

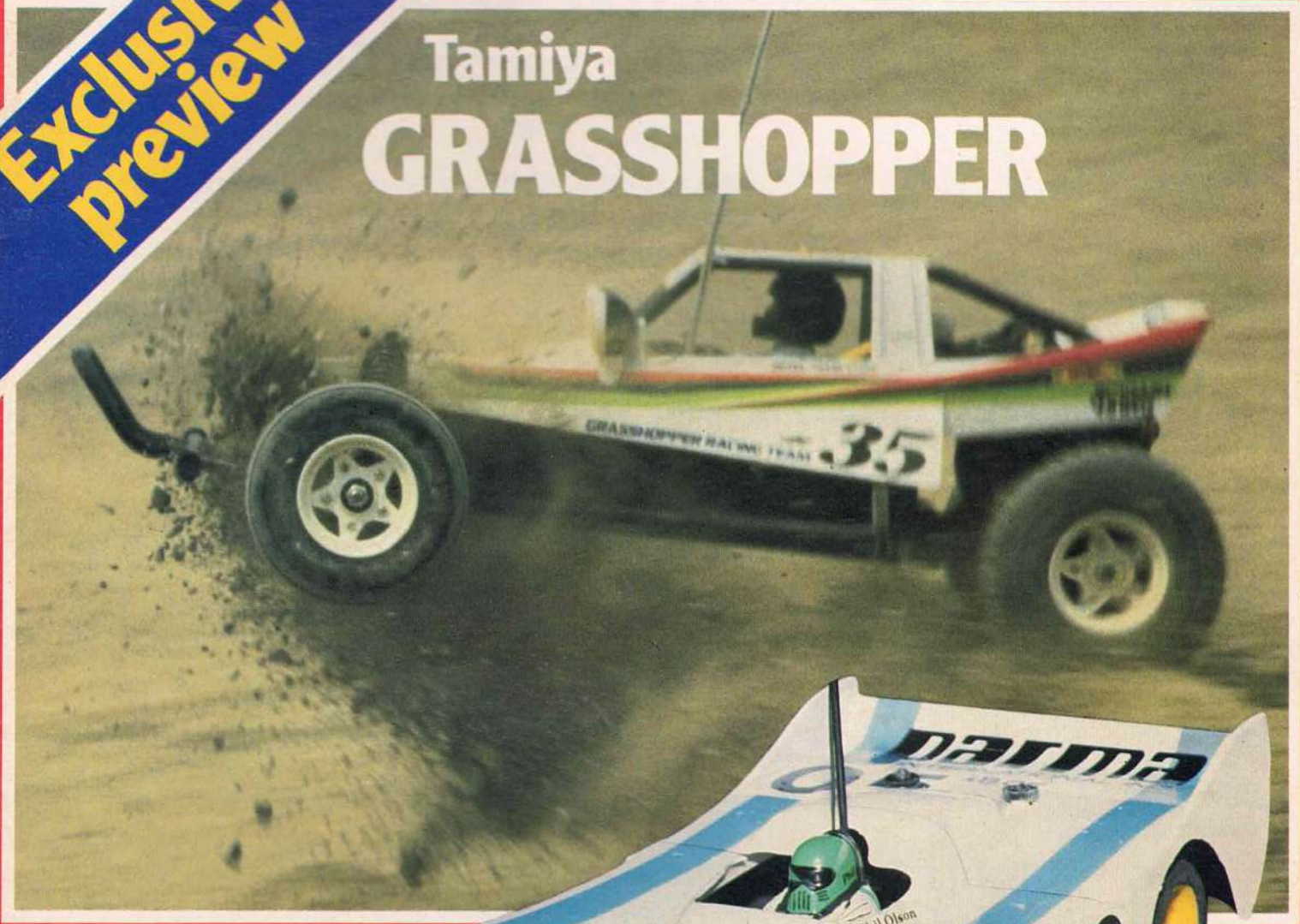


MODEL PUBLICATION

# Model Cars Monthly

**Exclusive  
preview**

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**GRASSHOPPER**



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COMPETITION**  
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# Model Cars Monthly

(I.R. £1.48½)

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## Cover

*The all-new Tamiya Grasshopper takes pride of place on this month's front page and further details are featured inside. Also pictured is Phil Olson's European Championship winning 1/12th scale Parma 'Panther' car. Full details of how Phil and Parma took on the rest of Europe are included in our in-depth report on page 30.*

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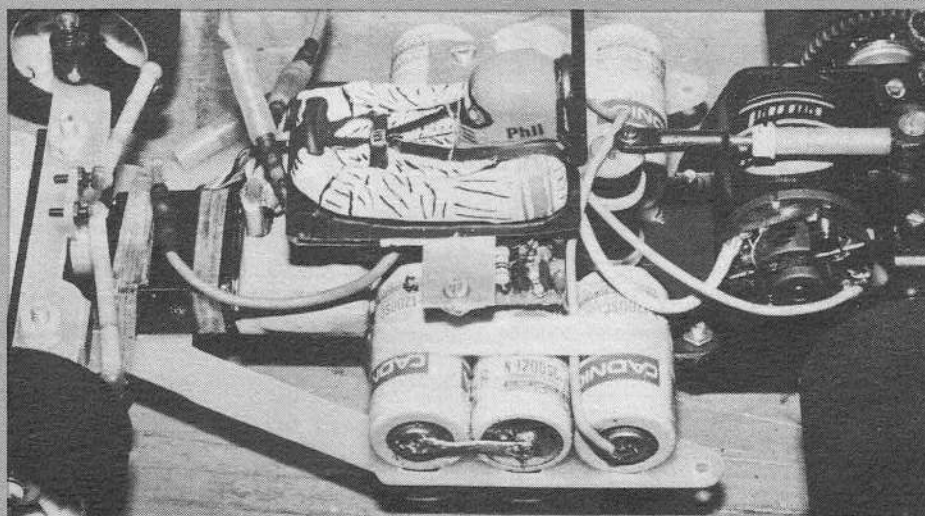
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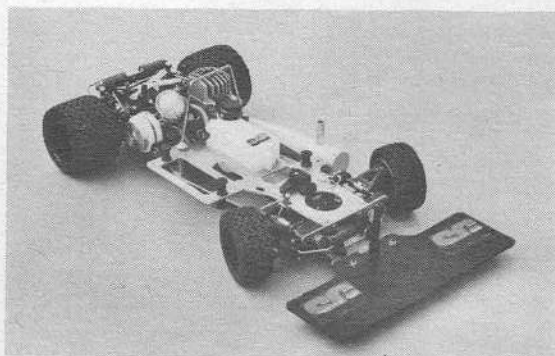
*The aggressive styling of the model makes it very attractive. The transmission is performed by three differentials, shafts and cardans, supported by ball bearings. The four wheels have a parallelogram suspension system with 4 hydraulic shock-absorbers and adjustable springs. If requested, two extra shock absorbers can be mounted to the model. The conical gears (front and rear) can work at their best, being contained in a tight box. The box also contains the pilot, of Lexan, specially designed to prevent dirt (mould and sand) from reaching the central transmission and the steering mechanisms. The break-gas control is located in the centre of the chassis, thus making every adjustment operation very easy. In addition, the fitting of two steering controls with two servo-saver is foreseen.*

*The chassis is made of high resistance light alloy and drilled with extreme precision. The high resistance steel roll bar is prepared for the assembling; the easy replaceable reduction gears are calculated for every kind of ground (9:1 - 12,5:1).*

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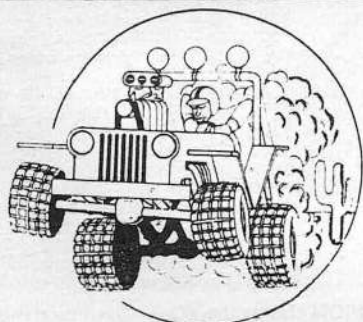
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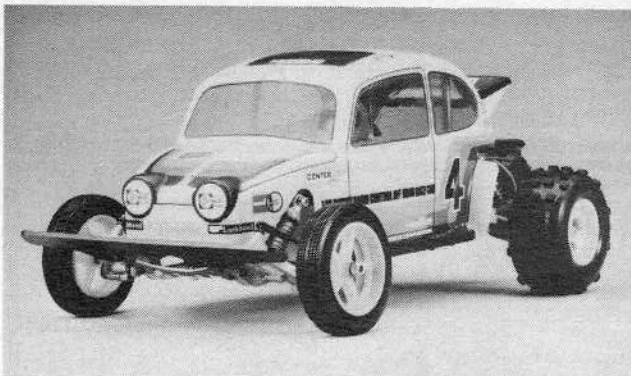
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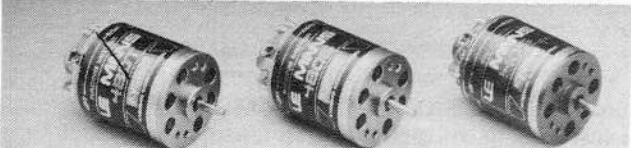


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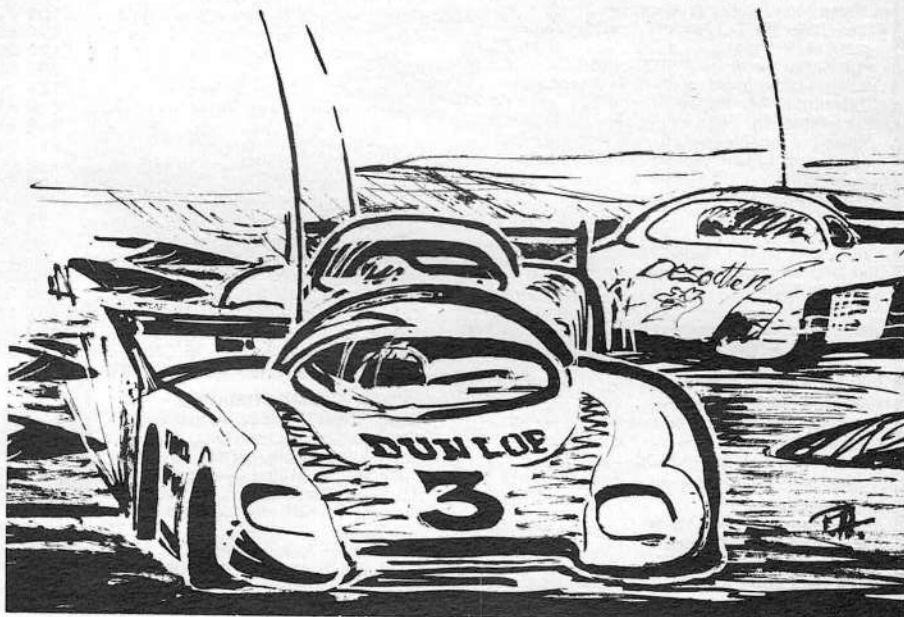
## Club chat

The Remote World Off-Road Club is rapidly progressing as membership increases and facilities improve. Projects currently under way include the imminent arrival of a permanent drivers' rostrum plus maintenance of the track surface. The club secretary Steve Dean has issued a second newsletter detailing all the club activities to date plus a calendar of club and national events.

The club meets the first Sunday in every month at the Remote World Circuit, Gatehampton Farm, Goring on Thames, Reading, Berks, RG7 9LU.

Terry Dutton of the Derby Model Car Club has dropped us a line to inform anyone interested in 1/12th scale racing of the club's existence. They meet weekly, on Tuesday nights from 6.30 to 10.30 at the Queen's Hall, London Road, Derby, racing on Primafelt Carpet with heats of eight minutes duration. The Derby Club offers new members exciting and competitive racing with a club championship meeting on the first race meeting of every month. Timing is by a computer and each driver gets three heats plus a final. Once a month they run a two hour team race with names drawn out of a hat.

Visitors and new members are always welcome so contact Terry on (0283) 38968 for more details.



The Nationals will be held on the 25/26/27 of August (Saloon, Formula, Sports/GT respectively) with the circuit open for practice on the 24th.

The Mendip club members are making every effort to ensure that this event will be highly enjoyable for competitors and their families.

Catering will be available from lunchtime Friday through to Monday evening with a service of breakfast, lunch and a barbeque on Saturday night for all ages. Half portions for children. A four-day licence for the sale of beer has also been applied for. For further details, contact R. Mayor on 045-387 2646.

### 1/8th Scale World Champs 1985

The actual date and location of this event, to be held in Japan, is still unknown, basically because of the problems in finding an attractive enough sponsorship deal to fund the event. Naomi Tomita, president of FEMCA (Far East Model Car Association) and director of JMRCA (Japan Model Radio Car Association) has organised a committee, which is at present working on acquiring the Suzuka circuit located in the middle part of Japan and which is owned by Honda. However financial backing from Honda is not assured and other arrangements will have to be made.

Finally, only six entries from Japan will make the trip to the 1/12th Scale World Championships in August, this brings the total number of places needed by FEMCA to seven. This is way below their quota and so the remaining places will go to EFRA and ultimately create extra places for Great Britain.

A recent BRCA 1/12th committee meeting has allocated three new placings to Frazer Smart, Chris Arnold and Bill Jones. Phil Daniels also looks likely to receive a place.

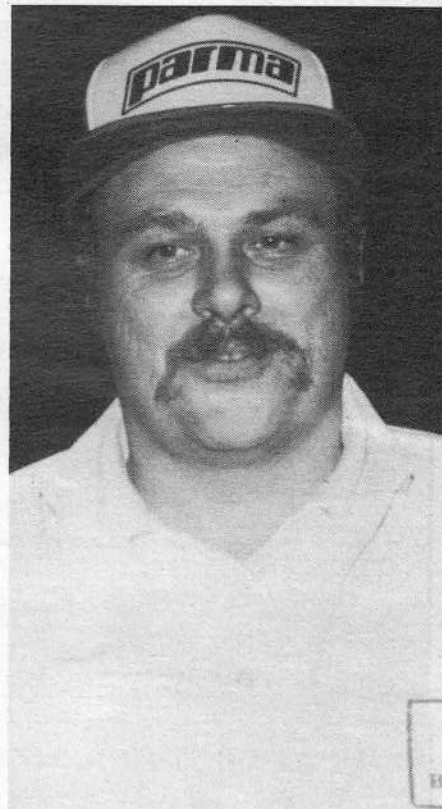


Above: John Keay (left) shakes on the deal with Ray Gillycuddy of Burmah Castrol (UK).

### Nationals sponsorship

John Keay, owner of the Mendip Model Racing Circuit, situated near Weston-Super-Mare has recently announced a sponsorship link with Castrol for the 1984 1/8th IC Nationals.

John and Ray Gillycuddy, publicity controller from Burmah Castrol (UK) recently shook hands on the deal which will give the event a wide promotion through Castrol's regular adverts in the national motoring press.



Above: George Land the latest Parma product release for two-function R/C.

### Helger Racing restyle

Gerry Goldberg informs us that he is handing over the marketing, distribution and technical side of his Parma agency to George Land. George is well known in 1/12th scale circles and attaining even greater renown as the BRCA 1/10th section chairman. George will no doubt be using his wealth of experience in both scales to actively promote Parma Products. The new address to contact



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for product information is: Helger Racing, 18 Manor Farm Drive, Chingford, Essex E4 6HJ. Tel: 01-628-8117.

## Associated changeover

The *Associated* import/distribution agency in Great Britain has once again changed hands and will now be handled by *Elite Models* of 145 Newgate Lane, Mansfield, Notts. NG18 2QD. Walt Bailey of *Elite Models* tells us that he will be handling the complete range of 1/12th scale racing equipment as well as the new 1/10th scale buggy. 1/8th scale products will only include bodysHELLS, tyres and spares for the 'RC 500' car. Customer orders will be dealt with promptly and sent out through the already established 'Superspeed' distribution service.

All enquiries concerning *Associated* Products should be directed to *Elite Models*, Tel. (0623) 36062.

## Events Focus

Although this is the August issue several events in July will be held after actual publication. Details of these meetings are available here.

### July 8

#### Medway Off-Road Club Open Meetings

Every two weeks 1/10th scale electric buggy racing to BRCA rules. Contact Jim Crabb, 10 Blenheim Close, Meopham, Kent. DA13 0PQ.

AUGUST 1984

### July 15

#### Weston Off-Road Trophy Meetings

This is an open event for 1/10th scale buggies run by the Weston Off-Road Models club to BRCA regulations incorporating local modifications. Entry fee £3.00. First race 10.30am. Practice 9.00-10.00am. For further details concerning rules, entries, race schedule contact Mark Pope, Timberscombe, Bridgewater Road, Lympham, Somerset. Enclose SAE.

### July 15

#### World's End Off Road Club Radio Race Car — round four

1/10th Scale buggies 540 + 380. Contact Colin Spinner, 52 St. John's Avenue, Northampton, Northants.

### July 21

#### Basildon Buggy Club 1/10th Open Meeting

540 Standard class (£10 motor limit) to BRCA rules. Venue Southwash Road, Laindon, Basildon, Essex (rear of *B&G Lawns*). Entry fee £4.00 to Jim Stone, 121a Collier Row Road, Romford, Essex. RM5 2AT. Enclose SAE.

### August 1

#### Poynton Buggy Club Open Meeting

At the Queen's Arms Hotel, Stockport Road, Cheadle, Manchester. Details from W. Pendleton, 49 Sledale Close, Offerton Estate, Stockport SK2 5NQ.

### August 5

#### Ilkeston Model Car Club Buggy Event

1/10th scale Off-Road 540, + 380. Venue Mundy Arms, Marpool, Heanor, Derbyshire (on the A6007 between Heanor and Ilkeston). Contact Jon Wood, 47 Byron Street, Ilkeston, Derby DE7 5JG. Tel. (0602) 302550.

### August 8/9

#### Rolls Royce Grand Prix

BRCA 1/12th scale National Points Scoring meeting, Saturday — Standard class, Sunday Modified Class. Venue Rolls Royce Sports Centre, Derby. Entry fee £5.00. Enquiries to Dave Towell, Derby 771805.

### August 19

#### Donisthorp Miners' Welfare Model Car Club

1/10th Scale Off-Road, 5 hour Enduro team race. 4-man teams plus manager. Entry fee: £16.00 per team. Contact: Roy Statham, 5 School Street, Oakthorpe, Nr. Burton-on-Trent, Staffs. DE12 7RE. (0530) 71285.

### July 29/September 23

#### Chesham Off-Road Club Open Meeting

To be held at the Royal Oak, purpose-built circuit at Little Missenden, Bucks. Racing classes are as follows: Tamiya Standard 380 + 540. 540 Open Class (£10 motor limit). Entry fee £4.00 per class. Send to Race Organiser, 5 Rickmansworth Road, Amersham, Bucks. Enclose SAE.



## Yokomo Dogfighter

Japanese company, *Yokomo*, are already well known for their electric motors, now they have

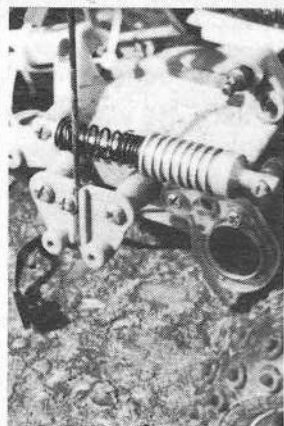
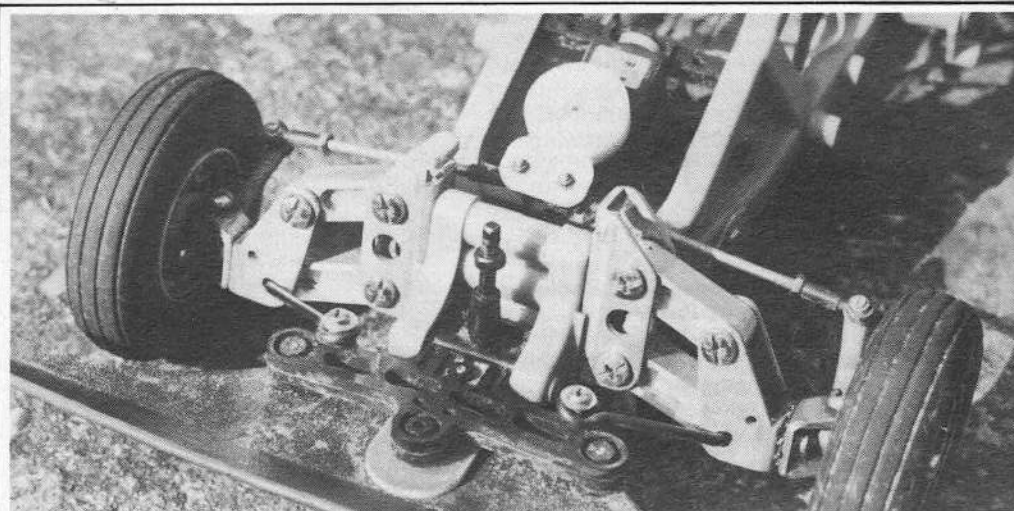
turned their hand to R/C car kit production. This 1/10th scale, electric powered, off-road racer incorporates four-wheel drive and a full racing specification.

The major features are as follows, rear differential; front wheel roller bearings; adjustable coil-spring shock absorbers; anti-roll bars; quick charge motor pinion system; heavy duty resistor type speed controller.

The 'Dogfighter' is supplied 'almost-ready-to-race' needing only the installation of R/C gear and fitting of wheels/tyres and bodyshell. The drive system for front and rear wheels is via a chain running lengthways to the chassis.

Optional extras for the kit are *Yokomo* 'Turbo-Power' 72 volt Ni-Cad pack and *Yokomo* 'Off-Road' standard racing motor.

The 'Dogfighter' should be widely available from model shops. Price TBA.



## A. Hopkinson buggy parts

*A. Hopkinson Ltd.*, of 14-15 South Gallery, Exchange Street, Sheffield. Can now supply a range of their 'home produced' tune-up parts for the popular makes of 1/10th scale electric buggy. These include the 'Frog' and 'Subaru Brat' extras shown here.

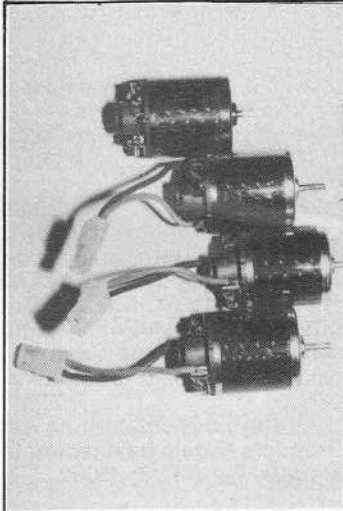
At the rear *A. Hopkinson* are manufacturing 5mm thick perspex side pivot plates for the suspension trailing arms. These will provide greater

support and lessen the rate of wear around the pivot point. Price £1.00 a pair.

At the front machined alloy suspension arms which are not only stronger but will also eliminate any 'play' in the suspension. Prices £2.50 each. £4.95 a pair, £8.95 a set of four.

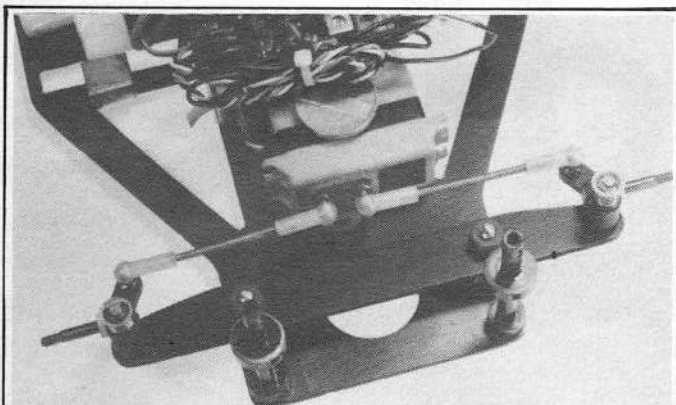
*A. Hopkinson* can also supply heatsinks for 540 Off-Road, 1/12th and 380 size motors. Price £4.00, £2.00 and £3.00 respectively.

All the above are available mail order from the above address.



## Demon Motors

Nick Adams of *Demon Products* is now supplying a range of *Yokomo* style motors for standard and modified class racing. These motors are BRCA legal and are available in a variety of winds for modified racing with two types of standard motor for 1/12th and 1/10th scale Off Road racing. BRCA price limits apply to all motors. Contact *Demon Products*, 79 Northumberland Avenue, North Harrow.



## New Parma products

Once again the *Parma* newsletter keeps us up to date with the latest releases. *Parma's* new, 'White Lightning' motor, commutator conditioner for standard and modified motors for that extra punch of the line.

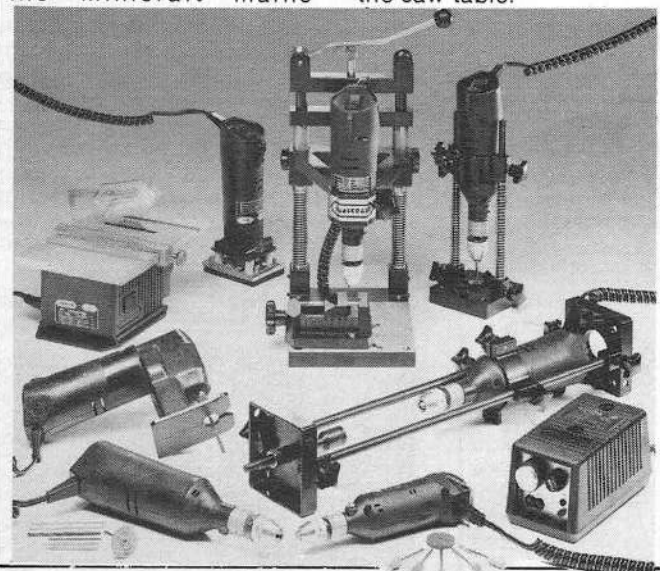
New lightweight design 'Panther' front end for more precise steering response. **COMING SOON!** the new specification 'Panther Euro' car as designed by Chris Arnold and winner of the 1984 European Championships. Contact *Helgar Racing*, c/o 18 Manor Farm Drive, Chingford, Essex E4 6MJ for further details.

## Minicraft Power Tools

A wide range of miniature power tools aimed specifically at the model and home craft enthusiast are now available through *Black and Decker*. The 'Minicraft' range includes various size drills, saw table, disc sander, jigsaw and orbital sander. All the above are powered from a 12 volt source either lead acid car battery or through the 'Minicraft' mains

transformer. The 'Minicraft' System is an extremely flexible one, the 'Buffalo' drill can be used to form a vertical drill press and lathe with the conversion kits available.

The complete range of tools are available from *Flair Products*, Holdcroft, off High Street, Blunsdown, Wilts. An SAE will get you the Minicraft catalogue and price list. Prices range from £12.50 for the drills to £32.95 for the saw table.



AUGUST 1984

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## Bearings and Bushes

In any Off-Road buggy, breakages and wear of moving parts are likely to form the most expensive part of running a car. Breakages are usually the result of accident or just plain stupid maltreatment, but wear is an insidious occurrence that creeps up almost without the user realising until it is too late. Of course the dusty environment that buggies are run in is the real problem, eliminate the grit and fine dust and wear rate diminishes rapidly.

For our purposes, bearings fall into three basic categories: see Fig. 1

(a) plain drilled or moulded in holes in parts, i.e. wishbones, pivots.

(b) bushed bearings, a suitable 'bearing' metal bush is fixed into parts requiring bearings and can be used anywhere on the buggy.

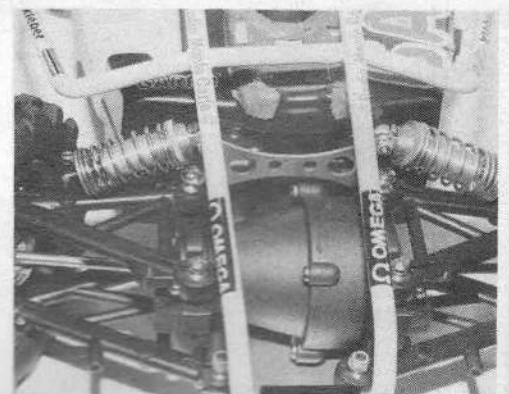
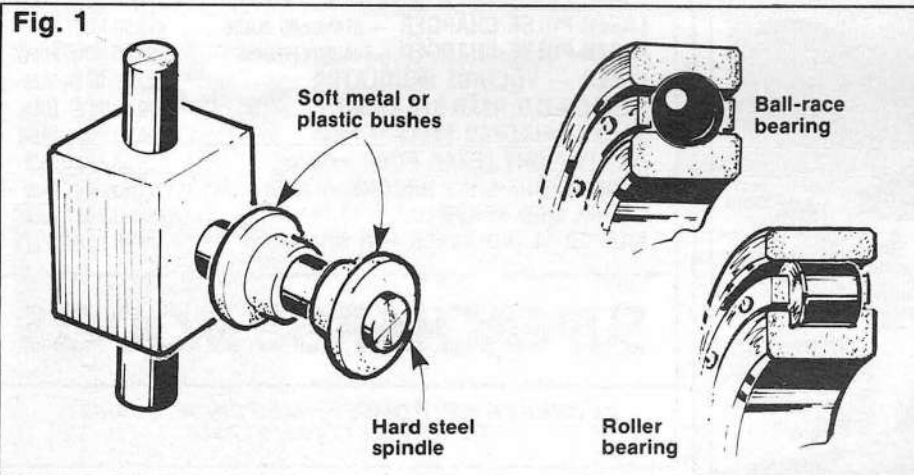
(c) ball or roller bearings, the top of the line system, once again can be used anywhere on the buggy.

