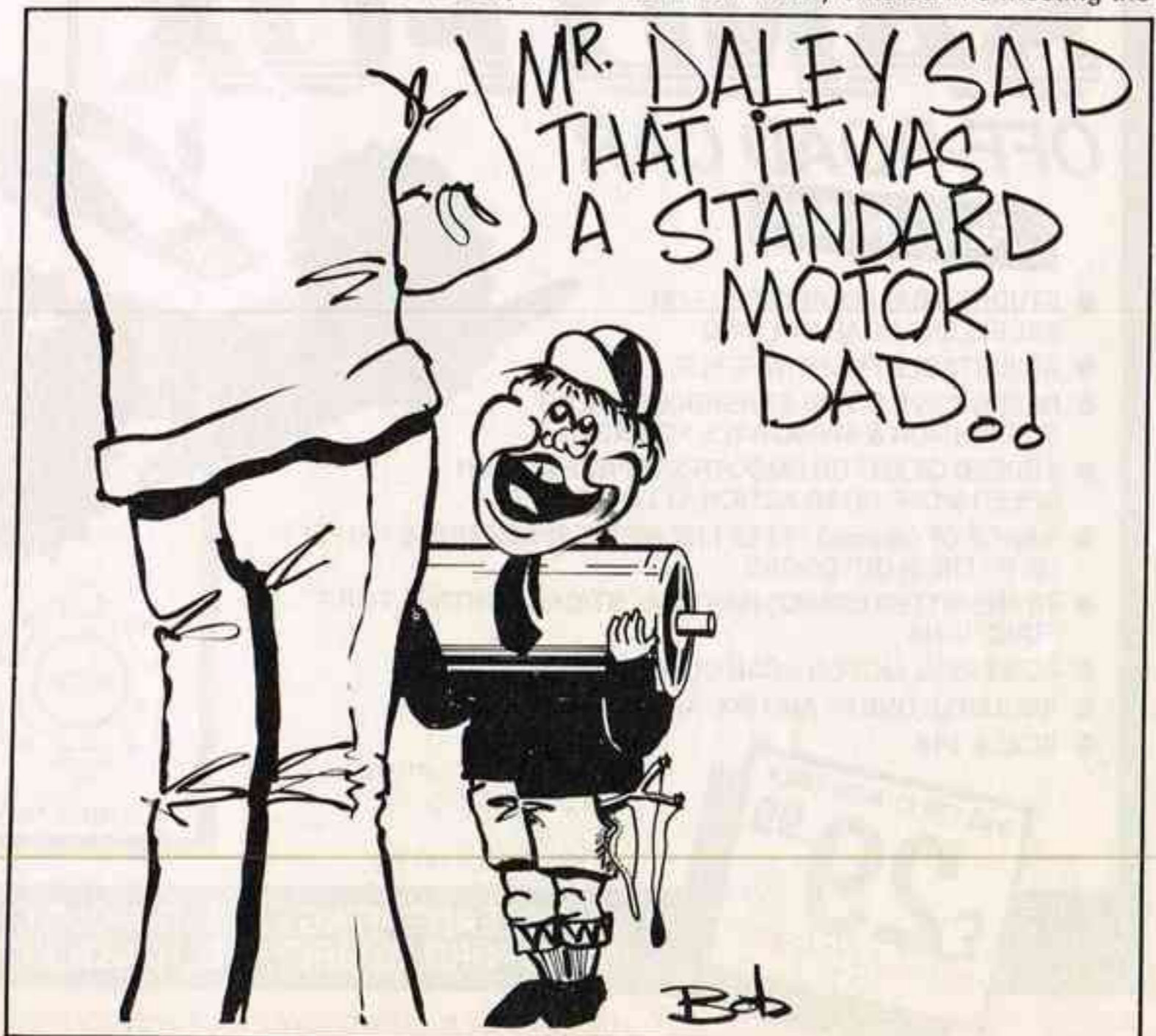
### Drag racing

Remember last month when the possibility of dragster racing was mentioned, well a set of rules has already been drawn up. Listed below are the building regulations for anyone wishing to try their arm at the terminal velocity game.

### Suggested 1/10 scale Drag Racing Rules — 3 classes

APPEARANCE (All classes)

- 1.1 All vehicles to be based on Custom Cars, Hot Rod or Drag Racing Vehicles.
- 1.2 When initially entered in a meeting the







Body must be neatly finished.  
 1.3 No Baja type Bodies or Bodies of a pure Rally Car may be used (i.e. RS200 Metro 6R4 would not be acceptable).  
 1.4 Two Wheel Drive only allowed — No 4WD.  
**CLASS 1 — STOCK**  
 Chassis: Any 1/10 off road, commercially available chassis may be used. (1/10 On Road or Scratchbuilt Chassis not allowed.)  
 Body: Any saloon or hot rod body of an appropriate type may be used. (Pure Rally Bodies, Drag Racing or Funny Car Bodies including Rail Dragsters are not allowed.)  
 Drive Cells: Maximum 6 cells (1.2v nominal

rating) — 7.2v pack.  
 Motor: Any 540 size motor may be used. (No cobalt or rare earth magnets.)  
 Minimum Weight: 3.5 lbs.  
 Maximum Length: 460mm  
 Maximum Width: 300mm  
 Tyres: Maximum Diameter 90mm  
         Minimum Diameter 60mm (rear)  
         Minimum Diameter 50mm (front)  
         Maximum Width 60mm  
**CLASS 2 — (PRO) SUPER STOCK**  
 Chassis: Any chassis including scratchbuilt.  
 Body: As Class 1 — Stock.  
 Drive Cells: Maximum 7 cells (1.2v nominal rating) — 8.4v pack.

Motor: As Class 1 — Stock.  
 Minimum Weight: 3 lbs.  
 Maximum Length: As Class 1 — Stock  
 Maximum Width: As Class 1 — Stock  
 Tyres: As Class 1 — Stock  
**CLASS 3 — COMPETITION ELIMINATOR**  
 Chassis: Any chassis including scratchbuilt.  
 Body: As Class 1 — Stock plus Funny Cars and Rail Dragsters.  
 Drive Cells: Maximum 10 cells (1.2v nominal rating) 12v pack.  
 Motor: 540 or 550 motors may be used. (No cobalt or rare earth magnets.)  
 Minimum Weight: 2.5 lbs  
 Maximum Length: 750mm  
 Maximum Width: 300mm  
 Tyres: As Class 1 — Stock.

**Final thoughts**

Please read the following as since RRC's February Issue several dates, telephone numbers etc. have changed, one or two gremlins crept into the works so this is where we put things right.

**RADIO RACE CAR SERIES CORRECTIONS**  
 Kidderminster — contact Vic Dawson 0562 754155.

Bournemouth — contact Paul Rouse 04252 4917.

Birmingham — contact Chris Kennedy 021 325 1117.

**Reedy International New Dates**

April 14, 15, 16, 17.

**French G.P. New Date**

April 30-1 May — Venue: Lyon

Any wishing to comment (by letter) is cordially invited to do so.

*Dave Pearson.*

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Suspension Movement — 45mm (1.77in.)

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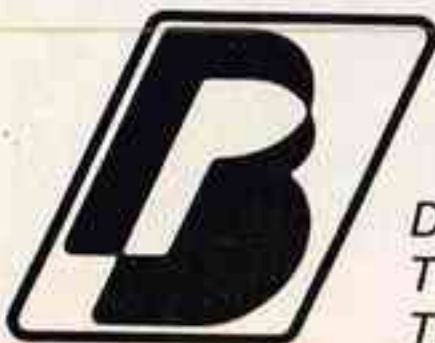
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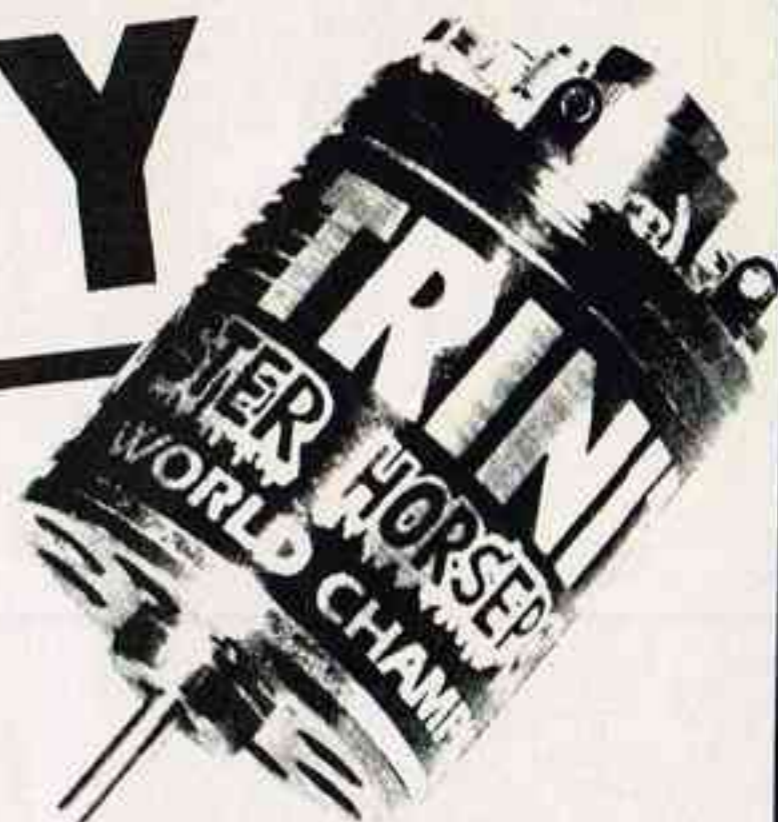
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**JOHN VARLEY** reviews this 1/10 scale saloon bodied racer from Marui

# Marui Melling THUNDERBIRD

A superb paint job really sets off the lines of this racing saloon.



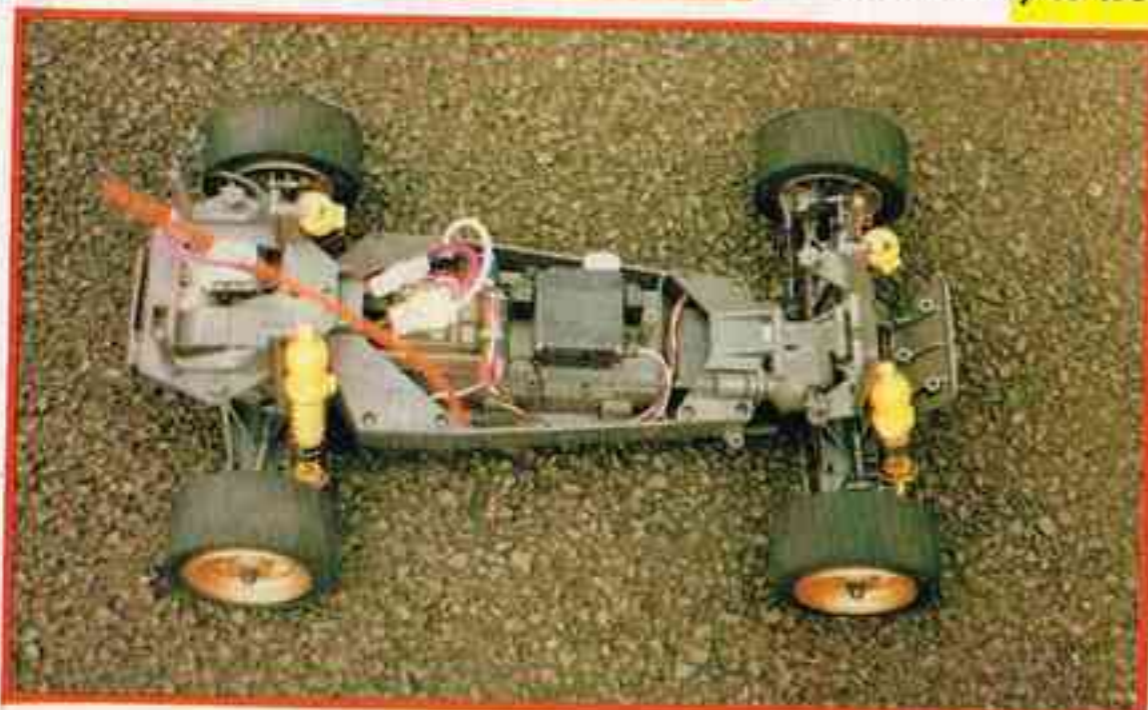
When is a Marui 'Ninja' not a 'Ninja'? answer, when it is a 'Melling Ford Thunderbird'.

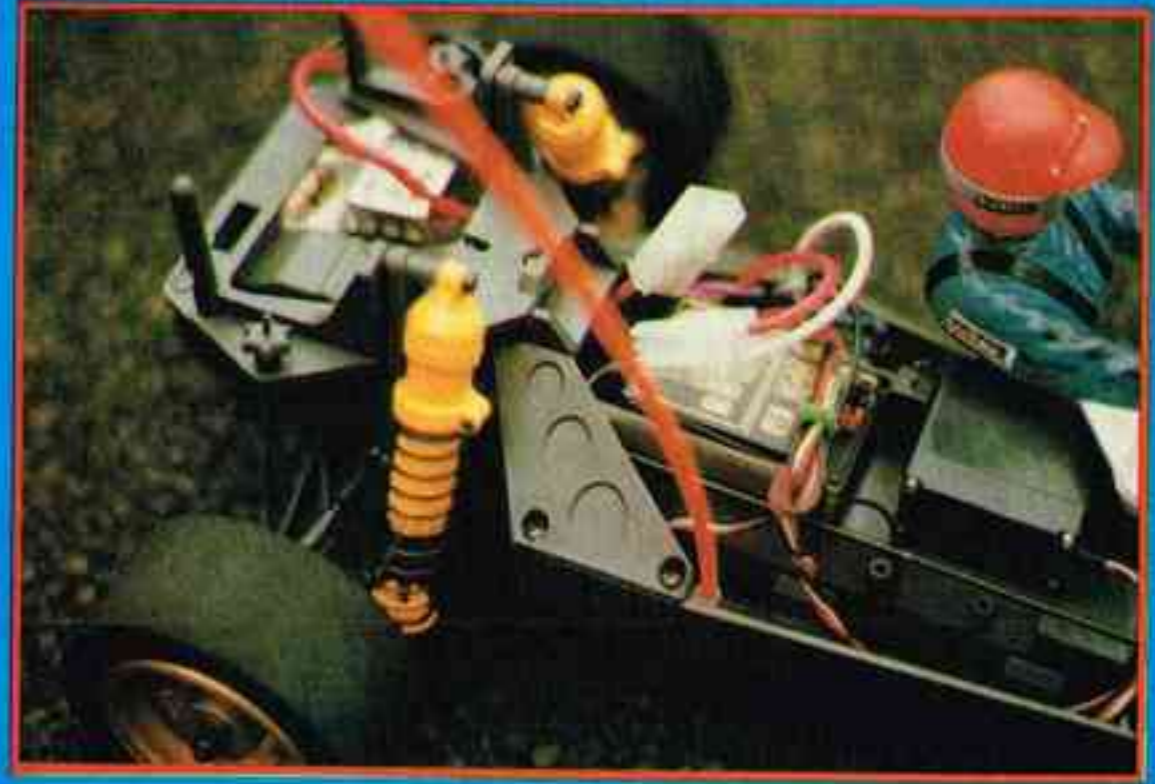
Why so one may ask? In my opinion it is a very neat job of revitalising an existing kit without the high cost of re-tooling involved with bringing out a completely new design of car.

What is pleasing, is that Marui have decided that 1/10th scale racing cars do not all originate from full scale desert racers, the like of which most Europeans have never seen, with the exception of the home built Volkswagen based kit cars.

In the USA, the range of racing for 1/10th scale cars far exceeds that catered for in the

A compact monocoque holds all of the Thunderbird together giving a finished package that is easy to work on and strong in use.





Above and left, clearly shown in these photos are the suspension ride height adjustment system. Left the Thunderbird comes complete with two sets of tyres, on and off road.



# THUNDERBIRD

UK. This Melling Thunderbird kit is representative of America's Stock Car style of racing. Merely a "silhouette" of the car you will see in the showroom, having all of the internals removed, and a very worked on engine block allowing average speeds in excess of 200 mph on America's banked oval tracks.

They have therefore taken that style of

racing and brought it down to 1/10th scale on dirt or tarmac oval tracks, with the choice of tyre and suspension setting coupled with the fully enveloping scale lexan body.

Personally speaking the very charm of this kit is generated by the high quality driver figure, excellently scaled Ford body, just ready for a custom paint job, and the realistic high quality set of decals covering

all sponsors products included on America's Bill Elliot's full size car.

With those few opening comments behind us, let's look at what this kit offers the potential buyer.

Marui have boxed clever by continuing to offer this kit with full adaptability, from flat circuit use, to off-road use by supplying a choice of sponge and rubber tyres, with

Imagine eight of these around a tarmac circuit, now that would be worth seeing.



simple chassis ride height features.

The car can be run indoors on carpet by using the foam tyre supplied, or by adapting to any of the 1/4th range of foam tyre on the market.

Moving outdoors on to tarmac circuits, popular with some clubs in the winter months, when the off-road areas are water-logged, the car can be left in this same guise and raced very successfully.

Come the summer, when off-road realises its popularity, the car has a change of wheel and tyre to the rubber spiked supplied, the ride height is altered dramatically to clear the new tyre, and you now have an off road racer.

The Melling Thunderbird car comes in ready to assemble kit form and builds into a full independent suspension, four wheel drive, racing scale car.

The front and rear drives through bevel differentials, both of moulded plastic and diecast alloy construction, both neatly housed in moulded plastic centrally split housings. All internal and output shafts running in greased nylon bushings, which would be best replaced by ballraces for long term racing use.

The four-wheel drive is achieved simply by connecting the front and rear drive housing with a pre-formed spring steel shaft, neatly held in place to each differential output shaft, with a nylon shroud around each shaft.

The chassis monocoque is a one-piece affair, very narrow in design but incorporating facilities for all the necessary equipment, comprising steering servo, throttle servo, the siting of your receiver and its aerial, and finally Marui's very small and neat fully enclosed proportional speed controller.

Operated by push-pull linkage from the servo it offers effective slow speeds with manageable mid range speeds up to full speed, without any noticeable 'jumps', and a single full speed reverse option.

Further mouldings are supplied in order to marry the assembled gearbox and differential housings on to the main chassis. Front and rear housings supports are supplied, along with suspension/wishbone mounts and body/suspension mounts.

None of these mouldings when in situ distract from the car's narrow design, a fact which is brought about by the design incorporating the main battery pack in its own compartment longitudinally inside the main chassis moulding. Access to the batteries is via a snap on cover in the base of the chassis.

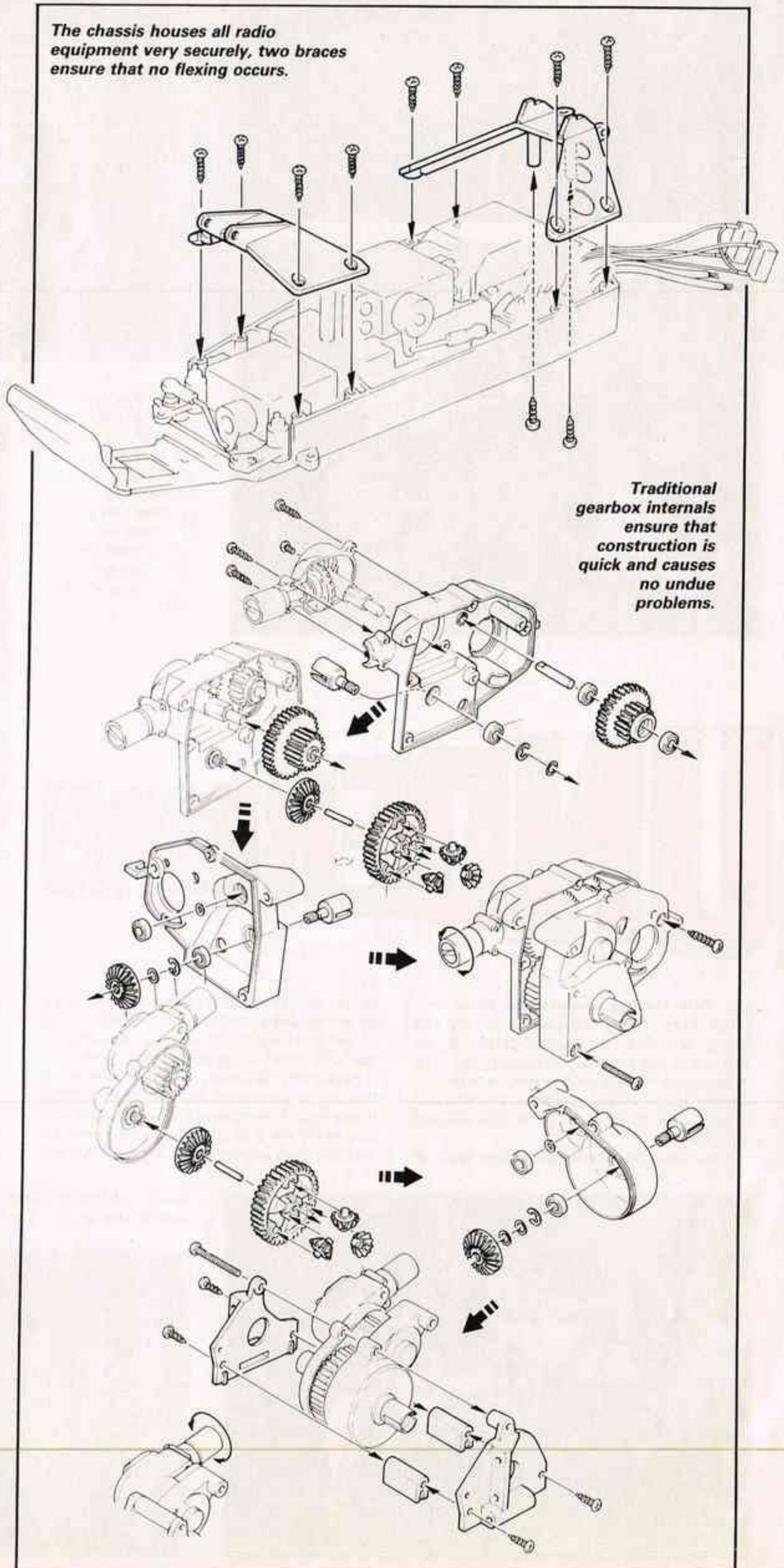
The fully independent suspension is by lower wishbone with adjustable upper links. Castor on the front is preset at what would appear to be somewhere between 12°-15°. The adjustable upper links all round, offering changes to camber to suit different types of terrain the car can be raced on.

Strangely though, upon assembly the rear wheels showed a tendency to slightly 'toe-out', the reverse of this however would be more in keeping with aiding the stability of the car in a straight line at speed. A very small point to concern most people however.

The lower wishbones have provisions for the adjustment of the lower pivot on the shock absorbers, another essential when setting the car for the requirements of off road racing.

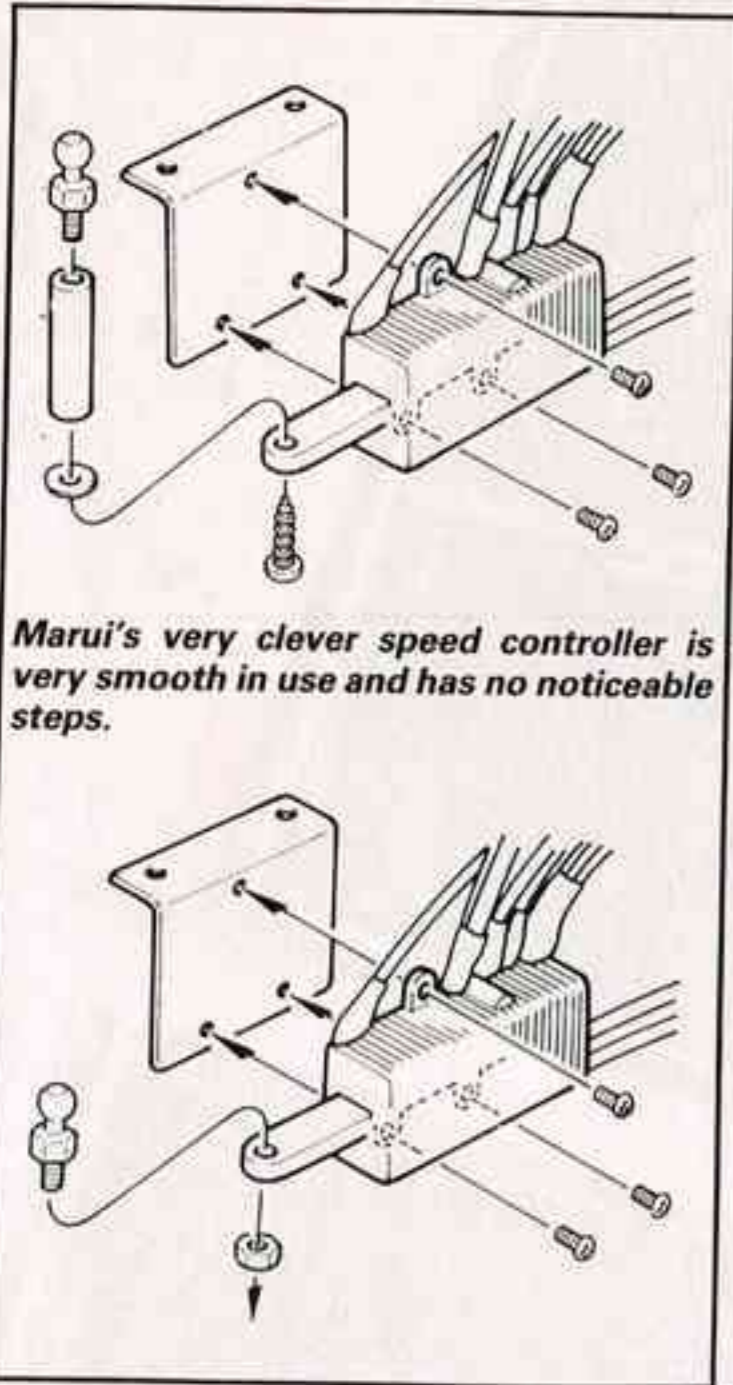
Shock absorbers are nylon moulded,

*The chassis houses all radio equipment very securely, two braces ensure that no flexing occurs.*



*Traditional gearbox internals ensure that construction is quick and causes no undue problems.*





Marui's very clever speed controller is very smooth in use and has no noticeable steps.

front tyres, leaving the outer half untreated. Do this well in advance of your race in order for the additive to soak in to a suitable depth, and wipe off all excess before putting your car down to race.

