

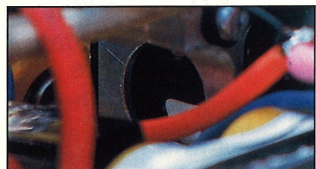
Adjustable rear upper suspension back plate made from GRP allows Phil to dial the car into any track.

GRP shock tower stiffener.

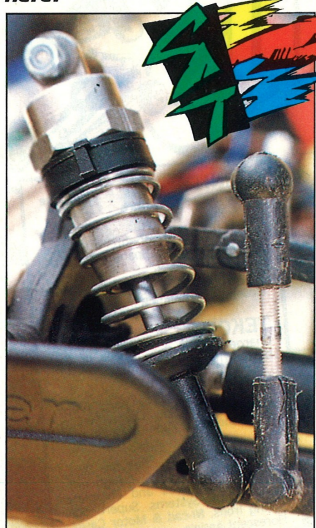


Phil Davies'

PRO-CAT



Alloy inner transmission housing (with hole for extra air flow to motor) can be seen here.



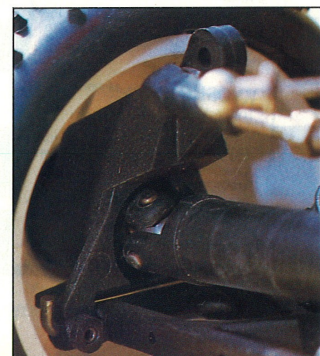
Notice balljoints on the bottom of the shock absorber.



Shimmed out upper suspension arms to reduce camber angle.



Shotgun rear hub carriers are stronger than the kit items.



GRP REAR SHOCK ABSORBER BRACE STIFFENER

MODIFIED GRP REAR SUSPENSION LINK MOUNT

ASSOCIATED TQ20/SCHUMACHER BLUE MINI SPIKE REAR TYRES

SLIPPER CLUTCH

ALLOY INNER TRANSMISSION HOUSING

The Euro Set-up

SEALED BELT COVER

KO FET SERVO

SUPER DIFFS FRONT AND REAR

BALLJOINTS ON END OF SHOCK ABSORBERS FOR EASY/ QUICK REMOVAL

30WT SILICONE OIL, R2 SPRINGS AND 2MM PISTONS IN THE REAR SHOCK ABSORBERS

REEDY MR J MOTOR

GALEFORCE 1700 SCE NICADS

TEKIN 411P ESC

JR APEX 40MHZ RECEIVER

SHIMMED UPPER FRONT SUSPENSION ARMS

CUT 3 ROW SPIKE, BLUE COMPOUND FRONT TYRES

30WT SILICONE OIL WITH 1MM PISTONS IN THE FRONT SHOCK ABSORBERS

**Phil Davies, two
time 4WD off
road Eurochamp,
megastar, and
all-round nice
guy, describes
how he set his
car up to win the
1990 Euros.....**

**How did you first become
interested in R/C model cars?**

A colleague where I used to work bought a Tamiya Beetle (Rough Rider type) which looked like great fun. It was even better fun when a second colleague bought one and they raced around the factory car park. I then decided I had to have one which I purchased early January 1981.

For approximately six months we would mark out a course on the car park and race each other at lunchtimes and some Saturday mornings.

**Which is your favourite type
of racing and why?**

Interest waned, and the regular racing became more irregular. However, after a lay-off for about 12 months somebody introduced me to a 1/12 club, Club Heathrow. I saw eight cars on the track at the same time, sliding around corners side by side.... I wanted to be part of this, the excitement and thrill of close racing, which is unparalleled in any other form of RC racing that I have experienced since.

Which cars do you race now?

1/12 scale, Associated RC12LX (World Edition).

1/10 2WD Off Road, Schumacher Cougar.
1/10 4WD Off Road, Schumacher Pro-Cat.
1/10 On Road, TRC/Composite Craft Lynx II.