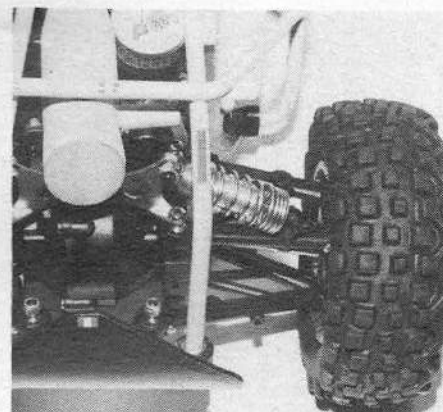
Bearings of type a and b rely on the 'hard against soft' principle, that is to say, in wheel bearings for arguments sake, the wheel spindle is a hard or hardened item whilst the bush or bearing is of softer material. A steel spindle would be used with either a

sintered bronze, brass or 'engineering' plastic bearing in the wheel. Sintering is a process which involves compressing and heating metal powder in a mould to produce dimensionally accurate, semi-porous items which in bearing bush form retain lubricating oil. Engineering plastics are usually reckoned to be the stronger, harder plastics such as Nylon, ABS, Acetate, etc. which are very rigid and dimensionally stable. It is possible that bushes from PTFE will be used, this plastic is notable for its very low coefficient of friction and thus is a good bearing material although not very robust.

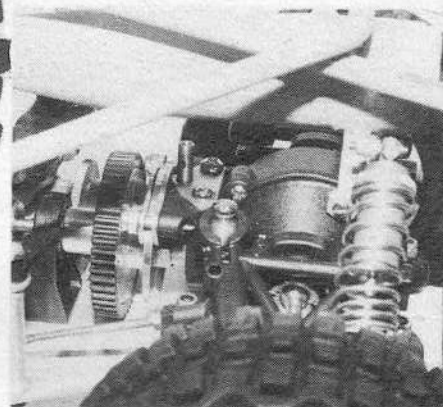
Both ball and roller bearings can be found in model cars and are, to all intents and purposes, the longest lasting and most free moving bearings relying on a rolling contact rather than sliding contact. In fact, bearings should not actually contact at all, the function of the lubricating oil in a bearing is to physically separate the two parts so that in an ideal world the moving part floats on a bed of fluid, the resistance to rotating then depends on the thickness or viscosity of the oil. Probably the lowest friction of any type of bearing is an air bearing where the moving parts are separated by a layer of air pumped through the bearing.

*Below: close-up of the 'Ghepard' front end showing injection moulded differential casing and adjustable coil spring shock absorbers.*





Above: the 'Ghepard' has a very large suspension movement, 3in. on each wheel whilst still keep the other three on the ground.



Above: close-up of the combined centre differential and disc brake.

## Garbo GHEPARD

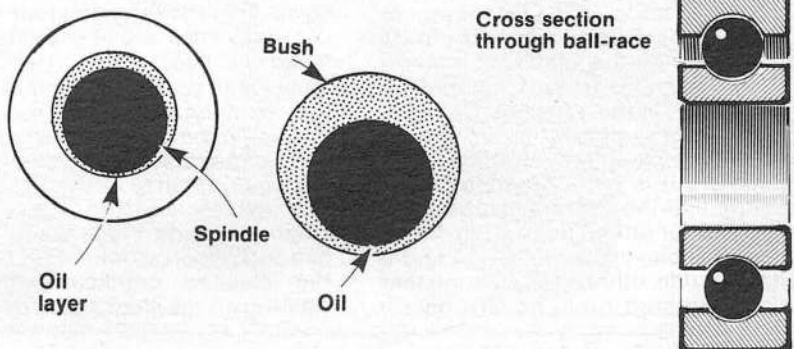
Above: the Garbo 'Ghepard' 4WD buggy will soon be available in the UK through PB Racing Products. The cars are supplied ready built minus R/C gear and engine. Features include: three differentials; adjustable coil-over shockers; water-tight radio crate.

Grease is frequently used to lubricate bearings but for ballraces in particular graphited greases are not recommended as they can cause lapping or wearing down of the moving parts. An ideal situation is an oil mist for ball-races, too much oil causes 'churning' an an increase in heat generation.

There must be a clearance between moving parts of a bearing to allow for this important layer of lubricant see Fig. 2. Too great a clearance will cause wear to increase as oil drains from the bearing whereas with just the right fit, capillary actions tend to retain oil for quite some time. Once the lubricating oil film breaks down, wear becomes very rapid as moving parts contact directly. On the other hand too small a clearance can cause problems, the thin layer of oil resulting heats up rapidly, the oil ceases to act as a lubricant with similar results.

Dirt is the major hazard however, for even very small amounts of dust in a closely fitting bearing will cause devastating damage in a very short time. Dust is usually nothing more or less than stone particles in very fine form. Try scraping a sharp stone across a piece of plastic and the result will show just how abrasive stone or

Fig. 2



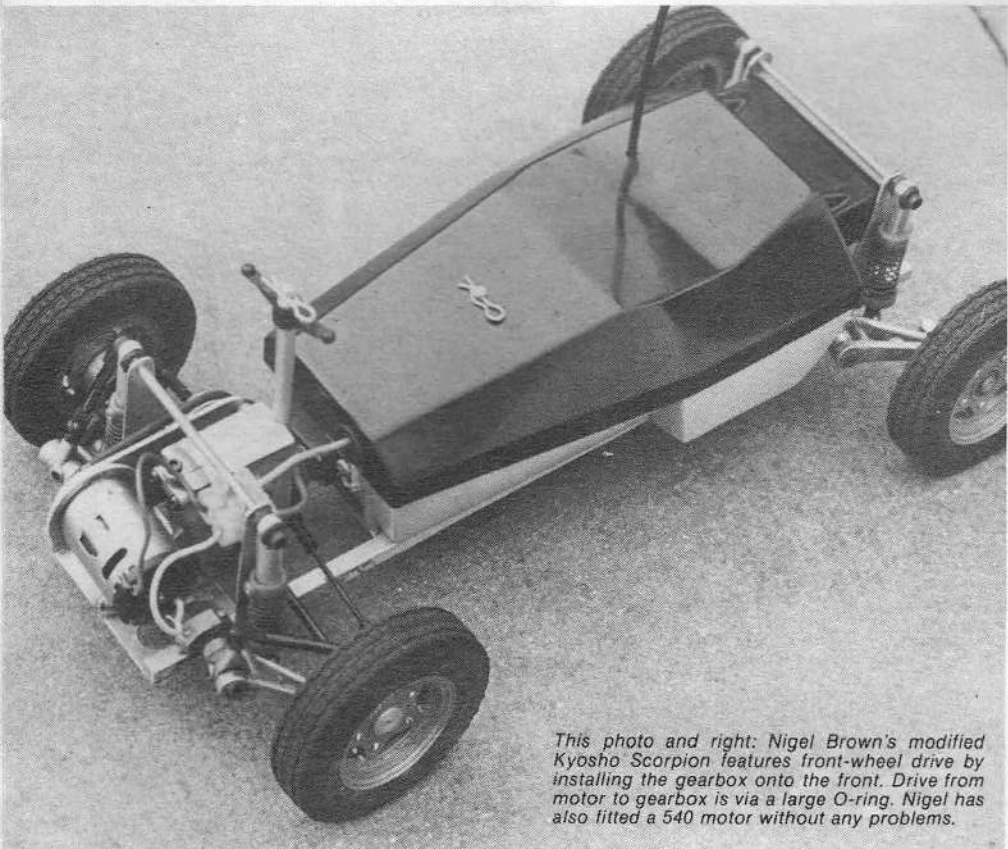
stone dust is. Unhappily the oil tends to retain dust lubricating its own cutting action very nicely, so on certain bearings the best solution is probably no lubrication at all just reliance on the relatively low coefficient of friction between plastic and metal parts.

### Looking after Bearings

Cleanliness, accuracy of fit and correct lubrication is the answer with an appreciation of the effect of wrongly loading certain types of bearing. Ideally, where plain metal or plastic bushed bearings are used, clean and re-lubricate after every 10-15 minutes

of use. Don't allow a build up of oil and dust slurry to occur. Gear boxes should be drained and re-filled with the correct grade of oil after each running session and unsealed ball-races should be thoroughly washed out in petrol and re-lubricated regularly.

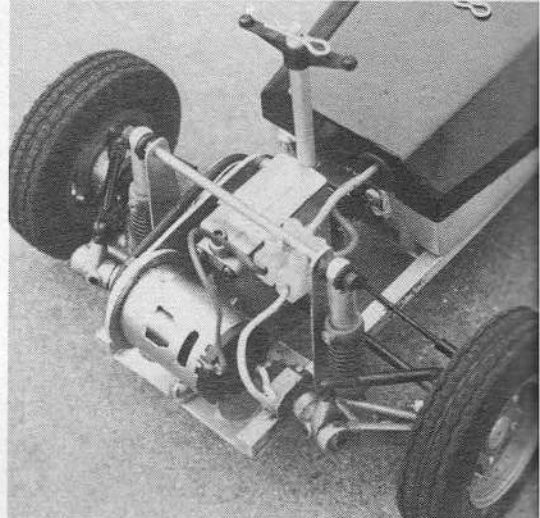
Some ball-races are sealed on both sides, others have only a single seal. Do install single sealed races so that the vulnerable, unsealed side of the race is protected by the bearing housing. Wear on ball-races is not easy for the inexperienced to detect, but the race should rotate without any feeling of notchiness or tightness anywhere and should be almost silent in operation and totally free of sideways play.



*This photo and right: Nigel Brown's modified Kyosho Scorpion features front-wheel drive by installing the gearbox onto the front. Drive from motor to gearbox is via a large O-ring. Nigel has also fitted a 540 motor without any problems.*

bearing as one unit into the heated case. Don't cool off the case under a cold water tap, leave it to cool naturally.

If a bearing is exceptionally tight on a shaft it can be reamed to size. A hand reamer can be used gripped in a tap wrench. Reamers are not cheap, far more expensive than the best drills but will last for years. A reamer is a cutting tool with precision ground cutting edges and should be stored well separated from anything which can damage it, preferably in a proper stand



### Fittings, Bearings and Bushes

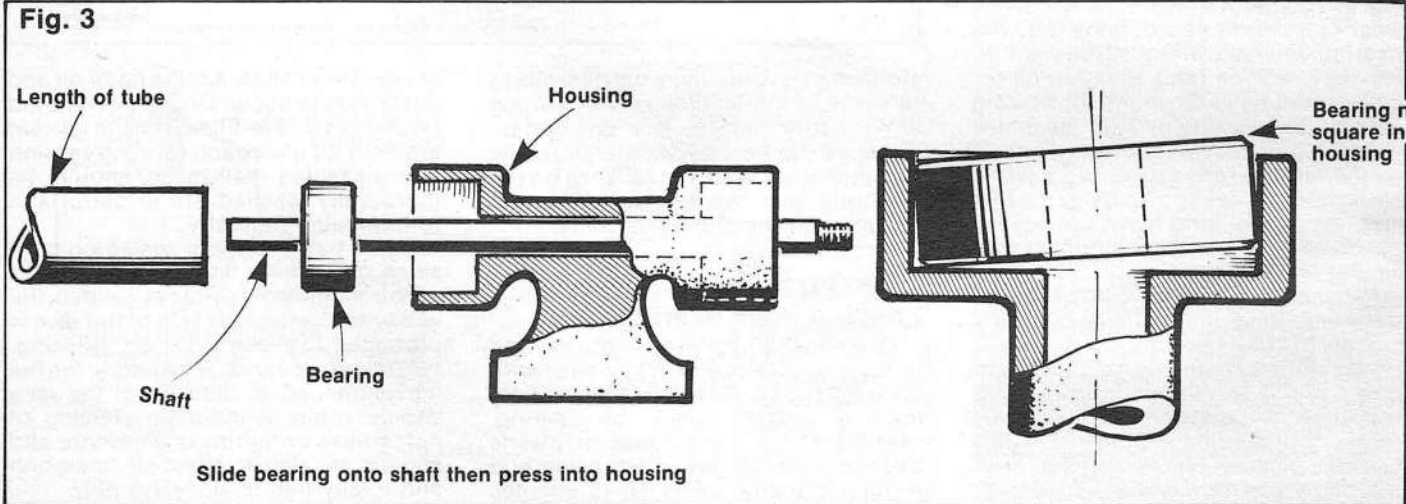
An incorrectly fitted bearing, be it ball-race or bush will be worse than useless, it will actually degrade the performance of the car. The first essential is that the bearing is a good fit in its housing and on the shaft that it is run on. Most bearings used in model cars are a press fit in the housings. To press bearings into plastic housings is usually a simple job requiring minimal equipment. It is often possible to use the shaft that the bearing is to support as a guide for fitting the bearing. If this is not possible, you will need to find a suitable guide, otherwise a bearing that is simply pressed in may not sit properly

in the housing. See Fig. 3. Fitting bearings into metal housing is simplified if the housing is first heated to expand it. This can be done in a hot domestic cover. Don't however heat sub-assemblies that involve metal and plastic parts, the plastic might not survive the ordeal. Crankshaft bearings in engines fall into this category both for removal and fitting. To remove a crankshaft bearing place the whole crankcase in an oven for 10-15 minutes and when good and hot, remove and tap it sharply on a clean softwood block whereupon the bearing will drop out. To re-fit warm up the cleaned crankcase, place the bearing on the shaft and drop shaft and

or protective wrapping. Ball races cannot be reamed to size and a shaft that is too tight will have to be polished down to a smooth fit. Spin the shaft in an electric drill and polish with oiled wet or dry emery paper, 400 grade should be alright. When you have finished the polishing process, do clean the shaft properly or the polishing process will continue.

### Racing Etiquette

During the course of the racing season I take part in a fair number of race meetings and also assist in, or actually organise a couple of meetings.



From the participation point of view I am frequently appalled at the foul language I hear on the drivers rostrum, not always uttered in 'under the breath' volume either. In my book, use of bad language should result in instant disqualification from the entire meeting. It seems a pretty sorry state of affairs if we have to consider writing a rule to this effect into the book but if needs must, it will be done.

With my organisers hat on now, I will say in common with many other organisers that the day is frequently soured by behaviour of competitors towards officials. Please remember, the guys that run the races are laying something on unpaid, often spending a lot of their own spare time to provide pleasure for drivers and don't take kindly to belligerent criticism. The pressure to complete a full days racing programme is considerable, mistakes can be made and spur of the moment decisions may at times seem to be unwise. I cannot think of any race organiser who would wittingly make errors, they are human and do occasionally slip up. If an error is suspected please remember your manners when you try to point out a mistake. It would help a great deal if a few more competitors who consistently take from the sport put a little back into it by organising a National Meeting so that they could experience first-hand just what it is like to be inside the control tent working instead of just racing and enjoying the day.

The B.R.C.A. 1/8th scale off-road rules provide for a referee to be present during racing and I will certainly be advocating this provision for 1/10th next season. I have been consistently disgusted by the over aggressive driving habits of some 1/10th scale drivers — a few disqualifications could sort that problem out. Recently at a race meeting I was involved with, a referee was present and would you believe it, one driver had the bare-faced cheek to argue when a warning was given. Any provision for a referee should cover, this power of instant disqualification for disputing his decision.

Final moan of the month concerns prize presentations, it is simple good manners to turn up for the award ceremony, the dismal attendance of a dozen or so at some presentations is a slap in the face to both winners and organisers, after all, if you won, wouldn't you like someone other than just your travelling companion to be there.

*Right: the latest creation from the Tamiya drawing board is the 'Grasshopper'. The kits are supplied with 380 size motors so this class of racing could now take an upturn in interest. The 'Grasshopper', ready to race is extremely lightweight so speed is a notable aspect particularly with a modified 540 size motor.*

*A full Track Test will follow next issue.*

**AUGUST 1984**

**NOW WAITING FOR CHALLENGERS!**

**1/10 SCALE OFF ROAD R/C RACER**

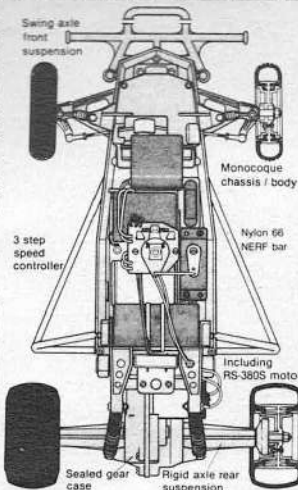
KIT NO 5843

# The GRASSHOPPER

**TAKE ON ALL COMERS WITH THIS KIT!** Join in and enjoy this wonderful sport of electric powered radio controlled vehicles. Tamiya has developed a brand new, sophisticated R/C off road racer named the "Grasshopper". Body, chassis and other parts have been made from heavy duty engineering plastics that are light in weight and extremely strong. Assembly has been made easier than in previous kits making this ideal for the newcomer to the field of R/C. You will be amazed at its performance.

**EFFECTIVE FRONT AND REAR SUSPENSION SYSTEM!**

The suspension system of the Grasshopper has been given special attention by Tamiya, as it is the key to a successful competition vehicle. The front suspension is an independent swing axle using large coil springs for damping, and straight ribbed semi-pneumatic rubber like compound tires mounted on a three piece wheel. Rear suspension is a rigid swing axle using two coil springs for damping and driving two large paddle type, semi-pneumatic rubber like compound, tires mounted on heavy duty three piece wheels. This combination of tires and suspension system has proved out to be a formidable combination for off road competition.

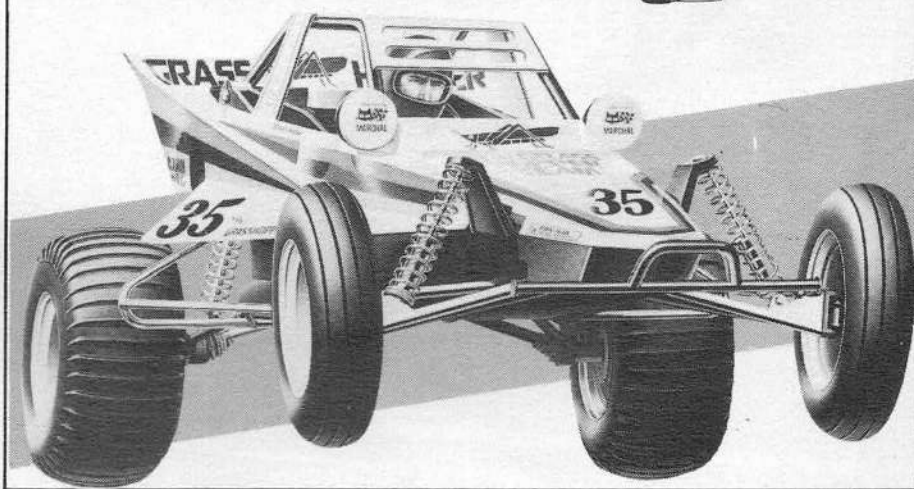


**DIFFERENTIAL GEAR INSTALLED IN A SEALED GEARBOX!** To protect the complicated mechanics of the gearing and differential, Tamiya has

housed these moving parts in a sealed gearbox. This closed in unit retains the necessary lubricants for smooth running, plus prevents the delicate but rugged parts from being damaged from dirt, small stones and dust that is prevalent during all off road running. The differential is made from industrial nylon 66 resin, and is powered by the well known Mabuchi RS-380S motor, with the pinion gear already attached.

**25 MINUTES OF FUN ON EACH CHARGE**

The kit's RS-380S motor will provide up to 25 minutes of exciting racing on each charge of the battery. After you have become accustomed to driving the Grasshopper with this motor, and crave even more excitement, the vehicle can be upgraded to unbelievable performance with the addition of the RS540S, Black Motor, optional ball bearings and adjustable oil filled shock absorbers. With these options the Grasshopper can outperform any off road vehicle produced by Tamiya. Try it, you'll like it!!



# Photo-Action Competition

## How to win a set of radio control equipment

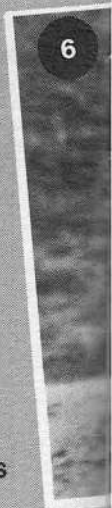
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  - (2) The photo may be of any type of R/C Model Car, the theme is ACTION.
  - (3) You may send black and white or colour prints (not negatives) or colour transparencies. Maximum size of 'Half Plate' please. Colour transparencies may be either 35mm or 120 size.
  - (4) Any number of photos may be submitted but please mark the back of the photos clearly with your name and address plus details of the models, the site and the camera used.
  - (5) If you wish us to return the photographs please include a stamped addressed envelope.
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  - (7) Entries will be judged by staff of MAP. No correspondence or telephone conversation can be entered into about entries.
  - (8) The judges' decision is final.
  - (9) *Model Cars* retains the right to publish winning entries plus selected runners-up in any form it sees fit. All photographs will be paid for at our usual rates.
  - (10) The publishers, MAP Ltd., can accept no responsibility for photographic material submitted but every care will be taken to ensure its safe return when requested.
- SEND YOUR ALL-ACTION PHOTOS TO: MODEL CARS PHOTO PRIZE, PO BOX 35, WOLSEY HOUSE, WOLSEY ROAD, HEMEL HEMPSTEAD HP2 4SS.



**PHOTO 1:** This month's winner, Y. Okhai of Dundee in Scotland produced five shots for the competition any one of which would have won him the first prize. A Canon AE1 with 135mm lens was used to show the cars at various locations.

**PHOTO 2:** Another Tamiya, 4WD 'Blazing Blazer' is the subject of R. Wilkins' entry from Epsom in Surrey, using a Canon A1.

**PHOTO 3:** Down to earth with a jolt! An exciting shot of the popular Subaru Brat.







**PHOTO 4:** A very realistic setting has been used by Gareth Lord of York School, Minster to show off this Tamiya 'Ford Ranger'. Gareth took the picture in the south of France using a Yashica FX-Dse with zoom lens.



**PHOTO 5:** Real explosive stuff is shown here as a 'Rough Rider' fights its way across some loose gravel. Mark Harvey of Plymouth, Devon, took the picture using a Canon 'Avi' with Vivitar lens.

**PHOTO 6:** P. W. Muirhead of Salisbury, Wilts., used a Minolta camera with zoom lens to show this 'Apache' car on the Chesham Off-Road club circuit.

**PHOTO 7:** Ready to roll! James Blacksel's 380 powered 'Sand Rover' was captured on film using a Practica camera. James' back garden in Colchester, Essex, was the location.



# Presto!

← Robbe

a look at the latest in 4WD 1/8th Off-Road technology



The Robbe 'Presto' ready for the race track. Very strong construction and excellent handling puts this car high on the potential winners list.

TWO, 4-WHEEL DRIVE 1/8th scale I.C. powered Off-Road racers dominated the 1983 European Championships finals. The *Yankee* and the *Robbe 'Presto'*. In terms of handling and sheer performance nothing separated the two, only the brilliant driving of the young Spaniard, P. Martinez enabled the 'Presto's' of the Italian team to be finally overcome by an incredibly small margin in 45 minutes of racing.

This car has been available in Continental Europe for about 12 months now but is only just available here in the U.K. via importers *Cougar Craft* who already handle the extensive *Robbe* aircraft and boat kit range.

Several unusual features separate

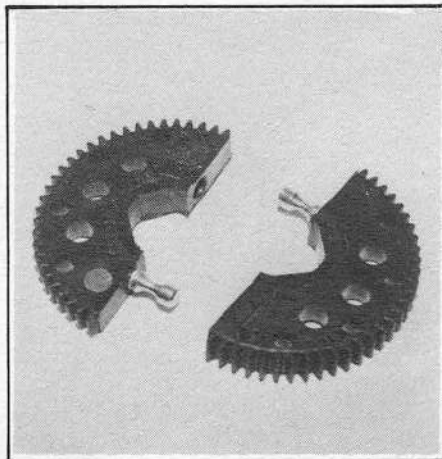
the 'Presto' from the rest. Firstly, the car is available in various different forms, 2-wheel drive, 4-wheel drive without differentials or 4-wheel drive with either 1 or 2 differentials. A 'competition' kit can also be obtained to uprate the car further. The kit examined here is the straight 4-wheel drive without differentials version.

All four wheels are independently suspension units. An interesting arrangement at the rear utilises the transverse countershaft to both transmit drive and act as pivot spindle for the rear trailing arms. Power is transmitted down the *inside* of the rear arms via chain and sprockets to the rear wheel spindles. There are no separate drive shafts for the rear drive.

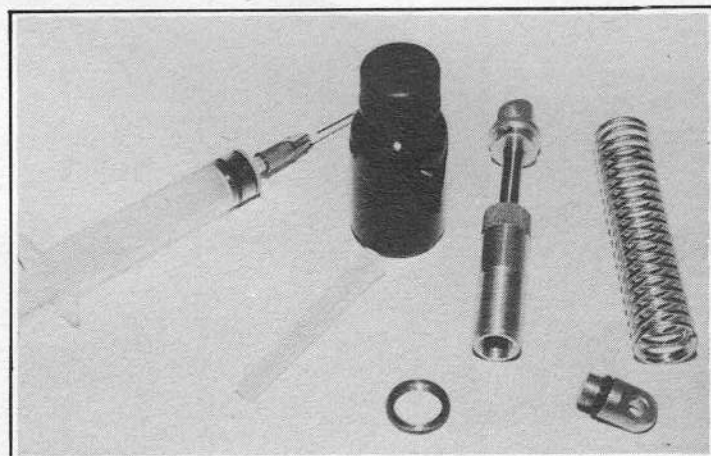
Chassis is of 'double-decker' style with both top and bottom plates of alluminium alloy. Drive from front to

rear utilises a roller chain with glass reinforced nylon sprockets. An ingenious, cam locked, split, main drive gear is used to overcome the necessity of removing the whole of suspension unit if a gear needs to be changed.

The kit is designed around either *HP.21* or *Enya .21CX* motors and although *HP* engine blocks will fit both *OPS* and *Picco* motors, it may be necessary for some modifications to be made if neither of these two engines are chosen. Although the standard 4-wheel drive kit does not include differentials or bodyshell, in other respects the kit is complete with a very good multi-language instruction book and two sheets of diagrams showing an exploded view and details of the various construction steps.



Above: the novel split main drive gear can be simply replaced without resorting to a major overhaul.



Left: rear coil-over shock absorbers ready for filling with suitable damping oil. Oil and filler syringe are included in the kit. Dampers for the front suspension are an optional extra to an optional extra.

## Assembly

With very minor exceptions all the parts fitted well. Some tolerance problems were noted on turned metal parts of the front suspension. The grooves for 'E' clips were not of sufficient depth and were not placed far enough out on the spindles to allow installation of the thrust washers without some initial trimming of the shoulders.

A neat system of tension adjustments for the drive chain is incorporated using adjustable tie-rods which should effectively prevent any problems resulting from the front differential or gear mountings moving. In spite of first impressions there are two different front suspension arms, they look the same but the lower arm has a location for the front 'hairpin' spring. An adjustment for suspension setting is provided plus three different spring rates. No front dampers are included, friction damping is obtained by tightening or loosening the front pivot pin nuts. A nicely moulded flexible front bumper is included.

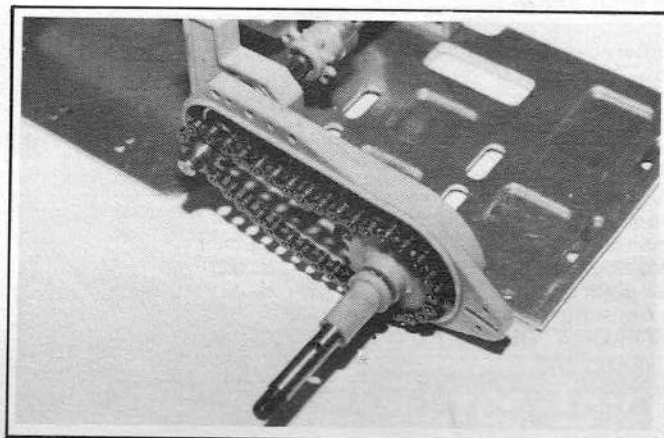
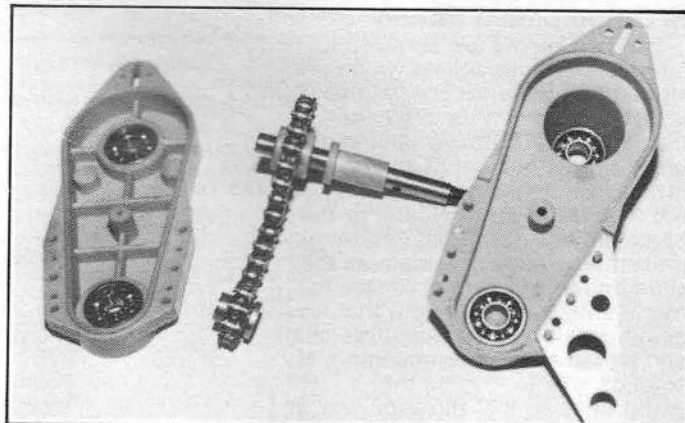
The main chassis has a double plate fitted for engine mounting and although no mention is made of bonding this to the chassis, it is a good idea to epoxy this in, using clamps to hold the plates together whilst the epoxy cures. Line up the plate using nuts and bolts whilst the glue cures.