If done correctly, the Mabuchi RS540 motor supplied with the kit, will propel this lightweight kit at a more than acceptable speed (our car weighs in at 3lb.5ozs) with all the grip and handling you require.

Outdoor tarmac racing requires little change to the set up. Slightly vary the ride height and damper spring tension in order to account for the less than perfect surfaces encountered.

Tyres can be left as they are, or have additives applied, if your club allows it.

We haven't as yet tried the car off road, but the Ninja car that it is derived from, has proved equally at home in such surroundings. The only changes you require would be substantial raising of the ride height, and the raising of the body to clear the spiked off road tyres. Soften up the suspension, and experiment with various damper oils and the pistons supplied with the kit.

Imported by Amerang. Available from all leading model shops. Say you read about it in Radio Race Car magazine.

supplied with twin 'O' ring seals in their base for easy replacement when worn and a choice of two pistons, a single and twin port for that variance of damping effect.

Damper oil is supplied, sufficient to fill four units. Oil of course can be varied by the user, depending upon the type of terrain and time of year (hot or cold). The screw-on nylon top to the damper is supplied with an O-ring seal to prevent any leakage, and finalises a very neat workmanlike assembly.

The dampers appear very efficient and would not be out of place if used on more exotic racing machinery. Just think how cheap they can be, and how much weight they can save you, and of course we shouldn't fail to mention that they are supplied with fully adjustable coil springs.

At this stage, there is little more to do in order to complete the kit. Assemble the steering track rod set, 3mm threaded studs with nylon rose joints. Link up the steering servo to the assembly, but be careful to note if the centre wire linkage between the track rods does not foul on the rose joints, thus restricting the turning circle of the car. A little packing in the form of 3mm washers to lift the rose joints clear of the wire will do the job for you.

Choose your wheel and tyre for the desired racing, adjust the front and rear ride height adjuster rods, paint the body, add on the kit decals, and you have yourself an extremely well scaled realistic, eye catching cat.

So far we have tried the car indoors on carpet, where you really can't go far wrong, as long as you adjust everything to drive in a straight line when desired. Most problems for beginners are centered around getting the car to drive 'straight' under the application of full power.

Indoor racing will, if on carpet, require the car to be set up as low as possible, without the tyre fouling in the wheel arch of the body. We adjusted the ride height until approx. 5-6mm of thread protruded at front and rear. We stiffened the spring tension on the dampers until approximately 10mm of damper body showed above the adjusting collar.

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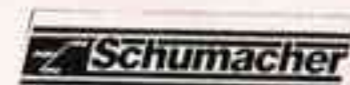


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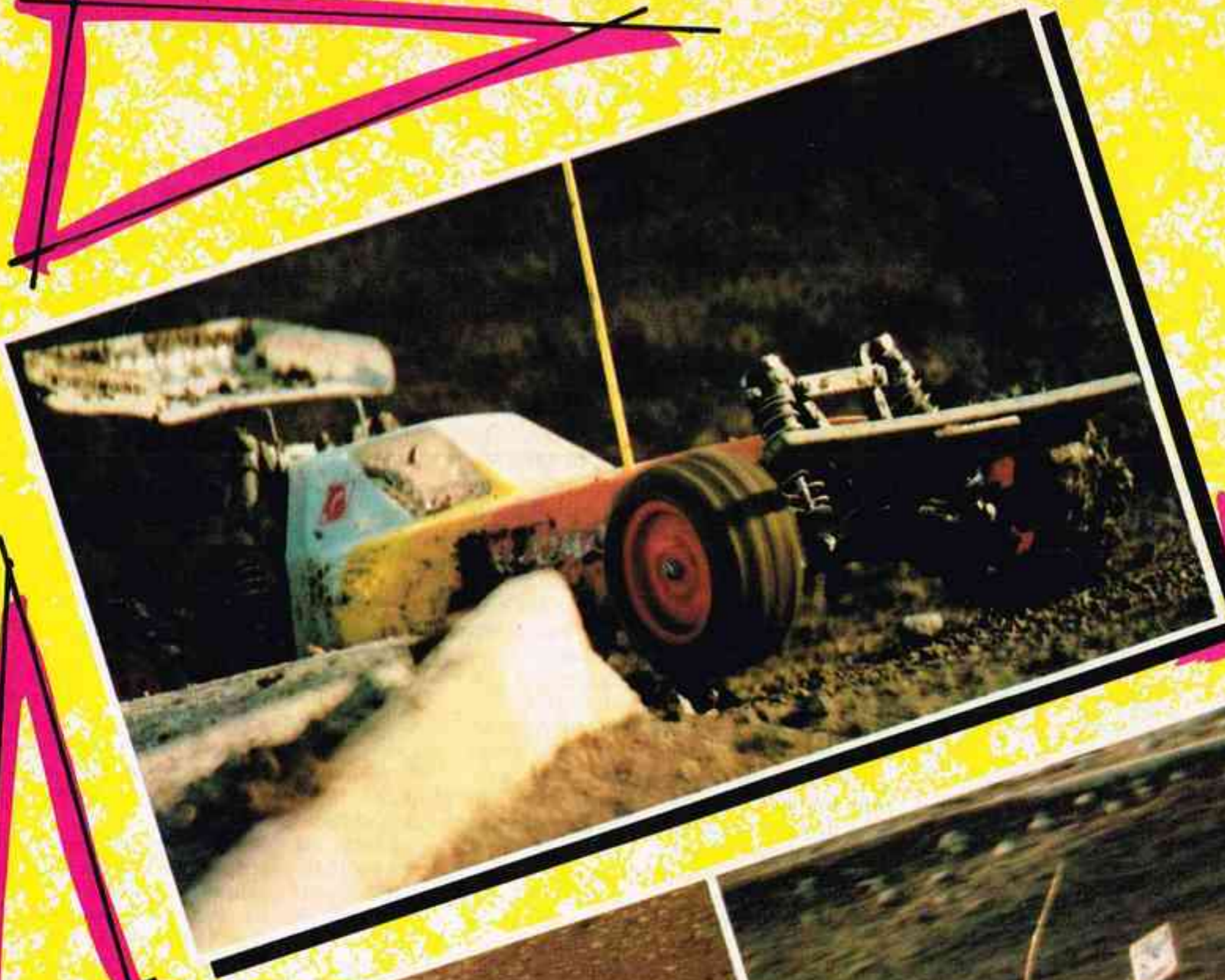
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# MAXIMA

Maxima Review Part II  
Or how to get the best from your PB

## Greg Halliday track tests PB's all new Maxima

As I explained in last month's initial review of the PB Maxima, the only true way to test a car of this calibre is to carry out a short test programme and hopefully enlist the help of some 'A' finalists quality drivers to give their assessment of it. Two such drivers are Mark Stockford and Steve Jones who are well known in the South West and Wales area. Mark also spends a lot of his time racing 1/8th scale i.c. cars around the country and has even ventured as far afield as Holland in pursuit of his hobby! Both have owned RC10's, Mini Mustangs, and currently race Schumacher CAT XL's, so I think you'll agree we couldn't have asked for a better team to help us in testing where it matters most, on the track! We were also



able to get the impressions of young James Porter, a junior class driver who is steadily working his way up through the finals, and of course, yours truly who also occasionally qualifies for the odd 'A' final!

### Roll out the carpet

The very first run was at Cardiff Red Dragons indoor carpet circuit. The shock absorber towers were fitted in the upper holes to lower the car, the rate of rear camber adjustment balls were fitted in the top inner holes, and no toe-in was used.

All the club members gathered around the circuit in anticipation; no excuses now, let's put it on the track and see how it goes. Mark was first on the sticks (that's another term for driver) as it was his Reedy Red Dot and selected SCR custom cells! It took off down the straight like the proverbial scalded cat, the sheer speed really was something to behold! With the suspension set up as mentioned it suffered from slight understeer, but a small amount of brake flicked the tail out in a very controllable manner. One of the other members just couldn't resist putting his Cat on the track at the same time and so, unintentionally, we were able to make the first comparisons. Cornering, nothing in it. Speed, well, the Cat driver, Simon Evans, is known for his wide selection of hot motors and is also often an 'A' finalist, but his car could not match the Maxima for straight line speed. Steve and I also drove it and found the experience exhilarating.

So, phase one of the test proved the car is fast and very easy to drive. If you want it to be more 'twitchy' then further adjustment to the rate of camber change with particular attention to the front, plus reducing the rear wing angle, should give you the handling you prefer. I have also heard that the wishbones can be reversed to shorten the wheelbase for carpet racing — keep your eyes open for this at indoor meetings!

### Who's a worm?

Probably the best track for outdoor testing in the area is the Weston Off-Road Models (WORM) circuit at Weston-Super-Mare. It has a tarmac start straight, is normally loose surfaced and bumpy and if your car's suspension is not able to cope, can flick it around 180° so you're facing the wrong way! Normally testing is not permitted on the circuit other than on race and club days. When Mark phoned Roy Atkinson of WORM he was advised this was the situation and it took a lot of arm twisting to persuade him to give permission. He finally relented saying that if anybody challenged us, say we were testing for a magazine. Well, Roy we couldn't tell you that in fact it was true! So thanks WORM members, take it as a real compliment that in this area your track is considered the most demanding and enjoyable to drive on.

The morning of the test day came and the weather was dry, but sticking your nose outside the front door indicated that the temperature was only just above freezing. Time to dig out the Damart!

As it was so cold we decided to change the damper oil from the recommended ST90 gear oil, to 3 in 1 oil. (PB specify ST90 oil for use between 17–25°C, the test day temperature was around 1–2°C.) The suspension was set up exactly as per maker's instructions, the rear camber change adjustment giving what looked to us like silly amounts of negative camber at its upper

travel limit. The front wheels were set parallel. Placed on the track, the Maxima was again off like a rocket! With this standard setting the car was very smooth over the rough terrain, but suffered from slight understeer — in fact in this form, but with a standard motor, it would make a good beginner's 4WD car as it is so easy to drive and very forgiving in its handling. PB were right about that rear set-up being a good basis to start adjustments from.

From the next run we changed the motor and put toe-in on the front which PB said would increase steering. We also set the spring collars way down on the rear shocks. The results were again tremendous speed and it rode the bumps even better, but understeered even more on the corners, so forget increasing the toe-in to give more steering!

On the third run the front wheels were put back parallel and rear tyres and wheels were fitted all round. This gave slightly more steering and the handling was now considered to be neutral. PB claim that using rear wheels all round is best on tracks with jumps and we can confirm the car 'flew' better in this form, landing on all four wheels as opposed to rear wheels first. Surprisingly in this form the Maxima was not oversteering or showing any signs of 'twitchiness'.

The next move was to alter the change of rear camber setting from the lower outer hole to the upper inboard position; one of the nine alternatives. We also lengthened the top links, or wishbones, so that the rear wheels were upright at the lowest position of the suspension travel, and remembered to adjust the rear drive-shaft lengths as per PB's instructions! This set-up increased the amount of steering on the track and the car was not noticeably more 'twitchy'! Well, we couldn't wait any longer, it was time for Mark to unwrap his Cat XL from its electric blanket in the boot of his car and get it dirty by running it alongside the Maxima. The result? Again the Maxima was faster on the straights, but the Cat could just get inside on some of the corners. At this point the cars were lapping together, it therefore does look as if reducing the amount of rear wing angle and playing about with front and rear camber adjustment can make the Maxima handle at least as well as the Cat, and it looks as if it's faster! Unfortunately at this point the cars collided with each other and the Maxima somersaulted end over end at high speed. From this point the handling deteriorated and an examination established that one of the rear lower wishbones had cracked at the inboard pivot pin position. It was probably a good time to pack in anyway because by now the first stages of frostbite seemed to be starting in the extremities.

### From the horses mouth

Breaking the rear wishbone did worry us a little, although we are all aware plastic can get very brittle at low temperatures. However, a telephone call to PB revealed that there is a potential fault in the mouldings of the first few kits produced — something to do with the plastic not flowing properly leaving a joint along the hinge pin pivot line. If you suffer from this problem, contact the manufacturer and they will replace them free of charge. Whilst talking to them I took the opportunity of raising a few other queries resulting from the construction and tests.

First of all, the front drive shafts needed shortening by 2mm. As these are hardened steel, grinding was necessary. PB advised the problem has already been overcome in later kits. With regard to the balljoint cups being thought to be too soft PB said customers originally complained they were too hard on previous cars! Well I still had difficulty in making the suspension operate as freely as I like, but I do appreciate the problem: "you can't keep all of the people happy all of the time" and to be honest they haven't popped off yet. A comment raised by lots of Mini-Mustang owners; why don't they put two shaft seals in the shock absorbers? PB's reply to this is that damping should only be done by the oil, if you put more seals on the shaft, then you start to get friction damping. It looks as if you won't ever get two seals on PB damper shafts. Finally, the car was stripped down after the test and all four inner hinge pins were found to be slightly bent indicating that a harder version should be used. PB say the cost of these would be prohibitive and they don't get many complaints — they advised drill blanks can be used, so come on 'goody' manufacturers, who will be first on the market with them?

### And so?

The Maxima is a very easy to drive car, and it can be set up to suit any driving style. When run on the carpet a lot of members were amazed at its performance; everybody was very surprised at its turn of speed, so the drive train is certainly very efficient — PB's 20% more efficient claim could be correct. It does not suffer from the complexities of some of the competition, and for a 4WD car, it is simple to work on. The inside of the body and undertray stayed very clean, and our stripdown showed that nothing got inside the chassis spine — very good!

### Final comment ...?

Mark Stockford: "I'm impressed to say the least, what a turn of speed!"

Steve Jones: "It's fast, efficient, easy to drive and will certainly win competitions in 1988."

James Porter: "Terrific! I'm getting my dad to buy me one for Christmas."

And me? Well, what can I add? The 1988 season will definitely not be a one horse race, the new Japanese cars will probably win some competitions, as will the Cat, but so will the Maxima! Nice one PB!

(My thanks to the test team for their help, and Bob Porter of Racetech for the action shots.)

**Note:** In last month's article on construction a few important words were missed — page 29, end of second paragraph should read: "Perhaps the gap between the carrier is a little wide and the introduction of thrust washers between the block and carrier would help."

**The test team, Mark Stockford, Steve Jones and James Porter.**



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*Le Mans 240ST motor comes standard on the 'Mid' with a three step mechanical speed controller.*



# MID ENGINE OPTIMA

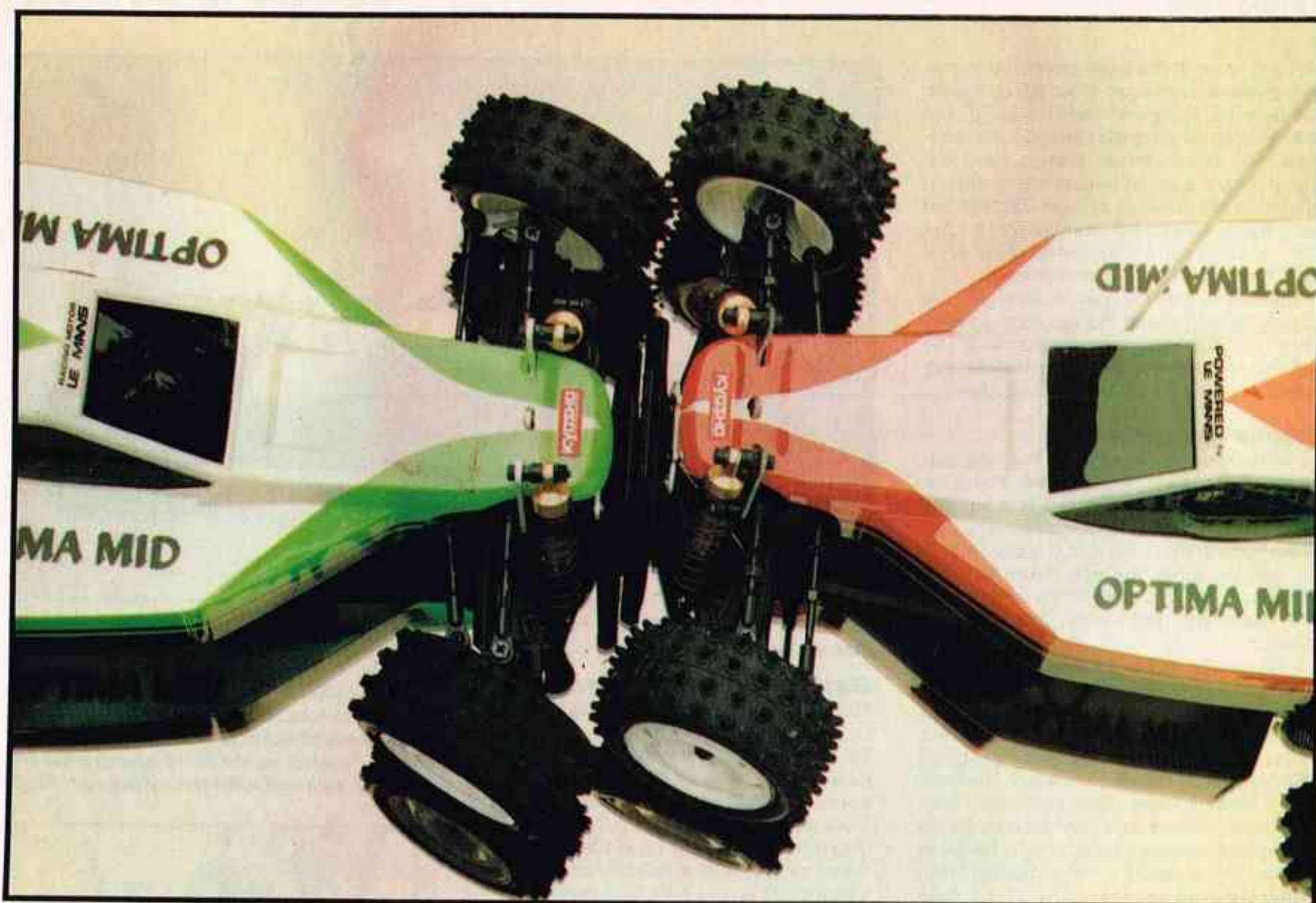
**JIM CRABB** reviews the longest-awaited car in the 1

"Rumours" by Fleetwood Mac is one of the best selling albums of all time. Almost as many rumours about the mid-engined Optima have been banded about for the last 10 months as records sold, they have been especially rife since the World Championships where five of the 'A' finalists were mid-engined Optimas. Rumours at the time were that about 40 cars had been hand built at a cost of anything between £400 and £1,400 each (depends who is telling the story) and were

given to any top driver with one purpose in mind, and that was to win the World Championships. Part of the rumour was true, the cars were hand built simply because the production line was not in full swing and production cars would not have been available for the championships. History will tell us that a mid-engined Optima did not win but it did take second place driven by Katsunori Kondo with a further four mid-engined Optimas in the top 10 places.

Other rumours since Romsey have been that the car is too short and only good drivers will be able to drive it, it won't be released for another 12 months because it will stop sales of the ever popular "Optima", it won't be released at all because (a) it will be too expensive and (b) it would affect sales of the Optima, Pro Optima and the Turbo Rocky.

Two versions of the car will be produced, one for the poor man and one for the rich. The rich man's car would be similar to the



Above, head to head test with the 'Mid' on the left and the 'Turbo' on the right.

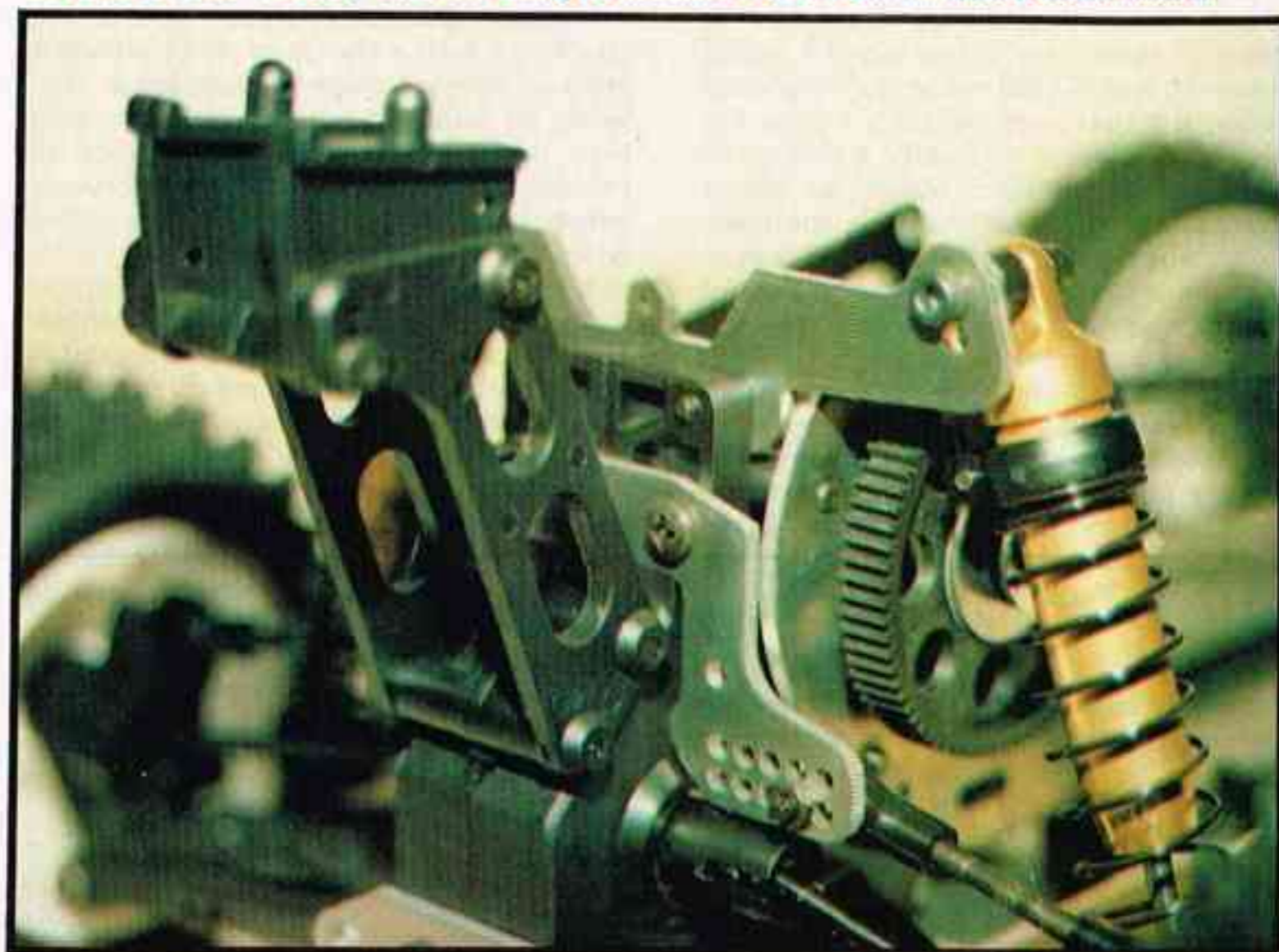
Below, 'Mid'. There are ten positions to dial RISE on the 'Mid' alloy shock mounts. (There are five on the 'Turbo'.) The rear wing is mounted on the girder type plastic mount.

# FINED IAS

story of 1/10 racing

one used at Romsey and the poor man's one would have no carbon fibre or titanium parts and have lower specification shock absorbers. These are just the rumours I have heard, no doubt there are many others.

Back in February when I was fortunate enough to be asked to review the "Rocky" the most popular rumour was that Kyosho were going to revamp their range of cars and bring out a new model every six months. Part of that rumour was true as



they have added and revamped their range. A new car every six months? Without a calculator that is about two cars, so how do we account for the Optima Turbo, Salute, Optima Pro, Ultima, Rocky Turbo, Cosmo, Big Brute and Raider, which have been released since the Rocky reviews, so much for rumours!! Let's forget them as the car is now here so what do we get?

### **We get the most eagerly awaited car of all time**

I thought this accolade would go to the 4WD RC10 but that seems to have died a death with the continued production of their 2WD car.

### **Car Concept**

It was designed from the outset not as just a racer to win the 1987 World Championship for 4WD cars. Although winning the Championship was the prime objective it

was not to be at the expense of the owner and driver who needed a car which would not only be straightforward to build, but easy to keep running when used in competition. The car therefore had to have designed into it, easy of maintenance, simple track side adjustments to cater for different track layouts and track conditions and the non-necessity for a major strip down after each meeting to keep it competitive.

Impressive, the car just looks right, the concept is sound and the technical specification on paper is very comprehensive. The Optima Mid cannot be described in any other way than as an out and out racer.