**Could you please list all of
your major results?**

1984: 3rd, 1/12 European Championships, Ulm (D).
1985: 2nd, 1/12 British BRCA Championships; 3rd, 1/12 European Championships, Fredrikstad (S).
1986: 2nd, 1/12 British BRCA Championships; 4th, 1/12 European Championships, Baarn (NL); 7th & 2nd TO, 1/12 World Championships, Las Vegas (USA).
1987: TO & 1st, 1/10 European Championships, Portschach (A); 2nd, 1/12 European Championships, Paris (F); 1st, 1/12 British BRCA Championships.
1988: TO & 1st, 1/12 European Championships, Herning (DK); 5th, 1/12 World Championships, Baarn (NL); 1st, 1/12 British Modified and Standard BRCA.
1989: 3rd, 1/10 4WD European Championships; 1st, 1/12 British Modified; 11th, 1/12 European Championships, Portschach (A); 6th, 1/10 World Championships,

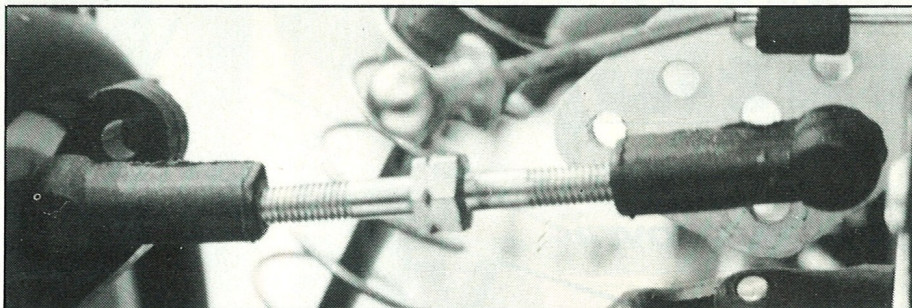
Sydney, Australia.

1990: 2nd, 1/12 European Championships, Gateshead (GB); 1st, 1/10 4WD European Championships, Antwerp (B); 1st, 1/12 British Modified; TO & 5th, 1/10 On Road European Championships, Portschach (A); 5th & 2nd TO, 1/12 World Championships, Singapore.
1991: The story so far.... 2nd, 1/12 European Championships, Staffenstorp (S).

**What was your favourite win
and why?**

My favourite win must be the 1987 European Championships 1/10 Off Road in Austria. It was my first full season of Off Road racing and although I had been making 'A' finals at nationals I hadn't figured as a threat.

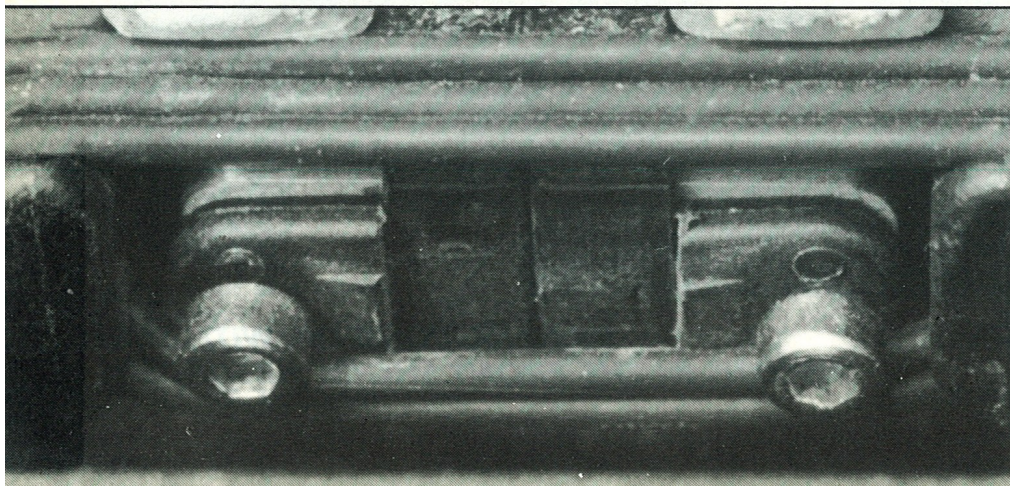
Yet at this meeting everything was superb. The car only needed small adjustment, the motor and batteries seemed ideally suited to the track, and from when qualifying started to when it finished I was the fastest in each round. Although the finals weren't such easy work, the fact that I was an unexpected winner (at least to myself) made it all the better.