Nylon mouldings support the transverse counter shaft which carries drive gear, chain sprocket for front drive transmission, brake disc and also doubles as pivot spindles for the rear suspension arms. All bearings on this countershaft are ball-raced, six ball-races in all plus a further four at the wheel spindle end of the swinging arms, ensuring that the drive train is free-moving. As usual it is necessary to free-off the fit of the 'ferodo' style brake disc on the carrier with a little file work. Some careful fettling will also be needed on the clever split drive gear. The moulding is very complex and although good, moulding flash needs to be removed with a sharp scalpel so that the two halves fit snugly together.

## Dampers

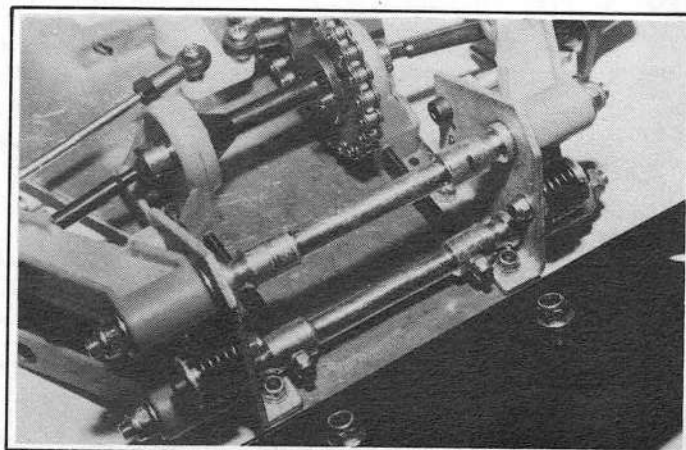
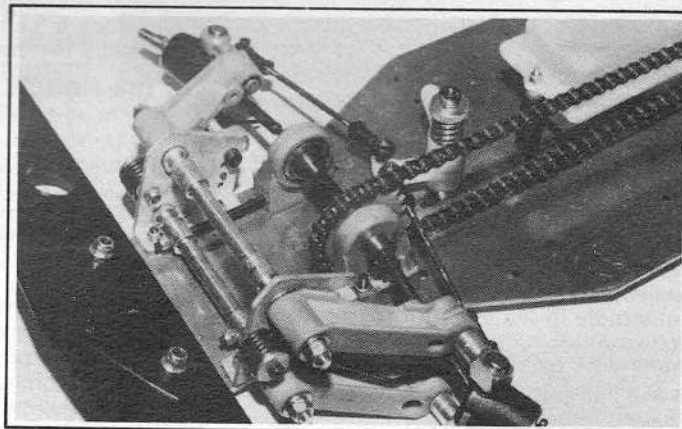
Large one-way dampers are provided with coil-over springing, adjustable for ride height. The oil supplied for the dampers appears to be a hydraulic fluid type with very low viscosity and is supplied with a hypodermic style filler to ease filling the units. Tyres supplied are of a very soft material and should really aid the suspension to smooth out the bumps. I fitted these using cyanoacrylate glue after first roughening up the hubs thoroughly using emery cloth.

*Right: the rear suspension, trailing arms are split down the centre and enclose drive chains to take power from the countershaft to the wheels. Ball-races are fitted throughout.*



*Left: the rear suspension system needs no drive shafts by using the method shown here. When attaching both halves of the trailing arm, seal the joint with silicone rubber compound.*

*Right: front suspension layout showing front-end drive shafts and chain. The servo-saver sits slightly off-centre but no steering bias is noticeable.*



*Left: suspension springing on the front-end is via 'hairpin' springs attached to the lower wishbones. Chain adjustment is simple, two threaded adjuster rods pull the bearing blocks forwards on slotted mounts.*

# Track Test

## R/C Equipment Fitting

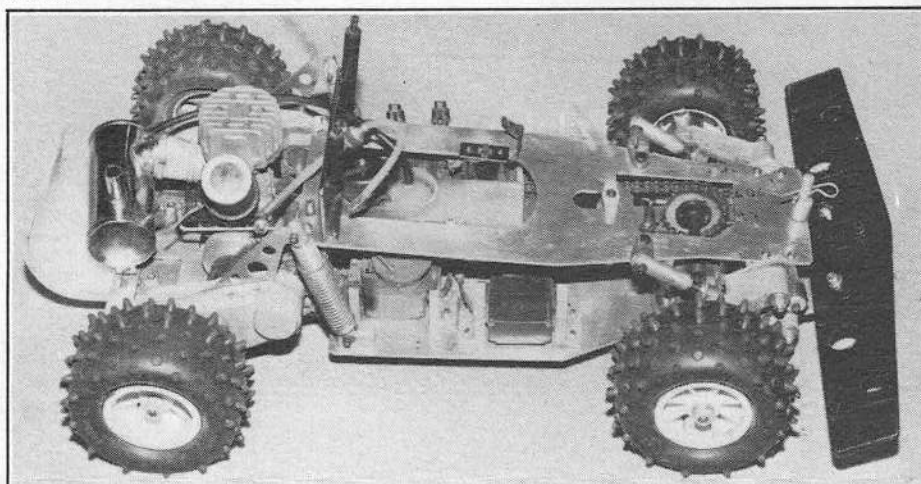
The two servos are screwed to moulded nylon brackets which are slotted to accommodate various lengths of servo. Space for the throttle servo is strictly limited and great care is needed in shaping and fitting the pushrods so that they do not foul either the fuel tank or the brake linkage. Using an OPS engine presented a minor problem as the slide on the carburettor is free to rotate and it was apparent that it could possibly foul the countershaft and jam in a half open position. My solution was to reverse the carburettor so that the slide was at the rear of the car with the pushrod passing right across the front of the carburettor.

Brake linkage is extremely simple, the pushrod just floats, a 'Z' bend fixing it to the servo disc. *PB Racing* servo discs were used, their *JR/Sanwa* style being very robust and long. Receiver and battery pack are suspended between posts on the rubber bands supplied. With the R/C equipment fitted the upper chassis plate can be installed. This plate has a support for the top of the servo-saver pivot spindle which really stiffens up the mounting, providing a very positive linkage. The actual link between servo arm and saver incorporates an adjustment facility to ease setting up. *Robbe* advise that steering should be set up with 0° toe-in or 1° toe-out not the more customary toe-in found in two-wheel drive cars.

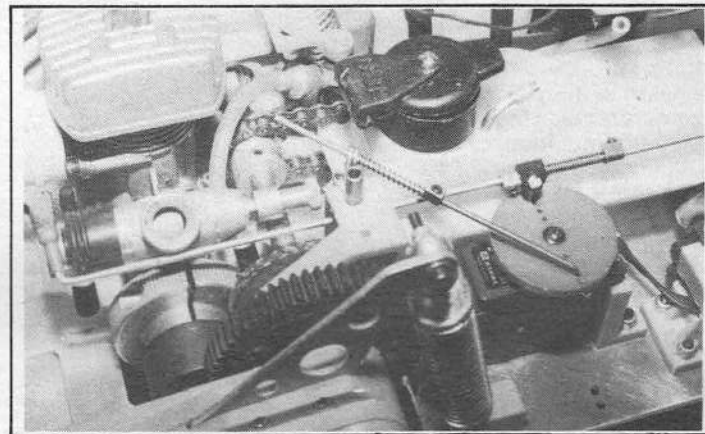
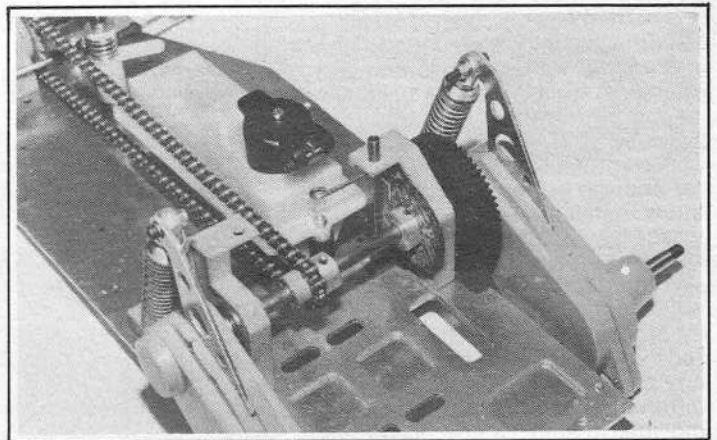
It is next to impossible to fit some rear exhaust motors as the rear swinging arm will pass very close to the rear of the motor. If you have a rear exhaust unit look very carefully at this aspect. Nor is it easy to fit anything other than *Robbe's* own transverse rear mounted silencer, the mini-pipe style unit will project rearwards a long way and be vulnerable in the event of rear-end collisions. A suitable silencer, manifold and silicone connector tube is available and I would advise its use.

I chose to use a *P.B. Racing*

Below: the 'Presto' at rest with optional front dampers fitted plus rear bumper to protect rear-facing silencer.



Right: the main drive countershaft transmits drive to front and rear via chains. Cam operated disc brakes also feature.



Left: close-up of the throttle and brake linkage. Note: the reversed slide carburettor with slide pointing rearwards to miss countershaft. Space is very limited and patience will be needed to achieve a good linkage.

'Corvette' bodyshell although *Robbe* do produce a 'Lancia' bodyshell specifically for the 'presto'.

## On the Rough

The chain drive transmission is free-running right from the word go and should not require much bedding-in. The steering is stiff to start off with and with the 'Presto', and any other 4-wheel drive car, I would only recommend high power ball-raced servos for steering. This type of car is expensive right through, there is little point in spending £200 plus for a kit then skimping on cheap engines and R/C equipment. Use of low power or 'standard' servos will cost more in the end as they will not last the distance.

## Prestisimo!

Any doubts about the handling qualities of the 'Presto' without differentials were very soon dispelled. Turning ability was amazing with excellent straight line performance also. The usual understeer expected from cars without a differential was just not there, the car turns well with a nice predictable amount of power-on understeer making the car very easy to handle. Providing the drivers reactions are quick enough to keep the wheels pointing in the right direction, use of the throttle pulls the 'Presto' back onto line instantly.

The enormous travel of the rear suspension really evens out the bumps, but I do feel that the optional extra of front dampers would be advantageous and the fitting of a rear anti-roll bar. My first run with the car resulted in losing a front drive shaft which was found and re-fitted with more attention given to the adjustment and shimming of the front trailing arms. Once properly set-up, no further trouble was encountered. The only other addition I would recommend is a rear bumper to protect the transversely mounted silencer. Overall a very easy car to drive, good acceleration, very compliant suspension and tough to boot.

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TRACK  
PARTS

The ATP 'Omega' chassis immediately impresses with its clean, uncluttered approach to competition chassis design.



## Pete Winton examines the latest in 1/12th scale chassis designs

TWELFTH SCALE RACERS seem to be a rather conservative (the non-Thatcher kind) bunch by nature, or perhaps a herd (as in the sheep kind). There are many items on the market for each component used in a car, but cast your eyes around any pit and you will see only two or three types in popular use. Chassis are a prime example. Most popular by far are the *Schumacher* and *Demon* but you could choose from *Associated*, *Delta*, *Parma* and *Alpha Track Parts*. The reasons for this are not clear, but a sound reputation built on track results, availability and access to spares, and the aforementioned sheep phenomenon go some way to explaining why.

The chassis reviewed here is the 'Omega', manufactured and marketed by *Alpha Track Parts (ATP)* of Leicester. It comes assembled (saving about three paragraphs!) and as a conversion kit includes the chassis, shaker plate, motor/axle unit, damper and body posts. All the major parts are made from carbon fibre except the motor/axle unit which is black anodised aluminium.

### Construction

The chassis is formed into a 'U' shaped channel, the same shape pioneered by the Neil Francis' Lexan 'Phantom' chassis. Carbon fibre is the material used by jet fighters and

'Formula One' cars for lightness with high strength, and its these qualities that make this chassis design work on carpet, where the stiffness helps to make the suspension work with the high grip available.

The motor/axle unit is described by ATP as a torque cage and is well made and very strong. The rear axle bearing housings fit into two square Lexan plates through a hole which is offset to the centre of the square. By fitting the plates into the square holes in the chassis in varying positions it is possible to alter the ride height of the rear of the car, the first such chassis from an English manufacturer to include this feature. This is not a simple adjustment to make but it is useful to have some control over the ground clearance to influence ride height as tyres wear. The damper is much the same as the *Schumacher* item, two PTFE washers either side of a damper plate attached to the rear axle. The washers are held in place by two springs one above the plate, one below. A nylon nut clamps the springs down and a fibreglass whip aerial fits into the damper post. The shaker plate has two 'ears' for the

cell retaining rings; stick cells are required.

The front of the chassis is drilled to accept *Associated* front blocks and a set of the spring variety (from 12is) were fitted. The body posts were threaded nylon rod and looked fragile, but no trouble was experienced.

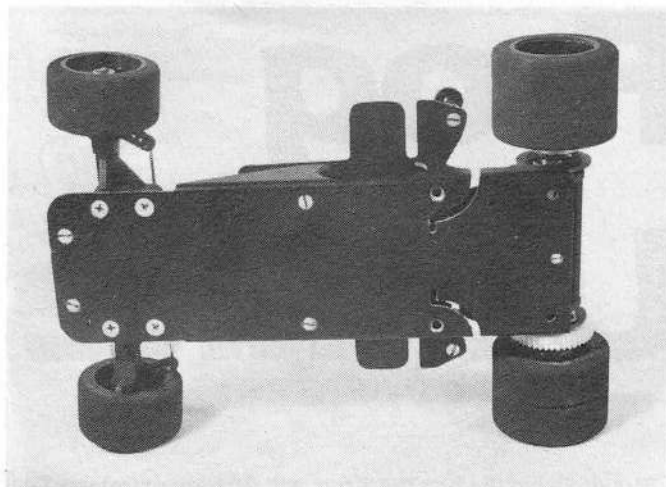
Included for review was a differential from ATP. This is a very neat unit which is totally different from existing diffs. Contained within the aluminium housing are four, star bevel gears to provide the differential action mounted on ball bearings throughout the line of the axle. The nut on the end of the axle is provided to adjust freeplay in the bevel gears, and once adjusted needs no further maintenance. Indeed, apart from oiling the two exposed bearings this diff requires virtually no attention. With the geared system there is of course no drive gear slip at all. The low maintenance and consistent no slip performance are very attractive features, but until a different wheel system is developed it is necessary to use the ATP sleeve system. Currently priced at £18.00 it will find favour if geared diffs become the in thing since ATP have a lead on their competitors due to over a year's testing in competition by Alan Blakeman.

Lastly, ATP provided a pair of their front wheels. These are six spoked in black moulded nylon and feature a thin walled bearing hub. They looked very nice indeed and ran true and straight, but why-oh-why do we always have black wheels. Only *Phil Greeno Models* do wheels in yellow or red, by why not blue, white, green, orange, etc. Come on moulders, show some imagination. ATP's wheels (despite being black) are a very nice alternative to the usual wear, and keenly priced at £1.00 per pair.

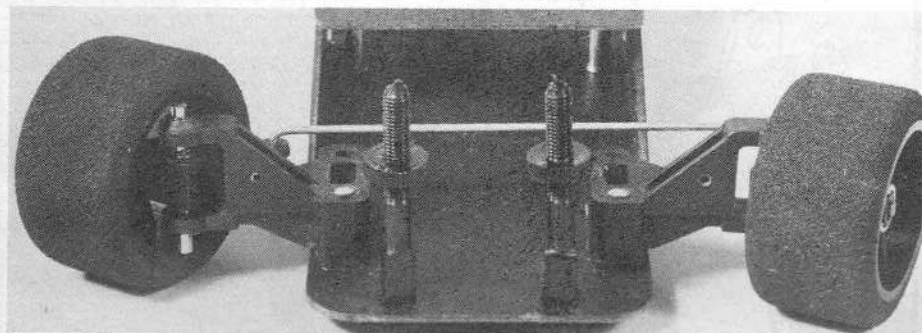
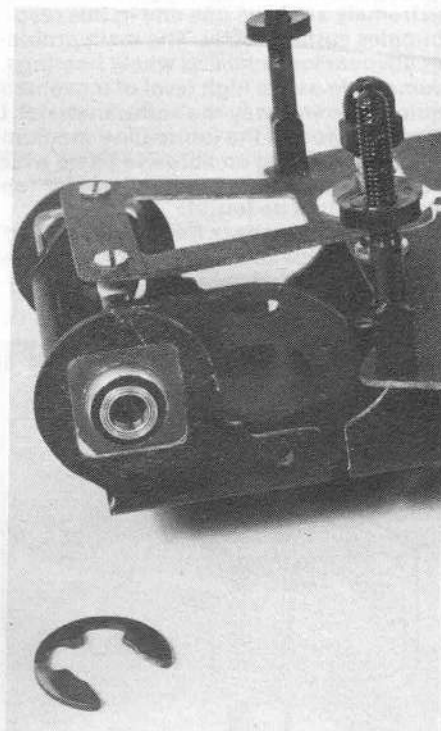
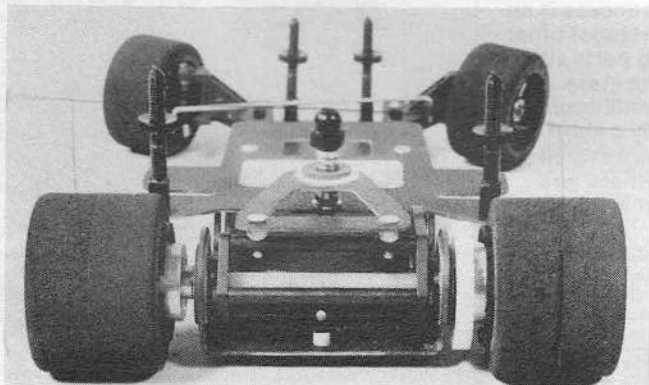
### To the track

I fitted a *Futaba '30M'* servo, *Demon '2c'*, and *Futaba* receiver with no difficulty and set off for the

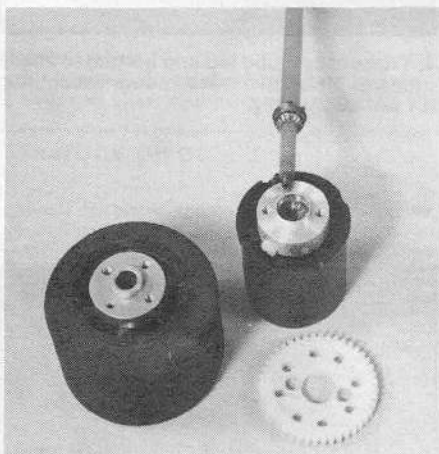
Right: 'Omega' chassis underside displaying rear, leaf-spring, cut-outs for rear-end flex à la Associated '12i.'



Left: the 'Omega' chassis incorporates a motor/axle torque cage coupled to an adjustable friction damper. Right: innovative rear-end ride-height adjustment system. Different side plates give varying axle positions.



Above: the 'Omega' is designed (and drilled) to accept Associated front steering blocks (preferably spring type).



Above: ATP geared differential system is well-designed/constructed to give trouble free running characteristics.

pleasant surroundings of our local club. Tyres provided were *Associated* kit rears on ATP sleeves and ATP fronts. Initial impressions were of understeer, but since some silly \*!x; had turned my rate switch right down this was hardly surprising! Having sorted that out it was down to the serious stuff. The car changed direction well, and showed little tendency to wander in a straight line. Once turned into a corner it was stable and predictable. However, I had trouble in getting rid of all the understeer at high cornering speeds, perhaps due to lack of suitable tyres, or insufficient time to play with rear ride height setting (higher rear centre of gravity promotes more weight transfer to the outside front wheel in cornering, thus reducing understeer).

To sum up I felt the rear end adjustments were more fiddly than I would have liked and the handling was not to my personal taste. On the plus side the car is light, very strong yet simple in construction which makes for easy maintenance and low cost of ownership, features, for which this car is the best I've seen.

The car hits the 'conversion chassis' market head on in the price war. At £20.00 for the carbon fibre bits and £15.85 for the torque cage it competes with the *Demon* (now £34.95), *Schumacher 'Clubmans'* (£35.00) and *Parma 'Panther'* (£39.00). Don't forget though that you need a set of front blocks (supplied with the *Demon* and *Parma*). Available from *Alpha Track Parts*, 11 Newark Street, Leicester LE1 5SS or leading model shops.

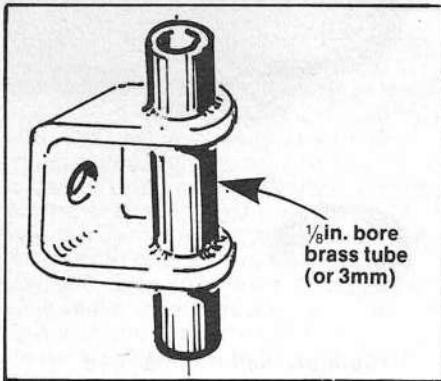
# Frog Update



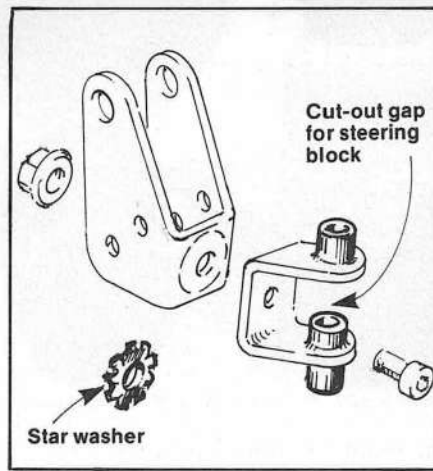
Straight from the box the 'Frog' will perform extremely well, whether in the back garden or on the race track. However, the competitive road to success is an extremely arduous one and in this respect the 'Frog' and to be honest most other buggies suffer greatly. The main problem is wear and tear on moving parts such as suspension links and wheel bearings. Metal to plastic joints are the most vulnerable as the high level of movement encountered under race conditions quickly wears away the softer material. Lubrication to the joint is only a short term solution as the lubricating medium (grease or WD40) quickly picks up grit and dust forming an abrasive paste which grinds away the plastic. Unless you are prepared to pay out regularly for replacement parts then a longer term solution must be found.

One of our readers Ray Davies of Bedworth in Warwickshire, has come up with some modifications to the 'Frog' which will guarantee a longer running life before a service is needed.

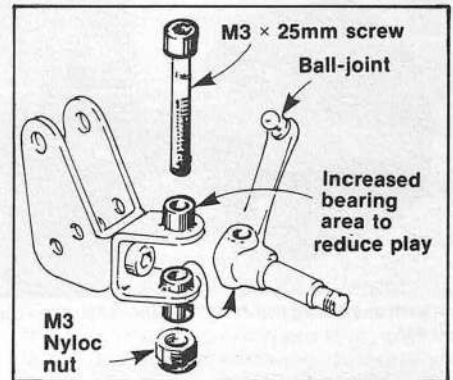
## Front Suspension



1: Drill  $\frac{3}{32}$  in. hole through arm.  
2: Solder in  $\frac{1}{8}$  in. (3mm) brass tube, overlap equally each side.

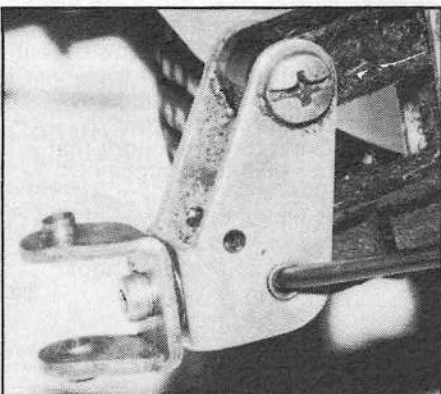


3: Cut through centre of tube to allow good fit of upright. Ensure space is matched either side to keep uprights at same height.

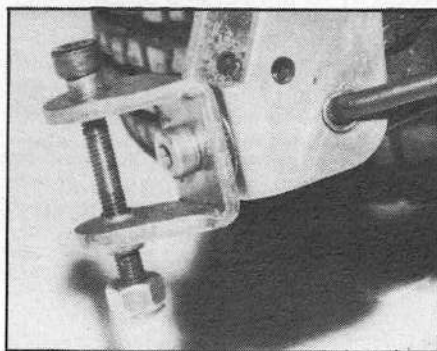


4: Trim excess tube top and bottom to allow fitting of M3 screw, leave enough clearance for nut depth only.

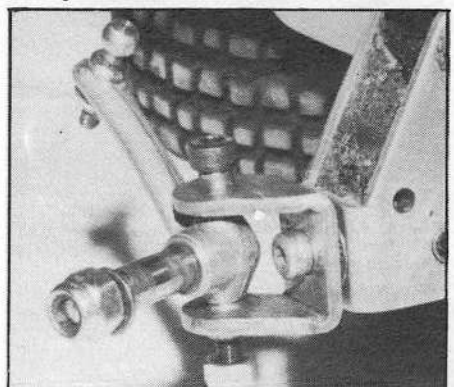
Below: front steering block fitted with brass tube bearing.



Below: leave only enough thread position for M3 nut.



Below: completed assembly. Standard steering ball-joints can be replaced with captive type by drilling out from underneath.



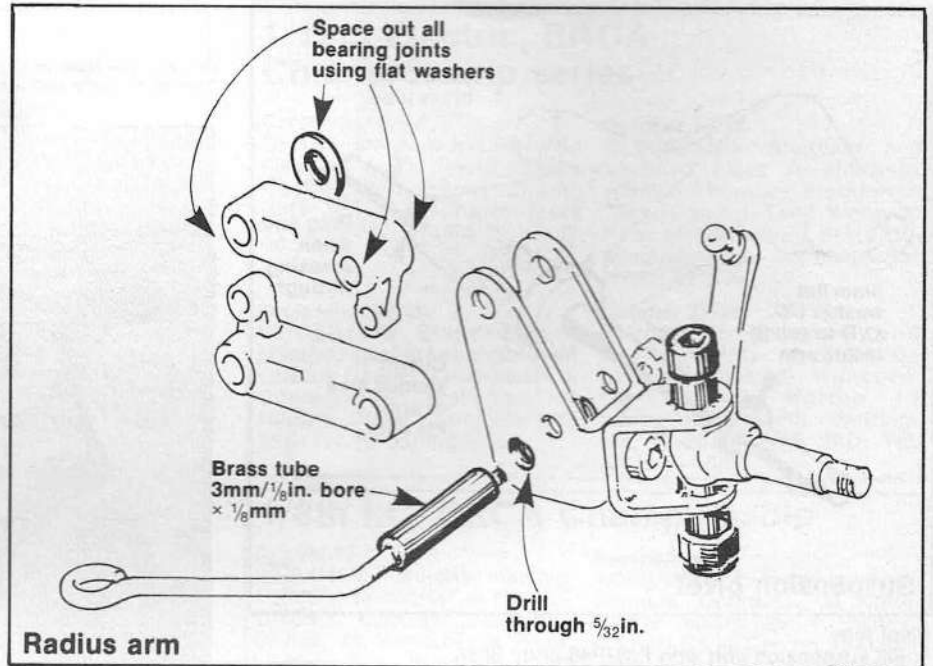


### Radius arm:

- 1: Drill through front arm with  $\frac{5}{32}$ in. drill.
- 2: Fit radius arm through suspension link using brass tube as new pivot.

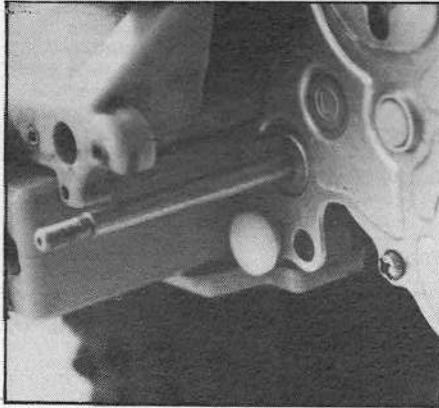


Left: the Tamiya 'Frog' ready for the race track and equipped to handle the rough treatment involved in Off-Road racing.



## Rear Suspension Arm Pivots

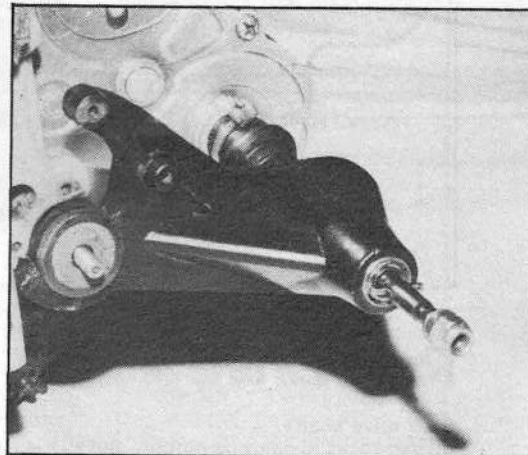
Below: gearbox assembly with suspension pivot tube and bush fitted.



Below: rear suspension arm ready for installation onto the 'Frog.' Ensure that body filler is completely cured before filing brass tube flat.