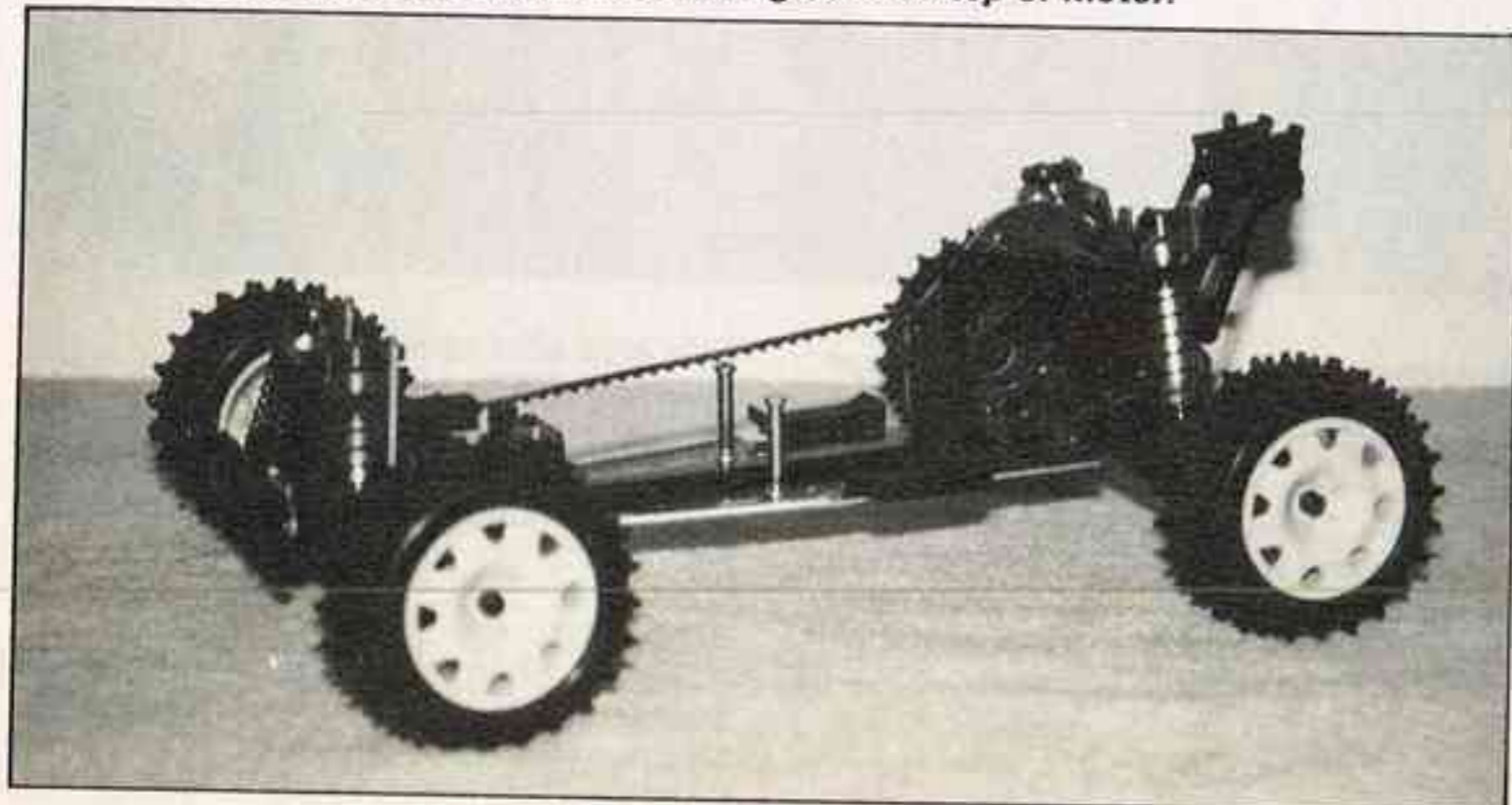
**Second thoughts**

As with most rumours in part they are correct and yes there are two cars being released, one called the Optima Mid and the other called the Turbo Optima Mid. The part of the rumour that calls one the poor man's car and the other the rich man's car is a silly statement, because firstly both prices and secondly both specifications are superb.

I appreciate Kyosho's market is worldwide and that we have some peculiar laws in this country, and that also the newcomer to the hobby has to be catered for with a motor and speed controller, so why is there a Le Mans 240ST motor in the kit? The laws in this country have made any motor with less than 27 turns and without adjustable timing and ballraces an anomaly, because it puts them straight in the modified class without the advantages. The 240ST falls into this category, I first came across the motor in the "Rocky", it's a very quick 20 turn single and as good as it is, it will have to compete against fully blown modifieds when raced in this country. It's a shame, although elsewhere in the world I would assume it would be accepted as a standard motor. If it had been possible, I think the best solution for this country would be to have included the Spirit 600 motor, which is an accepted standard motor, the newcomer would then have a car which because of its motor is not in the modified class and therefore up against most probably the more experienced driver.

Option House platinum dampers are of the latest design, where the degree of damping can be altered with the damper in situ without changing damper oils, they are not fitted to the top of the range 'Turbo' which is a surprise especially as they are fitted to the 'Turbo Rocky'.

*Bar before radio plate and spine fitted. Belt goes over top of motor.*



*"Turbo" in its original paint scheme. The shock absorbers are mounted more vertically than on the original Optima.*

**Optima Mid, Tech Spec.**

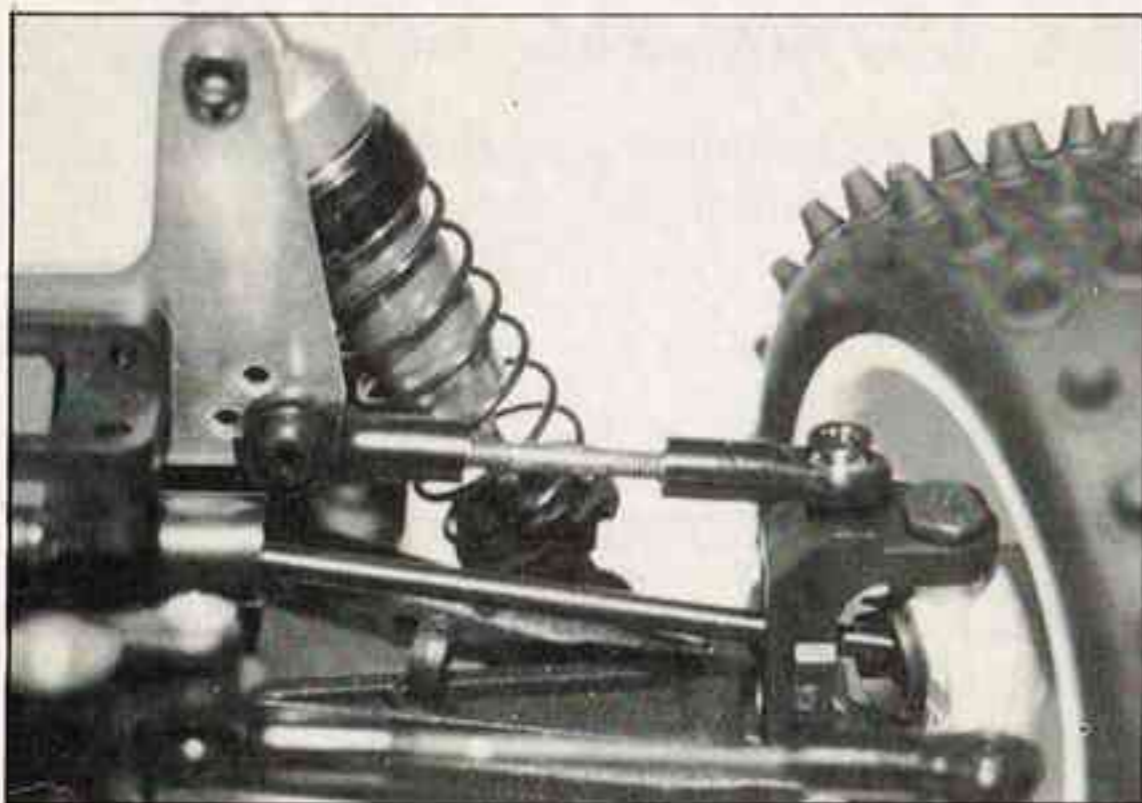
The mid mounted 20 turn single motor a Le Mans 240ST drives the rear gear differential via a slipping clutch arrangement and gear train. The gear train comprises 48DP gears. The rear gear differential drives the front gear differential (as opposed to a ball differential which will be available as an optional extra) with a deep toothed narrow lightweight timing belt. Suspension is fully independent with extra long single wishbones of glass-reinforced plastic (GRP) for both strength, lightweight and extra long wheel travel. Damping is provided by Option House gold oil filled coil over shock absorbers with a choice of three different pistons. Camber angle adjustment is provided by adjustable upper links on both front and rear wishbones. In addition to camber angle adjustment the arc through which both front and rear wheels move when the suspension operates can be altered by varying the position of the upper link whilst maintaining the camber angle. Ground clearance of the car is adjustable both front and rear, there are three adjustable positions on the rear wishbones and two on the front. A further minimum adjustment is possible on both front and rear dampers by using either of the two holes which provide the location point for the top of the damper. All the running gear is

*"Mid" slipper clutch arrangement. The clutch can be locked up by fitting a small bolt through the hole in the clutch and drive gear. Tension on the three spring washers can be adjusted with the nylock nut. 48DP gears.*

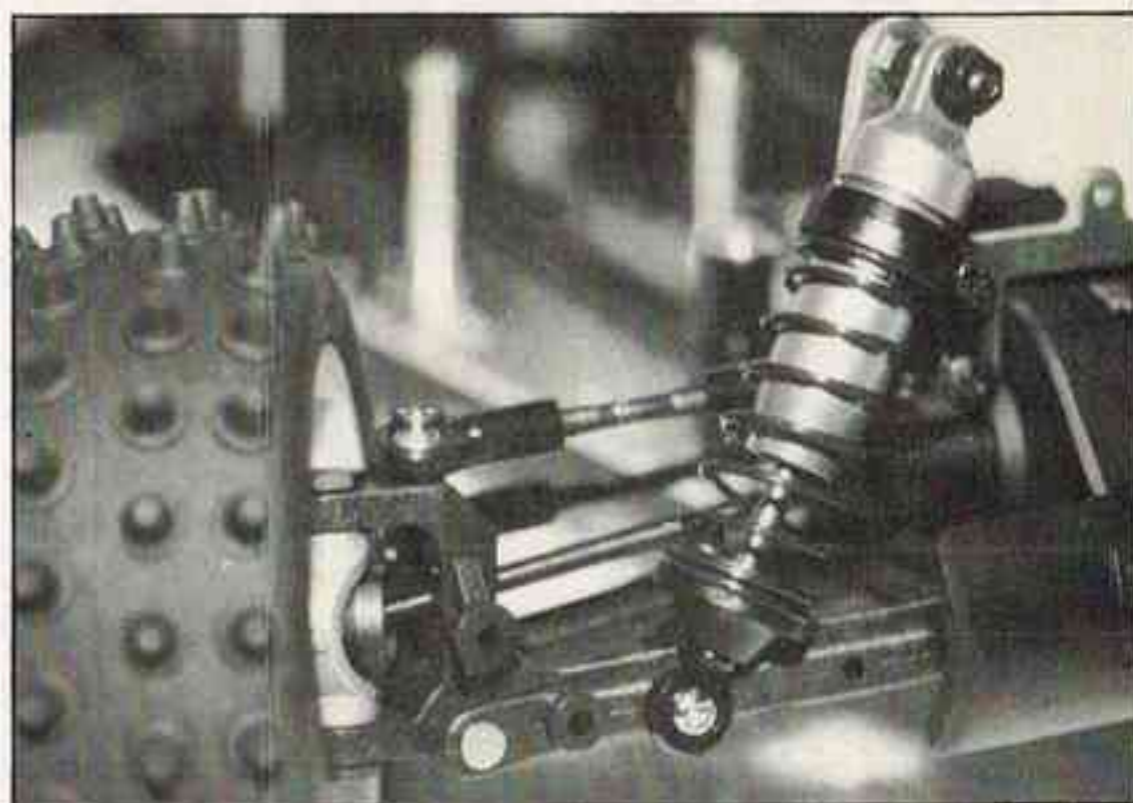


mounted on a flat aluminium-alloy plate chassis with a GRP radio plate for strength and rigidity. The battery is mounted transversely and has the choice of two positions with a movement of 8mm either backwards or forward, this can be altered at the discretion of the owner. Every bearing point is ballraced with a total of 18 being used. The differential outputs are four large 14mm OD x 8mm ID, two smaller 8mm OD x 4mm ID, two 8mm OD x 5mm ID and ten 8mm OD x 5mm ID races are used in the gearboxes and main wheel bearings. Speed control is the well proven three step forwards one reverse resistor controller used extensively in other Kyosho cars with the addition of a rubber balloon to keep it clean. The tyres are low profile high grip spikes fitted to a one piece lightweight hub. The body comes in two parts, the main shell with good looks and weather protection and a large rear aerofoil which can be adjusted to vary its angle of attack to the air which alters the down force on the rear wheels. Frontal protection is minimal with a very small Ultima style bumper. Ripmax are in negotiations with Kyosho to provide a bumper of ad-





"Mid" front suspension, three position location for top link camber angle adjustment and alloy shock mounts. King pins and knuckle arms same as Optima.



"Mid" front suspension, vulnerable front damper which broke during testing due most probably to minimal protection offered by the very small bumper. Wide low profile high grip tyres.

equate dimensions and to comply with the rules which govern racing in this country.

#### **Additional Technical Specification (Turbo Optima Mid)**

Motor and speed controller *not* included.

Anti-roll bars front and rear. Fibre reinforced plastic shock absorber mounts front and rear. Universal jointed drive shafts for the front wheels, the chassis is 0.3mm thicker and the track rods and adjustable upper links are the quick adjust type.

#### **Summary of Technical Specification**

As the name of the car implies it has its motor mounted mid ships, it is also belt driven, four wheel drive, fully ballraced, has independent suspension with a damper on each corner and, depending which car you buy, a motor and speed controller.

#### **Differences Explained**

Basically both cars are identical and the differences in specification do not affect construction, even the instruction manuals have the same number of pages, so what more (or in some aspects less) do you get for your money when you purchase the Turbo.

Neither the 240ST motor or Optima type speed controller are included in the kit. The aluminium alloy plate chassis is 2.3mm thick an increase of 0.3mm, this means all the screws on the bottom can be counter-sunk which gives a completely flat bottom and a claimed extra 9% increase in strength and rigidity. The chassis is finished in anodised gold. Both front and rear shock absorber mounts are made of black fibre reinforced plastic, as opposed to aluminium alloy which gives a claimed 25% increase in strength. Front and rear suspension is supplied with anti-roll bars similar to the Option House stabiliser set available for the Ultima. Front Universal jointed drive shafts replace the normal dog bone type of drive shaft which is retained in the back axle. The adjustable links which adjust the camber angle and also the two track rods on the front suspension are replaced with the "Turnbuckle" type which has a left handed thread one end and a right handed thread the other so the length can be altered in situ without removing the component from the car. Cosmetic changes have been made to the bodies which are barely discernable with the turbo's rear wing being squarer in shape.

#### **Open the box**

The presentation is as expected from Kyosho: First Class. A comprehensive instruction manual of 23 pages and a supplementary sheet. The sheet lists every part used in the kit plus a list of optional extras and bolt on goodies, they include incidently the drive shafts, the dampers mentioned in previous paragraphs and a front and rear anti roll bar kit which we may discover when we test the car should have been included in the original kit.

The instructions are three fold in this respect that each part is put in a numbered bag and each item on the instruction is listed as to which bag contains the part. Each step of construction, and there are 40, is given a number 1-40. A second loose sheet of the instruction manual itemises each step of construction with a drawing of each part and the numbers of components to be used in each step. The first two steps would be sufficient for most but just to make sure there are no mistakes and nothing is left to chance, the little boy wearing a Kyosho hat I first discovered when I built an Ultima is used again to point out any possible pitfalls the builder may encounter. Nothing is left to chance and there can be no real excuse for incorrect assembly, there

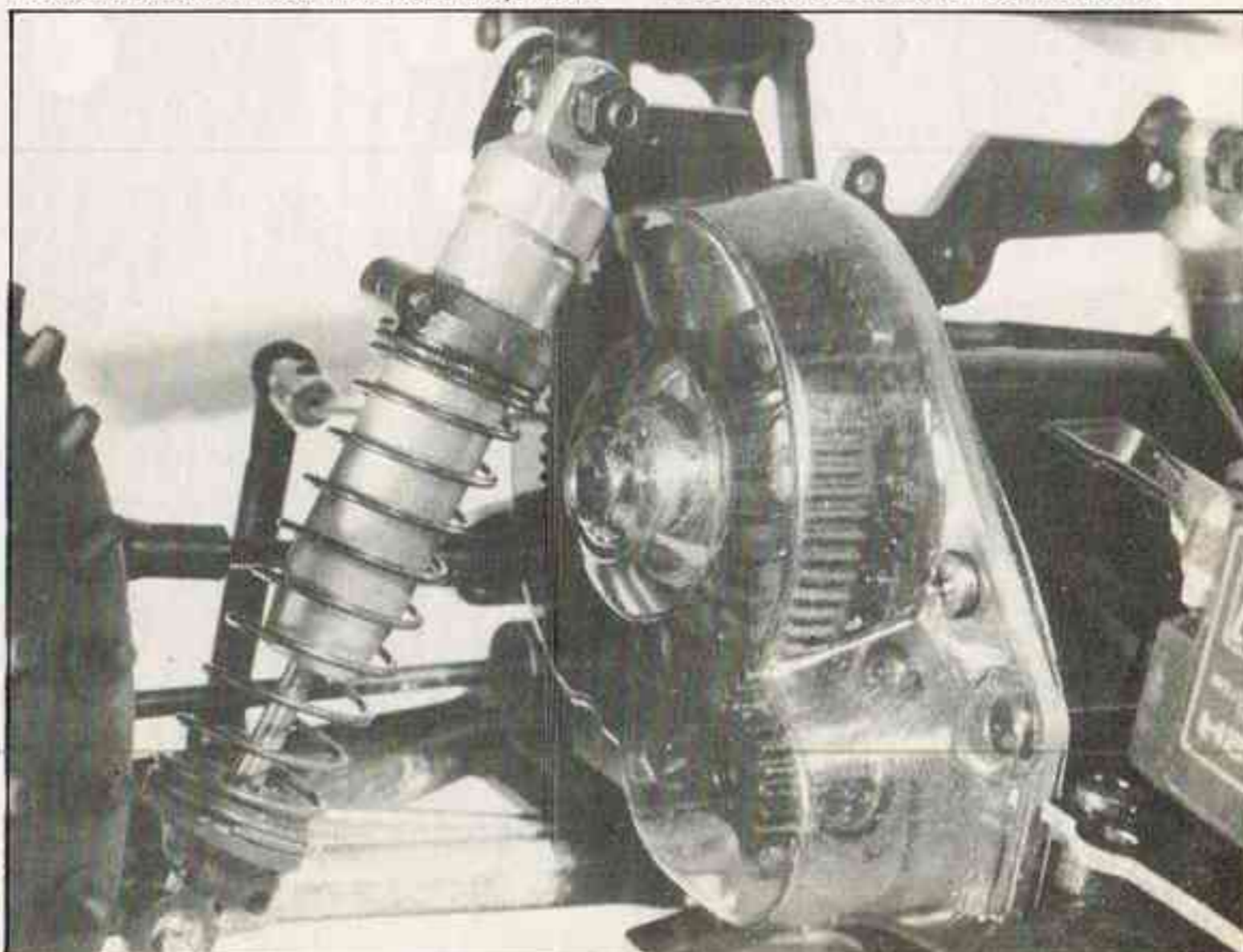
is even a rule so as to ensure the correct length screw is put in the desired hole.

#### **Construction**

The only tools supplied with the kit are three different size Allen keys for the cap headed screws used during construction, additional tools required are long-nosed pliers for the circlips, a small Phillips screwdriver for both the self-tapping and machine screws and a 3mm and 4mm spanner for the nuts. A model knife and scissors are required for body trimming. All of the tools required are essential for a model car owner so if you do not possess them already the investment on any new tool will not be wasted. Both thread lock and silicone grease are supplied in the kit but superglue is also required at a couple of points during construction and this is not supplied.

Both front and rear differential come ready assembled but I opened them up for two reasons, the first was just nosiness. I discovered the construction comprised

*"Turbo" gold tinted gearbox cover and slipping clutch arrangement. Note rear anti-roll bar, black fibre shock mounts and receiver mounted vertically on centre spine.*



# Futaba THE LOGICAL CHOICE

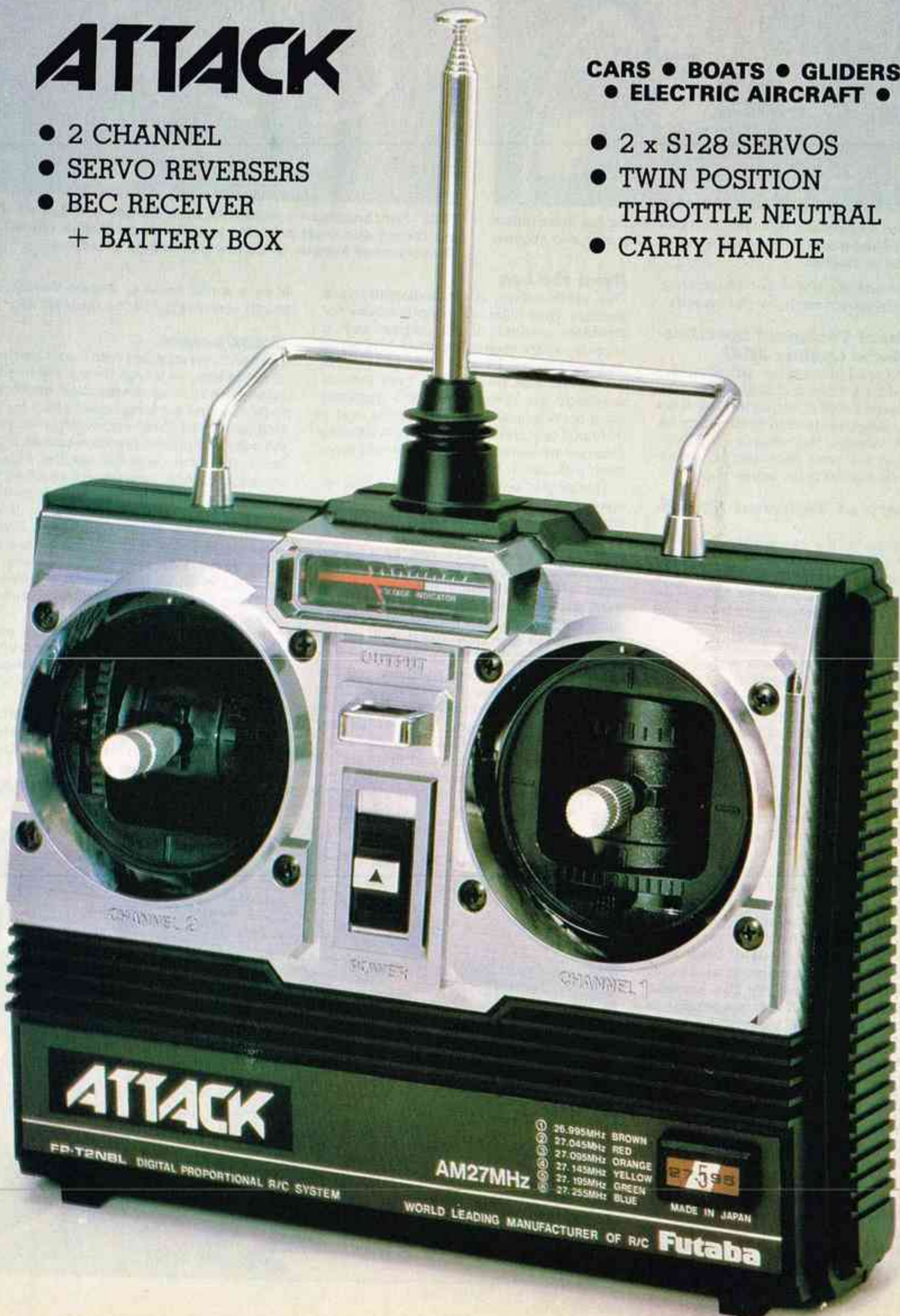
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metal gears with two large side gears for the power take off and two bevelled pinion gears. The internals looked identical to that of the Ultima. The second reason was to pack them with silicone grease to give some characteristics of limited slip. When assembled in Japan there had been a generous quantity already added.

The rear gearbox is built up first and it is here that a flange for the belt drive has to be superglued on and the rear differential (the one with the gear teeth on it) fitted in situ. Attached to the outside of the rear gear box is the motor plate through which protrudes the gear box drive shaft. A slipping clutch arrangement is fitted to this shaft. Clutch tension is provided by three wavy spring steel washers which is adjusted by a 3mm nylock nut. In each thrust plate and friction pad and also in the driven gear wheel is a small hole which I can only assume is there to give the driver, should he wish, the facility to lock the clutch up. It would be a simple operation to put a small diameter bolt (about 8BA) through the holes thus preventing any slippage. I will certainly try this device but I can imagine a lot of drivers who like a "bullet proof" car dispensing with the clutch arrangement and locking everything solid.

The front differential is fitted around the drive belt and the two gear boxes connected by the belt are fitted to the aluminium-alloy plate chassis. The position of both gearboxes is fixed and therefore means there is no provision for belt adjustment.

The belt is a deep tooth type which unlike the square section low profile type should not need adjustment. Viewed sideways the belt configuration is triangular as it runs over an idler in the rear gearbox so it can clear the motor which is mid mounted and not fitted on the side where it has to be if the belt drive is a straight loop between the rear and front differential.

With both gearboxes attached to the chassis the shock absorber mounts can be fitted to them. Hung from the gearboxes are the four wishbones and their respective adjustable upper links. Both the wishbones and the knuckle arms pivot on steel shafts, which are kept in position with circlips.

A translucent spine is stuck on the chassis with two sided tape, this protects the belt from debris ingress.

Two types of ball joint are used in the car differentiated by their colour. The black balls have either a hole, which will accept

a 2.6mm bolt, or have a 2.6mm threaded screw on them. The silver balls have either a 3mm hole or a 3mm threaded screw, make sure the correct ball is used. For example the adjustable upper links have one of each type fitted to either end.

Chassis furniture has to be fitted next, it comprises uprights for the servosaver, top deck mounting posts and the drive battery holder which has the choice of two positions (the rearmost is shown in the instructions). Two lugs have to be removed from the servosaver prior to fitting (failure to do this reduces steering lock and suspension travel) the geometry of the servosaver is of the type that keeps bump steer to a minimum.

Superb Option House gold shock absorbers provide the springing and damping, the units come unassembled. Assembly of the short (front) and long (rear) dampers is identical except that different pistons are used, two port pistons in the rear and a single port piston in the front. Once the dampers were in position I could not resist fitting the wheels to try out the damping, although not at racing weight the car could be dropped from about 18 inches and it landed with a dull thud much the same as a pet cat when it jumps onto a carpet.

The wheels are similar to those used on the Raider which, in turn, are of the Hotshot/PB type where the tyres are pulled over the hub, but unlike them in the respect that they have to be glued as the grip is insufficient to stop the tyre rotating on the hub.

**On the downhill slope now**

It was at this point in construction we decided to take some photographs so it gave a break from building and writing and an opportunity to see the differences. Construction had been a pleasure with no problems apart from fitting too small a washer to the outside of each differential main bearing, this was only discovered when fitting the wheels and that the four remaining washers were obviously incorrect, the mistake was soon rectified and was the fault of the builder not the instructions.