🔍 **Balljoints replace rose joints all round.**

🔍 **The front anti-roll bar goes under the upper chassis brace, so the belt doesn't rub on it.**

🔍 **A metal plate behind the front gearbox adjuster can be seen here.**



**Why are you such a good driver?
(What's the secret?)**

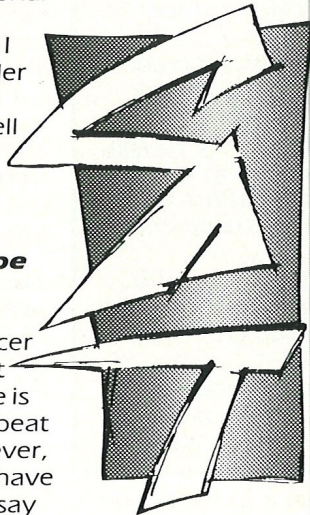
I don't really know why I get such good results, especially recently (the last 2½ years) as I have done practically no club racing, ie practice. However, as I take part in so many different classes of racing at national and international level I am rarely idle. In my earlier years of R/C car interests I would play with my Rough Rider at almost every opportunity. This car did not handle at all well and I think this helped me to develop the skills required for racing a car on the limit.

Who do you consider to be the best R/C racer in the world?

In any class of racing the best racer has to be Masami Hirosaka. At every event he participates in he is the man everybody wants to beat and has to beat to win. However, if you exclude him, of those I have seen and raced against I would say the following:

½ Chris Doseck — smoothness and accuracy at 1990 World Championships was truly exceptional.

2WD Off Road ½, Cliff Lett — Again, smoothness makes it look



Q The slipper clutch makes the car easier to drive.

Phil's Pro Cat

We asked Phil, "How does your Pro Cat vary from one you can buy off the shelf?"

I run 3mm spacers inside the front shocks, this limits the 'drop' of the front suspension and makes the car more stable.

I replaced the kit rose joints for large balljoints (T100 and T045) on the end of the shock absorbers. This makes shock removal much easier and faster.

Track rod ends and rear top link ends are replaced with Cougar balljoints (T320 and T321), again to make servicing easier.

Shims are put on the front upper suspension arms to reduce negative camber and make the car a little smoother on 'turn-in'.

Machined alloy bulkhead between upper and lower chassis to make chassis torsionally a little stiffer.

Aluminium transmission housing to help keep motor cool, it also adds rigidity to chassis.

Fibreglass shock bracket stiffener.

Fibreglass rear top link bracket with more holes for fine tuning rear suspension.

Shotgun rear hub carriers (T1000) which are stiffer and stronger.