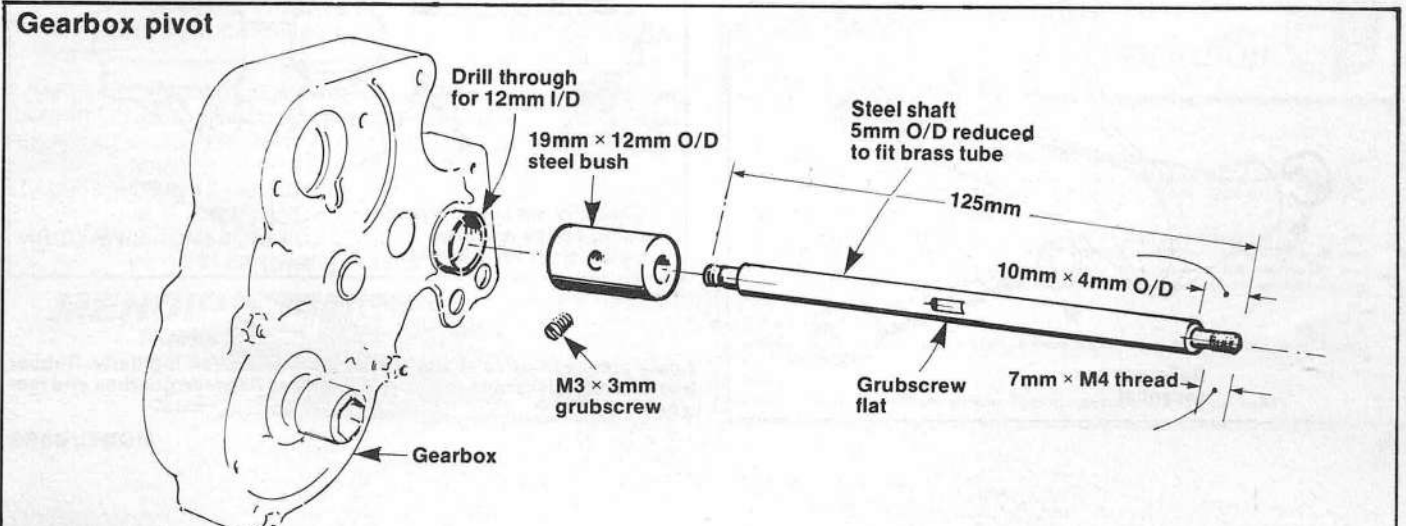


Below: suspension arm fitted to 'Frog.' Apply light layer of grease onto pivot shaft to ensure free rotation of suspension arm. When allowing filler to dry centralise tube by installing onto pivot shaft.

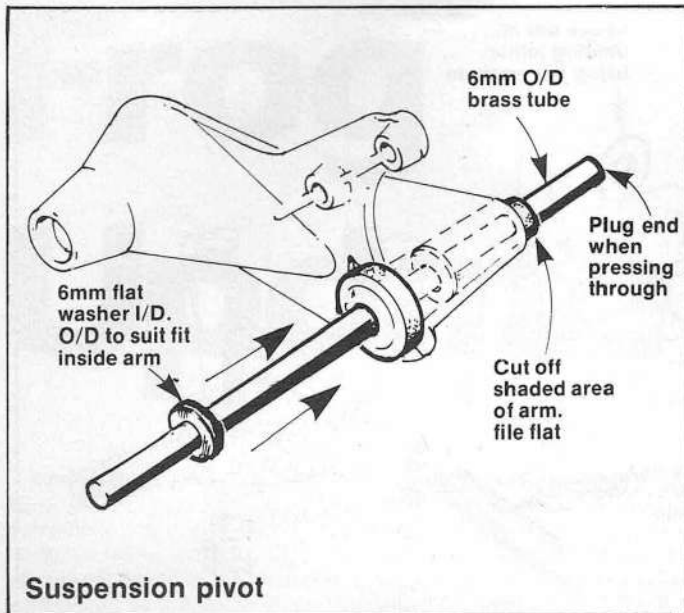


### Gearbox pivot

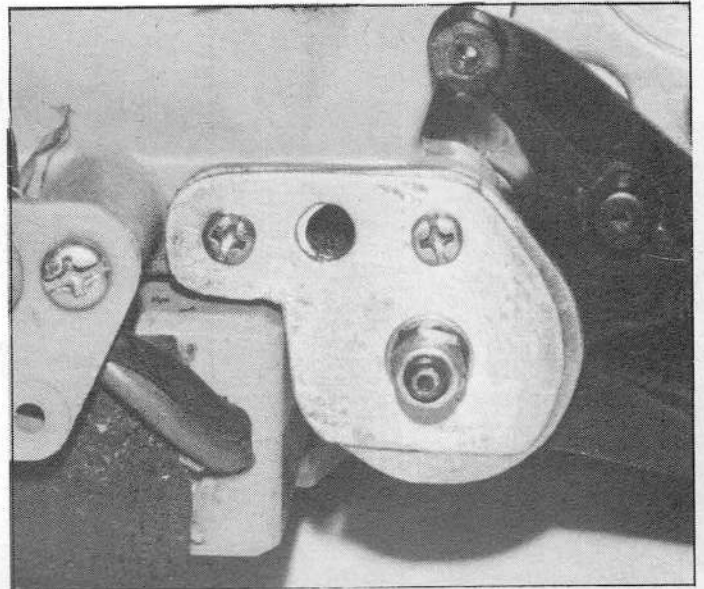
- 1: Fit brass bush to shaft centrally and secure with grub screw (apply thread lock).
- 2: Press fit shaft and bush into gearbox and secure with superglue or epoxy adhesive.



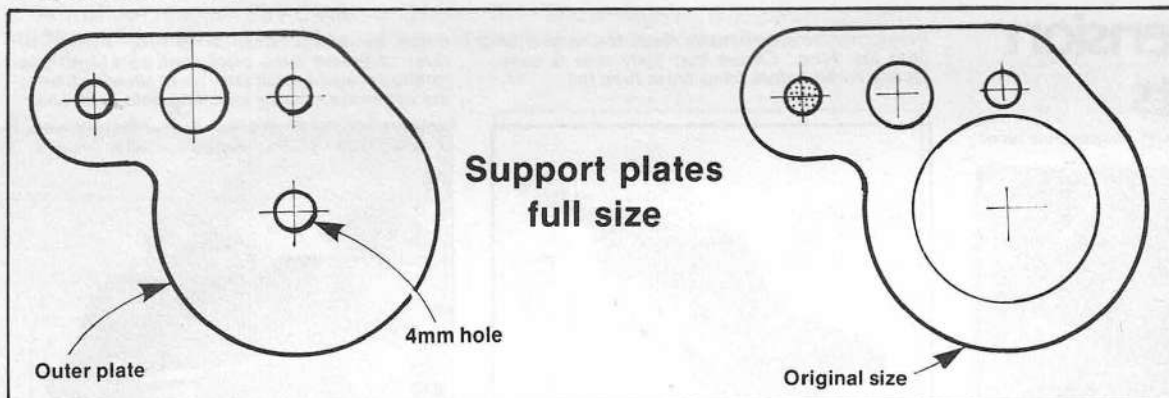
# Home Improvements



Below: triple layer of support plates to increase bearing area. Shape does not have to be perfect so long as pivot holes and self tapping screw holes line-up.



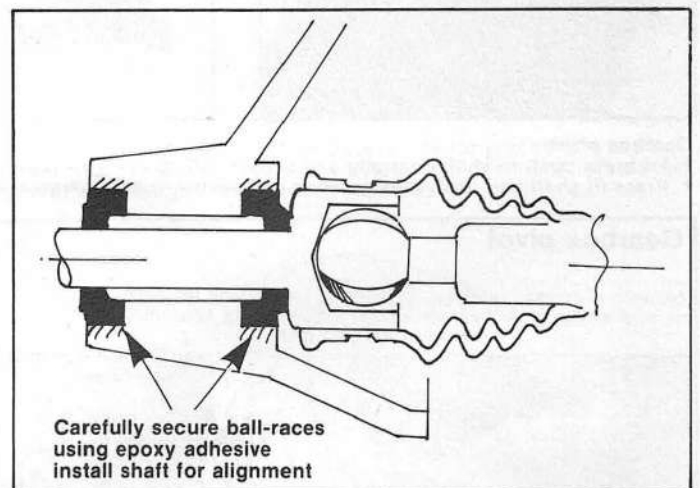
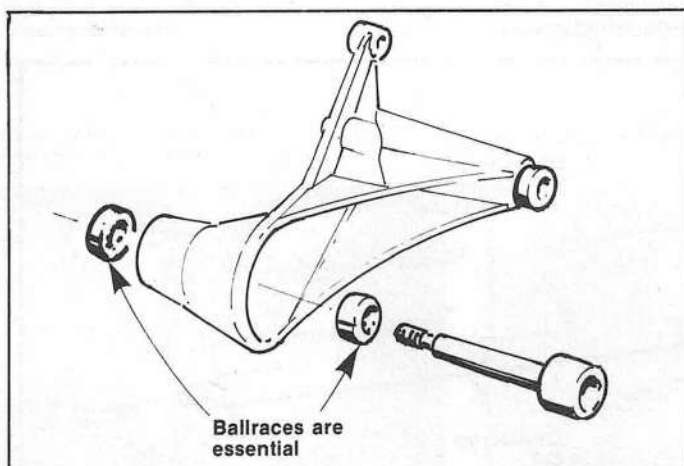
- Pivot tube**
- 1: Fill suspension arm with P38/P40 body filler.
  - 2: Push brass tube through filler. Press in support washer.
  - 3: Re-fill with filler, centralise tube, leave for 24 hours.
  - 4: Cut off excess tube, clean and file ends flat.



**Support plates:** Make two extra plates for each side in addition to original stopper plate (hz). Cut from 1/16 in. brass sheet. Assemble trailing arm onto pivot shaft. Fit support plates with original on inside. Tighten assembly using M4 locknut and washers.

## Rear Drive Shafts

**Rear drive shafts**  
Fit ball-races to gearbox outputs and suspension arms. If bearings are not secured, drive shaft action will rapidly elongate housing.



Apply grease to drive shafts and sockets and clean regularly. Rubber boots can be discarded to lessen power loss between gearbox and rear wheels.

# Contest Calendar

## 1/10th Off-Road BRCA Championship series

### August 5

LIVERPOOL Modified class at the Punch Bowl Hotel, Sefton, Merseyside. Contact Steve Newey, 15 Patricia Grove, Bootle, Merseyside.

### August 19

SOUTHAMPTON. Modified class. Contact Tim Reynolds, 23 Baddesley Close, North Baddesley, Southampton. (0705) 739734.

### August 26

MILTON KEYNES Modified class. Details from Dave Meadows, tel. 0908 72721.

### September 8/9

LILFORD Modified and Standard class at Lilford Park, Nr. Oundle, Northants. Contact Steve Taylor, 30 Blackhorse Lane, Swavsey, Cambridge.

### September 16

SCARBOROUGH: Modified class at McCain International Sports Site. Contact D. Webb, 60 Newlands Park Grove, Newlands Park, Scarborough, N. Yorkshire. YO12 6PT.

### September 23

BRADFORD Modified class. Details from A. Marsden, 91 Wrenthorpe Road, Wrenthorpe, Wakefield, Yorks.

### September 30

BASILDON. Standard class. Contact: Jim Stone, 121A Collier Row Road, Romford, Essex, RM5 2AT. (0708) 64319.

*All drivers are welcome to enter these events and BRCA membership is not necessary although only BRCA members can score points towards the Championship title. The only exception to this is the European International Meeting for which only BRCA members can enter.*

## 1/12th Electric, BRCA Championship series

### September 8/9

DERBY. Standard and Modified class at Rolls Royce Sports Centre, Derby. Entry closing date 8/8/84. Contact Dave Towell (0332) 771805.

### September 29/30

LEICESTER. Standard and Modified class at Loughborough Leisure Centre, Leicestershire. Contact Alan Blakeman, 11 Newark Street, Leicester LE2 5SS. Tel. (0533) 898528.

### October 13/14

CLEVELAND. Standard and Modified class at Thornaby Pavilion, Thornaby, Stockton on Tees. Contact Tony Wells, 10 Fawcett Avenue, Stainton, Middlesbrough, Cleveland. Tel. (0642) 591239.

### October 27/28

RUNCORN. Standard and Modified class at Brookvale Leisure Centre, Runcorn. Contact Paul Hatton, 12 Southdale, Penketh, Warrington, Cheshire WA5 2AD. Tel. (092572) 5883.

## 1/8th I.C. BRCA Championship

### August 12

WREXHAM Two-day meeting. Formula; Sports/GT at Hoseley Circuit. Contact Jonathan Davies, 20 Windermere Road, Little Acton, Wrexham LL12 8AN. Tel. (0978) 364854.

### September 16

YORKSHIRE Two-day meeting. Formula; Sports/GT at North Bridge Leisure Centre, Halifax. Contact Bryan Denton, 15 Highmoor Lane, Scholers, Cleckheaton, Yorks. Tel. (0274) 877177.

### September 2

WEST BURTON Two-day meeting. Formula; Sports/GT at West Burton Power Station Circuit, Nr. Retford, Notts. Contact Keith Davies, 37 Grove Coach Road, Retford, Notts. Tel. (0777) 703527.

### September 30

ALDERSHOT Two-day meeting. Formula; Sports/GT at Badshott Lea Circuit, Nr. Aldershot. Contact Jeff Stokes, 76 Sandhills, Farnborough, Hants. GU14 8ER. Tel. (0252) 46980.



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TELEPHONE: (0633) 278696



AUGUST 1984

## 1/8th Off-Road BRCA Championship

### August 5

MENDIP 1/8 Restricted.. 1/8 Unrestricted Entries SAE to Denis Jones.

### August 12

REMOTE WORLD 1/8 Restricted.. 1/8 Unrestricted Entries SAE to R. Cloke.

### August 19

LILFORD PARK 1/8 Restricted.. 1/8 Unrestricted Entries SAE to S. Taylor, 30 Blackhorse Lane, Swavest, Cambridge.

### September 9

BASINGSTOKE 1/8 Restricted.. 1/8 Unrestricted contact S. Pyne.

### September 16

BICESTER 1/8 Restricted.. 1/8 Unrestricted Entries SAE to Alec Hudson, Howes of Oxford, 9-10 Broad Street, Oxford. Entry fees £4.00.

### September 23

BRADFORD 1/8 Restricted.. 1/8 Unrestricted Entry SAE to A. Marsden, 91 Wrenthorpe Road, Wrenthorpe, Wakefield, Yorks.



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Car Association



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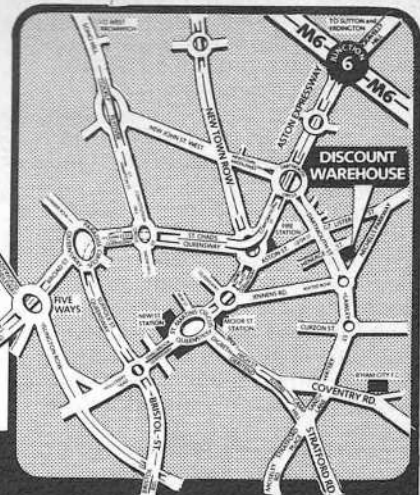
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## Racing Report

# 1/12th Euro-Champs

## Lewis Eckett and Pete Winton report

**AFTER ONE OF** the hardest fought qualifying sessions and a very exciting final, Phil Olson won his first major race ever, to become European Champion 1984. Andy Dobson, who led the final for 7¼ minutes was second, and the ever improving Phil Davies third. Top qualifier Christian Kiel suffered from a faulty servo or radio interference, and never figured in the final, coming in last.

Ulm is in the south of Germany, between Stuttgart and Munich, off the A8 motorway. The venue was a large events hall set in a Donauhalle with the circuit laid out in the centre by taping the felt carpet to the floor using double sided tape. This felt was quite thin and followed the line of the floor exactly, making some parts of the circuit very bumpy. There were additional bumps caused by rucking of the carpet and some corners became more difficult than first appearances suggested. The track was marked out with masking tape whilst wooden batons (2 x 1 in.) stopped cars crossing from one lane to another. Corner cutting was positively discouraged by the use of spun aluminium dots about 4in. high and 18in. dia. These were so substantial that they needed no additional support to keep them down and caused havoc if touched, the cars travelling a very long way in the air after hitting a dot. They made the Stafford 'toblerone' markers look inviting.

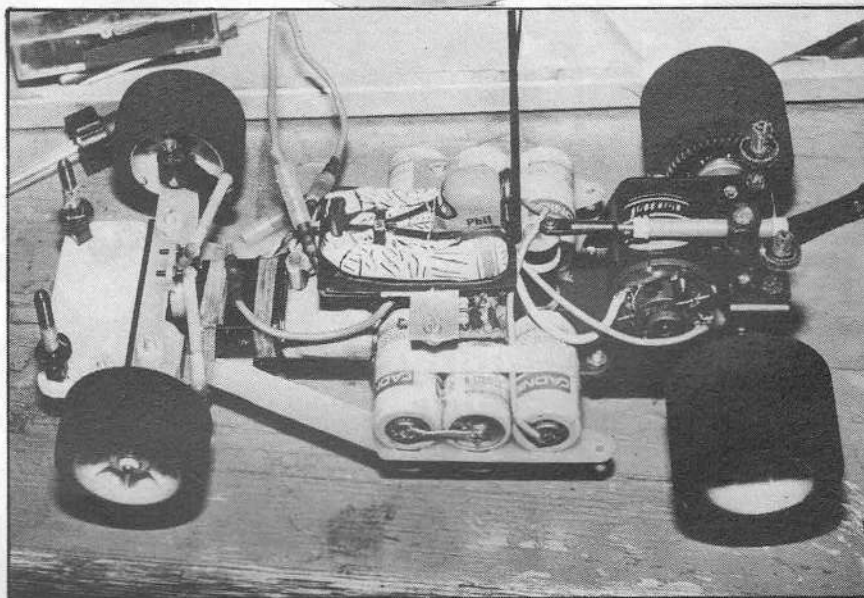
The promised extra practice on Thursday afternoon had not been possible as the track was not laid, so by Thursday evening all the British Team were safely installed in hotels around Ulm. On Friday morning practice started in earnest. Nick Adams had told the BRCA 1/12 Conference last year that EFRA had disallowed the use of wintergreen, but contrary to my and others expectations, wintergreen was in general use throughout the meeting. The smell was not noticeable once you were used to it (like living on a

farm, you don't notice the smell after a while) and had no effect on any of the participants. The British team had a choice of tyre additives from Tractite, TEAC or Wintergreen and additionally free supplies from Dave Towell of an 80/20% Tractite/Wintergreen mix. This was used exclusively by Bill Jones/Jimmy Davis and occasionally by others. A very nice thought by Dave, perhaps we'll see it in use at home particularly as all users had a favourable opinion. The majority of people used Wintergreen, but a variety of other additives in use included Trinity Wintergreen, with a special evaporating agent, a 50/50% Wintergreen/Tractite mix and Rolf Bergen using Polyclens/WD40!. The track was a light pinky red colour, and by the end of Saturday the corners were black with rubber. The blacker they got the higher the grip became and several people had difficulty with this situation. One person who regularly races at three day European events said that the best idea was to use Tractite in this situation as it had less bite. Certainly people using Tractite has less complaint than those using Wintergreen.

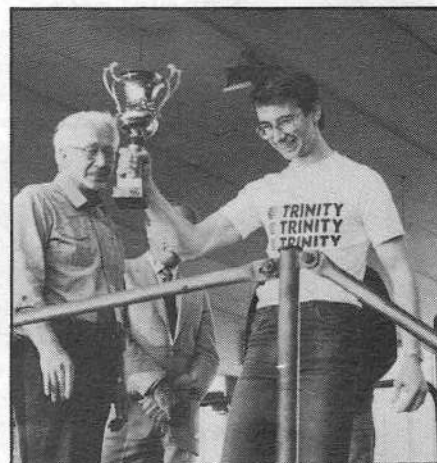
Practice was a nightmare for many people, the system was, to wait for your peg, and then go on to race. Since the rostrum was at least 7ft. up, a helper was essential to put the car down and keep an eye on it for marshalling purposes. The organisers were only allocating 27MHz and



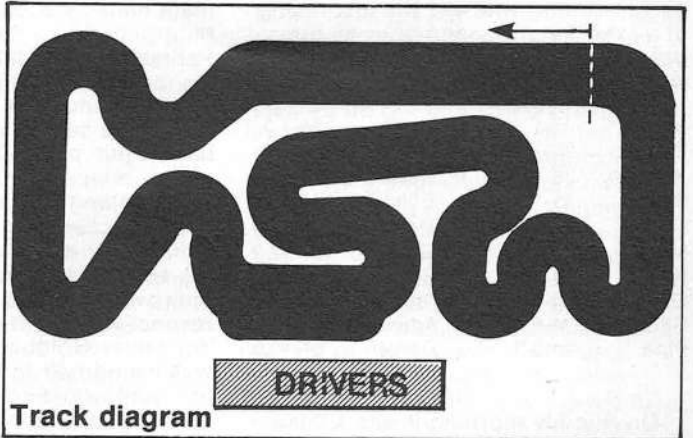
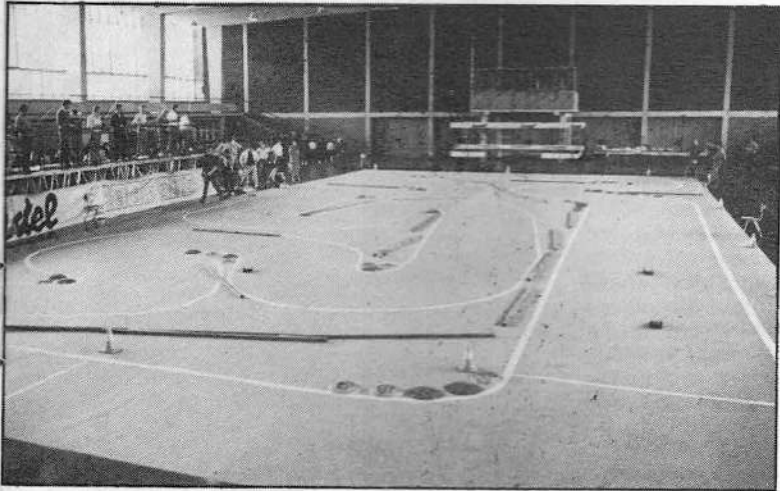
1st place Left; a jubilant Phil Olson clutching the trophy after winning the 1984 European Championship. Below: Phil's Parma 'Panther Euro' car designed by teammate Chris Arnold.



Above: second place, Andy Dobson wonders just what does it take to be Euro-champ?



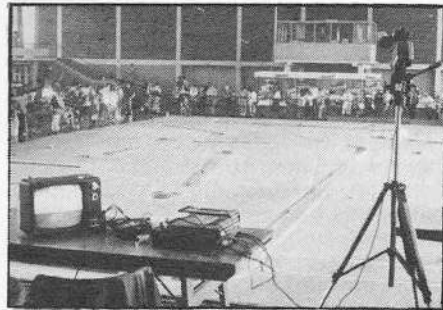
Above: third place, Phil Davies looks pleased after producing the goods when needed most.



Track diagram  
Left: the European championship circuit complete with 'sorting the men out from the boys', chicane at the end of the straight.

40MHz wave bands, making over 30 frequencies available. The result was that at any one time at least a dozen people were on the circuit, that figure going up to around 20 or so on many occasions. The record was 27 on the rostrum at one point on Saturday morning making the circuit worse than Hyde Park Corner in the rush hour. There was no point in going out in these circumstances, you could learn nothing about driving the circuit since learning the lines of the corners was impossible, but picking the right time could at least get you a reasonable run. Practice was time for teams to try tyres and chassis set-ups. Most people used old cells and known motors for this exercise, but the less fortunate souls had to wait until controlled practice to get a 'handling' run on their limited quantities of cells and motors.

Controlled practice was not very indicative of the battles to come, the *Associated* crew looking for more speed, *Sping* runners selecting awesomely quick motors, *Trinity* users having blown motor problems and the non-team runners consulting amongst (one another) as to which motor was working best on this or that chassis. The British amateurs found best results with some triple



Above: video camera set-up to record jump starts. Replaying the action decided categorically what penalties were applied.

turn motors, although the teams, *Associated* and *Trinity* used various winds, double turn motors looked a good compromise between high rpm and low down torque until the special cells started to appear. Mike Reedy's (*Associated*) triple turn 'white dot' motors were then in great demand and he seemed to have an inexhaustible supply!

Ernie Provetti (*Trinity*) was issuing a small quantity of motors to his selected runners, and they were also in demand. "People only know four English words" he said; "Yes, No,

*Trinity* and *Free!*" They had every reason to want one as they were extremely quick.

### Qualifying

After a day and a half of practicing, the time came to get down to business. Round one was the first test and when the lists were posted it was obvious that this was going to be very close racing indeed, Andy Dobson and Wayne Davis were already in trouble down in 98th and 101st place due to mechanical failures. At the top was Christian Keil, the young German Champion (35-10.2). Followed by José Rosas (35-14.7). The first British driver was in third place — Phil Davies (34-0.4) and then came Jean Michele Fraisse. Placings changed considerably in round two. Andy Dobson had to change speed controller to eliminate any potential problems that had caused a motor burn out in heat one. Jimmy Davis was re-adjusting his 12iS to the circuit conditions having tried the new suspension front end and not found it to his liking. Micky Booth was quite happy with his heat and consulting Reedy on more

Driver	Chassis	Motor	Ni-Cads	Servo	Speed Cont.	Body	Front Tyres	Rear Tyres	Tx Rx	880gms Min. Weight	Tyre Size (R)	Gear Ratio	Ultimate Ratio	Tyre Additive
<b>FINAL</b>														
Phil Olson	GB Parma Panther	Parma Yoko Ferrari	Parma Sanyo Double Wind DC	Futaba FD30M	Laser Special	Parma Osella	Parma Medium	Parma Medium	Futaba 2M Futaba	882g	52mm	11:48	37.44	Wintergreen Tractite (50/50)
Andy Dobson	GB Schumacher C Car	Trinity G Wind	Trinity Matched Sanyo OC	Novak	Laser Special	Alpha Track TOJ	T. Tyres 07	T. Tyres 07	Futaba Futaba	883g	48mm	13:50	39.21	Trinity Wintergreen
Phil Davies	GB Schumacher C Car	M.G.	Trinity Matched Sanyo OA	Novak	Laser Turbo	Alpha Track Skee	T. Tyres 07	T. Tyres 07	JRFM JRFM	915g	53mm	12:48	41.63	Tractite
José Rosas	F Associated 12i	Trinity Triple Wind	Sanyo OC	Novak	Demon 2 CeS	Associated TOJ	Associated Green	Associated Green/Med	Sanwa Sanwa	903g	52mm	12:48	40.84	Tractite
Rolf Bergen	NL Delta Phaser	Parma Yokomo	Sanyo ND	Novak	Resistor	Associated TOJ	Delta B	Delta B	Kraft S/Wheel Novak	882g	50mm	10:48	32.73	Polyclens WD40
Jimmy Davis	GB Associated 12iS	Reedy Triple 24g 27 turn	Associated Sanyo ND	Novak	Demon 2CeS	Associated TOJ	Associated Green	Associated Green	Futaba Futaba	925g	52mm	11:46	42.62	Dave Towell 80/20 mix
Finn Gjersee	DK Schumacher C Car	Trinity Double Wind	Trinity Matched Sanyo OC	Novak	TM-DK Electronic	TOJ	T. Tyres 07	T. Tyres 07	Futaba Futaba	890g	51mm	13:50	41.66	Trinity
Christian Kiel	D Associated 12iS	Reedy White DOT, Triple 25 Turn	Associated Sanyo ND	Novak	Resistor	Associated TOJ	Associated Green	Associated Green	Futaba Novak	890g	52mm	11:46	39.07	Wintergreen

# Racing Report

power. Round two was the last racing of a long Saturday and after all the heats were completed, the top twenty were:

Keil	35-1.2	Peglar	34-7.9
Dobson	35-7.4	Roem	34-8.0
Klier	35-10.1	Davis	34-8.8
Rosas	35-14.7	Bulck	34-9.4
Davies	34-0.4	Davis	34-12.6
Marchi	34-4.1	Gjersoe	34-12.9
Fraisse	34-4.2	Benson	34-13.9
Olson	34-5.2	Sterr	34-14.8
Booth	34-5.6	Adams	34-14.9
Pipe	34-6.3	Bergen	34-15.3

On Sunday morning it was a case of carry on where they left off, Round three started at nine o'clock and once again Christian Keil was the man who set the pits buzzing with the first 36 lapper of the event (36-5.4). This certainly sent everyone looking for that all important motor/cell combination. Meanwhile Phil Olson drove a storming heat, but was blocked on his last few laps so only recorded 34-0.5, very close to 35 laps. Life, however, was not so bright for others in the British team. Those without team backup were finding that motors that flew round in practice went like dogs in the timed heats. Some motors previously

mate hard for a good placing, recording 34-5.7 for 17th fastest. Pehrsson (*Associated/Sping*) made his mark for seventh place in heat 11 (35-13.4) and heat 12 was of great interest to see if Dobson could regain his 'sit-out' place. That he failed by over five laps seemed to spur on heats 13 and 14. Les Pipe (*Schumacher/Trinity*) (34-0.8) and Jimmy Davies (*Associated/Reedy*) (35-10.6) had a terrific race, their times improving them to 11th and 6th place respectively. By the last heat of the day Gerry Goldberg of team *Parma* was losing hair by the second hoping that Phil would keep his second fastest place. Finn Gjersoe (*Schumacher/Trinity*) and Klier (*Associated/Reedy*) were the pace setters in heat 14, but failed to break 35 laps, even though Gjersoe recorded his fastest time (34-2.4).