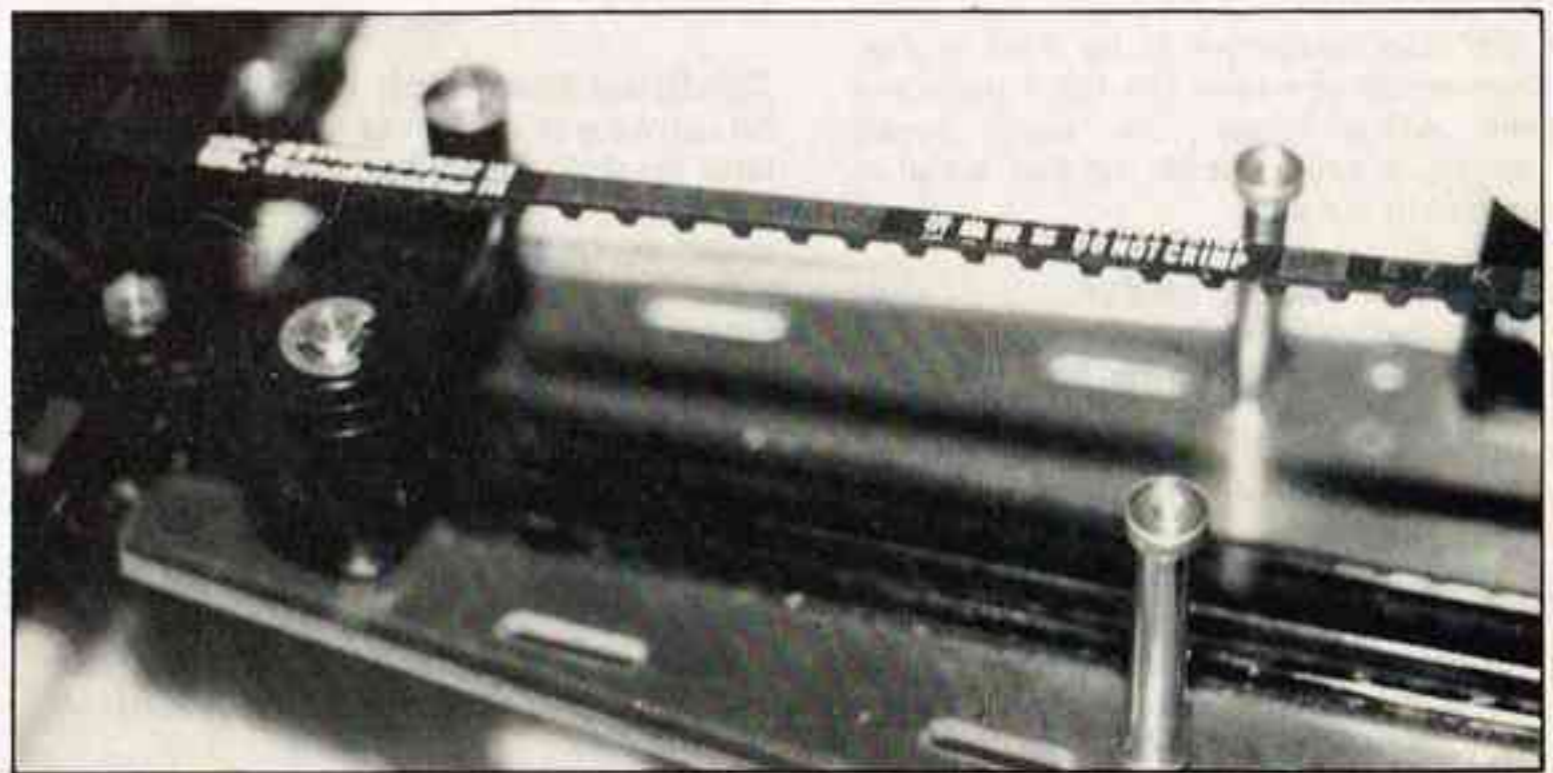
**Final completion**

Once the steering had been installed the radio plate was fitted. It was at this point I realised that there was provision for belt adjustment as the front two screw holes could be slotted, thus moving the top of the front gearbox to adjust the tension in the belt. A second translucent spine is fitted above the radio plate with two smaller pieces attached below it to totally enclose the belt.

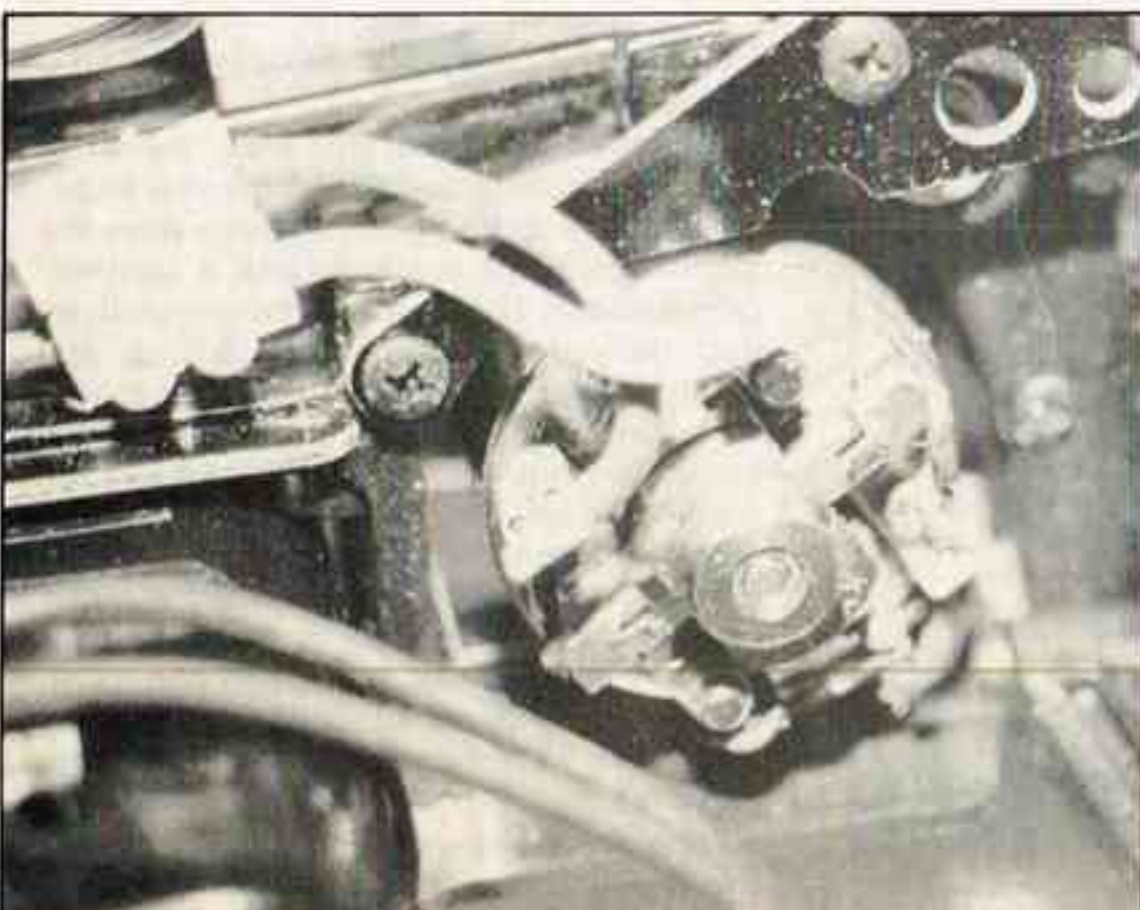
I elected to use the kit motor in the 'Mid' so as to race it straight from the box and fit a Le Mans 240WS motor which is a 18 turn double in the Turbo.

Motor attachment and adjustment is interesting as two slotted holes are used unlike the conventional single pivot hole and one slotted hole. The motor and external gearing is protected by a rubber boot fitted with a filter and a translucent cover respectively. Another non conventional fitting of

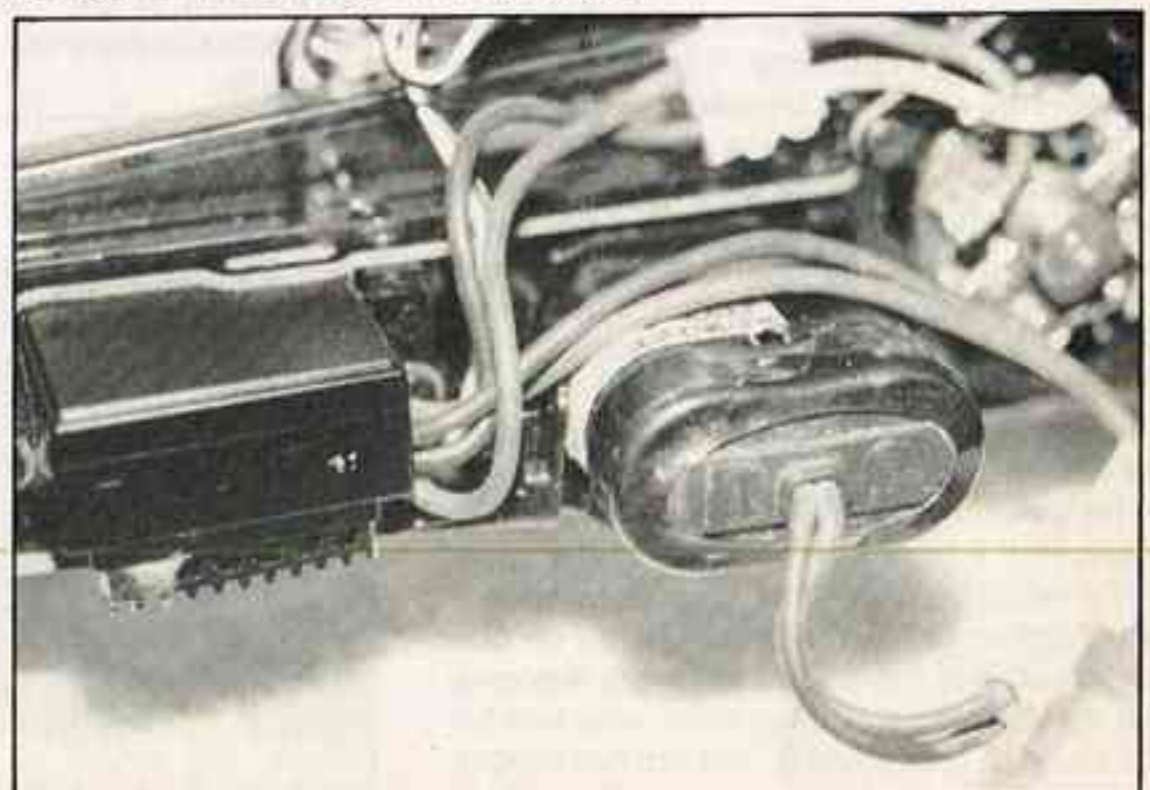
*"Do Not Crimp" is the very obvious advice on the deep toothed belt.*



*Brush gear maintenance of motor in situ is possible with care.*



*Transverse mounted battery with electronic speed controller mounted in position which would be occupied by servo if manual speed controller was used. Note how spine reduces places to mount radio and speed control equipment.*





The "Turbo".



The "Mid".

a component is used for the supplied speed controller which is mounted vertically, the Turbo is fitted with a speed controller of your own choice as is the motor. Final piece of electrical equipment to be fitted is a receiver which straddles the top translucent spine which makes for easy crystal changes, a white plastic tubular aerial is supplied in the kit.

**Paint the body: twice**

Pete Darwell offered to paint the cars and have a common theme for both of them, his task was made doubly difficult as one of the cars was to be test driven by his son without him knowing of its existence prior to the event.

I have noticed in the past how the younger drivers like to paint their cars similar to the review cars, so with the younger driver in mind Pete chose a paint job to not only accentuate the low line of the 'Mid' but be easy to copy. The white paint is not white but a pearl 'flip flop' paint which gives a hologram effect when viewed in different light conditions. The paint has a gold tinge under the different light conditions and compliments the gold shock absorbers.

The paint is expensive, it is made in the States and can only be used with an airbrush, it costs £5.50 for a 4oz tin (further information should you be interested ring 0474 813574). The red and green are normal fluorescent spray can paints as is the black, all of them being acrylic based. The colour scheme is very effective so I expect to see variations on the theme around the tracks this year. If you wish to have a similar paint scheme mask off all parts which do not want to be black and spray the clear parts black. Remove the tape and remask all the parts you wish to be white, the clear parts on the body will be either the green or red on our design so they have to be sprayed. Remove the masking tape and the clear area will be the parts to spray white. It does not matter

if the white goes on the black or red. I may be stating the obvious but all the masking and spraying is done on the inside of the bodyshell.

**Dialling for track conditions**

All up weight of the car is about the new limit for 4WD of 3lb 8oz, how much above you go will depend on the receiver and speed controller you elect to use.

Damping changes can be made by changing pistons (a choice of three) or by different viscosity oils. Ride height can be altered by changing the position of the top of the damper or by using some of the various location points available on the wishbones, so for suspension and damping there is nothing revolutionary. Down force on the rear wheels is supplied by a large rear wing which has two height positions and a choice of three angles of attack. The most fascinat-

ing adjustment choice is with the camber angle, most cars have camber angle adjustment and if you dial in some negative angle, top of the wheels closer together than the bottom, to make the back of the car slide on corners on a high grip surface, you also get less grip on the straight.

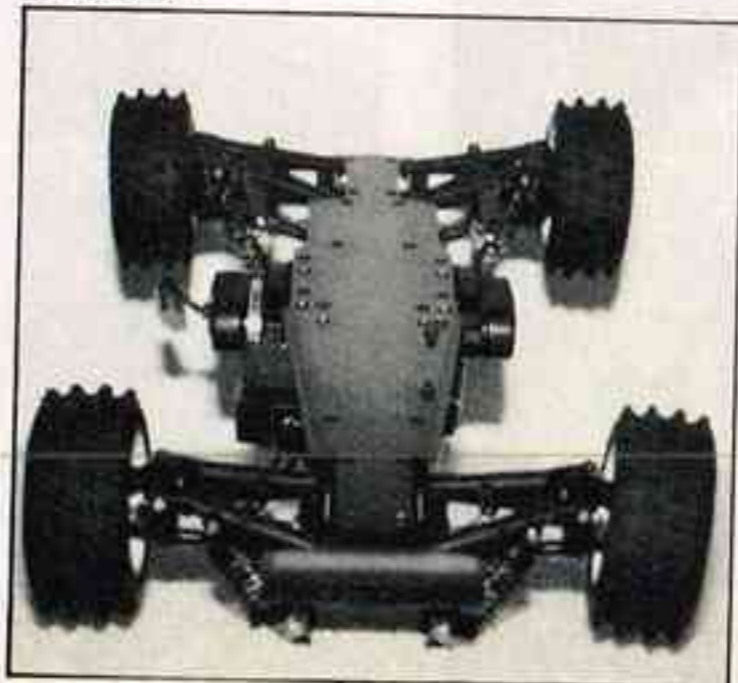
Although my instructions were in Japanese they showed that by adjusting the upper link by up to 4mm on the back and 6mm on the front and then relocating the position of the link on the body, the arc through which the wheels move when the suspension is raised can be altered. This means you can have 0° of camber on the straight with a choice of negative camber if required on corners: very novel indeed. This is known as RISE (roll induced steering effect) yet another piece of jargon to add to the list that appeared in last month's RRC. If you do not wish to use this facility or it proves to be a gimmick then normal upper link adjustment of camber angle can always be used.

**So should I buy the 'Turbo' or the 'Mid'?**

With these cars, are you after value for money or instant success? Only you know, whichever one you purchase you have the same quality of product, and a well engineered car. The degree of success will reflect on your car preparation and driving ability. Value for money, that's interesting, with the 'Mid' you get a motor and speed controller, but the motor puts you in the modified class. The Turbo does not have a motor or a speed controller and one would expect that if one offset the cost of a 240ST against the universal drive shafts, and the anti-roll bars against the speed controller, the Turbo with the other small improvements would not be appreciably more expensive, but it is.

People will always buy the best they can afford and some will always buy the most

*"Turbo" counter sunk screws distinguish the bottom of the Turbo as it is completely flat. Note the exposed position of the speed controller.*



expensive. These cars are a classic "you pay the money you take your choice". Whichever car you choose (and you cannot go wrong with either) you will have a car that compares very favourably in price and technology with the opposition, has a proven pedigree (the Optima is going to be a hard act to follow) and should be simple to maintain both at and between meetings.

**64,000 Question. Will it beat the Opposition?**

To be the car of champions or the champions car, there are several outstanding cars it has to beat and one of those is the English Cat, so how does this Oriental challenger compare on paper? The comparison is in physical dimensions only and I do not intend to compare any two cars directly with each other either in this report or future ones. The reasons are many, I will report what I find and the reader must make up his mind if the product is suitable for him. Different drivers have different criterion, some for example have limited resources and wish to race with a minimum of break-ages, some like myself are short of time and need a car that is reliable and does not need too much attention between meetings, others have limitless time and money but what we all like to do is compete, be it at various levels, so different cars suit different drivers requirements.

**Specification Check**

Car	Cat	Mid-Optima
Type	1/10 4WD	1/10 4WD
Differentials	1 Limited Slip	2 Gear Type
Length	345mm	350mm
Front Track	236mm	240mm
Rear Track	236mm	242mm
Wheel Base	250mm	255mm
Ground clearance	30mm	35mm
Front tyre	85 x 32mm	85 x 37mm
Rear tyre	85 x 40mm	85 x 37mm
Bearings	14	18
Motor	Not included	Le Mans 240ST
Speed Controller	Not included	3 step resistor with reverse
Weight	1500gm	1600gm

On paper there is little significant difference between the two cars so as we all really know the track is where the real comparison will take place and it's where the Mid-Optima will have to prove itself.

**Track testing the 'Mid'**

With a car so eagerly awaited as this, it would be easy to give it to a "Super Star" to test, he would most probably win even if he was driving a radio controlled wheelbarrow, a "rave review" would then be written proving nothing. I decided to go the opposite way.

The first run was with the 'Mid Optima' at a Maidstone outdoor meeting, the car being driven by Michael Tuson, who at 9 years of age is Medway's youngest driver. The weather conditions were as poor as the attendance of only 24 persons, it was cold, wet and slippery. The track was quite long bumpy grass with bare slippery non-grassed areas.

The story of the meeting was simple, the 'Mid' was the quickest car on the track and also one of the most stable. Partway through the meeting Cat tyres on Hotshot hubs were tried with plastic wheel adapters, they fitted the 'Mid' and coped equally as well as the standard tyres. The Cat tyres were left on as we decided to keep the kit



tyres for 'best'. Michael took not only FTD but also won the 'A' final.

The second test took place a week later at Grain where Round 3 of this year's RRC took place, although weather conditions could not have been more different with a sea fog and a ground frost evident.

The meeting was bigger, with two drivers present (P. Whittaker, B. Ralls) who had represented the SE of England in the regional finals, both drivers were in the top 14 in the country that day, one of them finishing third: competition indeed. Conditions were so bad on the grass that the track was moved to the asphalt car park. The kit tyres were removed and the most worn tyres we had fitted and the car's suspension lowered, damping (not that much was required) was almost non-existent because it was so cold with even the 'thinnest' of oils 'thick'.

Story of the day was simple the 'Mid' was the quickest car on the track yet again, and Michael driving-in on the corners 'where angels fear to tread'. Managed fourth fastest time of the day for his first ever 'A' final at Medway. As the day went on times got slower but Michael got quicker, a combination of him getting used to the car and its ability to cope better than most with the slippery conditions. Michael's comments on the subject were 'it's like driving on rails'.

The test car was then given to pole man Wayne Darwell for the 'B' final, which he won with comparative ease with second FTD. His comments were 'it's quick, it goes where you point it and the back does not hop out on the corners'. There appears to be no need under cold conditions for anti-roll bars.

A fresh set of cells were put in the car for the 'A' final, the car went well again finishing two seconds behind the third placed car and one lap behind the two regional finalists, who were both slower on the straight. Their comments were similar both saying, "we know what our next car will be".

**Why not test your cars elsewhere!**

A father of one of our younger members said, as much as he liked to see a review car tested, he wished I would do it elsewhere especially at Christmas time, as last year when I tested a 'Rocky' that's what his son wanted for Christmas and that history had just been repeated as now he wanted an Optima Mid.

**Track testing the 'Turbo'**

Venue Grain, a week after the second test on the 'Mid'. Weather conditions were good if you were an Eskimo, a bright blue sky with a freezing wind. Grain is situated on the coast about 200 yards from the sea with the next stop Scandinavia. The temperature in my car with windows shut was 4.8°C, so with the chill effect of the wind it was below zero. The grass this time was frozen so it was back to the car park. There were 48 drivers present, six in the past having represented the SE of England in regional championships. Robert, my son, a very experienced driver was to use the 'Mid Turbo' but unlike the other top drivers present he had not driven since winning the 'E' final at the RRC Finals two months previously.

We arrived late and although Medway seed drivers according to ability the Turbo was in mixed heat of novices and two eventual 'B' finalists.

The car had been completed Saturday morning and taken to Allan Bond to photograph so it had not been run. I was concerned that the 20T pinion giving a gear ratio of 9.78:1 would be too high for a modified double or triple wind, so I put in a Spa 480WT motor which is a 25 turn quad eight minute motor.

I could not bring myself to put on the new kit tyres on the asphalt surface so I put on a very well worn set of Mardave 3 x 2's on the old style (non low profile) Optima hubs. I did not take into account the smaller diameter of the wheels which lowered the gear ratio. The car was quick out of the corners but had no top speed. After the first round it was ninth FTD. With a slow 17, the best being a very fast 18 just two seconds short of 19. The only change for the next round was to fit a triple wind STS 17 turn motor which has a smooth power curve. One of the problems (or is it a joy) of testing a review car is the interest it creates, and this car created plenty. The problem is that every one wants to see it, hold it and ask questions so in between heats when you should be checking over the car, it is in the hands of other drivers. When I put the car on the line for the second heat the offside wheel had a funny camber angle; the bottom king pin was missing. I wanted to pull out of the heat fearing the strain on one king pin could break the knuckle arm and finish our day's racing, Robert, optimistic as ever, wanted to race. I am only the

mechanic and he being the driver had the final say. The car was very quick this time but on the corners proved tricky with the offside wheel changing from negative to positive camber depending whether it was a left or right hand bend. The car won its heat again with a very fast 17 just short of 18 to put it eighth FTD and on course for the 'A' final.

The king pin was replaced with one from an Optima (they are the same) and the motor I intended to fit in the first place a Spa 240WS fitted, and to cope with the extra power fitted the kit tyres to the rear. At this point it had got so cold the fourth round of heats were abandoned but everybody was put in a final. This time the car was very quick and with the extra grip on the back could be powered out of the corners very hard, it won again with a good 18 lapper to give it sixth place on the grid for the 'A' final.

For the 'A' final it was "go for it" kit tyres all round and a 17 double STS motor for even more punch. The 'Mid Turbo's' race was short but very exciting. The car was off the line like a rocket taking fourth placed man on the grid on the inside and holding that line to take third placed man on the outside to be in third place by the first bend. The end of lap three had the 'Turbo' in second place but radio interference was causing a problem at the same place on the track (one of the finalists was affected so badly he pulled off) and although the car was quicker than the leader the advantage was being lost. Driving with a transmitter held high above your head is not the best driving position and Robert paid the price and broke the plastic end off one of the front shock absorbers when he hit a track marker: end of race.

Whilst all this was going on Michael in the 'Mid' after electrical problems in the heats won the 'C' final with a fine drive of 19 laps for fourth FTD.

We left the meeting wondering several things, was it the extreme cold that caused the plastic to be brittle, would a full width bumper have protected the front suspension, would six regional finalists have been beaten and Robert won his first 'A' final for some time, we don't know we can only surmise, that's what dreams are made of.

**Track test debriefing**

The car is quick and holds the road well. It has the ability to go where you point it, the handling is positive without any signs of twitchiness, it can be powered out of bends without losing the back end and is just 3/4oz above the 3 1/2lb limit. The 20 tooth pinion supplied gives a gear ratio which is on the high side for grass or a heavy wet circuit, when using a modified motor. Two of our motors got very hot, I would anticipate an 18 tooth pinion giving a ratio of 10.87:1 would be more suitable. The 20 tooth pinion proved ideal when used on asphalt.

Our breakage and the lost component we suffered in the test were not so disastrous as we first thought, as both parts are the same as used on the Optima which means spares will be easily obtainable. Any Optima owners considering changing their car who have Optima spares in their kit box may wish to bear this in mind.

A test on the transmission system measuring the no load current of the motor and then connecting it to drive the transmission showed an increase of only 0.5 amps, this is very low and shows what an efficient drive system the car has.

**Can it be improved**

The perfect car has not yet been built although the 'Mid' takes us a step closer for reasons already expressed. It needs a wider bumper as we found to our cost (Ripmax have this in hand). A problem is the centre spine which means there is not a lot of room to fit the radio gear and the larger type of electronic speed controller. I fitted a Futaba 112B which is the same size as a servo, it fits where the speed control servo should go when the mechanical speed controller is used. Although the position of the controller is perfect for balance and access it is in a very exposed position low down at the front of the car.

**Summary**

Every good property of the original Optima is retained, beautiful handling, ease of maintenance both on and off the track but with the bonus of lighter weight and higher top speed.

An excellent car in all aspects, it looks right and it is right. It fulfils the properties asked for in its concept. A winner for Mr Kyosho and a winner for the owner, all you have to decide is whether it's to be the 'Mid' or the 'Turbo' the long wait for the car has been worthwhile, so what shall we do for 'rumours' now?

**Final comment**

I can say without fear of contradiction I have been fortunate to review a car which will not only give a lot of pleasure to drivers and spectators alike, but carry off a lot of major honours in 1988, it may well prove to be the champions champion!

My special thanks to Allan Bond, Pete Darwell and Amanda Jane Smith for their assistance in the preparation of this report.

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# MAINLINK SYSTEMS BATTERY TESTER

That well known explainer of the inexplicable and all round good chap Jim Davey looks at MainLinks Analyser and tells us why it does what it does.



The user's eye view shows the clearly laid out controls and the sturdy connecting terminals.

It could be argued that the two pieces of technology that have contributed most to the practicalisation of the RC hobby are the silicon chip and the nicad battery. Certainly, the model car racing branch (battery driven) is totally dependent on the nicad for its motive power. Electricity (charge) is the fuel of this game, but the big problem with using electricity for fuel, is you can't easily see what's in the tank! All that you can do is to know how big the tank is, and fill it!

The MainLink Process Tester is all about knowing how big the tank is, the rest is up to you.

Putting that rather more scientifically, it pays to keep tabs on the condition of your batteries by regularly checking their ability to hold charge — their capacity.

### Principle of operation

The conventional method of establishing the capacity of a nicad is to charge it fully, and then discharge down to a safe and consistent end point. The capacity is then calculated as the product of the charge current

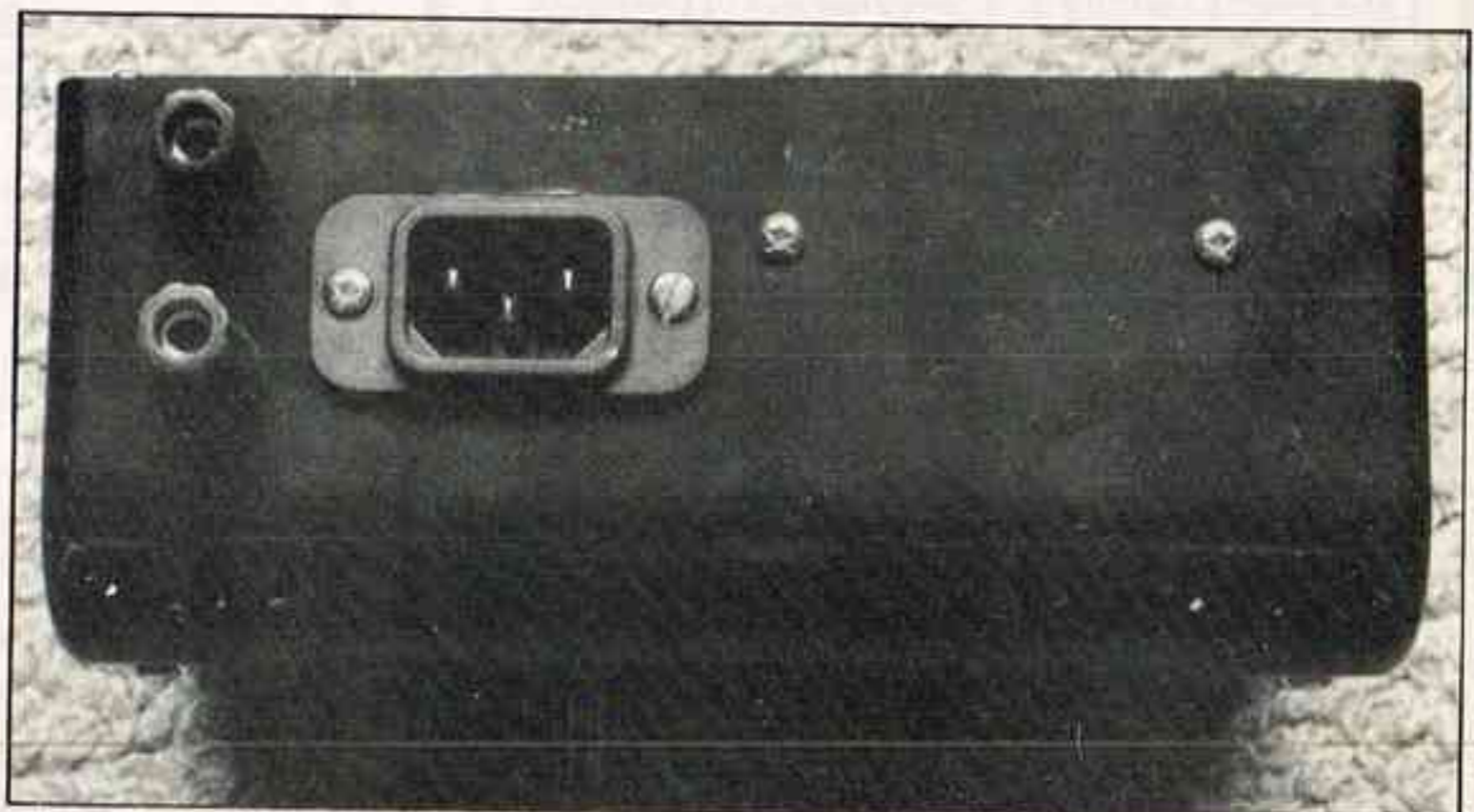
and the time taken, expressed in Amp Hours or similar. This is a pretty fair technique, but for the best results requires an accurate, constant current load. Remember that the battery voltage falls during the discharge, and you will see that a simple resistive load will result in a current that falls too, undermining the constant current assumption.

The true, mathematical, value of the battery's capacity can be obtained by plotting the current during the discharge against elapsed time, and then figuring the area under the curve — see diagram. You will note, with a few moments thought, that the current can vary during the discharge, but as long as we figure the total area, we get a true answer — low current for a long time equals high current for a short time. In practical terms, to achieve this, we would have to plot current every few seconds throughout the discharge on squared graph paper and then add up all the squares below the line, I don't know about you, but I have a lot better things to do!

An alternative method to plotting graphs would be to measure the current every 10 secs, multiply each reading by 10 to get an Amp Second value, and keep a running total of all the Amp Second contributors to give an Amp Hour total at the end. This process is a manual method of performing the mathematical function of integration — or taking areas — and will give much the same result as the graphical method — and drive you just as barmy! At this point, enter the computer.

Computers are just great for doing lots of incredibly boring and repetitive things accurately and quietly — such as measuring current, multiplying by a time interval, and keeping a running total. Basically, this is what the process tester does.

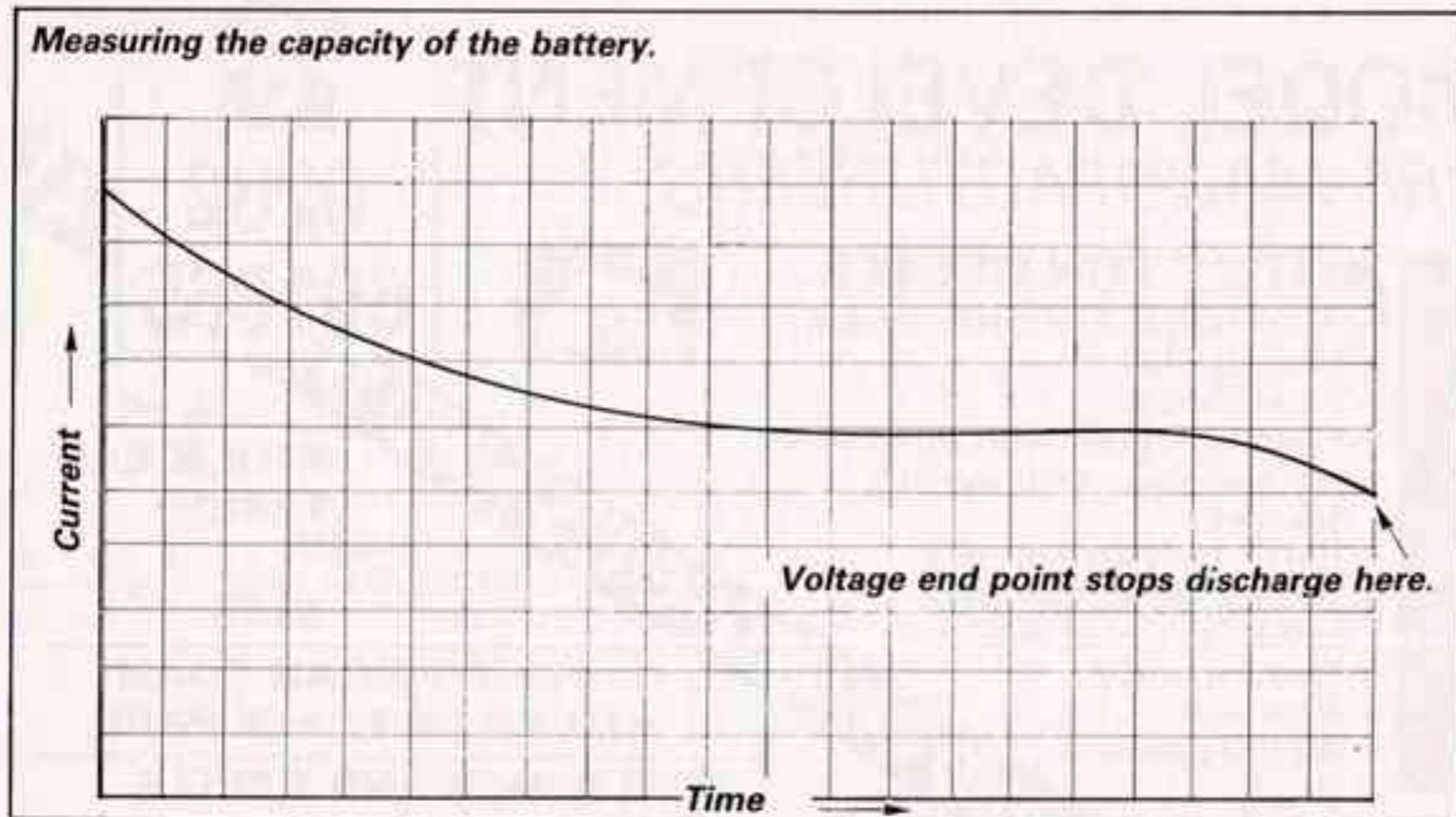
The unit contains a means of measuring discharge current, selectable level detectors to sense the charge end point, a microprocessor, display and power supply.



The discharge terminals connect to these terminals. Note also the plug-in mains connector.



Measuring the capacity of the battery.



Current scale is in one line every 100 mA. Time scale is one line every 10 minutes. So, each little square is 100 mA x 10 minutes of capacity = 1 amp minute. Count them all under the curve and you get about 70 squares so the battery capacity is 70 x 1 = 70 amp minutes = 70/60 = 1.17 amp hours. Looking at the curve it discharged at about 700 mA on average O.K.?

**In use**

The user selects a load of his own choice — advice is given in the instructions, auto bulbs being a favourite in this area — and connects the load and the battery to the appropriate terminals on the unit. A rotary switch is used to indicate to the device the number of cells being discharged. The process is initiated with the start button, and indicated by a flashing LED. During discharge, the instantaneous value of the discharge integral is displayed in increments of .1 Amp Hour, rising steadily as the test continues. A second push button allows the

actual discharge value to be displayed at any time. By virtue of the principle of operation, the load may be changed during the period of discharge, without affecting the validity of the result.

During the process, the unit may be forgotten, as all operations are fully automated. When the battery discharges to the end point — set by the rotary switch — the load is switched off and the capacity measured is held and displayed until a new cycle is commenced, or the mains power removed.

**Construction**

The unit is tidily built into a substantial plastic case. Inside, all electronic components are assembled onto a good quality printed circuit card. Wiring is tidy and well secured. It was not possible to establish the integrated circuits used, as their identification has been obliterated. The only component subject to the discharge current is the sensing resistor, and the substantial size of the item used should avoid any possible problem from heating. Substantial screw terminals are provided for load and battery connection and a nice touch is the provision of a plug-in mains lead, allowing the owner to fit a lead of length to suit his own needs. Similarly, in the common event of a chewed mains lead, you don't have to climb inside to replace it!

**Conclusion**

An easy to use unit that brings a "professional" approach to capacity measurement of nicad batteries. The design is very clearly aimed at the care and feeding of the sub C types used in car racing and meets its design aims well in this respect. The only limitation in the capacity measurement being made in .1 Amp Hour increments, whereas discharge currents between 100 mA and 5 Amps can be handled. This makes the unit less valuable for the checking of the 500 mAh cells commonly used for Transmitter and receiver power, as a 10% change in capacity here is only 50 mAh. An extension of the design, possibly via a range change switch, to cover these cells could make this little device a world beater. Having made that minor criticism, there is no doubt that here is a very valuable tool for keeping track of the state of your propulsion batteries.

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# PIT BATTER

Hi once again! Well, last issue we were able to bring you the National calendar, which starts at Easter, where as the East Midlands League, and all the club rounds will probably start in March. This is actually being written not long after the last issue (due to Christmas hols. etc.), and so club calendars are not yet available, expect them next issue.

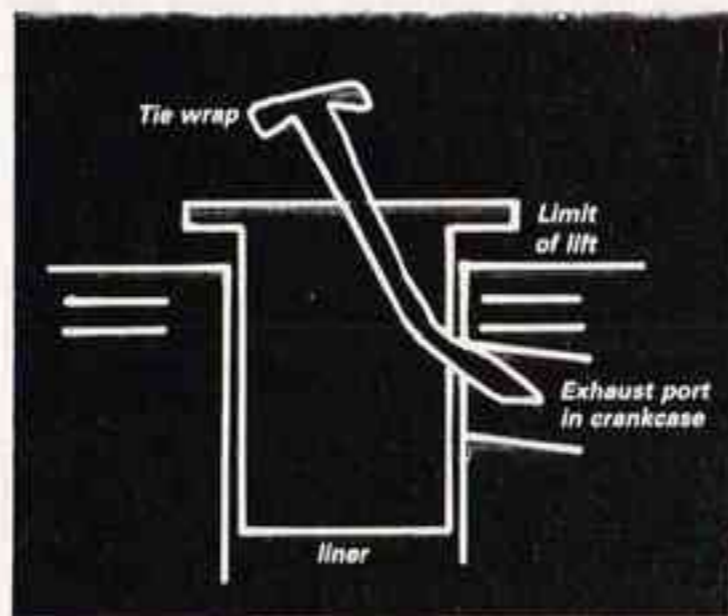
So now is a good time to start your main preparations and this we will do starting with used engines.

First thing is obviously to have the engine removed from the car and clean. Before you remove any dirt do block up the exhaust port, the carb intake and the plug hole to stop any rubbish from getting in. Brush off all surface dirt then strip the motor down carefully as follows. Firstly remove the glow plug then loosen all cylinder head screws and remove the head, ensuring that any shims are either on the head insert or on top of the liner. Remove shims carefully so as not to damage or kink them. Now loosen the back plate screws and remove it, which is usually best done by a twisting motion as the backplate is normally fitted with an 'O' ring seal and this tends to stick.

The next job is to remove the liner. Sounds easy — but it can be a really tricky operation. Now if you're really lucky you will be able to stick a suitably sized finger down the liner, hook the finger and simply pull the liner out! Right, now having tried this and found that you just weren't that lucky we'll try method two! Turn the piston down to the lowest point then twist up a length of strong tissue paper and insert it

firmly into the liner. Now turn the crankshaft over by the flywheel, pushing the piston and tissue upwards. What should happen is that the tissue will enter the ports, the piston will push up against it and hence lift the liner. This works about eight times out of ten although sometimes you cut through the tissue and have to try again. The last resort method is to place the tail end of a large tie wrap down through the liner and just out through the exhaust port, same procedure as for the tissue method only the nylon is a stronger medium. Note though that with the tie wrap method, the liner can only lift slightly before the tie wrap will jam with the top of the exhaust port in the crankcase.

When the liner has lifted, as in the associated sketch, then it is easy to fully extract either by a finger nail under each side, or by carefully levering up with two large wide bladed screwdrivers. *Never, repeat,*



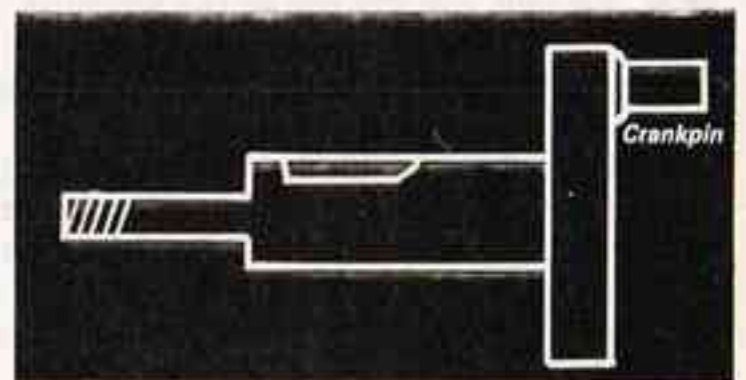
never try extracting the liner by means of mole grips or a monkey wrench, as this is guaranteed to distort the liner and render it completely useless.

O.K., so we've got the liner out, now how do you get the piston and con rod out? Well, if the engine is part worn, then the rod is simply hooked out away from the crankpin. If the set up is new then some "gentle" force is required to coax the rod off the crankpin. Finally, remove the flywheel, carb etc.

First thing I always do is to thoroughly clean everything, usually in white spirit, including the inside of the engine, which is best done first as the white spirit will be clean. Whilst washing the inside, give the bearings a few spins to thoroughly remove any residual oil. When dry, check the bearings for play and change them if there is any real wear. The easiest way to change a bearing is to use a gas torch on the crankcase playing the flame onto the bearing housing (outside of the crankcase only), and then when it is quite hot (don't touch it!) tap the crankcase onto a cloth pad, so as not to damage the crankcase, and the bearing will drop out into the pad. If it doesn't then it simply hasn't had enough heat all the way round. Then, whilst the crankcase is still hot, drop in the new bearing and press it firmly home with the help of a suitably sized screwdriver handle.

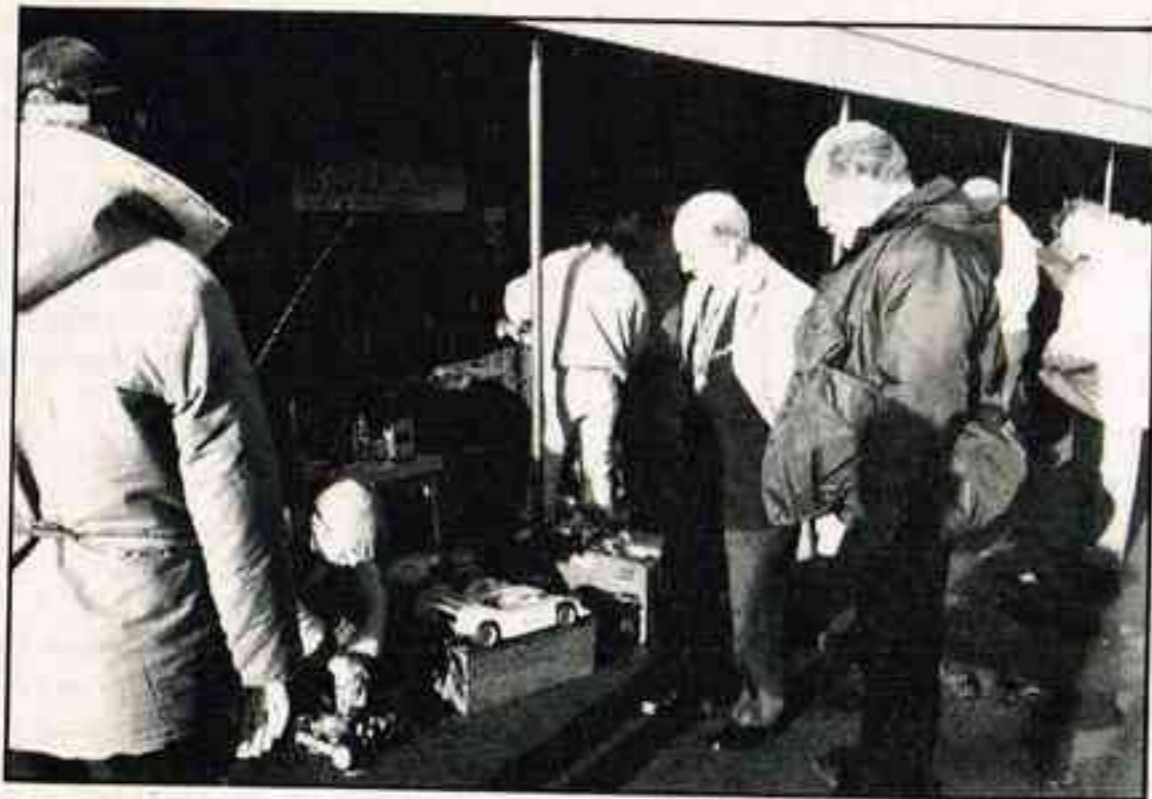
Before we finish with the crankcase, there is one further item to check, preferably before you change the bearings, but if in doubt, check with the bearings out. And that is the passageway between the two bearings. This is a close tolerance oversize on the crankshaft throat and does act as a part seal. What often happens when an air filter on the carb fails, is that grit finds its way between the crankshaft and the crankcase and grinds away the alloy of the case, thereby increasing this clearance and thus decreasing the ability of the engine to act efficiently. If this has been happening you will see score marks along this passageway.

Next item to check is the crankshaft. Look to see if the bearings have worn into the shaft (unusual), but more important, check the war on the crankpin.



Traditionally the day starts wet, this year proved to be no exception.

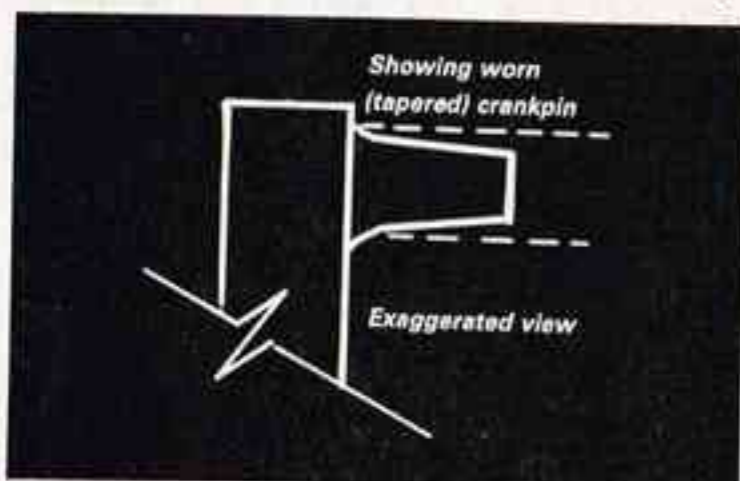




Councillor Horace Ashman caught surveying the proceedings.



Mike Hooper, second in the A final.



This is best checked with a micrometer or a good set of vernier calipers, which will show up any wear by being able to rock about the crankpin. Alternatively try fitting a new con rod and see how much play there is. Note though that even a new crankshaft and a new con rod will have some play to enable the ingress of lubricant.

A worn crankpin can still be used with a new rod to extend its life, but there will be an increase in wear. If the pin is badly worn then it's a new crankshaft.

The next thing to check is the piston and liner, look down the liner and see if there are any tramlines. If there are, they will let compressed gas escape by the piston and so reduce both the power and the efficiency of the engine. Make sure the piston and liner are clean, then push the piston up the liner. If it falls out the top of the liner then it is of no further use. In fact if it is able to come halfway out it is really well past its best.

Some makes of engine have pistons made of different alloys which in turn have a different rate of expansion when hot. This means that in one make of engine the piston/liner is past its best when it can go flush with the top of the liner, whereas in another engine it is only just considered to be run in!

Collecting his trophy Mark Stockford, a well deserved winner.



Rob Abiss, C final winner with his PB Nova X5.

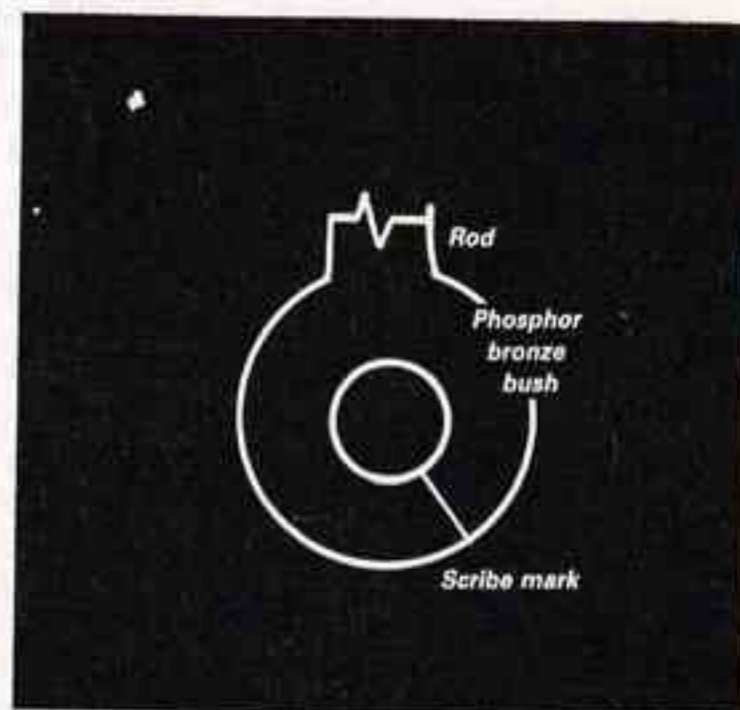
If the piston/liner is badly worn then, again, it requires replacement. If so then note that some makes of engine only sell replacement piston/liners complete with a new con rod fitted. This is probably no bad thing because the chance of finding an unworn rod with a worn piston/liner is pretty remote. Therefore it is always a good policy to fit a new rod with a new piston/liner. Conversely though, it does not follow that a rod will last as long as the piston/liner, so assuming that the piston/liner is O.K. then we should next check the rod.

The con rod has two bearing surfaces, the little end and the big end. The big end is fitted with a phosphor bronze bush which has from one to three oil holes through the bush and rod. Now what quite often happens is that the bush starts to spin within the rod, i.e. it sticks to the crankpin probably because of overheating. When this happens, then obviously the oil holes are no longer which thus reduces lubrication, increases heat and thus more chance of the bush spinning, and ultimately breaking. Therefore, the first thing to look for is the oil holes, and if they are out of line — then throw the rod as far away as you can.

The only way to check if the bush is worn is either to try it on a new crankpin, or, to compare a new rod on your existing crankpin, against the old rod. Try also the little end bearing by trying to push the rod in and out of the piston (not side to side). If excessive wear is felt then replace the rod.

When fitting a new rod, or indeed on refitting an existing rod, it is an excellent idea to carefully scribe, with a sharp modelling

knife, a small line across the outside facing end of the bush and rod. Thus enabling to see at a glance, by removing the engine backplate, if the rod bush is starting to turn. By doing this simple check after every meeting you stand a much better chance of preventing a rod breakage. The trouble with any rod breakage is that it usually destroys the piston/liner as well! So it is always worthwhile checking the rod.



With all these items checked and/or replaced it is merely a case of re-assembly using some light machine oil (3-in-1 or similar). Put plenty of oil in all the bearings as you washed all the old out with the white spirit.

Do remember that when you eventually start the motor up, it will pour white smoke out for a good few minutes, so don't do it in the kitchen!

The only other part of a motor that wears is the carburettor. Check this by pulling the slide out of the barrel to its fully open position.

Dave Withall receives his B final award from Councillor Ashman.