A look at the listing after round four showed that Glynn Peglar and Tony Wells has been bumped out of a place in the semis by the late charges of Chris Arnold and Pehrsson. Chris Arnold failed to realise this fact and drove into Ulm to fetch a *McDonalds* for the *Parma* team, reappearing only 12 minutes before the start of his semi, he nevertheless still made it to the line. The route to the final was clear. The

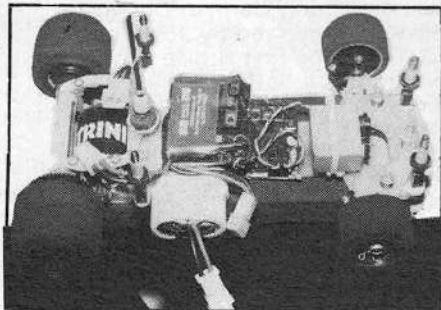


Above: Model Cars correspondent, Pete Winton (centre, left) gets the low-down from Mike Reedy on the *Associated* story. Jimmy Davis can't believe his eyes.

winners of each semi went through to join the top two qualifiers followed by the next four fastest from both semi-finals.

## Semi-Finals

Semi-Final A was an Andy Dobson benefit for most of the way, until he was caught by José Rosas of France on the last lap. Andy made a mistake on a dot and José was through, only for Andy to retake the lead when Rosas faltered two corners before the finish. It was a slow final, only the first two breaking 35 laps. Chris Arnold had made a good start and looked capable of going all the way until uncharacteristic mistakes began to creep in (must have been the 'Big Mac').



Above: just one of the numerous products on show, this speed controller is produced by CS Electronic from Germany.

rejected were re-substituted and flew round like rocketships, a very odd phenomenon which was without explanation. There was no qualifying list posted at the end of round three, so people were trying to work out their positions from the round two list and the round three heat times. The top two qualifiers go straight through to the final, the next 16 fight it out in two semi-finals for the remaining six final places.

In round four, heat 2 the first of a number of last ditch attempts was paying off. Rolf Bergen (*Delta* chassis, *Sping* motor) knocked 15 seconds off his round two time for tenth fastest (34-0.2). Heat seven had Phil Olson (*Parma/Parma*) driving beautifully for 35-5.9 to take the second 'sit-out' spot from Andy Dobson (*Schumacher/Trinity*). Three heats later Chris Arnold (*Parma/Parma*) was chasing his team

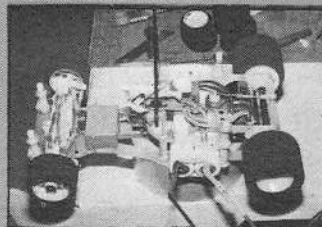
# Chassis talk

A fair cross section of manufacturers' marques were in evidence which still goes to show that a choice is available. As far as 'Teams' were concerned, these can be divided into three basic categories, 'Professionals', 'Expert/Enthusiasts' and 'Also Rans'.

Of the professional we immediately focus on *Associated*, whose philosophy seems to be "here is the problem, let's throw money at it". Mike Reedy had made the trip to supply his 'super selected' drivers with the best in motors and cells. He tried to spend most of his time with the following drivers, Jimmy and Wayne Davis, Micky Booth, Henrik Carstens, Christian Kiel and to a lesser extent Bill Jones, Marco de Marchi (Italy) and Tony Wells. Basically though, if you ran an *Associated* car you were entitled to a *Reedy* motor and Mike was prepared to give them out. The new *Associated Sprung* front end also featured on a fair few cars, but some drivers reverted back

to their standard set-up. Cells also played a major part in the fight for first place, *Associated* cells were issued in General Electric style heat shrink to confuse and psyche out the opposition. However a sneak look under the shrink wrap revealed the ubiquitous Sanyos (O.C's). Despite their rank professionalism, the *Associated* crowd were an extremely likeable and friendly lot.

*Team Trinity* in the shape (or bulk) of Ernie Provetti had joined forces with the *Schumacher* concern to beat the *Associated* machine. The percentage of top billing should be accorded thus; 20% *Trinity*, 20% *Schumacher*, 60% Andy Dobson. At this type of meeting, after this much practice the high grip available certainly caused the *Schumacher* cars problems. The 'C-Car' tended to judder into the corners and once committed tended to search for the correct line. The emphasis on winning had been firmly placed on Andy Dobson's shoulders to the detriment of his team mates, Les Pipe and Phil Davies. Amazingly Phil didn't get a crack with a *Trinity* motor until he had qualified for the semi-final. Other drivers under the *Trinity* banner were Finn Gjersoe of Denmark who had changed from *Parma* to *Schumacher* in readiness for





## Results

### Semi-Final A

Pos.	Name	Nat.	Laps
1	A. Dobson	UK	35/490.6
2	J. Rosas	F	35/495.0
3	H. Klier	DL	34/484.7
4	H. Carstens	DK	34/486.9
5	L. Pipe	UK	34/488.6
6	C. Arnold	UK	34/489.7
7	M. Marchi	I	34/491.2
8	H. Pehrsson		34/498.9

### Semi-Final B

Pos.	Name	Nat.	Laps
1	J. Davis	UK	35/483.7
2	R. Bergen	NL	35/483.9
3	P. Davies	UK	35/489.9
4	F. Gjersoe	DK	35/495.5
5	R. Roem	NL	33/491.9
6	J. M. Fraisse	F	32/482.2
7	W. Davis	UK	32/491.9
8	M. Booth	UK	3/47.9

Semi-Final B was both faster and closer. Throughout the race Jimmy Davis, Rolf Bergen and Phil Davies were within striking distance of each other, but Jimmy was across the line first and straight through to the final. The next three, Davies, Bergen and Gjersoe, all got 35 laps and subsequent qualification for the final. Micky Booth, up until then the

current Euro Champ. suffered disaster as his speed controller stuck in reverse after only three laps. A truly saddening end to his weekend.

### The main event

There was drama before the final when a loud bang was heard in the hall which immediately drew a large crowd to the *Associated* pit. Jimmy Davis' cells had vented so much that the heat shrink exploded. There was no damage to the cells, but a second pack was installed to be on the safe side. Then when the cars came to the line, Phil Olson and Andy Dobson suffered interference due to the organisers not asking Andy to change frequencies! As a result Andy's car punched itself into a wooden barrier and was rushed off for damage inspection.

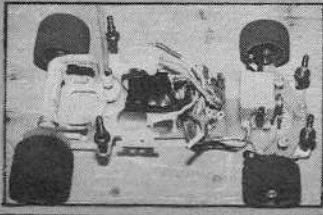
So, at just after 6-15 p.m., 57 hours after the first car started practice the eight best drivers lined up for the start of the final. At the horn it was Andy Dobson who shot through the chicane first and into a lead which he stretched to  $\frac{3}{4}$  of a lap by halfway. Behind him Phil Davies came out of the seven-car pile-up first and took up station in second.

Christian Keil suffered radio interference or a faulty servo after

seven laps, his car performing violent pirouettes every time it approached his end of the drivers' rostrum, so that was his lot. When the problem cleared he put in a string of sub-13½ second laps to confirm his status as the fastest man of the meeting. Meanwhile, Phil Olson was closing on the leading two whilst Jimmy Davis made two mistakes early on to end his challenge. Thinking that he was going to have to beat Keil, Andy's car was geared to find the extra lap he thought necessary. As it turned out Keil was out of it and Andy's cells marginal. So on the penultimate lap, as Andy started to slow Phil Olson kept his nerve to close the gap.

Andy's car was by now painfully slow and the gap was only a matter of yards. Phil Davies made a slight error of judgement with a back marker and the seconds lost were enough to only allow him third place. Phil Olson swept by Andy a few feet before the finish line and as Andy passed the line the hooter went leaving only these two drivers to finish the last lap. Phil with volts to spare drove carefully around the circuit to win the 1984 European Championship. At the end he looked on the point of collapse, leaning on the rostrum rail with head in hands.

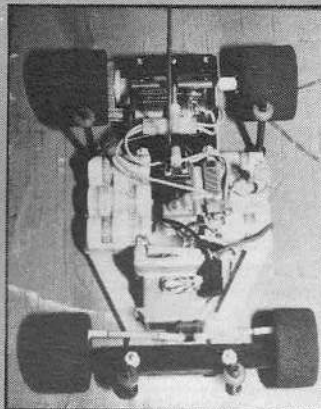
this event, he started to go well once his car had been set-up properly by a non-team British representative. Up till then help from Team Schumacher had not been forthcoming. Ernie also supplied the latest grade of Sanyo cells and these were used for one run only, a new pack being issued for each heat.



Moving down the list and Team Parma, the main constituents of which were Phil Olson, Chris Arnold and Fred Hatfield. Fred had only joined the team weeks beforehand, as a result no car other than Bud Barto's latest prototype was available to him. Fred duly tried the car and then proceeded to butcher it with hacksaw, file and scalpel (and not necessarily in that order) until he was partially happy with its performance. As work on the car proceeded - Fred's heat times proceeded to drop, until a last ditch time in the fourth round arrested the slide.

Chris and Phil however were both using Chris Arnold chassis to good effect, this particular set-up places the

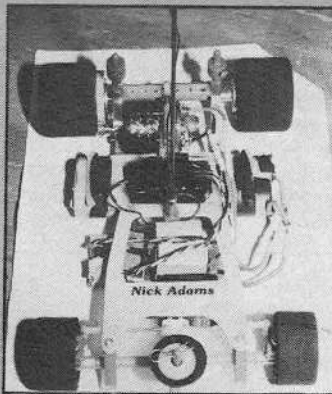
cells much closer together to give a lower roll tendency. These cars were not only stable but also quick due to Parma 'Yokomo' and 'Pulsar' motors released by Buddy Bartos. On the cells front problems were encountered in finding the necessary quality. In fact Gerry Goldberg paid money to various sources for



stocks of new, but unselected Sanyo Ni-Cads. The Parma team attitude to winning was clear, "we know it works, let's use it." In the event they were proved correct.

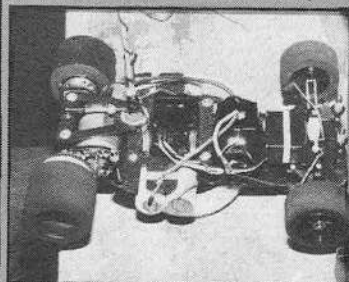
Demon Cars featured well, numerically, but less so out on the track. Once again the high grip quotient adversely affected the 'MF83' Cars despite the full length shaker plate fitted to their cars.

Unfortunately for team Demon they did not possess the driver to overcome the problem



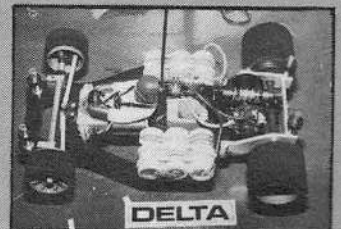
although Andy Benson looked set for a fast time until a violent shunt 'tweaked' his car out of the semi-final.

Alan Blakeman, proprietor, manufacturer and distributor of Alpha Track Parts Products once again provided the only



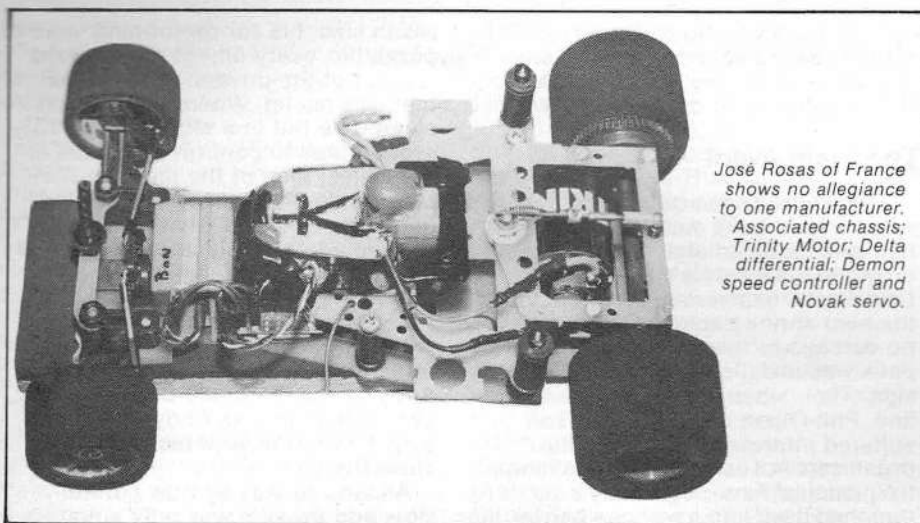
challenge with his carbon fibre 'Omega' chassis. His car looked super smooth on the circuit and his low qualifying was only the result of bad luck and a bad heat. It is almost certain that Alan will be recruiting new drivers into the fold as a result of some drivers chassis dissatisfaction at this event. Bodyshells seemed to be Alan's main business, particularly the new 'Sckee' which was used by many of the British drivers.

Delta drivers, although few in number made up for it with speed and quality. Rolf Bergen qualified for the semi and then the final with as standard a 'Phaser' as your ever likely to see. Hans Hippe fellow



countryman and team mate fared less well although was phenomenally fast on the straight bits. Hippe's car also sported a prototype transistor, Delta electronic speed controller plus a rear anti-sway device to stop the car from rolling.

# Racing Report



*José Rosas of France shows no allegiance to one manufacturer. Associated chassis; Trinity Motor; Delta differential; Demon speed controller and Novak servo.*

Gerry Goldberg, Parma team manager and Buddy Bartos were jumping up and down with unabashed glee.

The race was an extremely close one, Phil only managed to win by seconds; if he had not failed to catch Andy before the hooter the results would have been reversed.

Spare a thought too for Andy who once again came so close to victory.

Phil was congratulated by almost everyone present and still looked slightly dazed as the prize-giving ceremony began. Trophies were awarded to the top 18 with Gold Medals for all the finalists plus the essential champagne for the winner.

And so ended three days of well organised and friendly racing of the highest order. High praise must go to the race organiser, Heiner Martin and his army of efficient volunteers. The only problem was that every day the programme ran late, but since we had nowhere else to go, that hardly mattered. They had two computers to count lap scores as well as a manual

push-button system, plus an excellent P.A. and even a video camera to record the false starts for those dispute-free penalties!

There is no doubt that the continentals are getting quicker. We were the biggest contingent (21), 17 of whom were in the top 50 (of 106). We had eight of the top 18 and took first, second and third. The competition was friendly, but very tough. To see the *Associated* and *Trinity* machines in action at close quarters was very interesting. *Associated's* Mike Reedy spent hours setting up cars and issuing motors to his selected runners. Basically he did not allow the really fast motors to be run until drivers had their cars set up properly. From then on he used his experience of European events to interpret the feedback from his drivers before selecting which motors and cells to run. It was all to no avail. The *Associated* chassis looked nervous in the corners, Keil being the only runner to set a really smooth flowing style which well earned Mike

Reedy's praise. It seemed that the new independent front end was helping only slightly in this respect, but since Keil and Booth *can* make it work, comment must be withheld to to see how things develop.

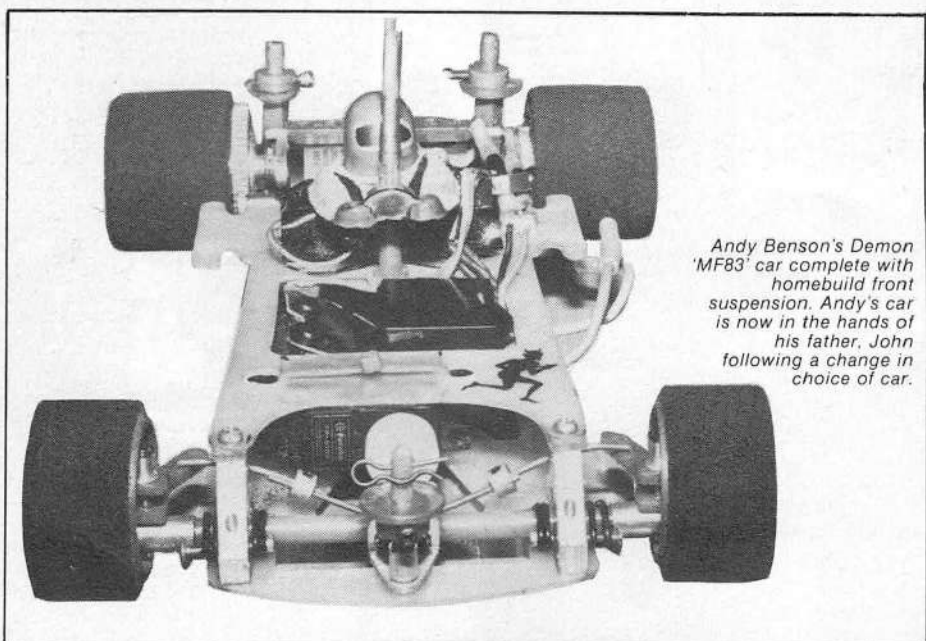
Ernie Provetti (Mr. *Trinity*) was a completely different style. He rushed hither and thither to get reaction from his drivers and seemed to be unsure of what the ultimate ratio meant. *Associated* use new tyres every time, so the gear ratios can be selected in advance. When you use tyres, two or three times as do team *Schumacher* they wear and thus the ratio which was right on 53mm tyres is wrong on 50mm. When Mike Reedy realised all his pre-planned ratios were falling 15/20 seconds short on duration he ordered the team tyres reduced by 1mm or so on diameter to give the required results. Ernie Provetti had the problem off pat by Sunday, maybe we even taught the Americans something! As for equipment in use I can give no hard facts. With 106 people present, 85 of whom were complete strangers, it was very difficult to find exactly what was in use. I found:

- 26 *Associated* 12is,
- 26 *Schumacher*,
- 10 *Demons*,
- 8 *Deltas*,
- 3 *Parmas*,
- 1 AYK (Delta copy),
- 1 *Associated* 12e (really!).

Finally one four wheel drive *Kyosho* machine plus Paul Hobbs' *Schumon* or *Demacher* combo. Paul was fairly embarrassed by the 4WD machine, having reviewed the thing and given it a moderate pasting, the intrepid Herr Lawenhack, using a *Kyosho* '480T' motor no less, proceeded to hurl it round one lap faster than Paul and qualified 18 places higher. Ah well, it's all in the preparation, eh Paul?

And so what of the result? As far as chassis' go it was unrepresentative of current 1/12th racing. As far as driving goes Phil drove a superb race, his attitude to the whole event was singleminded and he tactfully spurned unwanted advice, choosing to do his own thing. This might be the break-through he needs to put him into that exclusive club of U.K. National winners. It was a fairytale come true for Gerry Goldberg who was still grinning a week later! Well done Phil, congrats *Parma* who, compared to the *Associated* machine won the event on a shoe-string.

The last words must go to the last place man. Cyril Boyd who came by air from Ireland, their only representative. He was the only competitor in his hotel and had to pay £45 for a taxi from the airport to the venue on his own. He was the most personable man but having come all that way he finished dead last, still smiling. Nice one Cyril!



*Andy Benson's Demon 'MF83' car complete with homebuild front suspension. Andy's car is now in the hands of his father, John following a change in choice of car.*

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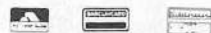
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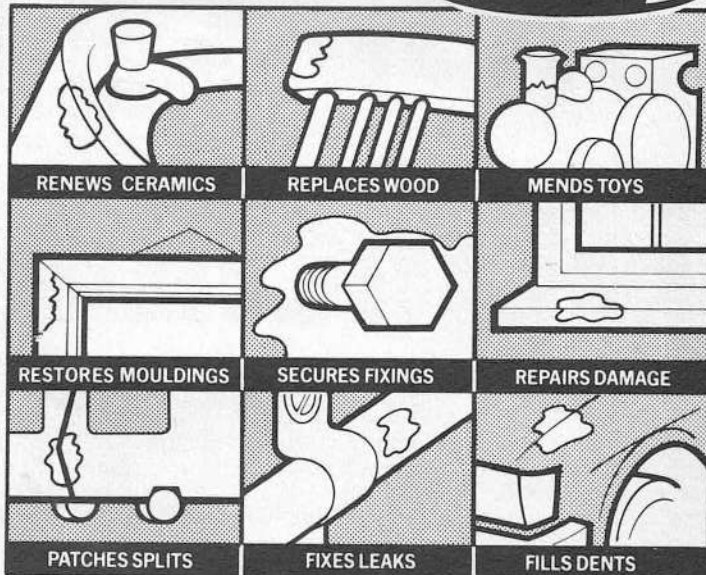
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# Slot Chassis Building

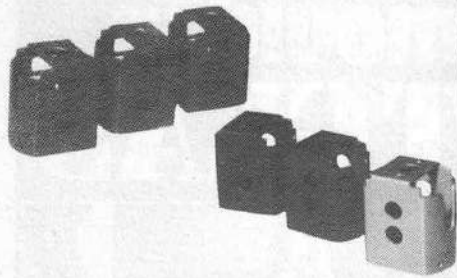
Mike Kettleson details his approach to race-car construction

THE ULTIMATE STEP for every slot racer is to design and build their own chassis. This can be a difficult and tiresome business for a total novice until, with a little experience, you manage to work out a logical procedure for construction. This is my method which I hope will be of use to the beginner which apart from the few tools specified does not require any complicated jigs. However, care must be taken in each stage of construction to achieve success.

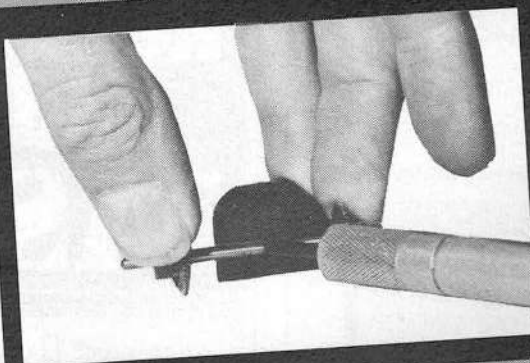
First and foremost requirements are suitable tools, without them easy jobs

become difficult. A good soldering iron is tool No. 1. I personally favour the 70 watt *Weller*. Soldering guns, due to their plain tip size, generally do not put out enough heat to be useful when soldering a brass chassis even though they may be rated at over 100 watts. tool No. 2 is a soldering block, I use a *SCD* block which I bought in 1968, the only problem with this particular item is that the material absorbs a lot of heat so I sometimes preheat mine over a paraffin heater which I use when

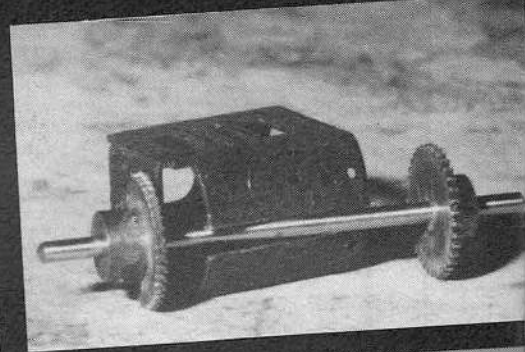
working in the garage. A good vice must be tool No. 3 and is essential for cutting and filing with accuracy. Good secondhand ones are available if you are prepared to look. I use a set of pliers with a hand cutting edge for cutting piano wire to a working length, then I clean up the sheared edge on a grindstone. A good variety of sizes of flat files and either a modeller's or full-size hacksaw complete the basic requirements. Brass strip, piano wire,



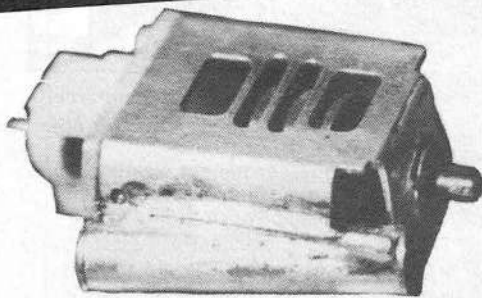
Above: 'C' can motors on right are standard. Trinity cans on the left have the advantage of larger cooling vents.



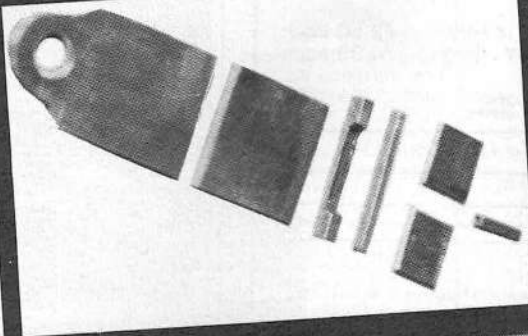
Above: use two spur gears of required make and size to give proper axle height. Mark out line on the motor can and cut a slot.



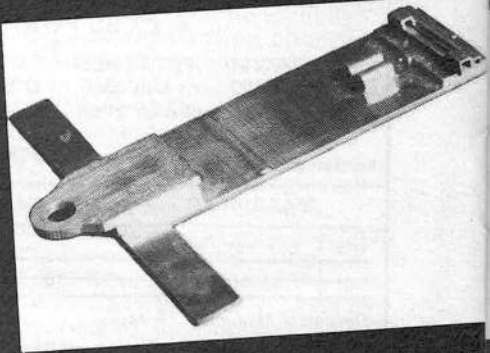
Above: check clearance between axle and motor can



Above: once soldered, add piano wire fillets to strengthen the joint between axle tube and can.



Above: guide tongue and spacer, rear hinges, stay limit tube and spacers.



Spring steel centre section (Tee-piece) complete with guide and rear hinges. Check that the guide hole is central and that a mitred guide will fit and turn. There should be a minimum clearance between rear of block and front of Tee-piece.

tubing, etc., can be obtained from a good model shop, spring steel can be obtained from *101 Models* who can supply almost any slot car accessory you care to mention.

I am going to build a 1/32 scale group 12 saloon car, powered by the *Trinity* 'C Can' motor to an 'ISO' design incorporating 'tee' section, spring steel centre. Gears will be 10:36 tooth *Mutleys*. This chassis is also suitable for a sports body although you may want to use either a *Nexus* or *Infinity* can motor with 8-38 tooth gears in place of the *Trinity*. For saloon racing a 'C' can motor must be used, either the standard version or the *Trinity* equivalent as apart from cutting out the axle clearance nothing may be removed from the motor can. Choose the full-size wheelbase you wish to scale down, 8ft. 4in., 9ft. 0in. or 9ft. 9in., Remember you can use your saloon in sports class just by changing the shell and although 8ft. 4in. and 9ft. 0in. scale shells abound there are no 9ft. 9in. wheelbase sports cars.

Set up the rear axle tube to the motor can as shown in the photos, use this to work out a drawing of the finished chassis, to obtain sizes of centre

section, motor plate, pans, etc.

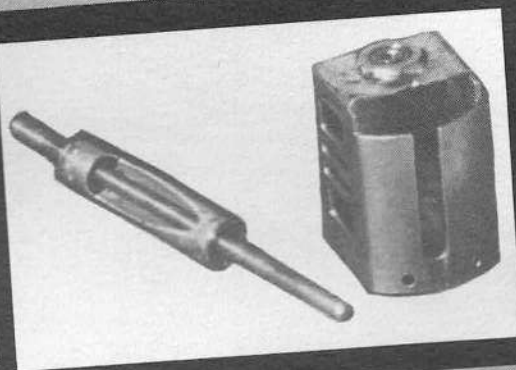
The angle of the motor to rear axle should be as low as possible; to achieve this the can may be cut away for axle clearance as may the magnets. I prefer to slot the un-notched side of the can to obtain the strongest joint between axle tube and motor. Since the notch on the other side is too large for the tubing, especially if you want to use reamed tube. Notching the axle tube to mate closely with the can at the correct angle must be done with care, try to make the joint as close as possible. A gap to be soldered across or 'bridged' is a weak joint. Make the axle tube just long enough to enable the bearing to touch the spur gear. When the teeth of this gear nearly touch the motor bearing then the mesh is correct, the other end of the axle tube should finish adjacent to the endbell of the motor so that the can end axle bearing just touches the plastic. Since nothing may be removed from the endbell moulding this is the practical limit to the minimum angle of the motor to axle.

The positioning of the front slot guide is another limiting factor in

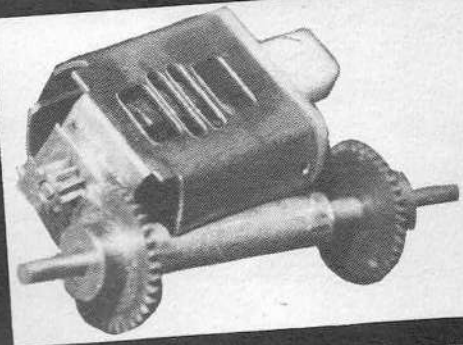
chassis design which must be taken into account when drawing up your chassis plan. A general rule of thumb is to place it as far forward as possible of the front wheels, within the framework of rules. The 'guide' rule was formulated in the mid-60s when chassis were either made from three poles with *MRRC* steering units bolted on, or stamped and folded alloy *Revel* kits with 16D motors. This rule is now quite archaic to the point where the only commercial guide available, the 'jet flag', is, in its standard form, illegal as the blade must be cut back to fit within the rules, it being 1/8in. too long. Also the guide in the slot may not be more than 1 1/4in. in front of centre line of the front wheels. Most drivers cut 1/4in. from the front of the guide blade to enable the pivot point to be moved further forward which improves handling. It would be nice if the BSCRA would agree to alter the guide rules to allow the 'jet flag' to be legal as standard and to alter the guide in slot rule to say — no part of guide or chassis



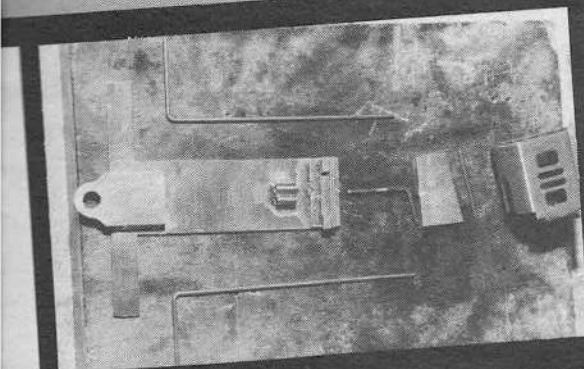
Above: using an old armature or 2mm diameter shaft, solder bearing to can. This bearing is fitted from the outside.