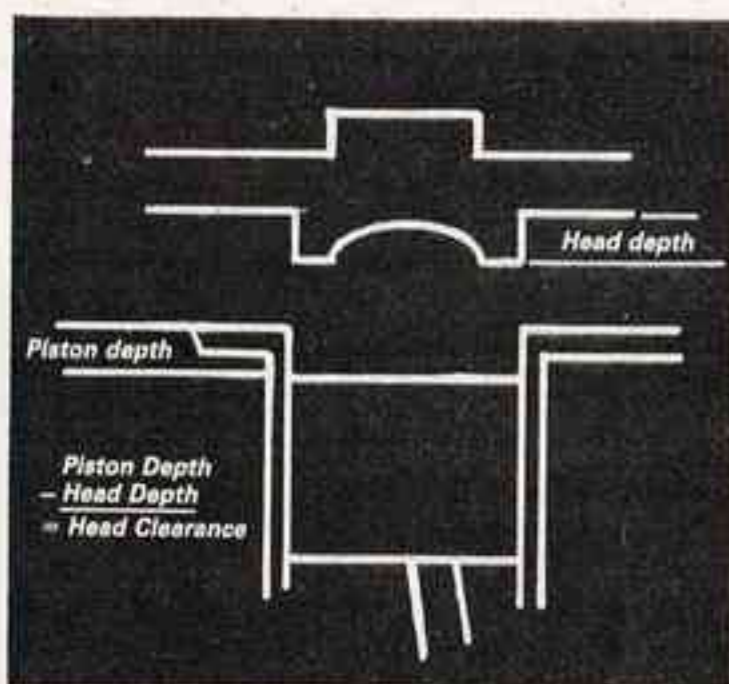
Roly Leonard did not have a good day all things considered.



The Mendip way to celebrate ten years, with champagne.

ition then see how much play you have from side to side. Too much play means the carb will suck more air than fuel and this will be especially noticeable at tick over when the motor would bubble and hunt.

Finally you should check and set the head clearance on the motor for the amount of nitro that you are using. The best method is to use a depth vernier, first measure the depth down the liner to the top of the piston when the piston is at top dead centre (TDC). Then measure the depth of the cylinder head insert, and take this figure away from the first. This would give you the head clearance with no shims fitted



As we said, different nitro contents require different head clearances and this should conform to the following table:—

Gareth Bell caught here pointing at his much lightened car.



% Nitro	Minimum Head Clearance
5%	14 thou. (0.3mm)
10%	16 thou. (0.4mm)
15%	18 thou. (0.45mm)
20%	20 thou. (0.5mm)
25%	22 thou. (0.55mm)
30%	24 thou. (0.6mm)

Twenty or 25% nitro is the maximum amount required for even the highest performance requirements and is actually what all the Italian engines are designed to run on.

Therefore the difference between the measured head clearance and the required clearance should be made by the use of head shims which come in either 4 thou. (0.1mm) or 8 thou. (0.2mm).

Finally, finally (we had one finally three paragraphs ago), it is worthwhile stripping the carburettor down, cleaning out all the jets and checking/replacing any 'O' rings found. Cleaning the air filter and sealing properly as we go, all this should ensure everything in the engine is in top order.

### New Years Day Meeting (3rd Jan)

As per tradition, the first Sunday after New Year day sees the first meeting of the year at Mendip circuit near Weston Super Mare. Now the day started bad with lousy weather and strong winds forecast, but this did not stop some 47 drivers from turning up for the event.

Mendip is undoubtedly the best equipped circuit in the country for bad, or shall we say normal English type, weather. Its full length covered pits with a brick back wall fully protect all competitors from wind and rain, whilst the enclosed rostrum ensures that the driver stays warm and dry throughout the day, which is all just as well as the heavens had opened just prior to the start of the heats, rendering the track extremely wet.

So, time for a look around the pits for new machinery, hmmm, not much change here, mostly Serpents with a smattering of SG's and PB's and a lone Associated belonging to Mike Spurway. Talk around the pits through is about the surprise move of Dave Dixon to PB and of Steve White's announced retirement!! I for one certainly hope the latter proves wrong as it will be a sad day when Steve is no longer competing.

Hey look! it's stopped raining and the brushes are out sweeping all the surface water off the circuit. Time is now 11.30 and the track is wet and slippery. Heat one records 14 laps in 5:11.7 for Greg Morley to set the bench mark.

The sun is shining well and with the strong

wind it is quickly drying up the circuit, well quick for this time of year, however this puts the track into the greasy stage and tends to slow things down. Heat three was a good run for Ian Anderson on 14 laps in 5:15.5, followed by an excellent dice in heat four between Tony Gilson and Tony Jones for the first half of the heat, Tony Gilson finally getting the better to score 14 laps in 5:21.3. Conditions were definitely slowing the cars!

Heat five saw Ray Killgallon shoot off into the lead followed by a 'hard to loose' Mike Lewis but at the end it was Hugh Rimron who scored a 15 in 5:17.2 leaving Ray on 14 laps. Heat six saw Roly Hamblin shoot off, but straight on as well, giving the early lead to Mike Hooper but it was soon stolen by Mark Stockford who drove well to score 15 laps in 5:20.3 from Mike Hooper on 14 laps in 5:16.4.

Thus at the end of the first round we had two 15 lappers, fastest to Hugh Rimron with Mark Stockford just 3.2 seconds behind.

The second round followed swiftly on with very similar track conditions although slightly quicker for Hugh Rimron, by 3 secs, and by a lap for Mike Hooper to put him in the 15 lap club with his 15 laps in 5:13.7 followed by Dave Withal on 15 laps in 5:16.8.

There was then a short lunch break which gave us the chance for another prowl around the pits where we came across the lightened Serpent of Gareth Bell. The car features lightened graphite shaker plate and brace courtesy of M and P Fabrications of 56 Sand Lane, Fair Oak, Hants (Tel. Southampton 600884 evenings) as well as extensive lightening of the chassis, to the extent of a short front layshaft, bringing it to an all up weight of 2.61 kg (sound suspicious, as the BRCA limit is 2.6 kg?). Talking to Phil Jones of M and P, he told me that developments are continuing with the Serpent and that he hopes to have parts for other makes as well later in the year. Emphasis of the carbon fibre was for increased strength, but it was nice to see that this could be purchased as either a blank sheet or a cut out version.

Talking to some of the quick boys we found a range of tyres in use like Mike Hooper was on Arrow's White front and rear, Dave Withal on Silver fronts and White rears, whilst Mark Stockford had MRC slick fronts with White rears which gave him gross understeer.

Round three re-convened at 2.15 p.m. with the sun still out and the track now dry but still greasy enough to cause a mild panic amongst the drivers as the early heats were

showing that the first two rounds were to count for nothing.

Heat one — Greg Marley 15 laps in 5:19.6.  
Heat three — Mick Harney, now living in the Plymouth area, scored 15 laps in 5:17.6. But it was heat four that got them all worried. Gareth Bell shot off from the flag and led all the way to clock the first 16 of the day in 5:05.9, taking a lap off of the previous FTD and registering laps as quick as 18.0 seconds. Tony Gilson followed Gareth round to a 16 in 5:14.5 — the pace was hotting up.

Heat five and Adrian Malin showed that he could mix it with the best by scoring 16 laps in 5:13.8 whilst poor Ray Killgallon got "mixed" on his last lap by another car leaving him unfinished but still with 15 laps dead to his credit.

Heat six and Dave Withal got a good start, however as Mark Stockford made a passing move, it was Dave that found himself stuck on the barrier, all of this letting Mike Hooper get away. Mark chased hard though and just clinched the heat from Mike. Thus Mark had FTD with 16 laps in 5:00.5 and Mike Hooper 16 laps in 5:03.3, Gareth Bell qualifying third.

Finalists were quickly sorted out as darkness was not far away, so the 'C' final got under way with Mike Spurway pulling away quickly from Adrian Hill in second. However Adrian's good run was not to last as body damage started to affect the handling of the car leaving Mike Spurway about half a lap head of second place Rob Abiss. By the first

fuel stop the gap had closed to five seconds but here things got complicated as Rob Abiss stayed out for six minutes and then had a spin on exiting the pits giving Mike Spurway back the lead. A few laps later Mike got into a minor difficulty and let Rob pass him back. Thus by the 10 minute mark Rob had pulled out nearly a lap on second place Mike and third place Dave Jones catching Mike every lap. Two minutes later and Dave Jones was in second and although both Dave and Mike started circulating quicker than Rob Abiss, they were only able to unlap themselves. At the end it was a good win for the PB Alpha X5 of Rob Abiss, from Dave Jones and just one and a half seconds back to third place Mike Spurway.

Next was the 'B' final and it was Dave Withal who gated well to lead for half a lap before a mistake dropped him back to last with Hugh Rimron leading and Pete Margate in third. On the first fuel stop Hugh Rimron exited wrongly from the pits to sneak a few yards but then justice was done as he touched a back marker putting himself the wrong side of the track marker, letting Dave back into the lead.

Problems never come singly and it wasn't long before Hugh was in for problems with servo failure. Thus Dave Withal had a nice Sunday afternoon drive to win by four laps from Greg Marley.

Final result of the 'B' final were:—

1st Dave Withal	46 laps
2nd Roly Leonard	42 "
3rd Greg Marley	40 "
4th Hugh Rimron	39 "
5th Dave Smith	38 "

6th Phil Jones	37 "
7th Simon Rimron	18 "

So to the main 'A' final, also reduced in time to try to beat the light. Mike Hooper took the lead closely followed by Mark Stockford with Gareth Bell third and Mike Lewis fourth. Mike Hooper makes a small mistake to let Mark Stockford through into the lead but then tries too hard to re-gain the lead catching Mark in a 'T' bone manoeuvre. The gap between first and second is now five seconds and that stays constant up to the second fuel stop. Then Mike has a bad spin on the straight letting Mark through to lap him. Now Gareth Bell has problems dropping him back and lifting Mike Lewis to third spot and that's how it stayed to the end. Final result:

1st Mark Stockford	47 laps "
2nd Mike Hooper	45 "
3rd Mike Lewis	42 "
4th John Diver	41 "
5th Gareth Bell	40 "
6th Ray Killgallon	39 "
7th Adrian Malin	37 "
8th Tony Gilson	36 "

Well certainly a good start to the year for Mark Stockford and his Serpent. For the final Mark was using Arrow's Yellow fronts and Arrow's White rears with a Nova Rossi ECO engine on 25% nitro. (Engine had been modified by a certain Mr Errington though!)

Another fine event held by the Mendip club. Well done lads and this your 10th Anniversary — more of that next month.

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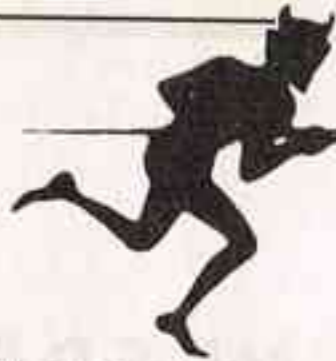
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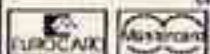
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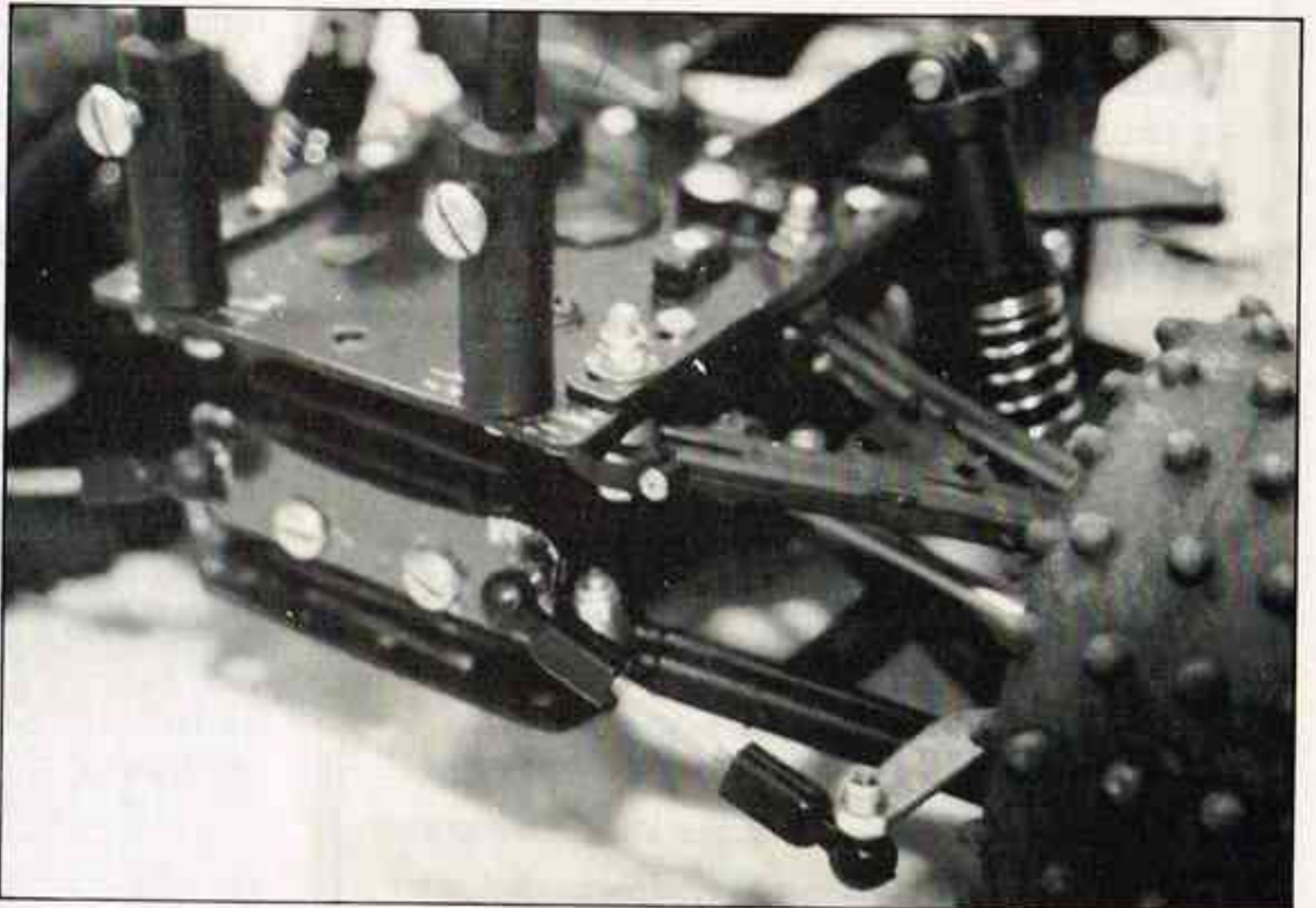
by Paul Leach

Now its only about a month until the first meeting of the 1988 season, so without further ado, its on with part two of running and tuning your PBX3.

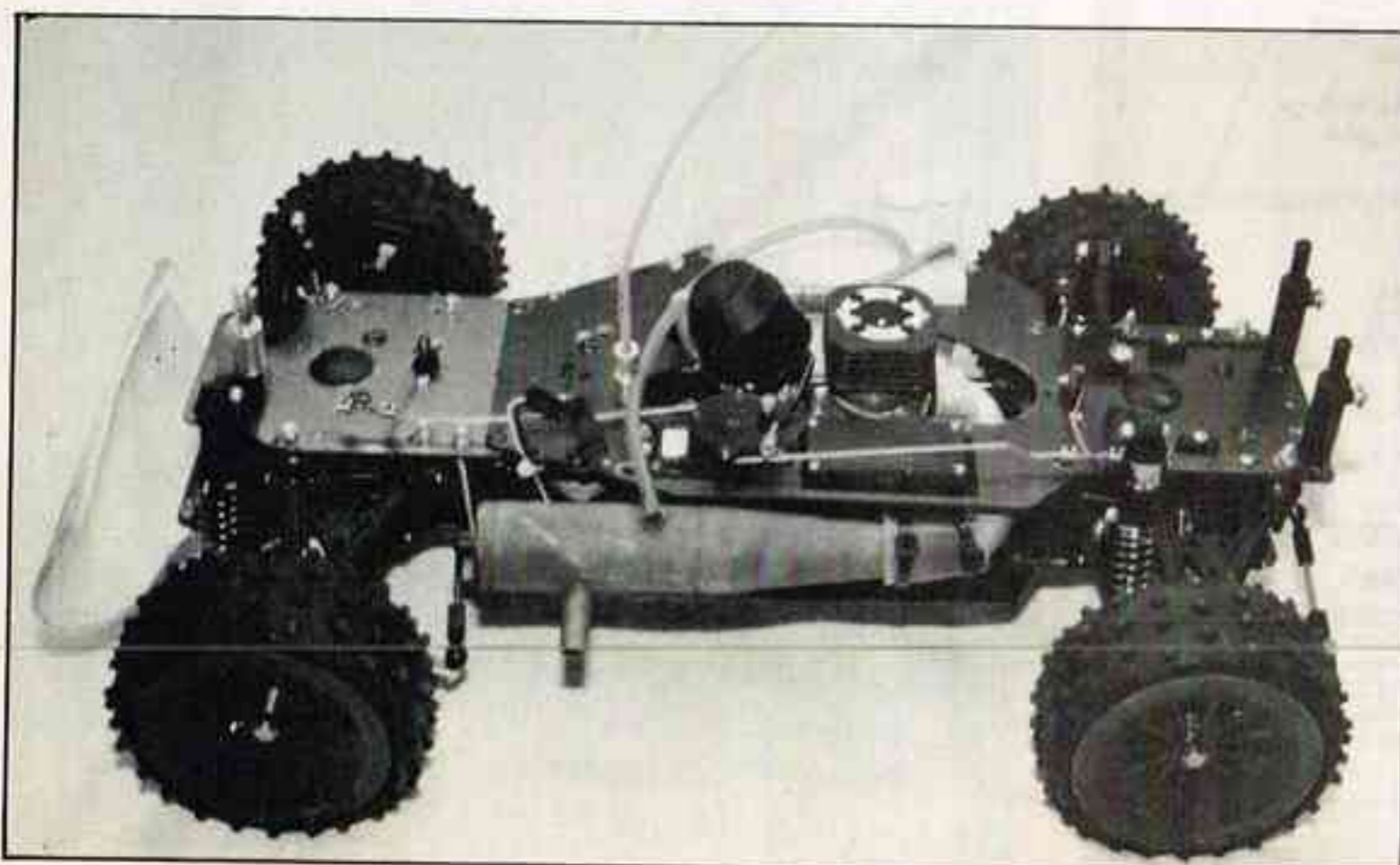
## Suspension and Shock Absorbers

The PBX3 in its standard specification comes with what is termed R.I.S.E. rear suspension. This stands for Roll Induced Steering effect, and in simple terms, means that when the car rolls, especially on slower corners, the rear wheels turn and give the effect of rear wheel steering, the idea being to make the car turn tighter as more roll is encountered. In practice, I have found that the car tends to "oversteer" in slower turns, with a tendency for the back end of the car to snap around, and cause some difficulty in getting traction out of the corner. Another effect of the R.I.S.E. suspension is that a lot of rear camber change is also encountered. Personally, I have removed the spacers from between the top wishbones, and the rear top plate, (Photo 1), as have most of the top drivers, and set the rear suspension for maximum negative camber. This combined with soft rear springs gives excellent trac-

*The rear suspension before any modifications, as you can see the RISE spaces are well and truly still attached, under certain conditions this can prove a disadvantage.*



*The modified PBX3 ready and raring to go.*



tion, and seems to keep the car much more stable, under rough conditions. Whilst on the rear suspension, provision is made on the standard kit for three different positions of inner tie rod ball joint. The best position for the ball joint, is that which will give the car no rear "bump steer". This position is dependent upon the "ride height" of the car, and should be adapted once the ride height has been set. The best position is that which gives the wheels no toe in or out, as the suspension is moved up and down. When in the car's neutral ride height position, about 2 to 3mm of rear toe in is an advantage, this helps with the straight running of the car when under power.

The front suspension is very good on its standard setting, the only modification that can be done is as mentioned last month, to allow the inner top wishbone to move forward, in order to enable you to adjust the front caster. The benefits of this are only of any use to an experienced driver, although experimentation with the caster settings may pay dividends in enabling you to fine tune the car to your own liking.

It goes without saying that the ride height of the car will vary depending on each particular track, but always try and run the car as low as possible, as this will help the car

to stay upright, and cut down the tendency to dig in and roll over.

Only a rear roll bar is included in the standard kit, this seems strange as cars fitted this way seem to have a tendency to dig in on the front corners, and lift a rear wheel, thus losing traction. A front roll bar can be made quite simply using components from the rear roll bar kit (see photo 2), and a couple of small plastic mounting blocks, and should be made from piano wire, substantially stronger than the rear, (about 10 or 12 gauge). When do you use the roll bars? Well, again, this will depend on personal driving techniques, but as a general guide, only fit the roll bars on smooth tracks, where the surface is grass, or very high traction. The effect of the roll bars will be to stop the car rolling, and the outer wheels digging in too much, and causing the car to turn over. On rougher, or low traction surfaces the roll bars should be removed, both front and rear, as this allows the four

corners of the car to work more independently, and enables the wheels to stay in contact with the track surface for more of the time, giving greater traction and better handling.

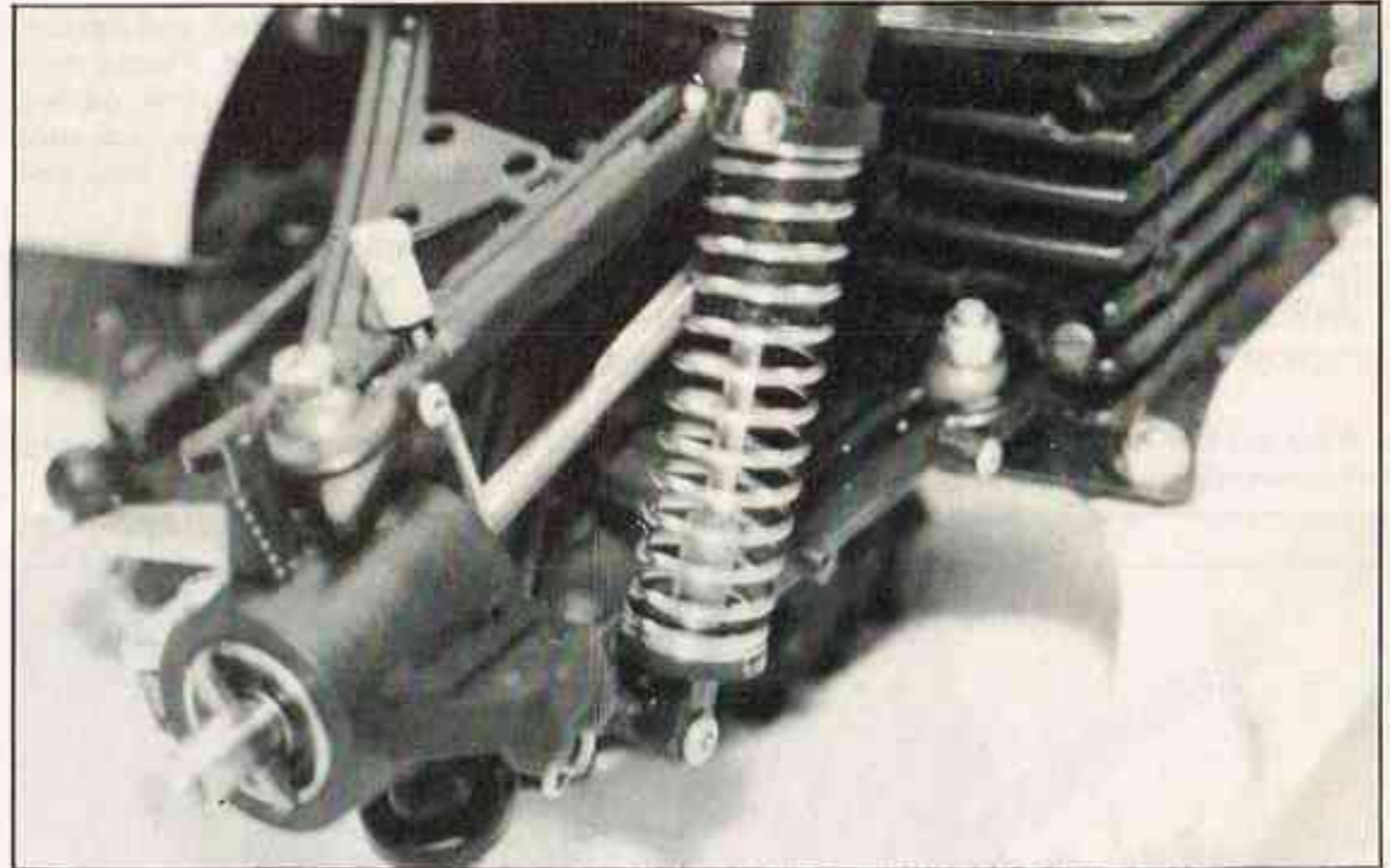
The springs that come with the kit are soft for the front, and hard for the rear, in practice soft springs all round seem to work best allowing full movement of the suspension without the tendency for the rear end of the car to kick up as it does with the standard hard rear springs. The best springs should be as soft as possible, but must be able to return the car to its ride height position without assistance.

A recommendation of "the guvnor" Keith Pledsted, is to fit the shoes in "leading" rather than trailing configuration, this way the shoe is pressing against the post, rather than trying to pull it off it, and whilst this enhances the life of the shoes, it tends to make the clutch grab, with the effect of killing the engine before it has picked up enough revs to be in its power band. Many people confuse this with having a sick engine, the symptoms being to think the engine is running too lean and not picking up, when actually it is insufficient clutch slip which is causing the problem. There are many various forms of clutch on the market, which with a little adaptation will fit the PB. My own solution to the problem has been to fit a PB three pin flywheel, along with Siccom clutch shoes, and serpent springs, (Photo 4), a strange mixture, but one that has this year done the complete British Championships, the Nationals, European Championships and a team race, with 100% reliability, and its still in perfect condition, so it can't be that bad.

Remember the clutch bearing too, a drop of oil between each heat will certainly help prolong the life of the bearing, and reduce the risk of it seizing up.

### Wheels and Tyres

The vital link between car and track, many types are available. PB produce only one type of tyre pattern, but in two compounds. The first type is the one which is supplied



**Look carefully at the shocker shaft and you will notice a silicone bump stop, this modification is simple to do and stops the car bottoming out on rough ground.**

with the kit, and is a synthetic rubber, or plastic, the second is one made from natural rubber. It is generally agreed that the natural rubber tyres are better, but they do wear quicker. The tyres can be fitted with foam rubber, as advised in the kit, this does give them more grip, but makes the tyre bite in more, this is better when the going is soft or muddy, but can give the tyre too much sideways grip on high traction and grassy tracks, so sometimes it is best to remove the foam, and allow the car to slide a little. This can also be achieved by removing the outer row of studs, if you have problems with the car rolling over.

Early in the year, some problems were encountered with the standard shock absorbers, and this tempted people to try different makes, however perseverance with the standard PB units has shown that they can work adequately, provided care is taken when assembling them.

One problem seems to stem from inaccu-

racy of the manufacture of the shocker piston, this seems to cause inconsistency in the damping achieved by each individual unit, and it was necessary to make up about three sets of dampers, in order to be able to match them to make up sets. A good modification here is to use an aluminium damper piston, these are available from Ted Longshaw Model Cars, and once fitted give a much smoother and more consistent damper unit. After final assembly of the units it is advisable to put a spot of superglue on the roll pin which holds the base in position, as these have been known to work loose in use.

One final tip on shock absorbers, is to fit a small piece of silicon rubber (approx 5/8 inch long) to the shocker shaft, to act as a bump stop. (Photo 3). The effect of this is twofold, firstly it stops the chassis from bottoming out after a jump, or over very rough ground, but more importantly it helps in stopping the car from "kicking" up as it lands from jumps etc.

### Engine and Clutch

I am not going to go into detail of what to do to your engine, or how to tune it, as this would take up an issue on its own, and I hope to cover the subject at a later date, so on with the clutch, an area in which people seem to have problems. The clutch on a 4WD rallycross car has much to do, and unfortunately the standard PBX3 clutch is not really up to the job, this is acknowledged by the fact that the manufacturer is at work on a replacement unit. The standard clutch is a two shoe, "trailing type". Two problems arise here, one is the tendency for the springs to fracture, the other is for the shoe to pull off its mounting post, as this is the weakest part of the shoe.

Early in the year, the Siccom team introduced a "spiked tyre" to racing, and this proved very popular, and are definitely worth a try when the ground is very wet or soft, as the spikes bite into the surface better. They do not however give as much sideways grip as the PB studded tyres and the car will tend to stick around a bit more. The spiked tyres do not work on a hard surface as the length of the spike tends to make the car wander, especially in a straight line, and also the spikes tear off quite easily.

Lastly, a new tyre from the Dynamite

*Your scribe's tried and tested clutch conversion, a range of parts which work very well.*



company was tried towards the end of last year, and this I feel will become popular next season. It is based on the studded pattern of the PB tyre, but has the addition of a series of paddles going across the tyre. This should prove good in very sandy tyre conditions, where the studs cannot find grip.

Well, that's about it for tips on the PBX3, so now its up to you to go out and try them

for yourself, and see if this year you too can be a budding James Weedon. Please note these tips are only a personal view, gained from running the car last year, but I'm sure if you follow some of them it will help you get the most from your car.

P.B. will be bringing out some modifications for the car, these are in the form of new strengthened top wishbones, fibreglass top plates and radio plate, and also

universal joint drive shafts. These should be available by about March.

Most of the top drivers seem to be staying loyal to the teams they drove for last season. Again, a strong Siccom team will be headed by John Chamberlain, Richard Stitson, Allan Harman and Ralph Allum, with many more good drivers backing them up. James Weedon will again be driving for the PB team, and your scribe will be driving his own PB. A new team will be seen next year, and this will be team "Kyosho", probably starting with a team of three drivers, soon to be announced. Shaun Armstrong has sold his old Serpent car and also joined the PB ranks. Rumour has it that Mike Brinkworth will also be doing the same. It's nice to see new manufacturers joining the fun, and adding to what is going to be a great new season. So make sure you come along and join in the action. I'll finish by wishing you all good luck for the new season and see you all soon.

P.S. The new calendar has just arrived. The first two races are at Slough on March 20th and next at Ipswich on April 3rd. The names to be contacted are:

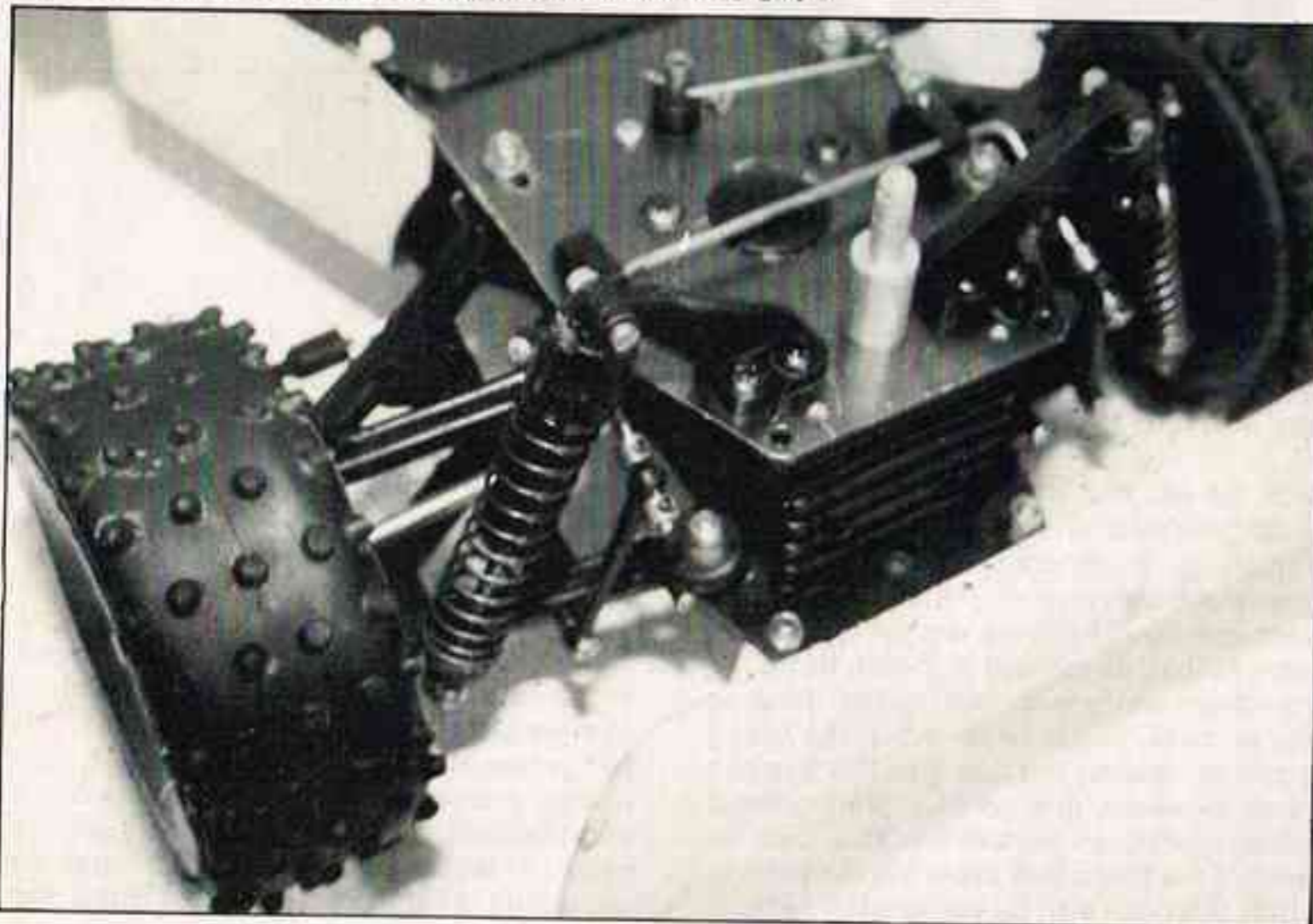
**Slough, March 20**

Mr R. Stitson,  
c/o Windsor Model Shop,  
45 Albany Road,  
Windsor SL4 1HL

**Ipswich, April 3**

Mr G. Weston,  
c/o Galaxy Models,  
Felixtowe Road,  
Ipswich, Norfolk.

**A front roll bar modification is easy to accomplish and well worth doing as it does stop any tendency to stop the rear inside wheel losing grip.**



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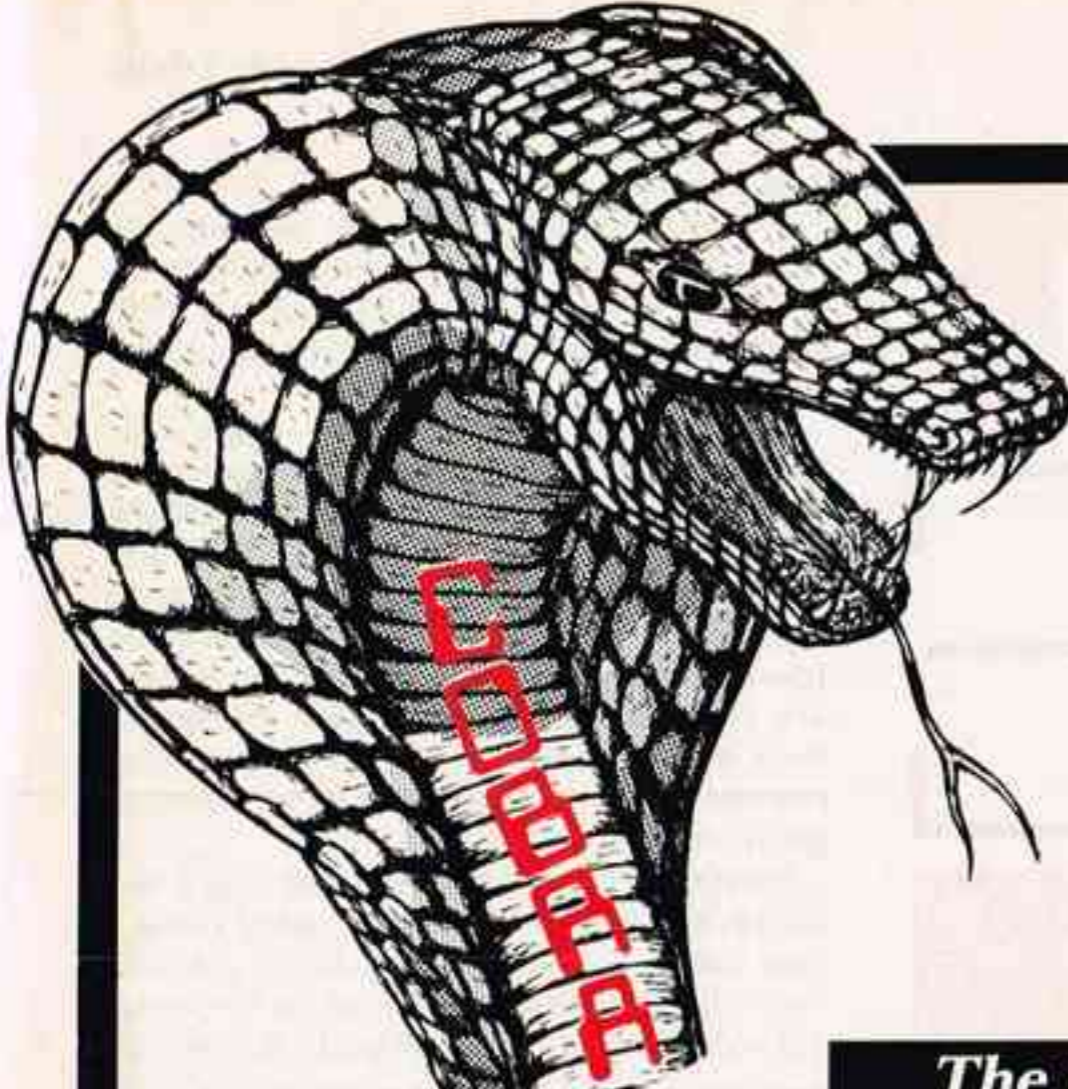


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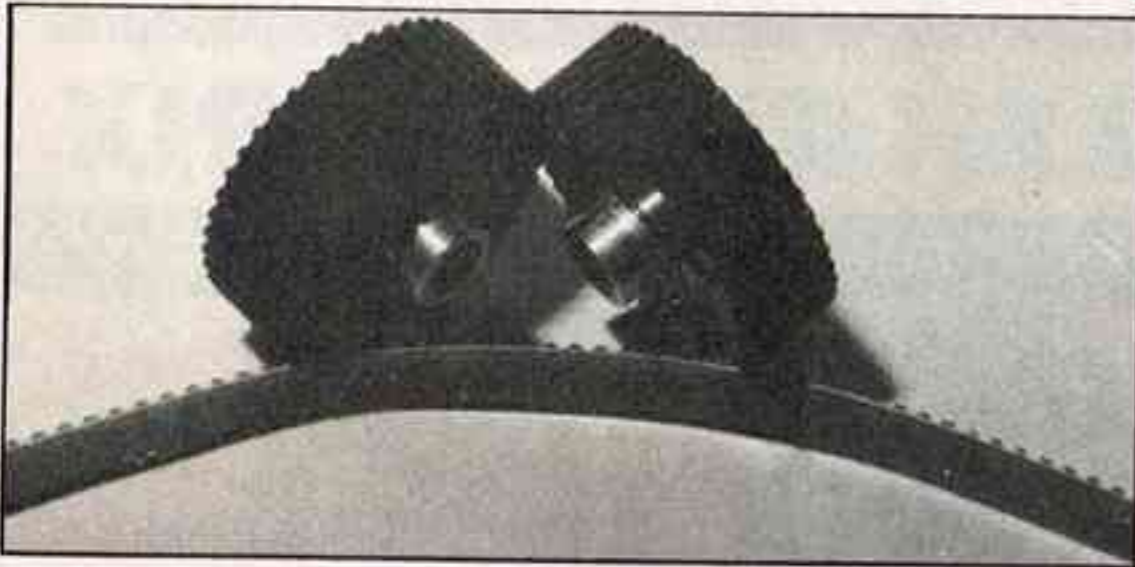
# MARKET PLACE

and guides.

The Wasp unit utilises eight ballbearings instead of the twelve ex-factory and is claimed, when used in conjunction with Wasp belts to be more efficient and aid belt tracking.

Second new product from Wasp this month is this belt driver conversion for the Optima family of r/c cars, nothing radically changed or different from the factory unit except the Wasp belt is fine pitch and once again due to belt material is claimed to be more efficient. Both front and rear pulleys are black anodized. One point worthy of note is that the new drive belt is claimed to contact over half the pulley circumference giving maximum traction.

Finally a 12 volt soldering iron that must be the iron to end irons. After using Wasp's new iron we can back their claims that this iron solders leads to batteries, in the freezing cold in less than 90 seconds! Consump-



### Wasp Products

Two new items from Wasp this month. First a beef up part for the CAT, the Wasp ball differential unit, this consists of a single

piece pulley unit which replaces the standard three piece factory unit, main gear centre bush, layshafts and pulley spacers



tion is less than 8 amps approx. The new Superheat iron is just the job for resoldering those last minute wire breaks just before your race.

- Cat Differential = £24.95
- Optima Belt conversion = £21.50
- Superheat Iron = £23.75

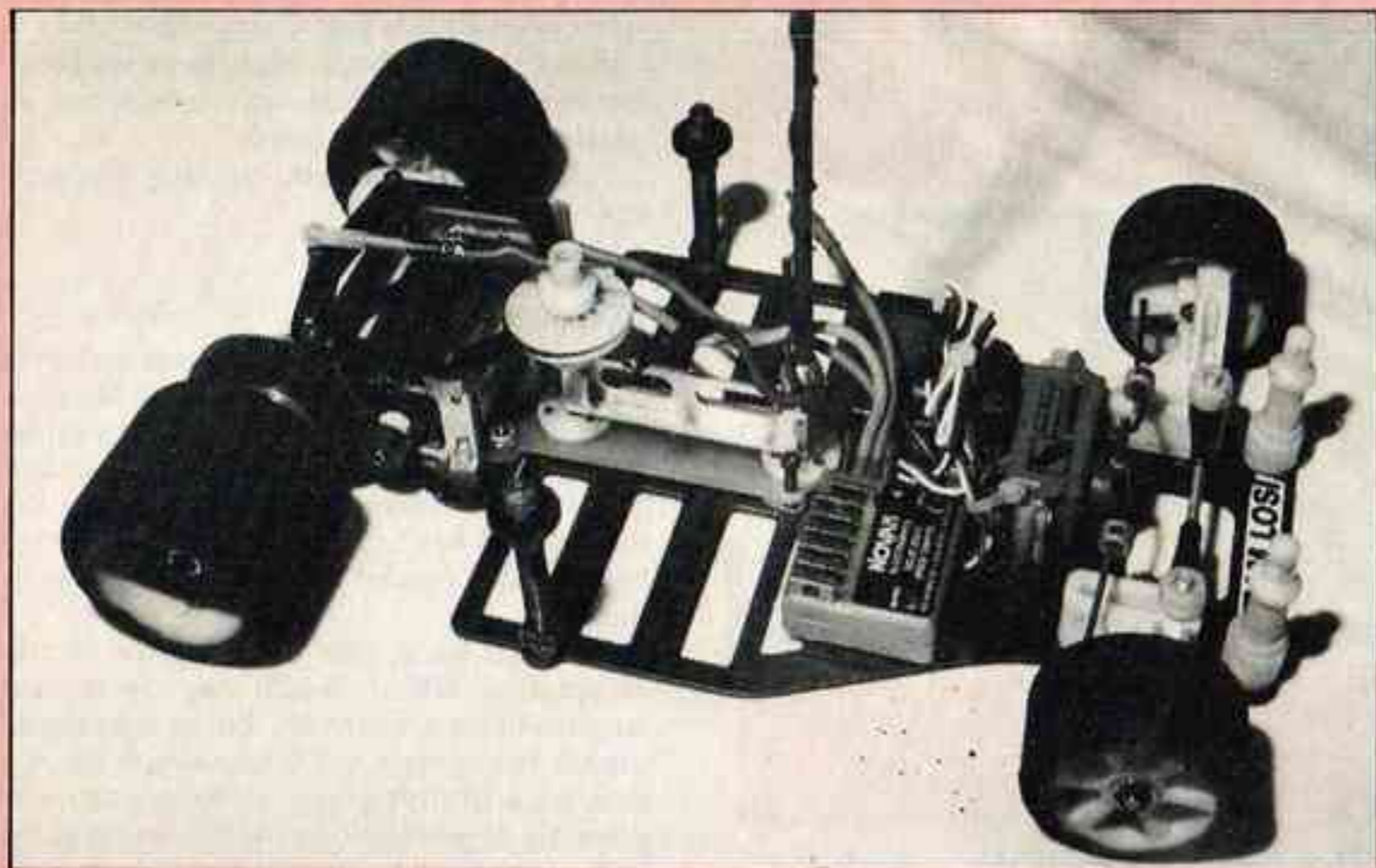
All available from Wasp Products Ltd., 13 Morningside Road, Worcester Park, Surrey KT4 8LQ.

### Parma

Several new items from Parma this month starting with no less than five new car releases all at 1/10 scale. Clockwise from left to right Pro Panther Sports, Pro Panther Hot Rod, Challenger sprint, Pro Drag funny car and Pro Panther NASCAR, all kits are available in basic (rolling chassis and body) or deluxe, motor, batteries and resistor speed controller. Race numbers are the next item from Parma in a bold black on white design which is highly visible, making sure your car is counted correctly. 1/12 lightweight wheels will fit all 1/12 hubs. Finally the combination body detailing pen, the ultimate source for detailing scale bodies from slot to 1/4 scale.

All above products available from Helger Racing or your nearest Parma agent.





**Associated RC12L strengthening brace and roll mast support**

Chassis rigidity increased, eliminates any longitudinal flex between front and rear T-bar mounts, thus allowing all damping to be concentrated at rear damper plate assembly. Front end incorporates roll mast support, interested parties should state whether using Schumacher or D&D graphite mast.

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Modified motors require constant attention to commutator, brushes, springs etc. in order to obtain the best results on the track. Poorly maintained bearings can also let you down. This new tool with all relevant instructions will enable you to remove and maintain those bearings so you are running at the highest efficiency. Price £4.95.

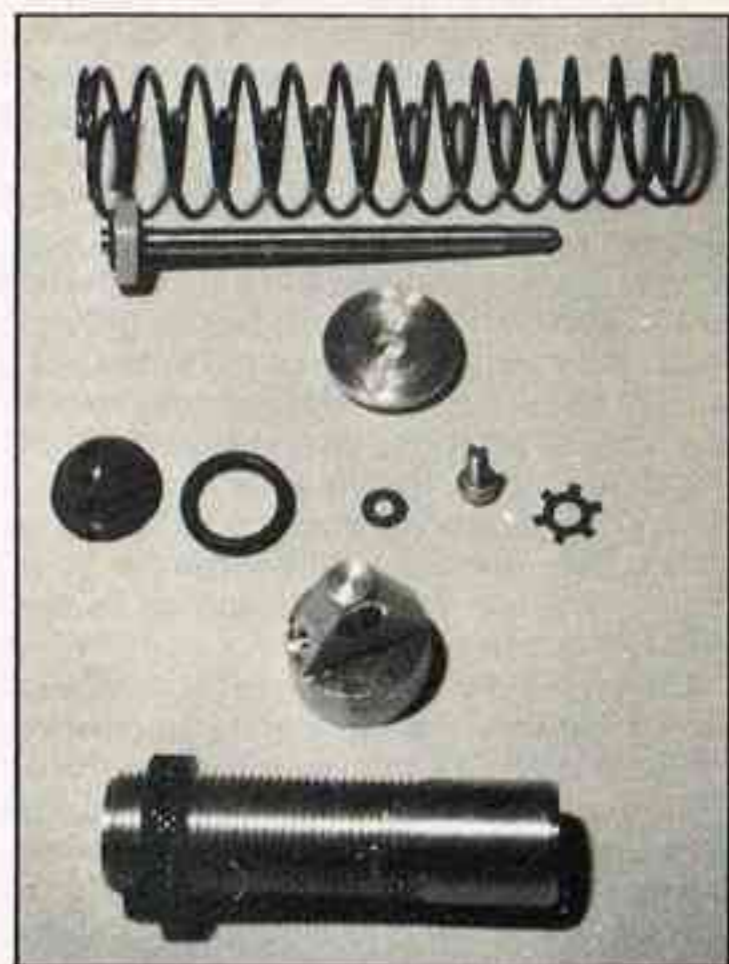
Both items available from Central Models Ltd., Unit 11, 16-20 George Street, Birmingham B12 9RG. Tel. 021-440 2677.



**Brimod SX**

Seems like Brimod have done it again. How do you improve a first class product such as the Brimod S shock absorber? Well it seems that you relocate both seals, O ring or optional VVC diaphragm in the roof of the shocker cap. Then you use 24 threads per inch instead of 32, this reduces any binding which may occur under bad conditions. Next you move the sealing system guide onto the inner side of the lip seal, this submerges the guide in oil making for a smoother action and allows the bush to act as a guide itself, simple really! In all seriousness Brimod shockers are one product that we at RRC do recommend. Now those clever Brimodies have made them even better.

Available from Brimod Engineering Developments, 45 Rooker Avenue, Parkfields, Wolverhampton, West Midlands WV2 2DT. Phone Bilston 403121 or 43463.



**Coming soon from Tamiya**

Hot on the heels of Tamiya's latest release the Thundershot, comes news of spares and beefed up parts. A Thundershot body part set complete with stickers will shortly be available. Whilst on the subject a rear roll bar is also due to be released, the set comprises, roll bar, bull joints, ball connectors, threaded shafts, grub screws and instructions.

As the likelihood of Monster truck competitions becomes ever closer the need for ballraces grows. Tamiya have pre-empted this and are about to release a bearing set for the Clod Buster allowing all metal and plastic kit bearings to be changed.



**Bolink**

Two new bodysells from Bolink, relive the era of the factory hot rods with Bolink's latest classic, the 67 Super Sport Camaro, a perfect companion for your Mustang. Now for something completely different. To mark Ferrari's fortieth birthday a 1/10th scale Ferrari F40 Le Mans with all the scale detail of the real thing including the rear wing.

# STOCK AND OVAL

by Mike Smith

It is becoming apparent that the £150 maximum engine rule for I.C. Stock Cars has been given a mixed reception, from the post bag this month an air of uncertainty appears to dominate the correspondence, most would agree that it was a necessary move to rid the sport of the anomalies with last season's exclusion list where certain engines were not allowed to be raced due to their power capabilities or their cost. The next season will be the final testing ground for past theories never been put to the test, will we all have to spend the money or will there be no effect, I have always been of the opinion that providing the oval circuits remain the same dimensions as they are today, then the extra Whoomph for your money will not Whoomph you on to the winning rostrum.

The engine that is coming to the forefront as number one contender in the popularity stakes is the OS21, this engine was permissible under last year's regulations but for some reason has climbed the charts, the fascination with this engine can be attributed to a number of things, other than its performance and reliability.

Firstly it did win the 1987 World final in Holland, not on its own of course, it was in a well designed car with an experienced Eddy Smeets at the controls.

Secondly the fast man of the circuits Trevor Heasman, who snatched the European

title so convincingly in '87 certainly has a way with the OS, again it must be said that Trevor's engine knowledge has a lot to do with the performance he obtains from the OS engines.