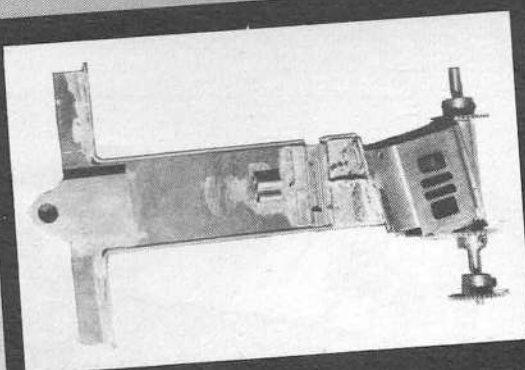
Above: axle tube, notched to provide clearance, with bearings soldered in.



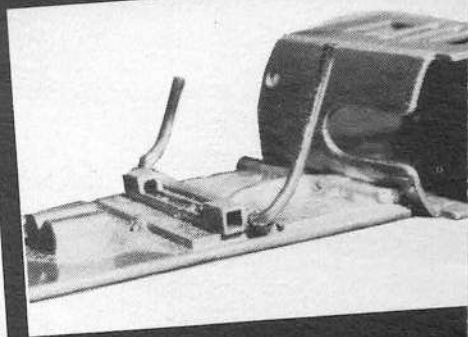
Above: axle tube set up for soldering to the can. Note: tight fit to motor and 4 thou shim behind pinion to separate spur gear from bearing.



Above: motor plate stiffener for motor can to plate fillet, hinge pin and main rails. The latter can be 16, 17 or 18 gauge wire depending on degree of flex required.

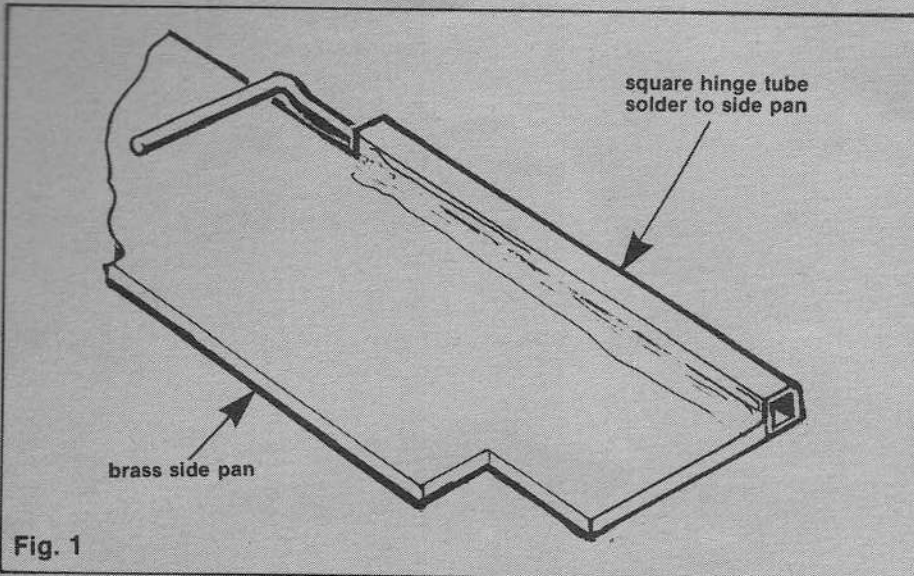


Above: completed centre section. Note: only solder main rails to arm of Tee-piece.



ISO hinge wire. Bend one end to fit — push through tube and carefully bend other side to match.

# Slot Car Acceleration



to extend more than perhaps 35 to 38 mm in front of centre line of axle. This would simplify matters somewhat.

## Notes

After soldering in ball races, clean them out and oil before use. After chassis is finished boil in soapy water to remove fluxes and use a brillo pad or small wire brush to get into the tight corners on all pivot points and bearings after drying.

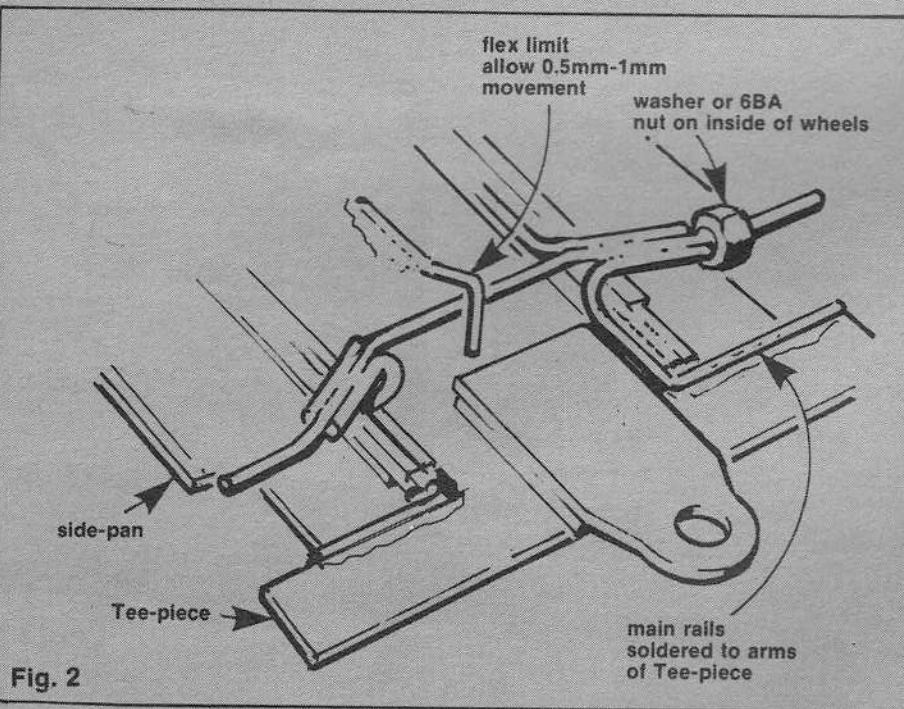
## Some soldering tips

Use an acid flux such as Baker's No. 3 or similar, for ball races use 101 Models' flux.

Degrease items and remove any corrosion before applying flux and attempting to solder.

Use the iron only when it is very hot, allow an extra few minutes after the iron has reached operating temperature before using.

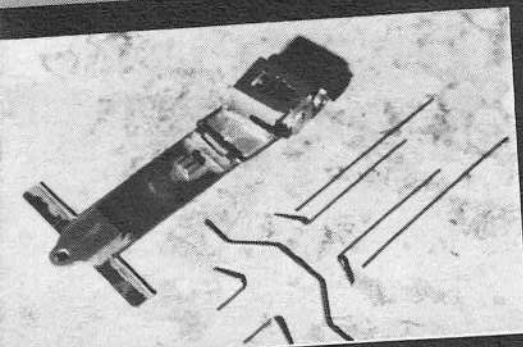
Use a cotton rag to regularly remove rubbish from the soldering iron tip. If this becomes corroded file to a chisel point for best heat transfer.



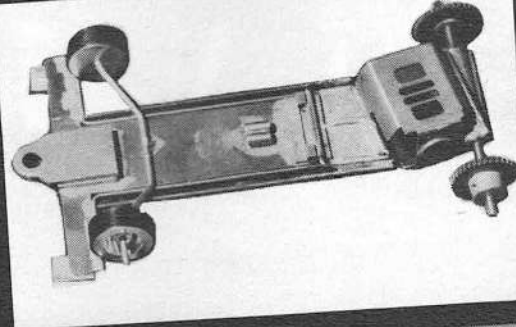
## Chassis Tuning

Tuning a chassis just by adding lead at the front for less grip and more at the rear for better grip is not the best method. Try changing the main chassis rails, use thicker rails to make the car slide, thinner to give the reverse effect. The same results can sometimes be achieved by changing the thin side pans for thicker versions to make the car slide and vice-versa. After changing these items to suit, lead may be required in small amounts to trim the car.

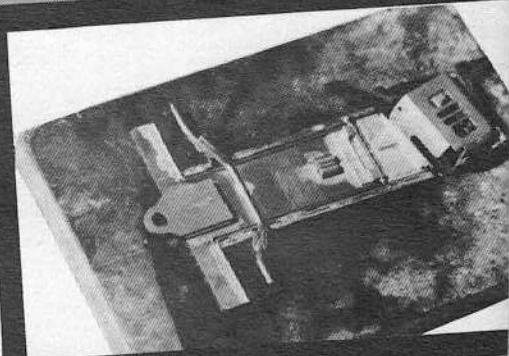
If you have never built your own chassis before I hope this article has been of some use to you. happy building.



Above: ISO flex hinges made from 18 gauge wire with a 16 gauge, cranked, front axle.



Above: using larger spur gears and shims under the front. Tee-piece arms. Solder the front axle lightly to the centre section at the correct height.



Above: assemble other piano wire components to the flex hinges and front axle.

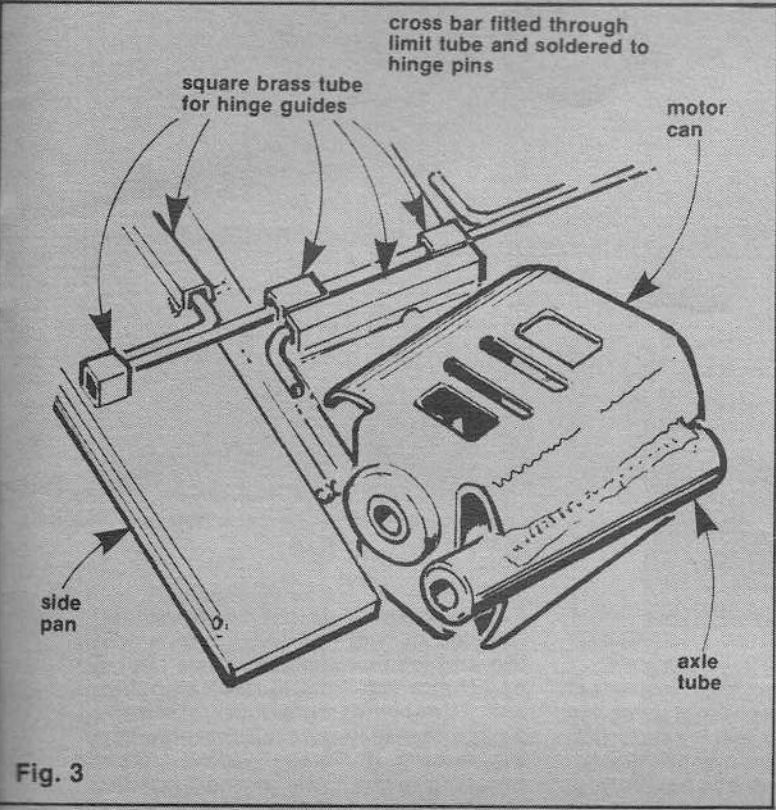
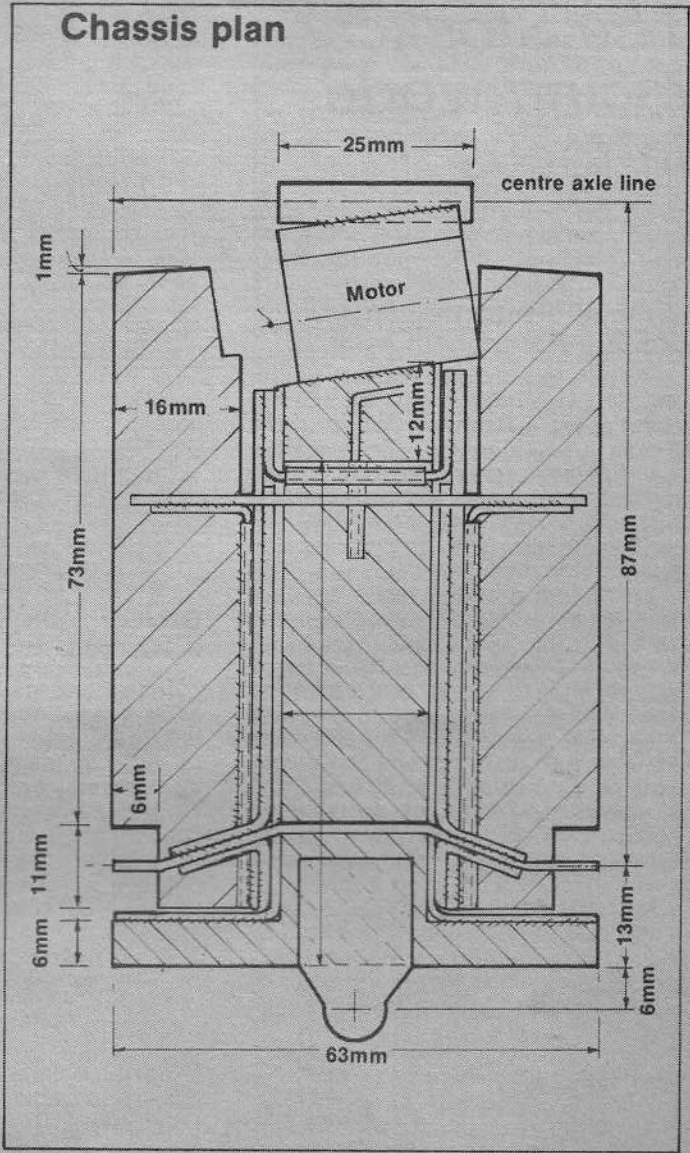
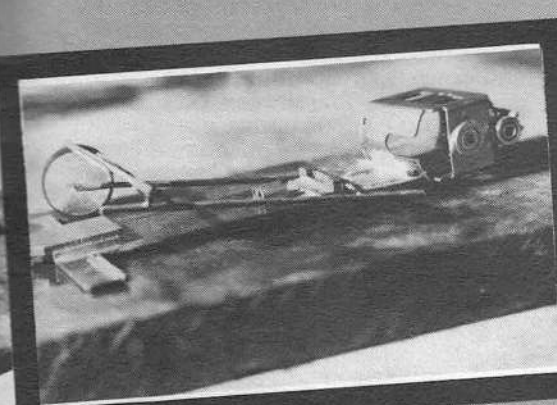


Fig. 3

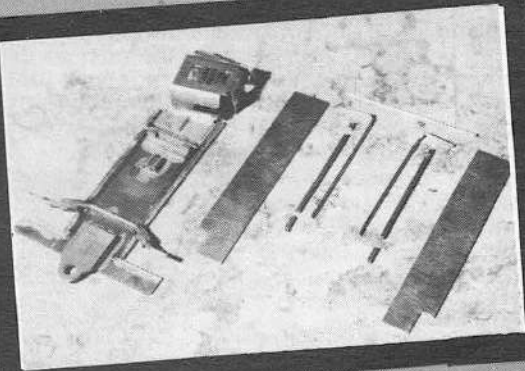


**Parts list**

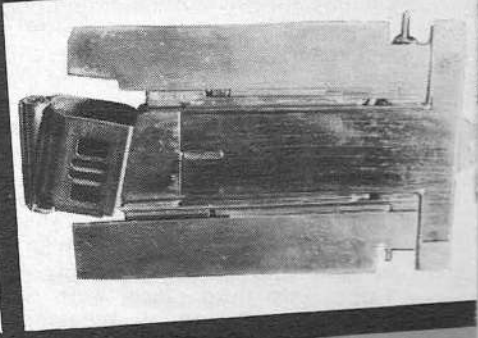
- $\frac{1}{16}$ in. piano wire (16swg) for front axle.
- 18swg for main rails and ISO rails, hinges, etc.
- Spring steel (101 Models) 0.035in.-0.045in. depending on availability.
- Hinge tubing -  $\frac{1}{16}$ in. square brass tube.
- Stops -  $\frac{3}{32}$ in. square brass tube -  $\frac{1}{32}$  O/O tube for rear axle tube.
- Brass side pans and motor plate -  $\frac{1}{16}$ in.



Above: remove solder from front axle and check freedom of movement of hinged section.



Above: chassis side pans, hinge tubes, pivots and cross bar.



Above: completed chassis ready for motor installation.

## The Stockcar racing world in focus

### 1/8th Midlands Regional Round, Nottingham April 22

Twenty two Midlands drivers got together at Nottingham on Easter Sunday for a Regional Round of the Series Championship. The weather was fine so the drivers settled in for a perfect afternoon's racing. Perhaps because of the date there were few visiting drivers, only three being non Nottingham members.

In the first round of heats the pace was set by J. Wheeler and R. Thorpe with 43 laps followed closely by N. Wheeler, J. Buckley and C. Emms all with 42 and D. Buckley one lap further back with 41. In the second round C. Emms got going setting the FTD with 45 laps, with S. Talbot and D. Buckley both on 43, J. Buckley on 42 and J. and N. Wheeler both on 41. In the third round Cliff dropped down to 38, leaving J. Buckley to set the pace with 44 followed by two good 43's from P. Wheeler and J. Hall, with N. Wheeler, R. Thorpe, J. Wheeler and S. Talbot all on 42's. One driver who was having a poor day by his standards was Peter Butlin who so far had only managed 36, 39 and 31, and was only to get 33 in the fourth round which was headed by J. Wheeler and S. Talbot's 44s, C. Emms on 43, and D. and J. Buckley and P. Wheeler on 42.

Those qualifying for the Final were C. Emms, S. Talbot, J. Wheeler and J. Buckley, whilst D. Buckley, N. Wheeler, P. Wheeler, R. Thorpe, Paul Butlin and J. Hall were to fight it out in the Consolation for the two remaining places.

J. Hall's race lasted for only nine laps, whilst P. Wheeler came in with 45 laps, five laps ahead of second placed R. Thorpe. D. Buckley was third with 38, and in a close scrap for fourth place Paul Butlin just beat N. Wheeler both with 30 laps.

The Final proved to be a close affair, Cliff Emms just edging home ahead of John Buckley by one lap with 57, who in turn just managed to pip Steve Talbot into third place, both drivers recording 56 laps. J. Wheeler was fourth on 53 whilst R. Thorpe was fifth on 51 and P. Wheeler with 38 back in sixth place.

My thanks to Norman Wheeler and family for sending me the race sheet, remember secretaries it is up to you to send the information to me at 85 Elliott Road, March, Cambs. and I'll do my best to print it.

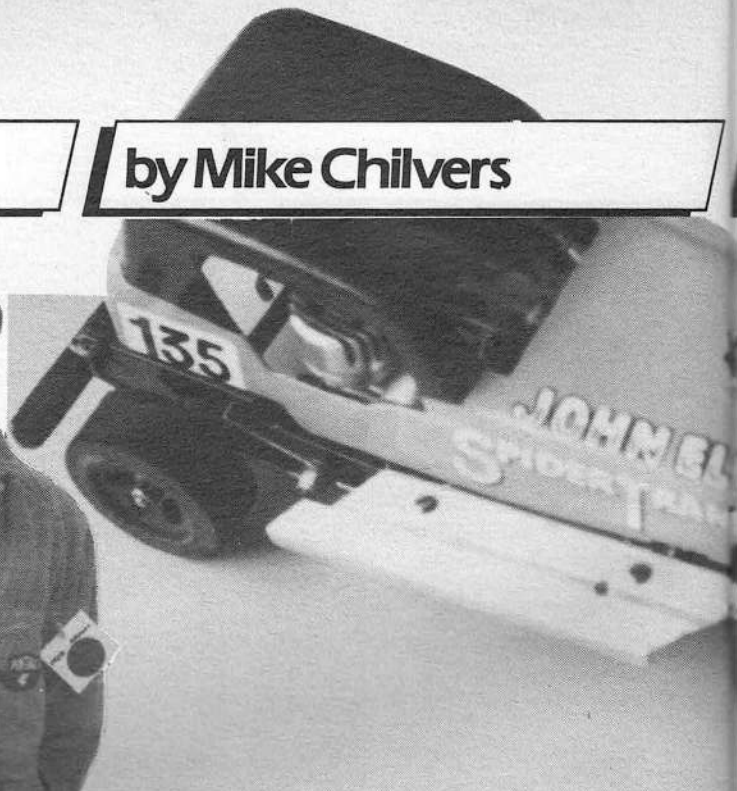


### Driver Profile. John Elliott. RSCA No. 135

John Elliott first came to my notice as a result of the newsletters sent to me by the Chessington Club and via reports I received on major meetings abroad. In due course I was to meet up with this modest 32 year old batchelor from Cippenham in Berkshire.

If anyone in the sport can claim to be blooded in stockcar racing then that person must surely be John as he has been involved in the sport all his life one way or another. As a boy his father raced F1 cars at all the major ovals until he retired in 1965, his racing number was 135, a number John managed to acquire when he joined the RSCA. When the family moved to Cippenham, a small village between Slough and Maidenhead, the house they moved into was owned by a top BRISCA driver Ted Parkhurst (104) for whom John worked as mechanic for a year or so before moving to join the Webb brothers, Peter (No. 8) and Ron (No. 56). Working every spare hour on the cars trying to build both speed and reliability into them for the next six or seven years until the big 'bust up' between BRISCA and the southern drivers who formed SCOTA and raced on the Speedworth tracks.

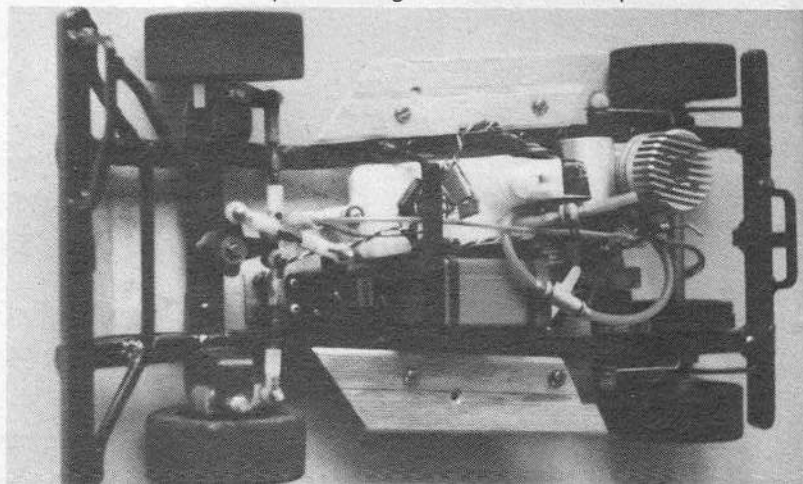
Right: John's 'modded' Mardave, sports a number of commercially available parts, including PB Racing Products (fuel tank) Puma, Kingsway Kar Komponenten and home built items.



Above: Star-rated driver, John Elliott together with modified Mardave stockcar.

It was about this time that John decided he had had enough of watching and mechanicing for other people and that it was time to have a go himself. The savings were duely raided and a car and transporter purchased. In his own words the next year was spent breaking every rule in the Highway Code and mastering the art of going round a left hand bend on full right hand lock in a four wheel drift with a seven litre car on your tail giving you a helping hand! For the first two or three months John had considerable practice at backing the car out of the fence. As time progressed he found his five litre Pontiac was uncompetitive against the seven litre cars and as funds were not available to uprate the car he was forced to retire. An so with car and transporter sold it was back to watching.

It was whilst holidaying in his home town of Bridgewater that John saw a stockcar for sale and could not resist the urge to buy it, it was a 1/8th scale car in a model shop window! The car was a 'Mk1' Mardave with Veco '19' engine with which John spent many hours roaring around car parks and up and down the road until he was introduced to the Chessington Club. The size of the track came as a real surprise being so small in comparison







to the area in which he had been practising. However the people were friendly and helpful, the racing was exciting and he was hooked. This was mid 1980.

After the first car came a variety of *Mardave 'MkII's'*, but when he teamed up with his present team mate Nigel Forster (RSCA No. 104) various modifications were made to the *Mardave* in an attempt to improve both reliability and strength. John decided to cut the front bumper off and widen the chassis as far as possible plus welding on a new bumper. This modification made the chassis 4in. wide at the front, with the side rails a lot straighter and as a result the chassis a lot stronger. Shortly after this modification the car was raced to 13th place in the '81 World Final in Holland. Since then all the chassis' have been scratchbuilt using a variety of commercially made items available on the model market from *Puma*, *Mardave*, *PB*, *Kingsway* etc. Everything on the car is mid mounted with *Super Tigre* engines fitted with either *Puma* or *Mardave* clutches.

Since April '82 John has been a star grade driver, and also for the past couple of years Club Secretary at Chessington involving himself with the running, maintaining and transportation of the track to away meetings. With team mate Nigel he averages about 36 meetings a year, which include club meetings, national meetings up and down the country and some international meetings abroad, having raced in Holland, Italy and Germany.

Since he began racing John lists his best results as the 13th place in the '81 World Championships in Holland, 14th in the '83 Championships in Germany, his win in the Duckham's Invitation at Bournemouth in '82 and in the same year two second places to Paul Dudley at the Sandown Model Exhibition. His ambition is to build a competitive car of his own design to compete at the top

level of racing. He likes racing abroad, especially Holland, and would like to thank Paul Dudley for all the help he has given him to enable him to do this. At home his favourite track is surprisingly not his own at Chessington, but Bournemouth and his greatest dislike is changing radio frequencies in the pouring rain.

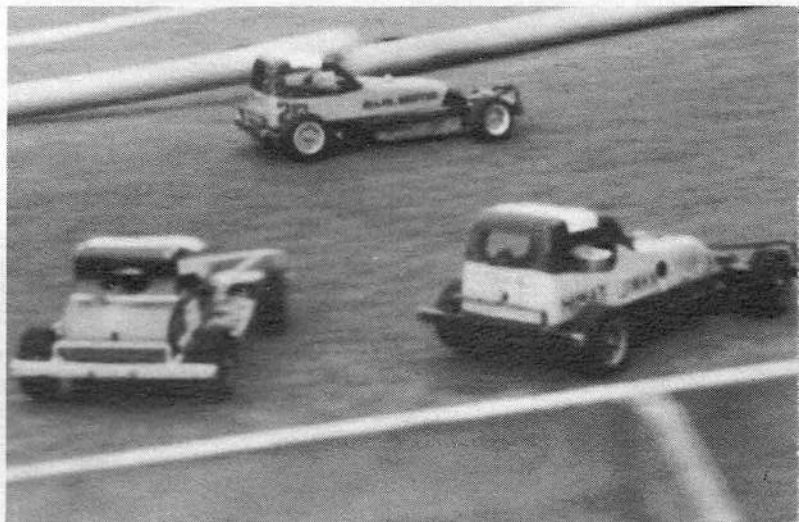
John's attitude to the sport typifies a man dedicated to racing, but for whom participation and enjoyment are more important than winning. As a clubman he gives of his all to the club, and is prepared to do more than his share to ensure that the sport can be enjoyed by others. In talking to him he is more concerned to pass credit on to others especially to team mate Nigel, then take it for himself, but admits that racing his 1/8th car is cheaper than the *Pontiac* and has meant he can afford to buy a house of his own.

### Club in Focus. First All Stockcar Team (FAST) Bolton

Clubs featured in past issues have all been well established organisations, some for as long as ten years, others two or three. However this month we turn to a club in its infancy having just celebrated its first birthday.

**First All Stockcar Team, or FAST as it**

*Right: exciting stockcar action seen at the aptly named FAST Bolton Circuit. First All Stockcar Team. The circuit is situated at the Tesco car park in Norwich.*



is known, was formed at the start of the '83 season by a small group of model stock car enthusiasts from the Bolton area aided by Art Burley of *Art Burley Models* who passed the word round to customers. At this stage the club had nothing in the way of facilities, but did possess the one necessary ingredient, an enthusiastic group of members. They were fortunate to include Eddie Slater, a director of a timber merchants and who was responsible for the construction of the portable track, which now needed a location. The club are grateful to *Tesco* who allow them to use the car park at Horwich for their race meetings and it is this venue that the club still uses in '84.

The '83 season was a period for members to gain some experience, as most were complete novices, having never raced before. During the year, as the club expanded, others were attracted to the racing, including drivers who had previously raced with either the *Pendle* or *Keighley* Clubs. Their experience was of particular benefit to those who were completely new to the sport. Current Club Champion and Super Star is Stephen Sandiford, who, with his father Roy used to be members of *Keighley*. Midway through the '83 season the club decided to get itself properly organised, formed a committee and affiliated itself to the RSCA; FAST had arrived on the scene! With Jackie Offord as chairperson, Mike Seddon as Secretary and Eddie Slater taking care of the money FAST was on the move. Recently electronic lap scoring equipment has been acquired and the club looks forward to the future.

At the moment membership stands at about 28, with 18 or so turning out for each meeting. The club hope to increase this number and would welcome any new members, whether experienced or not. This year the club are hosting a round of the Series Championship (Round 5) on August 26, and hope to constantly improve

their facilities. They would like to have a permanent track with toilets etc., but know that they need a site somewhere, someone to allow them to construct one plus the finances to make it possible.

The Secretary would like me to thank all those who have helped make the club a success so far and to point out to those interested that if you would like to be a member of a new, expanding club then he would be pleased to hear from you or see you at *Tesco's* car park, Mansell Way, Lostock, Horwich, Nr. Bolton. So contact Mike Seddon at 54 The Cheethams, Blackrod, Nr. Bolton, Lancs. (Phone Wigan 831978) if interested.

# Taking Stock

## European Championships

Leicester — April 29

I WELL REMEMBER some of the comments made at the RSCA AGM in December when it was announced that April 29 was to be the date for this meeting. Comments concerning cold, rain and even snow were suggested for the weather possibilities, plus the fact that it was too early in the season and no one would have competitive cars. Well in the event none of these comments were to prove true.

When I arrived at the *Everards* 'Tiger Raceway' the weather was bright, the sun was shining and a cool wind was helping to keep the temperature down. Having decided not to participate in the meeting my 9.30 arrival enabled me to have a good wander around the pits, chatting to the drivers and getting a good look at their cars. A total of 64 drivers had pre-entered, three of whom did not turn up. The entry list was, as expected, full of top class drivers, including the '82 and '83 Champion Paul Dudley trying for a hat trick. World Champion Les Calder, Series Champion Graham Lawrence, British Champion Steve Talbot, Champion of Champions and past European Champion Cliff Emms, twice World Champion Bob Clayfield, past British Champion Steve Wearing and past RSCA Champion and runner up in the '83 World Final Roy Crowson. Eleven drivers had made the trip from Holland, two from Belgium, one from Germany and there were two from Italy counting the Sussex Club's Peter Micheli. The one and only lady driver was Leicester's Karen Dexter. Walking around the pits one noted the cog driven car of Dave Perou from Haywards Heath, the laid back engine on Roy Crowson's car, the rear exhaust on Paul Dudley's HB GP, the very smart appearance of the British entry, and the very tatty appearance of most of the foreign entry, many of whose cars were sporting OPS engines plus tuned pipes. Both Ken Cornish and Scott Grocock were trying prototype *Mardave* 'MkIII' chassis' to see how they would perform.

As an EMSA this meeting was run to EMSA rules, which meant that the racing format was that each driver would have three heats in a fixed programme order, with the best two heats counting for qualification through to the quarter finals into which the top 24 qualifiers would go. From the four quarter finals the individual winners of each would go into the two semi finals, where they would be joined by the next

eight fastest from the quarter finals. From the two semis the winners would go to the final, being joined by the next four fastest from the two semis.

The first round of heats saw four drivers failing to make the start line, Kurt Kok of Holland, Steve Wearing, Dave Mawson of England and Jean Vroge of Belgium. The pace was set by Cliff Emms and Roy Crowson both with 44 laps, followed by Bob Clayfield on 43 and Paul Dudley, Martin Robbins and Steve Talbot all on 42's, with Les Calder and Mark Tichurst one lap further back on 41. This was a good start for 13 year old Mark, the Haywards Heath Club Champion who had put himself well up with the front runners as all took a 30 minute dinner break. The leading foreign driver at the time was the Italian Ascanio Cherici who had 40 laps along with Colin Bunyard, Brian Sylvester and Graham Lawrence.

When racing resumed after lunch for Round Two. Once again the pace was set by Cliff Emms with his second 44, the same as his travelling companion Steve Talbot. Whilst just behind on 43's were Graham Lawrence, Roy Crowson and Colin Bunyard, leaving Martin Robbins to score his second 42 of the day. The only other drivers to hit the 40 mark in the round were Peter Butterworth with 41, and Mark Tichurst, Pete Hart and Belgian Eddy Smeets. Bob Clayfield could only manage a four lap heat as his front axle broke.

At this stage there were seven drivers, with a total of 80 or over to their credit who were able to sit back and take Round Three easy, or at least more relaxed, confident that they had made it through to the top 24, although there were many others who were awaiting the final round knowing that further progress was dependent upon their performance. Paul Dudley knew that his 33 of Round Two was not enough, Brian Sylvester and Les Calder were not too happy with their 37 and 38, Ascanio Cherici knew he had to better his 35, and Bob Clayfield was wondering what effect the fitting of a replacement front axle would have on the handling of the car.

The racing in the third round was, as expected, fast with 15 drivers recording

40 laps or more, the pace and FTD for a four minute race being the 45 laps of Steve Talbot. Hot on his heels was 'Mr. Consistency' Cliff Emms with his third 44 of the day, followed by Roy Crowson, Graham Lawrence and Holland's Gerard Tomlinson on 43. Ken Cornish managed 42 laps with his *Mardave* 'MkIII,' with Andy Fulford, Scott Grocock, Colin Bunyard and Russ Kearn all managing 41's, whilst Eddy Smeets, Ascanio Cherici, Peter Butterworth, Bob Clayfield and 13 year old Darren Hart recorded 40's.

Whilst the organisers set about the task of working out the top 24 qualifiers and putting them into their quarter final heats the pits were full of activity. There were those who knew they had made it, busy preparing their cars, those who knew they had not made it busy packing away so as not to miss the action that was to come, and those who thought they might have made it busy biting their nails awaiting the official announcement. Those that did make it to the quarter finals were as follows:

### Quarter Final Qualifiers

Name	Laps
S. Talbot	89
C. Emms	88
R. Crowson	87
G. Lawrence	86
M. Robbins	84
C. Bunyard	84
R. Clayfield	83
P. Butterworth	81
M. Tichurst	81
G. Tewssen	81
E. Sweets	80
P. Dudley	80
A. Cherici	80
A. Fulford	79
L. Calder	79
S. Grocock	79
P. Hart	79
F. Emson	78
K. Cornish	78
N. Forster	77
R. Kearn	77
D. Hart	77
D. Bird	77
B. Sylvester	77



Above: the top three finalists in the European Championship final. Third, Colin Bunyard (left). Roy Crowson - winner (centre) and Graham Lawrence. Needless to say, Roy popped the cork on his champagne to celebrate his win.

## Quarter Final results

	Laps
1. S. Talbot	55
2. C. Bunyard	52
3. A. Fulford	50
4. D. Hart	50
5. S. Grocock	46
6. M. Tichurst	33

With the sun still shining the first five minute quarter final got underway. It was clear from the start that Steve was out to book his place in the next round, which he did by winning convincingly.

	Laps
1. C. Emms	52
2. M. Robbins	52
3. B. Sylvester	52
4. P. Butterworth	52
5. P. Hart	49
6. K. Cornish	47

The second quarter final was the best race of the four with four of the six cars in very close company for most of the race with little to separate Pete H. Martin, Cliff and Brian. A tangle in the last 30 seconds resulted in Pete H.'s car going sick as a result of a lost fuel tank plug.

	Laps
1. R. Crowson	56
2. R. Clayfield	55
3. N. Forster	53
4. E. Smeets	51
5. F. Emson	45
6. R. Kearn	11

The third quarter final was to be the fastest of the four and was the first to feature a non British driver. Russ's race was to last for only 11 laps, whilst Roy and Bob had a good race for the lead until Roy took the upper hand finally coming in a lap ahead with a splendid 56.

	Laps
1. G. Lawrence	54
2. D. Bird	47
3. G. Teunissen	36
4. P. Dudley	23
5. L. Calder	15
6. A. Cherici	6

The last quarter final was one full of incident, all drivers were at the disadvantage of knowing that they either had to win or get into the 50's to qualify as one of the fastest losers. Ascario's race lasted for only six laps before a broken front stub axle forced him to give up his challenge, a great pity as till then he had been going well. Lap 15 saw Les, bettless - his car of course, and that ended his challenge. Gerard was having a frustrating drive with a car that seemed to be lacking in power and was lurching all around the track being rushed after by Dutch supporters from all areas of the track, the front axle on Paul's car was broken. That was on lap 23, and so there were only three cars left in the race.

## Semi-Final 1

1. R. Crowson	4. C. Emms
2. C. Bunyard	5. S. Talbot
3. N. Forster	6. R. Clayfield

With the tension building Bob Clayfield, Steve Talbot, Colin Bunyard, Roy Crowson, Nigel Forster and Cliff Emms took up their positions for the first semi. After the problems in the last quarter final the organisers wisely decided that they would nominate marshals and that they only were to touch the cars, the mechanics having to retreat behind the ropes once the cars had been released. This was to backfire for Bob whose car stalled at the start whilst his mechanic was running back behind the ropes with his back to the car. The car was quickly restarted however, but by then Bob had lost too many laps to make them up. Steve was also not having a very good time, as his car stalled after being involved in a tangle, and although it was restarted and returned to the track it did the

same thing again. Whilst these two were having their problems the other four were having a real battle Cliff eventually dropping back to be lapped by the first three who all recorded 54 laps with Roy getting the verdict ahead of Colin and Nigel and so earning his place in the final.

## Semi-Final 2

1. G. Lawrence	4. D. Hart
2. B. Sylvester	5. A. Fulford
3. M. Robbins	6. E. Smeets

At least the drivers in the second semi knew what they had to aim for in order to qualify, but I feel that they realised they had a job on their hands, and that the aim would be to win. The line up was Andy Fulford, Darren Hart, Martin Robbins, Graham Lawrence, Brian Sylvester and Eddy Smeets. Whilst the pace was not as fast this proved to be a very close entertaining battle, gradually the pace proved too fast for Eddy who dropped back, but the others were swapping places continually, Graham taking it with 51 laps from Brian.

## Final

1. R. Crowson	4. C. Emms
2. G. Lawrence	5. N. Forster
3. C. Bunyard	6. B. Sylvester

There was the expected delay as drivers were given the chance to prepare their cars after the semis, and walking through the almost deserted pits I found Brian Sylvester sitting alone hardly believing he had made it to the final. His qualifying score of 77 had seen him just scrape into the top 24 in equal 20th place with four others. Good drives in the quarter and semi's had got him through. Could he now go on and win? Or would it be Nigel, who like Brian had qualified through in equal 20th place?

Could Colin who had gone so well in qualifying into fifth place spring a surprise, or would it be Roy, Graham or Cliff who would take the title? Around the track side these three were about equal favourites, Roy having driven superbly all day, qualifying third and winning both his quarter and semi. Graham having qualified fourth and Cliff knowing the track so well and having been so consistent in qualifying as well as being a past champion. Well the answer would soon be known.

The crowd cheered as the drivers came out to take their places on the rostrum and roars of encouragement were to be heard from all parts as the '84 European Final got underway. It was to prove to be a very close race, but Brian's luck ran out when he was forced to pull out due to a flat battery in his radio gear after only 15 laps. Just after halfway through the race Nigel also went out with a broken belt, but for the others the race was going on at a fast pace. Roy had started rather slowly and had been in about fourth place, but he drove well, keeping out of trouble and avoiding being tempted into reckless moves, his car was going well and gradually he eased his way into the lead and never looked back. Behind him Colin, Graham and Cliff were engaged in a real scrap that looked as if

it might involve Roy as he weaved his way through, lapping them not once but twice to end up in the undisputed position of champion even before the results were officially announced.

The official results showed Roy Crowson to have won with 55 laps, with the tussle for the minor positions going on to the very end with Graham Lawrence second, Colin Bunyard third and Cliff Emms fourth, all with 53 laps. Nigel Forster was fifth with 36 and Brian Sylvester sixth with 15.

The trophies were presented in the garden of the 'Airman's Rest' by Rod Charles, the General Manager of Wadkin Machine Tools who had sponsored the meeting. All drivers received a trophy to commemorate the occasion, with the major congratulations going to the new '84 European Champion Roy Crowson from the Lilford Club with his Irvine powered Puma.

Congratulations were also passed on very deservedly to the Leicester club who had organised the meeting magnificently due to real club involvement. Well done Roy, and well done the lads and lasses of Leicester, especially chief organiser and commentator Dave Grocock.

## Mardave developments

As mentioned in earlier issues Mardave are working on the production of a 'MkIII' 1/8th scale car. At the time of writing many of ideas are being tried out and put to practical tests. Two prototype chassis raced in the European Championship at Leicester, resulting in the Mardave stand being besieged by potential buyers. Before putting the car on general release Mardave are trying to implement the ideas suggested by drivers into the car, at the same time bearing in mind that it must fall within the present price limit, and be acceptable as a kit to be sold in bulk via the model shops.

At the moment Mardave are looking at the problem of mounting the radio gear, as the old style crate will not fit into the new chassis, at least as far as the throttle servo is concerned due to the absence of a bell crank. It is intended to supply some form of radio crate, possibly one that will carry the throttle servo in the top, and the steering servo on its side (similar to the present). The box is shaped to allow the exhaust to vent out through the base of the undershield.

The other day I received a chassis to 'play around with' and so will be able to put it to the test and keep you informed of progress from Mardave in future issues. No doubt there will be changes to the present ideas, but the 'MkIII' is well and truly on the way, hopefully including modification to those parts criticised in the 'MkII,' but no doubt leaving the enthusiast able to make those little changes that make the car 'his.'

THE ADVENT OF carpet racing has thrown the subject of gear ratio's into sharp relief due to the need to extract every available amount of torque and revs from the motor. This factor was not so prevalent on silicone tyres as the constraints were somewhat different. Nevertheless all the remarks in this article can apply equally to silicone racers, except of course, that you will have to specifically make tyres of different diameters, whereas carpet racers have this facility built in due to tyre wear.

In considering what gear ratio to run, the traditional parameters were, straight line speed and acceleration out of corners. If you were racing on a twisty track then acceleration mattered, top speed was sought on circuits with lots of straight or flat out corners. Nowadays the high grip carpet surfaces means that cell duration has become more important.

Gear ratios are expressed in two different ways. The ratio is an expression of the main gear teeth divided by the motor pinion teeth (see Fig. 1). So, a 48-tooth gear driven by a 12-tooth motor pinion is said to be 4:1 or 12:48 in answer to the 'what ratio are you running' question. To confuse matters, low ratio's are in the 5:1 or 5.5:1 area (slot gearing) and high ratio's are in the 3.5:1 or 3:1 area (tall gearing). This is the reverse of what you might expect, since low ratio's have high numbers and high ratio's low numbers. What we are talking about all along is the number of revolutions of the pinion for one revolution of the main gear.

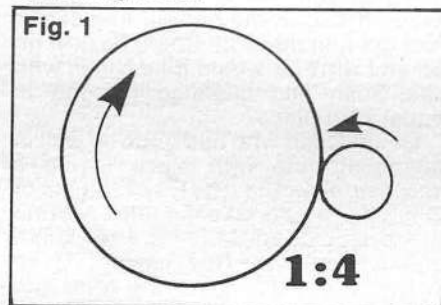
The cells only have a finite amount of current that can be drawn by the motor and all small dc permanent magnet motors draw most current when under load, less when free revving. So if you ask a motor to do a lot of work to accelerate your car by fitting a ratio of say 3.5:1, don't expect the cells to last long. But by fitting the correct ratio you will get good speed, acceleration and duration.



Left: Phil Olson's prototype 'Euro' car which won him and Parma International the European championship. Phil has now relegated the car to his mantelpiece where it takes prize position.

## Parma Panther Euro

Remember however, that standard motors obtain their speed by use of torque and that modified motors have lower torques but much higher rpm. Thus a standard Igorashi 05 will pull around 12:46 for eight minutes, yet a modified will have to use 11:48 or something lower.



Now enter the tyre into the equation. All the above information assumes that the tyre diameter is constant. But it is

not. The tyre is constantly wearing down and this effects the overall gear ratio which in full-size cars is expressed as miles per hour per thousand rpm. On a model we talk of milli-metres (mm) per revolution, that is, how far the car travels in mm for every one revolution of the motor (see Fig. 2).

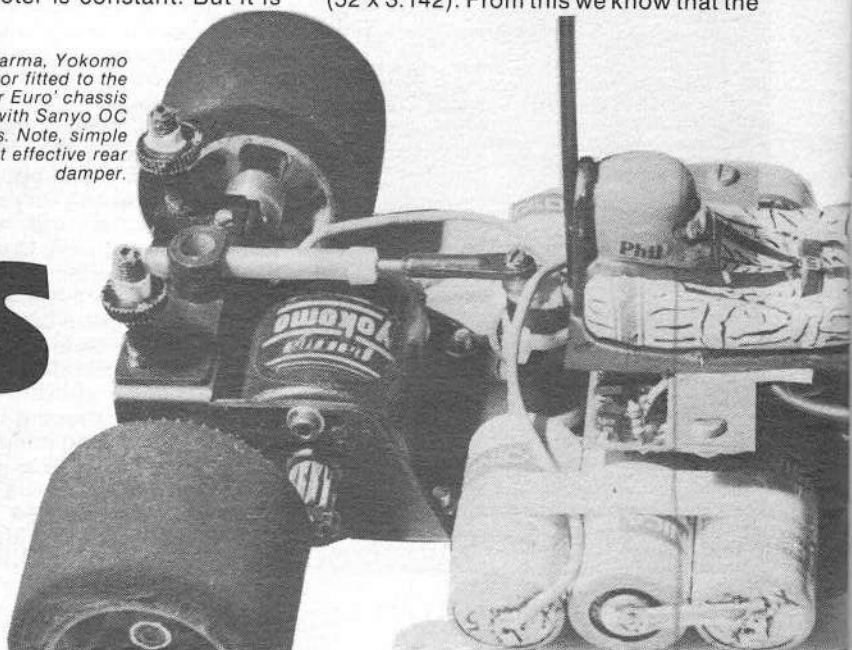
In order to work this out, you will need a very old invention, and a more up to date one. The former is Pi ( $\pi$ ) the Greek word for periphery and a mathematical constant which is usually given the value 3.142. The latter is a calculator.

Let us assume that you are running a car on 52mm diameter rear tyres with a gear ratio of 12:48. In order to work out how far the car travels in one motor revolution, first work out the distance the wheel travels in one wheel revolution. In this case it is the circumference calculated by the formula  $\pi \times D$  ( $52 \times 3.142$ ). From this we know that the

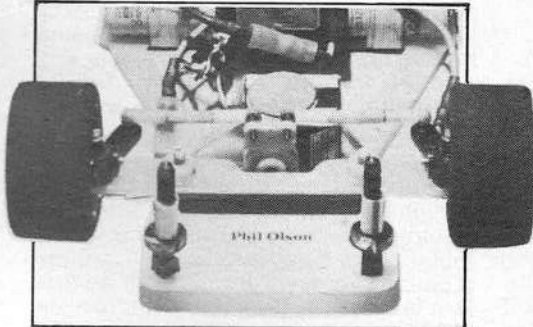
# Gear Ratios

Right: Parma, Yokomo motor fitted to the 'Panther Euro' chassis along with Sanyo OC Ni-Cads. Note, simple but effective rear damper.

Unable to find the right gearing? Here's our opinion to spur you on



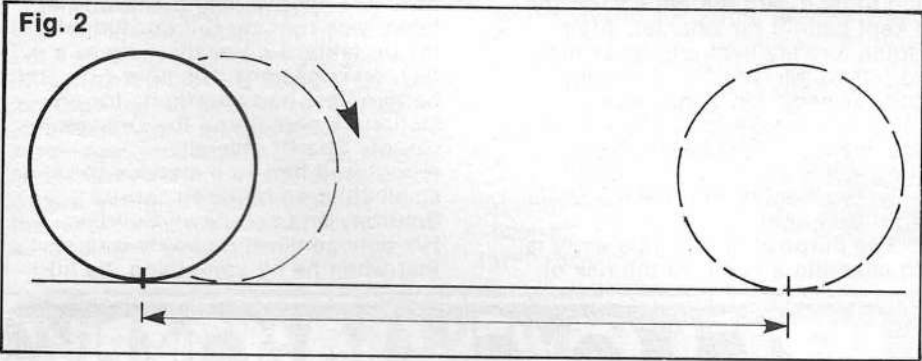
	55	54	53	52	51	50	49	48	47	46	45	
10:50	34.56	33.93	33.30	32.67	32.05	31.42	30.79	30.16	29.53	28.90	28.27	5.0:1
10:48	36.00	35.34	34.69	34.04	33.38	32.73	32.08	31.43	30.78	30.13	29.48	4.8:1
10:46	37.56	36.88	36.20	35.52	34.83	34.15	33.47	32.79	32.11	31.43	30.75	4.6:1
11:50	38.06	37.38	36.67	35.98	35.29	34.60	33.91	33.22	32.53	31.84	31.15	4.54:1
10:44	39.27	38.56	37.84	37.13	36.42	35.70	34.98	34.28	33.57	32.86	32.15	4.4:1
11:48	39.63	38.91	38.19	37.47	36.75	36.03	35.31	34.59	33.87	33.15	32.43	4.36:1
11:46	41.34	40.59	39.83	39.08	38.33	37.58	36.83	36.07	35.32	34.57	33.82	4.18:1
12:50	41.54	40.78	40.03	39.27	38.52	37.76	37.00	36.25	35.49	34.73	33.98	4.16:1
11:44	43.20	42.41	41.63	40.84	40.06	39.27	38.48	37.70	36.91	36.12	35.34	4.0:1
12:48	43.20	42.41	41.63	40.84	40.06	39.27	38.48	37.70	36.91	36.12	35.34	4.0:1
13:50	45.00	44.18	43.36	42.54	41.73	40.91	40.09	39.27	38.45	37.63	36.82	3.84:1
12:46	45.12	44.30	43.48	42.66	41.84	41.02	40.20	39.38	38.56	37.74	36.92	3.83:1
13:48	46.83	45.98	45.13	44.27	43.42	42.57	41.72	40.86	40.01	39.16	38.31	3.69:1
12:44	47.21	46.35	45.49	44.64	43.78	42.92	42.06	41.20	40.34	39.49	38.63	3.66:1
14:50	48.40	47.52	46.64	45.76	44.88	44.00	43.12	42.24	41.36	40.48	39.60	3.57:1
13:46	48.82	47.93	47.04	46.15	45.26	44.37	43.48	42.59	41.70	40.81	39.92	3.54:1
14:48	50.38	49.46	48.55	47.63	46.71	45.80	44.88	43.96	43.05	42.13	41.21	3.43:1
13:44	51.12	50.19	49.27	48.34	47.41	46.48	45.55	44.62	43.69	42.76	41.84	3.38:1
14:46	52.68	51.72	50.77	49.81	48.85	47.89	46.93	45.97	45.01	44.06	43.10	3.28:1
14:44	55.03	54.03	53.03	52.03	51.03	50.03	49.03	48.03	47.03	46.03	45.03	3.2:1



Above: the simplified 'Euro' front-end used Delta steering blocks. Parma blocks will be available for inclusion into the latest kits.

reduce mm/rev from 41.02 to say 39.27, reduce to 12:48 or (11.44).

On 46mm dia. tyres, you have good duration on 13:46. However, you wish to fit new tyres at 53mm dia. and retain same mm/rev of 39.92. Read down the 53mm column the nearest is 39.83 which can be achieved on 11.46.



distance covered by each wheel revolution is 163.38mm.

Using a ratio of 4:1, the motor is turning four times for every one turn of the rear wheel. So, to find the distance travelled in one motor revolution, we divide the distance of one wheel revolution (163.38mm) by 4. Answer? 40.84mm per motor rev.

How do we use this information? What does it mean? In order to move the car a certain distance in one motor revolution, a certain amount of work must be done. The further the distance, the more work required. Since work requires energy, and this energy is in the finite form of the Ni-Cad cells, there is a limit to the value of mm per rev you can apply. However, you are far more likely to encounter the reverse problem. As the tyres wear, the value of mm per rev reduces. In other words, the ultimate gear ratio is getting lower all the time, and you are not going as fast as you could. Going back to our first example, at 12:48 on 52mm tyres we know that the ultimate ratio is 40.84. As the tyres wear down to 50mm, the ultimate ratio is 39.27, or the same as 12.50 on 52mm tyres. To restore the original ultimate ratio the 50mm tyres must be run on 13.50 (40.91 mm/rev). The ratio chart is accurate, in as much as it gives the nearest practical ratio.

So you should have no trouble selecting the overall gear ratio which

allows the car to run for 8 min. 15 secs. Now all you need to do is to drive perfectly with no mistakes! Talking of which, it is interesting to look at the ultimate ratio's used by the standard motor A finalists at a recent National meeting A. Dobson 46.2, C. Arnold 43.2, D. Gale 43.2, I. Dutton 43.2, L. Pipe 46.8, M. Booth 44.3, F. Smart 43.4, P. Handy 40.0, D. Atterwell 42.6 and P. Davies 41.8.

Nobody failed to complete 8 minutes, yet there is quite a diversity of ultimate ratio. This does suggest that quality of Ni-Cads is now just as important as choice of motor. An excellent set of Ni-Cads can be made to pull an ordinary motor along as quickly as an ordinary set of nicads and an excellent motor. Looking at the list above Andy Dobson and Les Pipe appear to have excellent motors and Ni-Cads.

**How to use**

If you have ratio's not covered above, these can be added using the formula...

$$\frac{\pi \times D}{\text{Main gear teeth}} \times \text{Pinion Teeth}$$

So for 52mm tyres on 12:48

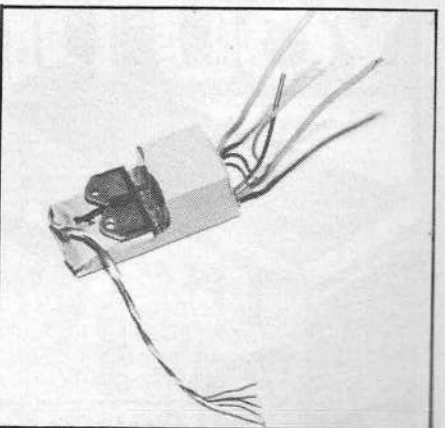
$$\frac{3.142 \times 52}{48} \times 12 = 40.84$$

On 50mm dia. tyres and 12:46, your car does not last eight minutes. So

**New Speed Controller for Demon Products**

Every industry, art form or sport has its standards; those items against which others are judged before consumers buy a television, invest in a picture or hail a new champion. In 1/12th racing Sanyo nicads and Futaba radio predominate due to their suitability and high reputation. So it is that Nick Adams' Demon speed controllers are highly popular due to their reputation for quality and reliability. Demon are now releasing their latest offering the '2D'.

This new release is in the main a follower of fashion, allowing low down



Above: Demon Products' '2D' speed controller features many improvements and updates on the 2C.

mounting on the chassis plate as does the Laser 'Compact' and Firefly 'GT'. On the 2D, the circuit board tracks are wider so as to pass the high current now such a feature of carpet racing. This in turn has allowed the two relays to be mounted directly onto the circuit board, eliminating wire runs (less voltage drop) and making replacement easier, when contacts become worn.

# On The Carpet

Other components are grouped neatly at the other end of the board, including the neutral and full power pre-sets, and the wires for reversing normal operation made (to suit Sanwa and Acoms R/C equipment).

Nick designed and layed out the circuit board himself, and was delighted to find no errors when the prototypes were delivered for initial build. Already several people around London are using the '2D', all reports are favourable. Overall the impression is of a very neat and compact unit, simply constructed and up to Nick's established standards of workmanship, quality and presentation. Customers should avail themselves of £3.95 before rushing round to their local model shop or sending it pigeon post to *Demon Products*, 79 Northumberland Road, North Harrow HA2 7RA including P&P.

## Practice Practice Practice

'Racing with the Team' is the house magazine of the *Associated Manufacturing Company* in the USA. Available by subscription it is full of the latest exploits of 'The Team' at home and abroad. It really flies the flag, containing all matters *Associated*, and very little else. The Editor is one, Matt

Azzara, and down on page nine is an article by him which I reproduce (with permission) below. I should explain that, (a) *Ruskit* used to be to slot racing what *Schumacher* and *Associated* are to 1/12th racing today; (b) that Bill Jianas is the Greek and (c) that the American's hold almost all their 1/8th Scale Meetings during the week, with people free to practice at any time. Hope you enjoy it, and take note of its message.

About a million years ago when I was managing a slot car track. (You do remember those), a fellow came in to my shop that I'm certain was a member of the *Ruskit* factory team — the absolute God's of their day. This guy's running for a few minutes when his car nails a wall and breaks a solder joint on the chassis. Much to my awe, he asks me to fix it with the hot solder iron I kept behind the counter. After doing a really neat job, so as not to offend 'Mr. Big Time', I hand the car back. He stands there staring at it for a long while, then looks up at me and asks: "How long will it take to dry?" I never saw 'Pro-Racers' in quite the same light ever again.

The purpose of this little story is to illustrate a point. At the risk of

causing a major blow to your psyche, I feel compelled to reveal the secret that a lot of the Pro-Vet racers you read about or see in action are really only a few short steps ahead of you. I bring this up because a lot of beginner R/C'ers get easily frustrated and begin to wonder if their lot in life is performing errands for the guys in the 'D' Main. The answer to that is, of course not — if you follow the tried-and-proved formula it is simple. There are three things that make a competitive racer — and all three are practice. **Practice, practice, practice.** Look at Art Carbonell. Look at Gene Husting. Look at Herman Gump. Never heard of Herman Gump? Of course not, Gump never practiced!

Some years ago, I met a new racer who had what I recognised as a very special talent. His special talent was running full throttle into my pit table. Two or three times a day, on occasions. His poor battered car had an affinity for any stationary object and the Orange County Sheriff officially recognised him as a menace to small children between sun-up Saturday and sun-down Sunday. His only consistent quality was that when he hit something, he hit

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# TMS

it HARD, and OFTEN. We don't all have the parts or the patience to completely rebuild during each fuel stop as this guy was forced to do. However most of us have a more conservative approach to learning and refining our driving skills than Bill Jianas had during those formative days in his early racing career.

Many of us still believe that the Greek's persistence eventually wears down the spirit of a track until the barriers just give in and start jumping out of the way of his car by the end of a practice day. By race day, the course has learned its lesson and offers no further resistance to eighth-scale's 1 racer. I know this is true, because many times I have actually seen the boards jump back into place just in time to tear a fender off my own car.