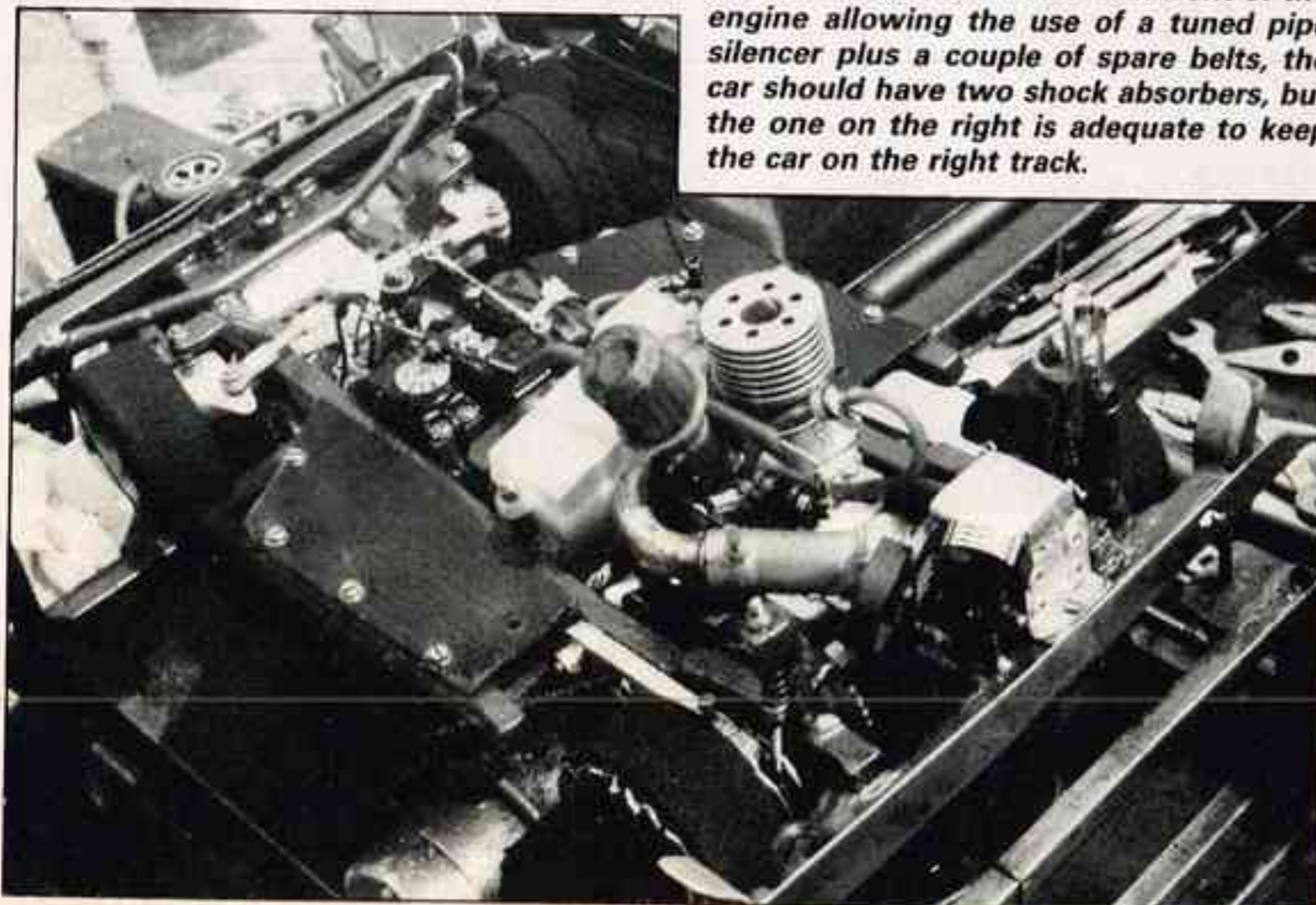
Thirdly and probably the most obscure reason is the fact that if you can now spend £150, with a list of engines as long as your arm that include such notables as OPS, Rossi, Picco, then the OS is the only £100 plus motor that has been doing the stuff on the oval circuit, as £150 to the Stock car zealot is worth selling your Grandmother for, who's playing Russian Roulette with your Grannie's ransom?

One point that seems to be overlooked is that your last year's engine will be as competitive this year as was last.

Most will have heard the name Steve Talbot, most will agree that he can be classed as a fairly useful chap when it comes to handling an IC stocker, he has put all the main titles under his belt in his time and

*The car of the current World Champion Belgium's Eddy Smeets. It is not unusual for the cars of the European countries to be on the heavy side, anything up to and over 8lb is common, the European circuits are on average almost twice the size of those in Britain, so fast engines with high nitro content are the order of the day.*

*The fuel tank is mounted in front of the engine allowing the use of a tuned pipe silencer plus a couple of spare belts, the car should have two shock absorbers, but the one on the right is adequate to keep the car on the right track.*



paces both British and European circuits.

In a recent telephone interview with Steve the matter of engines was mentioned in passing, I said, point blank

"What engine are you running this season?"

He said, blank point, "I'm not telling."

Which made me say

"Allo allo what we got here then" in a policeman like voice bending both knees in unison, which doesn't have the same effect on the telephone, I thought to myself can Steve be foresaking his Irvine's to join the throng hell bent on purchase of power or had the old master got something else in mind.

It would be at this point where an unscrupulous Editor would say 'read next issue to find out the truth', but as the subject matter is not really a life and death issue it would be of little point, so here goes, the possible engine change for Steve was planned a long time before the new engine rule was brought into effect. In fact a complete new car is in the offing for this season which will incorporate new ideas that Steve has worked on over the closed season, he has a mind to win back the titles he lost last year and to that end the car will have a leaning to be designed for the much larger European circuits where Steve has to admit, he was definitely under power last year. As Steve says, "You can't rely on your Irvine to deliver the goods when you are up against high power engines running on very high concentration of nitro, on a circuit that dwarfs the British circuits".

Trevor Heasman was the first to point out to Steve that there is a limit to what he can do to the Irvine, and although Steve was very reluctant he has had to look elsewhere for that bit extra.

Steve is very quick to point out that for this country he will be still running the Irvine, and as long as the clubs stick to the

*Below, Steve Talbot, the man who lost more titles last year than I could hope to win in a life time.*

*Steve plans on a return to the top with a new car for this season, with his eyes on the European circuits the master Ovalkeeni is planning some tarmac splitting changes in the construction of the 1988 car, you need the bottle to use the throttle in Holland (nitro), but drop the speed to take the lead in the UK.*





present size of the circuit then there is no need to change.

It will be interesting to see if names not normally in the listings of excellence will be powering their way to victory, with the purchase of power, or as I think, don't panic into a situation that will not materialise whilst the simple and most effective restrictions stay and that is the length of a straight and the width of a tyre, the words may change but the song will remain the same.

**Motile Beetle**

The popularity of limited cost racing created by the Mardave Mini Stock, has prompted Motile Model Development the tyre manufacturers, to introduce a 1/12th electric VW Beetle kit, which is hoped will race alongside the Mini to give a little more variety on the circuits.

So as not to out-perform the Mini and infringe the basic reasons for running limited cost racing, the Beetle utilises the Mini Stock axles and motor mounts.

The Beetle can be purchased in two forms either as a rolling chassis with body shell to enable those with Mini's to change cars inexpensively, or if you don't possess a Mini any electrics will fit, or you can purchase the full kit which includes the Mini Stock electrics, i.e. motor, speed controller, 4 cell battery pack and charging leads.

**Construction**

The rolling chassis version is already assembled, it includes the chassis plate which provides for the longer more standard wheelbase, a polypropylene front bumper, this is a circuit car flat bumper, a rather mean looking Beetle bodyshell with mounts, front and rear axles with motor mounts and front steering arms, servo saver and track rods.

The front wheels are standard mini, but the rear are wider to take the more popular circuit car rear tyres which are 38mm, the wider rear wheels will fit the Mini but the Mini's narrow ones won't fit the Beetle's wide rear wheel arches.

The tyres supplied are as one would expect from a tyre manufacturer, a little special, they are non-additive carpet tyres, that is to say traction is not improved by the use of additives this is hoped to make the car

allow the use of tyre treatments, there is also a firmer grade of tyre available for carpet and outdoor use.

With the chassis being that much longer

it makes space for the batteries, up to six cell can be easily installed, it also allows a little breathing space for your radio gear, the instructions with the car are sparse so



Above, the VW Beetle is a classic, with enough nostalgia to endear it to young and old alike, Motile's version looks the part with large flared wheel arches and rear spoiler, the wide rear wheels and tyres give the car purpose as well as grip.



Above, the rolling chassis and the Beetle body shell, this shell has been spray painted using normal cellulose car sprays, the shell is ABS plastic and requires the windows and wheel arches cutting away before you paint your Wagon. Below, the Beetle looks like a real flier and it does, but the theme of limited cost racing is what this car is all about, the use of Mini Stock components ensures the continuation of low cost competitive racing, either on the Oval or circuit.



more acceptable with clubs that will not say the least, it makes one think that Motile are assuming that everyone is fully acquainted with the layout of the Mini, or other circuit cars, although neither Mini or Beetle resemble a full blown circuit car, except for the four wheels, fitting the rest of the necessary equipment was not difficult and even the raw beginner should stumble his way through the process without having one gear forward four in reverse.

**Conclusion**

The Motile Beetle is a perfect running mate to the Mini, even the most ardent zealot of limit cost racing could take little exception to its presence in the same class of racing, the Beetle's longer wheelbase means that most of the 1/12th bodysells could be made to fit including the Grand Prix or GT class of bodies which gives the car variety.

This car is no great performer compared to the specialist 1/12th cars, but has more than enough speed to satisfy the most demanding limited cost racer.

The Beetle has enough of a cult following to make this scaled down version an attractive proposition to anyone who wishes to compete in an inexpensive formula. The price of the rolling chassis is £24.95, the full kit is £49.95, for further details contact Motile Model Development, 2 Linkside, Nelson, Lancs BB9 9LJ. Tel. 0282 691665.



*Terry Dickinson, the Chairman of the 1/8th Oval section of the BRCA doing what he likes the best and that's racing, Terry likes to take the bull by the horns, let's hope the BRCA don't bring him to his knees.*

**The Chairman of the 1/8th Oval section of the BRCA states the case**

A new name emerges from the ranks of the BRCA committee, Terry Dickinson, the new 1/8th Oval section chairman.

With all the turmoil of the past year I asked Terry to explain how he sees the future of the organisation and what part he would play in aiding communications throughout the sport.

For those who have only just become acquainted with the name, let me say that Terry is experienced in all aspects of IC stockcars and if he doesn't know all the answers he certainly knows those who do, you will find him easy to get along with even if you support the other point of view.

I would like to thank Terry for taking time out to explain his viewpoint at this most involved time of the year and wish him every success in this thankless task and hope he is still talking to me at the end of the year.

"When Mike Smith leaned across to me at the BRCA AGM and asked me why I didn't stand for the job of 1/8 IC Oval Section Chairman, my initial reaction was a light-hearted laugh. Mike's sense of humour is well known and I put this down as being one of his little jokes.

It took me a minute but eventually I realised he was being serious, and after weighing up an escape route and deciding that I'd never make the exit, I settled for Plan B and came up with a brilliant excuse 'It's not really practical, you know, since all the meetings are in the Midlands, and I live up 'ere in the North'. Now I was well pleased with this, but Mike didn't seem impressed at all, and insisted that he was going to nominate me, which he duly did. There was still a ray of hope however when Steve Talbot nominated Paul Dudley to contest this

prestigious position. I smiled contentedly, sure in the knowledge that the contest was already over and wished him well in his new job as we waited outside for the inevitable result. However, it didn't quite work out as expected, and here I am putting pen to paper on a bleak January morning, once again at Mike's request. And to think I sent him a Christmas card!

The problems of the past twelve months have been well documented elsewhere, and in any case are well known to all but the most infrequent competitors in the sport.

Amalgamation between the RSCA and the BRCA came in with much expectation and nearly ended in disaster. As it is, although damage has been done, and splits in the ranks do exist, I believe at this point in time that these are not beyond repair, and that we can all still profit greatly from the venture.

At the Tibshelf AGM, all the mumblings, and moans and groans of the previous twelve months 'probationary period' of amalgamation came to a head and the BRCA Chairman Paul Pagdin, came in for some pretty heavy attention from people well used to putting the bumper in. Several things came out of this heavyweight contest, and I'll try briefly to outline the main points for the benefit of those who were not present.

Most of the really heavy griping seemed to surround membership problems. Many people, it appears, either never receive their membership details or had had to wait for most of the season before they arrived. Now I should really reserve judgement on this issue, because as far as I know everyone in my home base in the North of England got their details early and continued to get 'Circuit Chatter' etc. throughout the year. I do know, however that this was not the case universally and can therefore understand the problems.

The situation was explained away by Paul as being a combination of computer malfunction and difficulties with the new Club affiliation scheme. Strangely enough, whilst this explanation may not go the whole way towards silencing the critics, having worked with computers myself I can honestly say that I'd have more faith in the reliability of my Stock-car which doesn't say too much for computers. Because of this, I for one was prepared to accept his explanation.

Other problems which raised dissent included Insurance cover, lack of information on available discounts, club affiliation, and a general breakdown of communication about forthcoming events, not least the fact that no fixture list had ever been published

At the end of an hour's battering about this varied range of subjects, Paul began to look like he wished he'd stayed in bed that morning, but had accounted well for the BRCA's part in the shortcomings of the organisation's year. His appeal for continued unity was later rewarded by a unanimous vote to continue as you were in the foreseeable future.

I would like to take this opportunity to endorse that decision, and to say a few words as to why I believe it to have been the correct one to make.

When joining any organisation, it's important to remember the aims of that organisation. In this case, the BRCA exists to promote model car racing in this country. As the leading body in this field, it naturally attracts considerable attention and support from the manufacturing side of the industry

and in fact some of the leading figures in the Association are also leading manufacturers (Ted Longshaw, Cecil Schumacher to name but two).

With this in mind, it would seem to make sense for anyone with a serious interest in the success and continuation of the sport to be able to have some kind of say over how these people go about their business. Similarly, the manufacturers themselves have a vested interest in a continued relationship with the BRCA since it keeps their fingers on the pulse of the people who matter most to them; those who buy their products. So the message as far as I'm concerned is — If you want to have a say, join the BRCA!

At more grass routes level, everyone can benefit from the services that the BRCA can provide, things like cut price insurance cover, discounts on travel, and the supply of information which keeps everyone in touch with the scene.

On this last point I have a serious complaint to make against the membership of the oval sections, who griped all last year about the lack of communication and the supply of information. Whether you like it or not, this is a situation which can only be improved by a two-way trade. Whilst I am not for a moment trying to excuse last year's Committee their share of the blame for the difficulties, they can only act on, and distribute information if it is given to them in the first place, and I'm afraid that did not happen.

To a certain extent it is still not happening now, so I would like to make a plea at this point for increased co-operation from all the clubs and their Reps, in all aspects of the running of the Association.

Without your help, we as a Committee cannot function and I for one am not prepared to take the blame for shortcomings under those circumstances.

On the other hand, I am very prepared to make myself available for (constructive) criticism and as a first line of communication at all times. My phone number has been, or will be, well circulated and I look forward to hearing from any of the members of this section about any subject.

So what of the future? On the membership front I understand that Paul Pagden and company have now sorted out their computer problems and I would like to encourage all stock-car drivers to take out membership in the Association and to make as much use as possible of its facilities and services. I will be glad to supply details of these if required.

My own personal view of the overall future of model stock-car racing is that it could soon begin to suffer membership problems in some areas of the country. One of the main driving forces behind our sport, the full-size racing has recently been suffering a decline with several stadiums closing and falling attendances. Unless concerted efforts are made by the clubs to continue the influx of new members, and unless all the clubs are united under one banner, I believe our own decline may follow. There is, at present, no reason why this should happen, as the means are there to prevent it. If the BRCA is given a chance to act in the interests of all the clubs, by the clubs, I believe the future could be quite rosy.

I hope one or two of these points are taken on board by the membership, and that next season will be successful and profitable for the Association. I would personally like to wish you all the best of luck in 1988."

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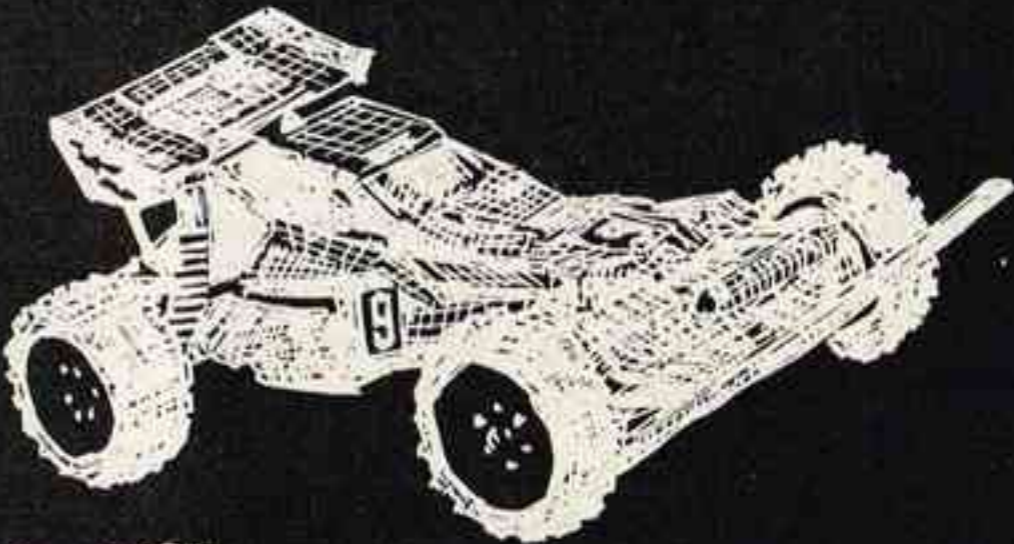
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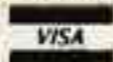
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# DIARY DATES

### WMBC Tarmac Meeting

Following recent successes, West Midlands Buggy Club are holding another tarmac meeting on February 28. Application forms are available from Chris Kennedy, 3 Nora Court, Great Barr, Birmingham B43 6OX.

### Aylesbury Off Road Club

Dates for 1988 meetings at Aylesbury are as follows:

April 17	Standard
May 22	Modified
June 19	Standard
July 17	Modified
August 12	Standard
Sept 18	Modified
Oct 16	Charity event

All enquiries should be addressed to Roger Fellows on 0296 21250.

### GEC Stychfields

Stafford is the place to be on Monday April 4. A Tarmac meeting for 2 and 4WWD is being held with separate finals for each class. Each competitor will have at least three heats plus a final.

For further information contact J. Robson, 1 Aldersleigh Drive, Wildwood, Stafford ST17 4RY.

### Schumacher 1/10 Indoor National Championships

A series of indoor meetings to find an Indoor champ will be held at the Mansfield Leisure Centre. Dates are as follows: February 14, March 12, April 3, April 23, Finals May 29.

For further details phone Malcolm Webb 0623 653346.

# RADIO RACE CAR SERIES

## DRIVER'S NUMBERS 1988

Listed below is your Radio Race Car number, be sure to quote it on any correspondence you may have with any club in the R.R.C. series. If your name doesn't appear here, don't worry, applications for numbers are still coming in and another list will appear next month. If you haven't yet applied for your number we would encourage you to do so. If you don't apply you will be allocated a number at the first heat you take part in.

RRC No.	Driver's Name	Club / Team	RRC No.	Driver's Name	Club / Team
<b>4WD MOD</b>			<b>4WD STD (contd.)</b>		
5001	John Zotti	Basingstoke Radio CC	4014	Mark Rogers	Basingstoke Radio CC
5002	Mark Cox	Chippenham MCC	4015	Roy Kelley	Basingstoke Radio CC
5003	Michael Wray	Basildon BC	4016	Tony Bretton	Basildon Buggy Club
5004	Andy Shaw	Cranford BC	4017	Phillip Walden	Heathrow
5005	Chris Davidson	Racestore	4018	Gareth Delve	Private
5006	Jim Carr	Private	4019	Carl Treleaven	Medway Off Road Club
5007	Paul Rouse	Bournemouth	4020	M. Dingle	Perry Common BC
5008	Len Gibbons	Basingstoke	4021	Stuart Anderson	Basingstoke Radio CC
5009	A. M. Stevenson	Bury Buggy Club	4022	Matthew Stent	Basingstoke Radio CC
5010	Dave Eggleton	Sandwell C.A.C.	4023	Danny Stent	Basingstoke Radio CC
5011	Matthew Taylor	West Midlands B.C.	4024	G. Hind	Private
5012	Ian Francis	Swansea Electric C.C.	4025	Tony Hickson	Dudley Buggy Club
5013	Nigel Cooke	Private	4026	Steve Cook	Aylesbury Off RC
5014	Edward Walden	Crawley/Heathrow	4027	Colin Steele	RCP
5015	Peter Coope	Rotherham B.C.	4028	Dave Pearson	Radio Race Car
5016	Paul Jorgensen	Club Heathrow	4029	Steven Pearson	Radio Race Car
5017	Chris Long	Cranford B.C.	4030	Sharon Billington	Radio Race Car
5018	Gareth Jones	S.S.R.C.C.C.	4031	Matthew Trump	Thatcham
5019	Ben Fuller	Eden Park Overlander	4032	Andy Shaw	Cranford B.C.
5020	Mike Billett	Chippenham MCC	4033	Jim Carr	Private
5021	Jason Billett	Chippenham MCC	4034	Edward Walden	Crawley/Heathrow
5022	Paul Hartstone	Rolls Royce	4035	Paul Jorgenson	Club Heathrow
5023	Colin Pates	Private	4036	Simon Hardy	Shrewsbury South R.C.C.C.
5024	Martin Laye	Private	4037	Mark Buckle	Y.O.R.C.C.
5025	Gary Crowther Green	Private	4038	Mark Alexander	Wrexham E.P.O.R.
5026	Simon Hardy	Shrewsbury South RCC	4039	Stuart Perry	Basingstoke Radio CC
5027	Mark Buckle	Y.O.R.C.C.	4040	Carl Treleaven	Medway O.R.C.
5028	Alexander Page	Puma Racing	4041	Tony Hickson	Dudley B.C.
5029	Mark Alexander	Wrexham E.P.O.R.	4042	Sam Durbin	Oakdale R.C.C.C.
5030	Wayne Jones	Dudley R.C.C.	<b>2 WD MOD</b>		
5031	Carl Treleaven	Medway Off Road Club	3001	James Brewer	Sandwell C.A.
5032	Craig Darnley	Timmins Electrical	3002	Andy Shaw	Cranford B.C.
5033	Paul Metcalf	East Grinstead O.R.	3003	Jim Carr	Private
5034	William Mitcham	Bury Buggy Club	3004	Paul Rouse	Bournemouth
5035	Richard Gorringe	Bath Buggy Club	3005	Ian Francis	Swansea Electric C.C.
5036	Paul Green	Blake Hall	3006	Martin Laye	Private
5037	Gary Cutler	West Midlands B.C.,	3007	Mark Buckle	Y.O.R.C.C.
5038	Stephen Smith	Pyramid Model C.C.	3008	Wayne Jones	Dudley R.C.C.
5039	Andrew Smith	Pyramid Model C.C.	3009	Carl Treleaven	Medway O.R.C.
5040	R. C. Carless	Swindon O.R.C.	3010	William Mitcham	Bury B.C.
5041	John Littlewood	Private	3011	John Littlewood	Private
5042	Andrew Robson	G.E.C. Stychfields	3012	Andrew Langdon	Swindon O.R.
5043	John Robson	G.E.C. Stychfields	3013	Ken Reith	Donisthorpe
5044	Paul Lisseter	Team F.T.D.	3014	Jason Cook	Medway O.R.C.
5045	Andrew Langdon	Swindon O.R.C.	3015	Larry Cook	Medway O.R.C.
5046	Jason Cook	Medway Off Road Club	3016	Hayden Spreadborough	Aylesbury
5047	Larry Cook	Medway Off Road Club	3017	Mike Bridges	M.G.N.
5048	Hayden Spreadborough	Aylesbury	3018	Steve Haynes	M.G.N.
5049	Peter Darwell	Medway Off Road Club	3019	Steve West	M.G.N.
5050	Wayne Darwell	Medway Off Road Club	3020	Neil Stringfellow	M.G.N.
5051	Stuart Ashford	Private	3021	Nick Marson	M.G.N.
5052	Mike Bridges	M.G.N.	3022	Keith Chaplin	M.G.N.
5053	Steve Haynes	M.G.N.	<b>2WD STD</b>		
5054	Steve West	M.G.N.	2001	Warren Dawson	Radio Race Car
5055	Neil Stringfellow	M.G.N.	2002	Kevin Griffin	Macartneys Models
5056	Keith Chaplin	M.G.N.	2003	Andy Pierce	R.C.P.
5057	Nick Marson	M.G.N.	2004	Brian Pierce	Kidderminster M.C.C.
<b>4WD STD</b>			2005	Paul Lisseter	Team F.T.D.
4001	Warren Dawson	Radio Race Car	2006	G. Hind	Private
4002	Kevin Griffin	Macartneys Models	2007	Carl Treleaven	Medway O.R.C.
4003	Andy Pierce	RCP	2008	Mark Rogers	Basingstoke Radio C.C.
4004	Brian Pierce	Kidderminster MCC	2009	Matthew Williams	Oakdale R.C.C.C.
4005	Nicholas Tulip	Thatcham RCC	2010	Mark Southall	Kidderminster M.C.C.
4006	Mark Ashton	Rushden Buggy Club	2011	Mark Buckle	York O.R.C.C.
4007	Leon Pearson	Medway Off Road Club	2012	Chris Davidson	Racestore
4008	Tony Meech	Abergavenny RCCC	2013	Andy Shaw	Cranford B.C.
4009	Richard Barton	Aylesbury ORRC	2014	James Brewer	Sandwell C.A.
4010	Mark Southall	Kidderminster MCC	2015	Mark Cox	Chippenham M.C.C.
4011	Matthew Williams	Oakdale RCCC	2016	Simon Cumberpatch	Nene Radio C.C.
4012	Cy Lapwood	Basildon BC	2017	Jim Carr	Private
4013	Andrew Rose	Abergavenny RCCC			

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## Radio Race Car International

# 1988

	2WD	4WD
March	6 Stafford	March 13 Swindon
April	24 Chesterfield	April 3 Birmingham
May	8 Worcester 29 Medway	May 15 Medway
June	5 Kidderminster 18 Aberdare	June 19 Aberdare
July	17 Donisthorpe	July 10 Cosford 31 Kidderminster
August	28 Birmingham	August 7 Bournemouth
September	11 Bournemouth	September 4 Chesterfield 25 Stafford
October	9 Swindon	October 2 Worcester

### FINALS

- STAFFORD in writing to 1 Aldersleigh Drive, Wild Wood, Stafford ST17 4RY
- SWINDON 0793 29239
- MEDWAY in writing to 10 Blenheim Close, Meopham, Kent, DA13 0PQ
- CHESTERFIELD 0246 35796
- BIRMINGHAM 021 325 1117
- WORCESTER 0905 353142
- KIDDERMINSTER 0562 754155
- ABERDARE 0222 30443
- BOURNEMOUTH 04252 4917
- COSFORD in writing to RRC, Masefield House, Wells Road, Malvern, Worcs WR14 4PA

### RULES

1. Unless previously notified by the organiser all racing will be to BRCA rules.
2. Standard and Modified classes will both be catered for in each and all events.
3. Six rounds of racing plus the final will be raced, all meetings including the final will count towards final scores.
4. All results will be taken on qualifying times.
5. Each driver will be allocated a driver number and should remember to quote this on all entry forms when possible.

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