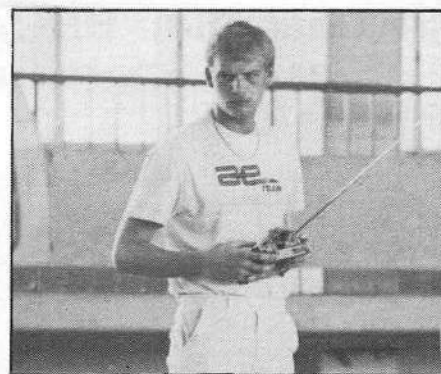
This is where I'm supposed to say "All kidding aside" — but no, I'm not kidding. Well, maybe just a little. The truth of the matter is, 'practice makes perfect' is not just something your mother told you when you were learning to tie your shoes. Let me put this another way. If you arrived at the site of the next Nationals a week in advance and spent all the daylight

hours observing, you'd probably discover that the guys who end up in the 'A' Mains are the same guys who got there a week before you did and ground out laps until they fatigued their chassis plates in half.

R/C racing can be a ball, but like anything else, you gotta keep at it. I can tell you from personal experience that as soon as that track opens, I'm ready and raring to — what? Going to the liquor store? Wait up, I'm goin' too. I'll catch the next practice round. Matt who? Didn't he used to pit for Herman Gump?

### Joking Aside

As a footnote to the Stafford National motor controversy, there was an excellent example of the British ability to laugh at their own misfortune. You will recall that the South African Grand Prix was held on Saturday, 7th April (there were portable T.V.'s in the pits!) the same day as all the fuss. On Sunday during a pause between rounds, John Robson picked up the microphone and announced: "The latest news from Kyalami is that Renault have been disqualified (pause for audience silence) for using Cosworth engines with no labels on!!"



Above: Wayne Davis, shy, retiring, Birmingham commentator and driver.

### A Star is Born

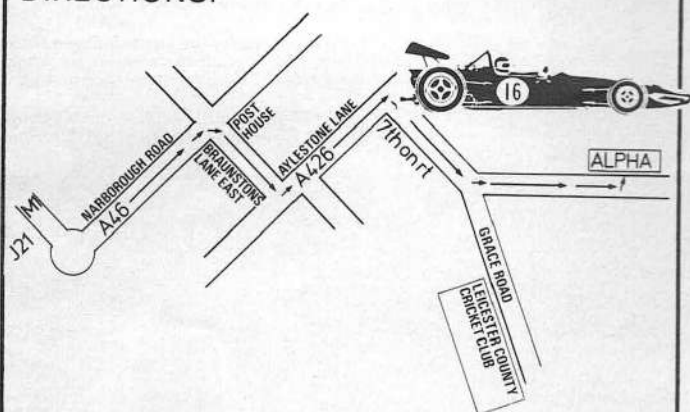
Those of you who know Wayne Davis, will already be aware of his shy and retiring nature, those who do not can readily identify him as the source of the 90 decibel insults hurled across a hall in a perfect Brummie accent! But at Stafford he showed a side I have never seen. Throughout the modified finals he provided commentary which was both funny and interesting. Organisers who expect spectators could do worse than hire the services of 'Jane' Davis, or perhaps we could interest the BBC in a replacement for 'Jane' Hunt? Those F1 cars have real 'awesposa' Wayne!

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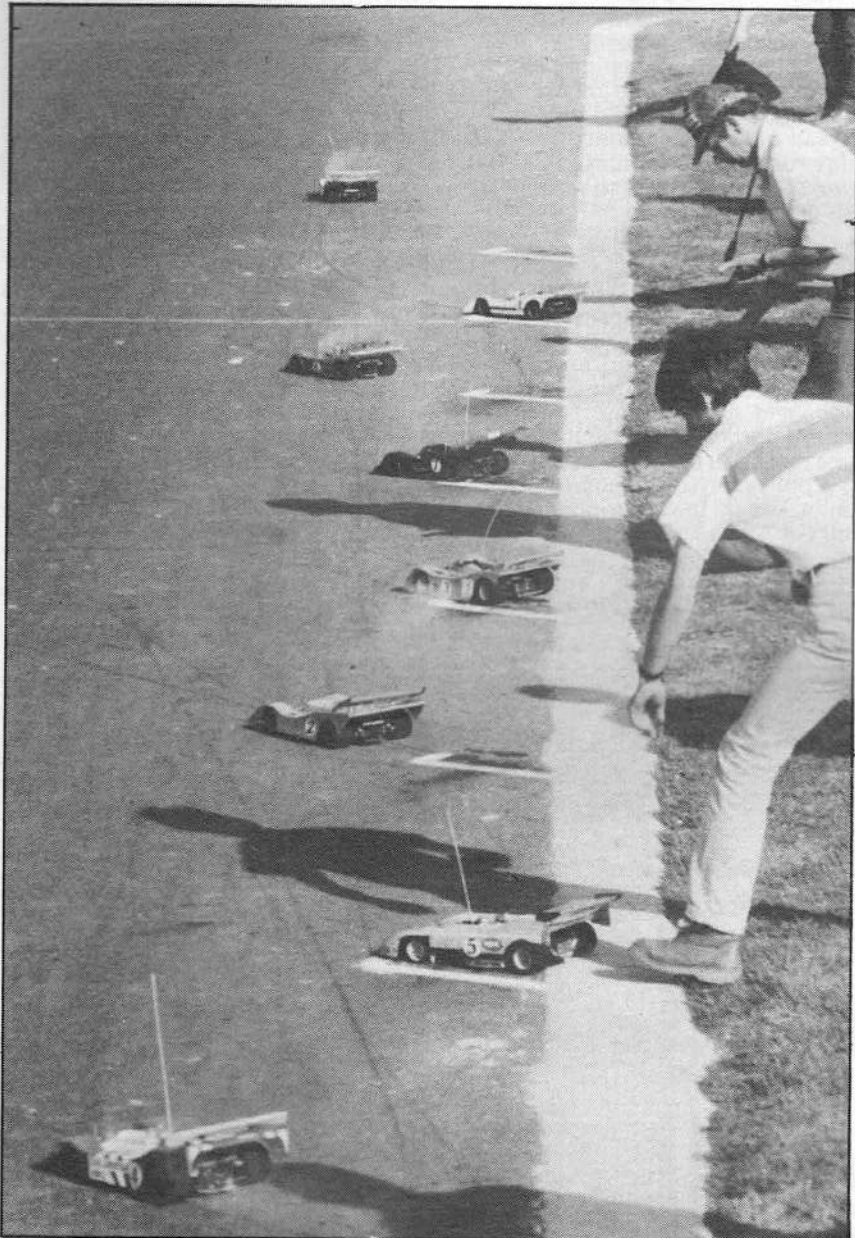
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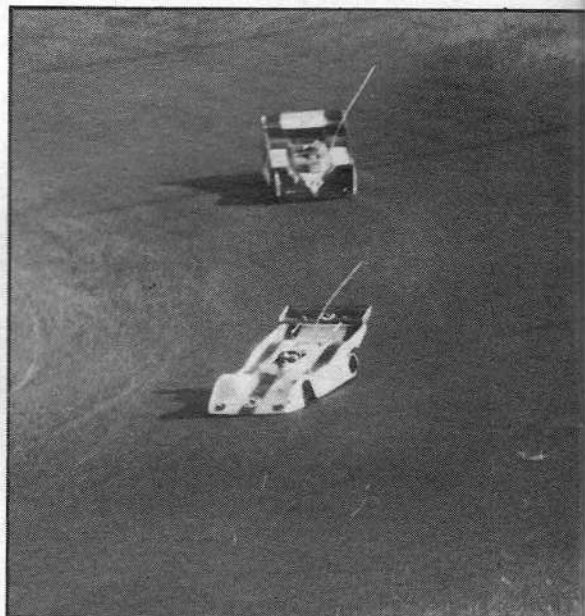
# Racing Round-up

## Southampton BRCA Open Meeting — Weston Shore Saloon, Formula, Sports/GT

April 22 — report by Paul Landels



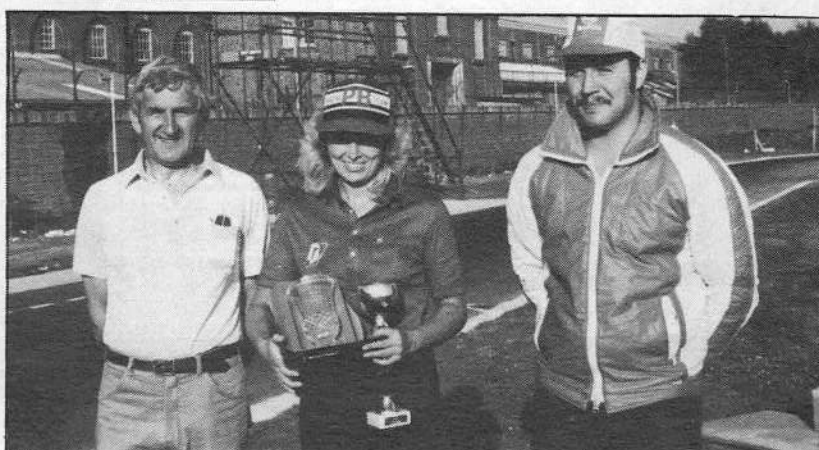
Above: the Southampton club circuit at Weston Shore basks in some of the most dramatic British weather during the Easter weekend. Low grip was the aspect due to the dust left over from track improvements. This is no circuit on a par with any circuit in Great Britain.



Above: close racing in all the heats was a feature during the whole weekend. Left: start of Monday's Clubmans final which was won by Malcolm Smith of the Mendip club. Le Mans style starts for all finals were instigated to avoid unnecessary calamity at the first corner.

Below left: the driver line-up for the Formula Open Final. Left to right: Bob Errington, Colin Strauss, Steve White, Paul Pagdin, Gary Culver, Debbie Preston, Paul Booth, Phil Greeno.

Below: Debbie Preston (centre) collects her Formula winner's trophy plus FTD from Eric White (left) and Paul Landels.





## Southampton results table

### Saloon

Name	Car	Open				Rear tyres	Front tyres	Radio	Clubmans	25%	5-20%
		Nitro %	Engine	Carb.	P.B.						
1 G. Culver	P.B.	40	Picco	P.B.	Gandini	202	Futaba	1 B. Davis	1 J. Russell	1 M. Collins	
2 P. Greeno	S.G.	25	OPS	OPS	Assoc. Med	PGF1	Sanwa	2 A. Posner	2 T. Stone	2 J. Daniels	
3 B. Errington	S.G.	25	OPS	OPS	Assoc. Med	Gold	Sanwa	3 M. Stockford	3 D. Swift	3 M. Brooker	
4 S. White	S.G.	25	OPS	OPS	Gandini	S.G. 311	Sanwa	4 M. Smith	4 A. MacEwan	4 P. Britton	
5 P. Pagdin	P.B.	40	Picco	P.B.	215 Combo	202	Futaba	5 T. Wareham	5 V. Mulgrew	5 K. Corke	
6 D. Dixon	S.G.	25	OPS	OPS	Assoc. Med	S.G.	Futaba	6 S. Whiting	6 P. Lewis	6 J. Nicholas	
7 P. Hague	P.B.	40	Picco	P.B.	Japs	Gold	Futaba	7 S. Fagg	7 D. Jones	7 K. Tubby	
8 D. Preston	P.B.	40	OPS	D.P.	Houdini	202	Futaba	8 P. Mirkovic	8 J. Price	8 D. Hill	

FTD Paul Pagdin.

### Formula

Name	Car	Open				Rear tyres	Front tyres	Radio	Clubmans	25%	5-20%
		Nitro %	Engine	Carb.	P.B.						
1 P. Greeno	S.G.	25	OPS	OPS	Gandini	PGF1	Sanwa	1 D. Dixon	1 M. Stockford	1 K. Tubby	
2 D. Preston	P.B.	40	OPS	D.P.	Gandini	202	Futaba	2 P. Maughan	2 M. Bartlett	2 J. Daniels	
3 P. Pagdin	P.B.	40	Picco	P.B.	2402	Japs	Futaba	3 C. Dudfield	3 M. Spurway	3 M. Brooker	
4 C. Strauss	P.B.	40	Picco	P.B.	Japs	202	Futaba	4 M. Smith	4 T. Wareham	4 S. Harris	
5 B. Errington	S.G.	25	OPS	OPS	Bajoma	SG White	Sanwa	5 A. Mahatme	5 J. Pryce	5 J. Nicholls	
6 S. White	S.G.	25	OPS	OPS	Gandini	UFRA	Sanwa	6 P. Mirkovic	6 A. Posner	6 D. Hill	
7 G. Culver	P.B.	40	Picco	P.B.	Gandini	202	Futaba	7 S. Whiting	7 L. Strange	7 M. Harmsworth	
8 P. Booth	P.B.	40	Picco	P.B.	Japs	202	Futaba	8 A. Stafford	8 T. Stone	8 P. Britton	

FTD Phil Greeno.

### Sports/GT

Name	Car	Open				Rear tyres	Front tyres	Radio	Clubmans	25%	5-20%
		Nitro %	Engine	Carb.	P.B.						
1 D. Preston	P.B.	40	OPS	D.P.	Gandini	202	Futaba	1 M. Smith	1 M. Bartlett	1 D. Ashton	
2 B. Errington	S.G.	25	OPS	OPS	Bajoma	SG	Sanwa	2 S. Fagg	2 T. Wareham	2 M. Collins	
3 P. Greeno	S.G.	25	OPS	OPS	Assoc.	PGF1	Sanwa	3 P. Mirkovic	3 F. Chung	3 J. Nicholls	
4 G. Culver	P.B.	40	Picco	P.B.	Gandini	202	Futaba	4 D. Farndale	4 A. MacEwan	4 K. Drinkwater	
5 S. White	S.G.	25	OPS	OPS	Gandini	UFRA	Sanwa	5 D. Preston	5 P. Lewis	5 C. Baldry	
6 D. Dixon	S.G.	25	OPS	OPS	Assoc.	Gold	Futaba	6 B. Davis	6 M. Spurway	6 M. Brooker	
7 C. White	P.B.	40	Picco	P.B.	P.B.	202	Futaba	7 N. Robertson	7 J. Pryce	7 S. Leake	
8 P. Booth	P.B.	40	Picco	P.B.	Japs	202	Futaba	8 K. Tubby	8 S. Whiting	8 P. Britton	

FTD Debbie Preston.

Below: Panic! Phil Greeno tried to go one lap too many and runs out of fuel.



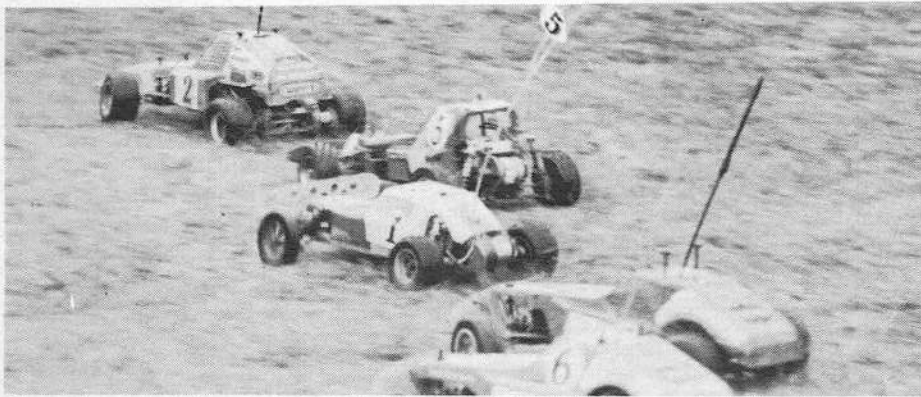
Below: Debbie's car undergoes a re-fuelling on its way to the Sports/GT win on Monday. Dave Preston (dad) does the honours.



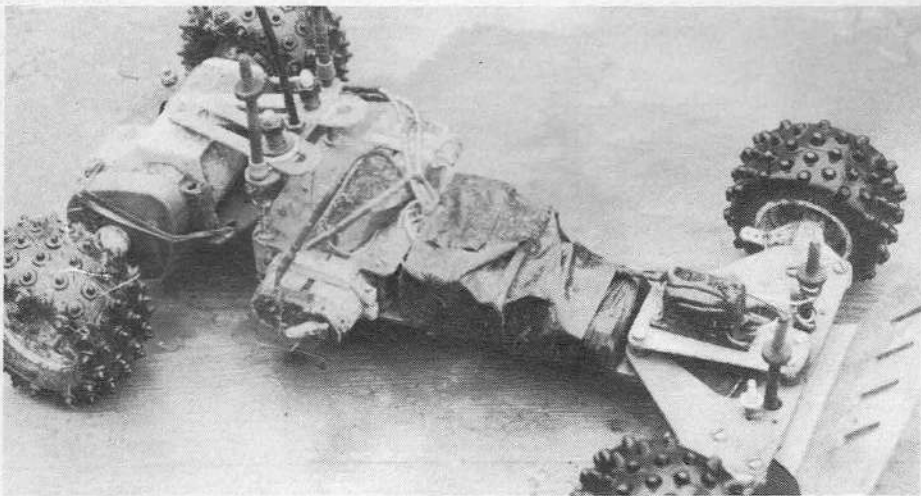
# Racing Round-up

## Stoneleigh European International 1/10th Off-Road Open Meeting. Modified Class

May 27, RASE, Warwickshire



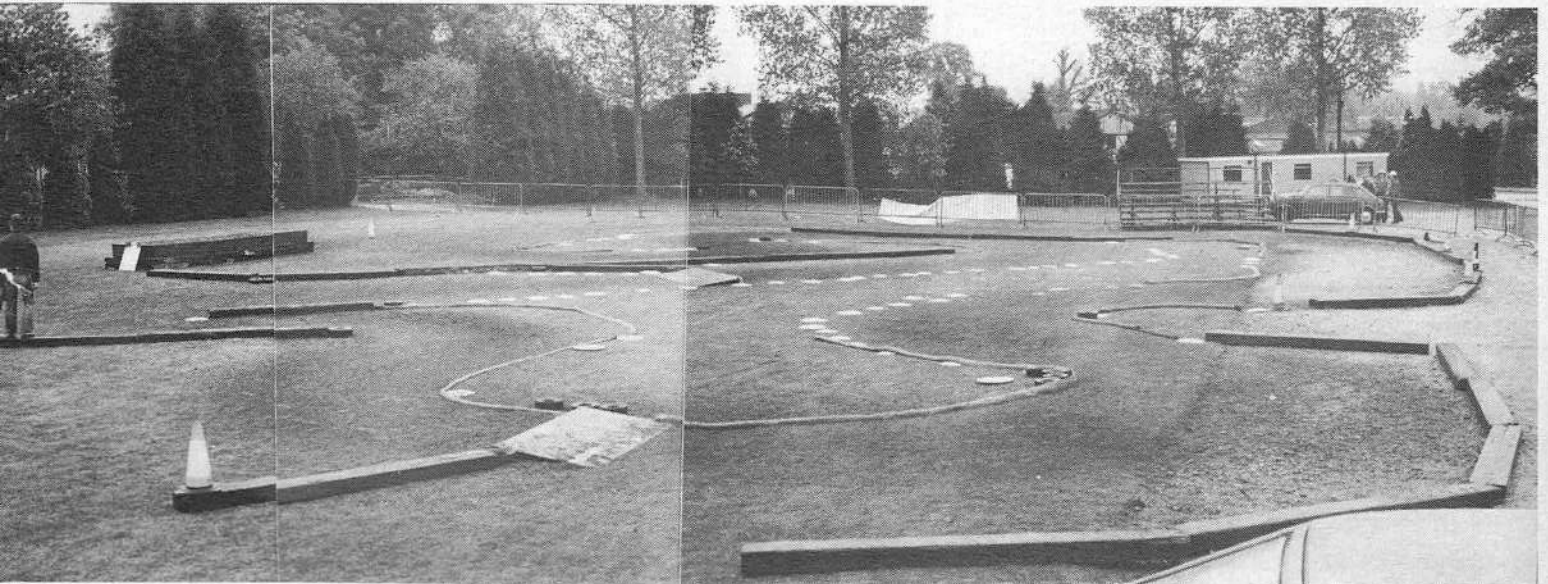
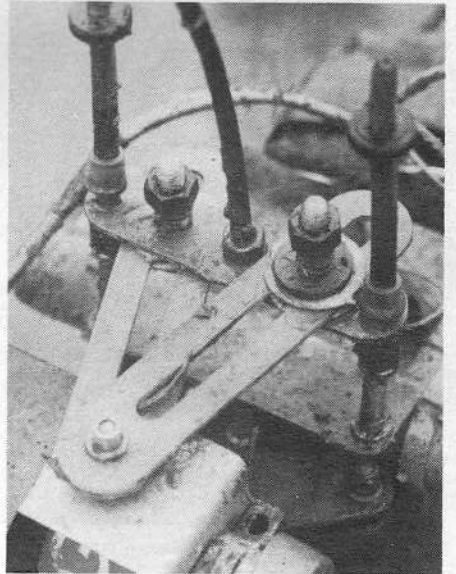
Above: the start of the main A-final with Glyn Peglar's Bolink Digger on pole position. Below: Glyn's winning car incorporating some interesting modifications. Ever Ready Ni-Cads were used along with MG Yokomo motor. Eight-minute 1/12th carpet racing motors proved popular for the Modified class, six minute heats format. Centre right: double, rear-end damping arrangement on Glyn's 'Digger.'



Below: the Stoneleigh Off-Road circuit, not to everybody's liking - oh well you can't please them all. Two jumps were included along with a tricky loose gravel section.



Above: Glyn Peglar, fastest qualifier and winner of the first 1/10th Off-Road, European International A-Final.



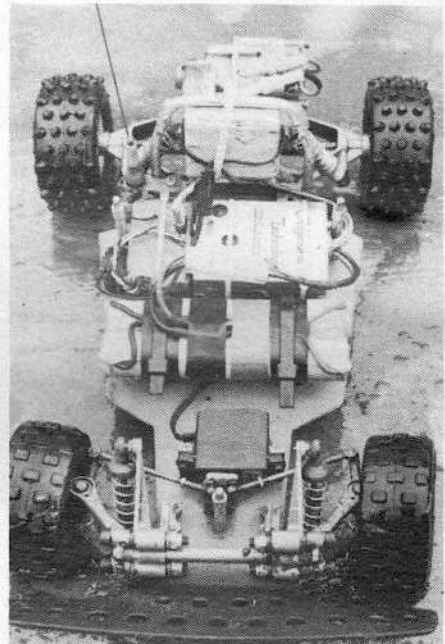
*Tense concentration on the faces of the A-finalists as their cars battle it out on the circuit.*



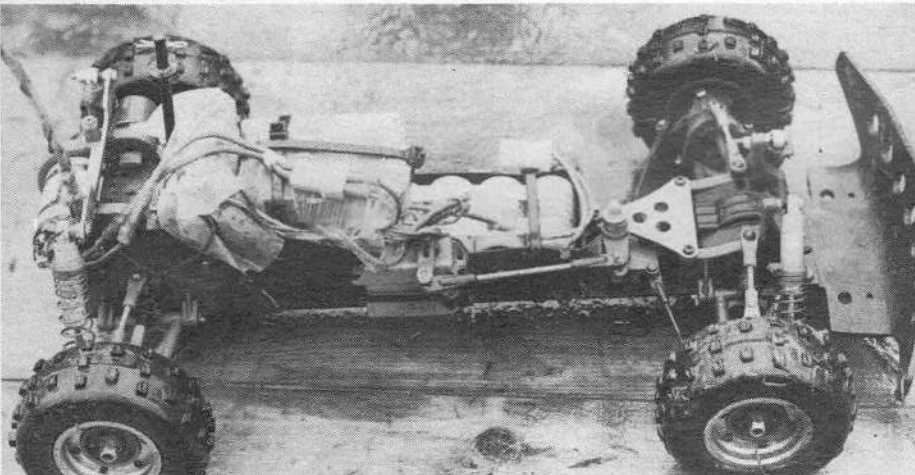
# Racing Round-up



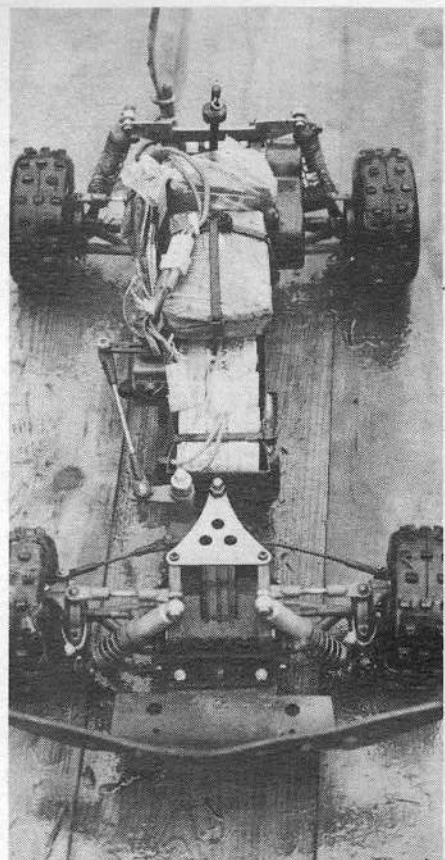
Above: the top three with their prizes. Left to right: George Land (second), Glyn Peglar (first) and Robin Schumacher (third). The winner's Silver Salver will only be retained for one year and will be re-awarded to the winner of next year's event.



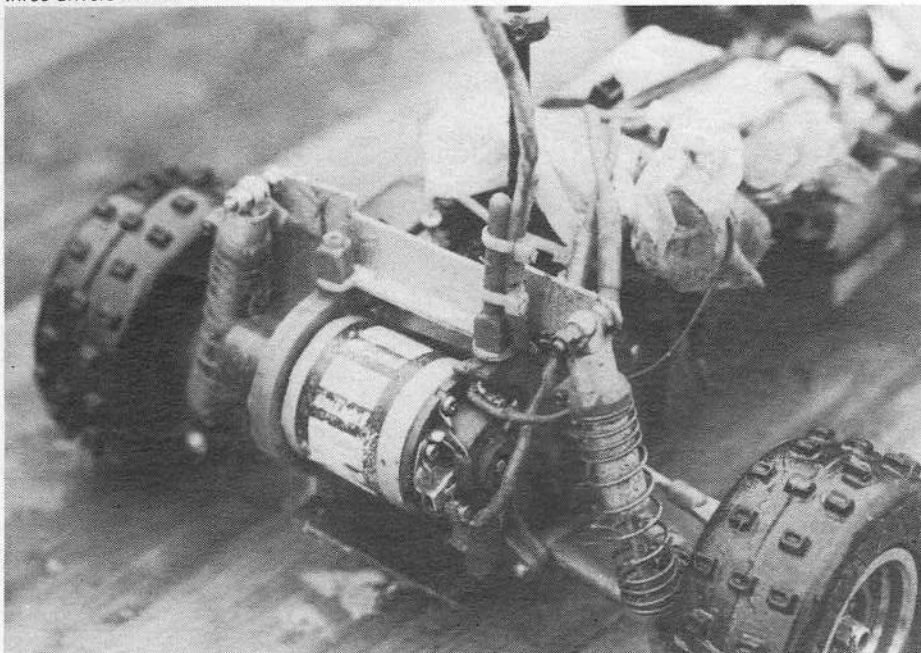
Above: interesting, highly modified, Rough Rider which featured in the main final, modifications include adjustable coil-over shocks, wider chassis plate and wider front tyres. Also note the Ashbourne Technology 'Robot' speed controller.



Above: George Land's second place Hirobo four-wheel drive car. George drives for Team Parma and all three drivers in the team have switched to the Hirobo car.



Above: George Land's slimmed down Hirobo 4WD used Laser Turbo Speed Controller designed and built by the winner, Glyn Peglar. Novak mini servo (steering) Parma selected Ni-Cads and Parma Ferrari motor. Left: modified motor mount on the Hirobo allows for easy removal of the Parma 'Ferrari' Off-Road motor.



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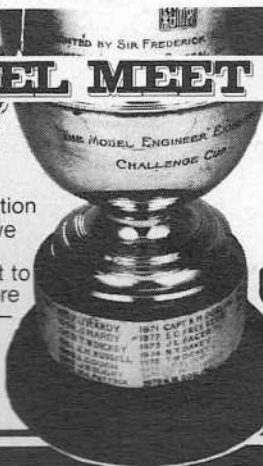
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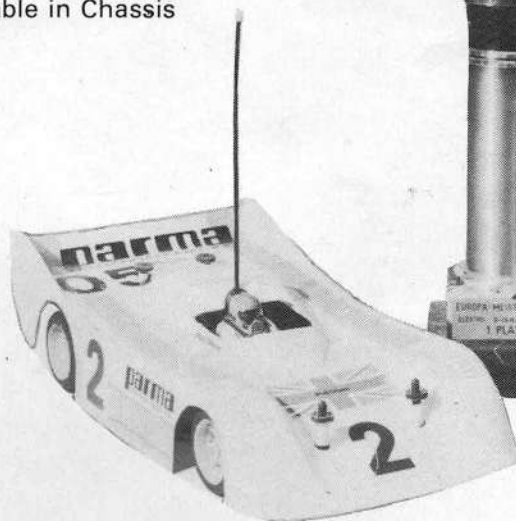
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