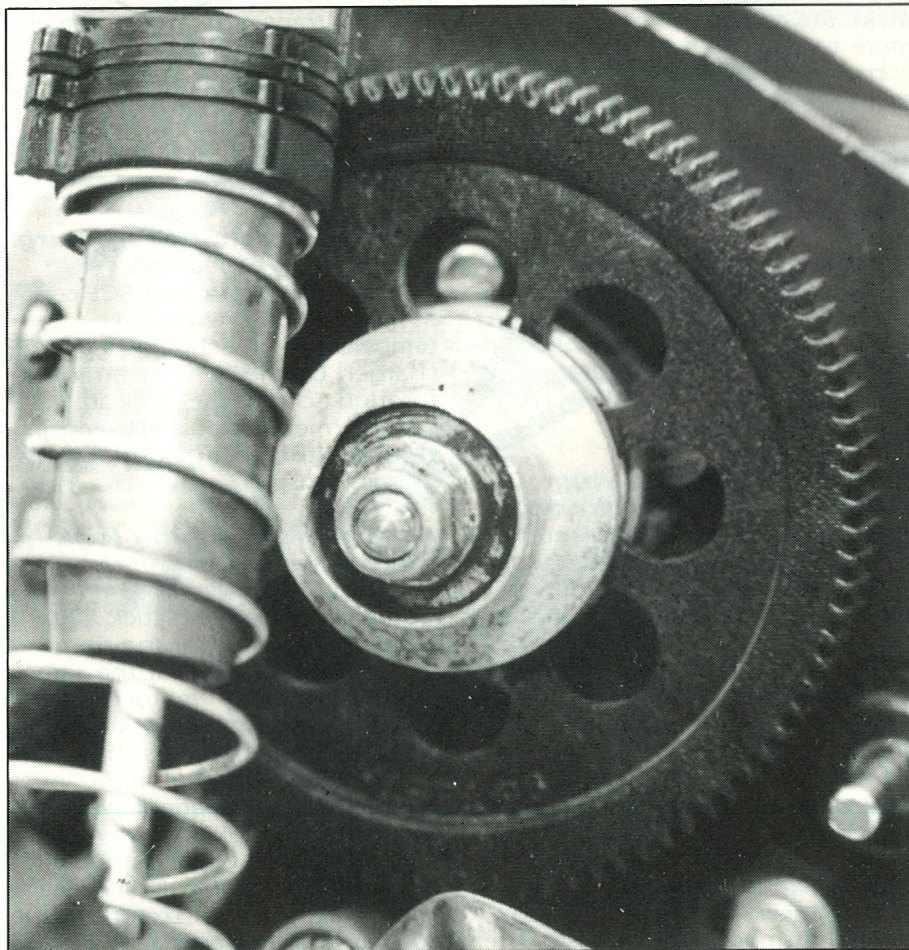
I shim out rear wishbone pivot brackets to the amount of toe-in required for track conditions.

I made the steering pivots from some 3mm turnbuckles. These are a little stronger than standard.

Rear anti-roll bar fitted for slippery tracks. This improves turn-in and keeps the inside front tyre in contact with the ground making the car much more stable under power.

Upper belt cover and undertray sealed using draught excluder to keep dirt out of the transmission, which means fewer rebuilds and greater reliability.

Alloy eccentric bearing housings and super diffs front and rear. These make the transmission more robust and able to withstand higher loads.



easy, very good setting up a car, but Craig Drescher is definitely one to watch in the near future.

4WD Off Road ½, Jurgen Lautenbach — Aggressive driving style well suited to this class.

On Road ½ — Few international races in this class mean that I would limit my choice to British drivers, and for sheer consistency at the top of this class it's David 'Windy' Gale.

How do you see the future of R/C cars going?

I think there is a very bright future for R/C cars. People, especially males, seem to be very competitive, and this means that racing will continue. But I do worry at the spiralling cost of going racing, not because it has to be but because people want to win, and to win they think they have to buy ten packs of 'X' brand of selected batteries and four 'Y' brand hand-wound mega motors before they start to understand what makes a car go fast and handle well.

What is your main ambition for the future?

To be a world champion — What else! Apart from that, something I have designed to be world champion, but preferably both!

PRO CAT

Euro Set-up

For the Euros 'A' final I ran the car exactly the same as I had throughout qualifying which ended up as follows:

No roll bars front or rear. The very bumpy nature of this track made it necessary to have the car handle very safely, no roll bars did the trick.

Kit standard front springs. Front shocks had a 3mm spacer under piston. This limited the suspension 'drop' and so made the car less likely to roll over on bumps and corners. It also reduced roll when cornering and the tendency for the car to lift the front too much when accelerating. Front was set at around 30mm ride height. 20W silicone shock oil was used with standard 1mm pistons.

On the rear end I used R2 springs, standard 2mm pistons and 30W silicone shock oil with the shock mounted on the second hole out along the wishbone, the third is more normal but the extra travel seemed to help the car a lot on the track.

Tyres: up front the Schumacher three row spike in blue compound with the spikes cut to about $\frac{2}{3}$ height. On the rear I used the Associated TO 20 tyre with a full length spike.

General Car Set-up

Do you take the shields out of the bearings?

I do not take shields or seals out of my bearings as within a couple of runs the seals free off and the car will resist siezing bearings.

How do you go about choosing tyres for different types of track, ie grass, mud, clay?

Choosing tyres for a track is very difficult as car set-up can influence your choice, also whether the car is 2WD or 4WD. Generally on a fresh grass track, practice and early heats, a 4x20 spike (T687) or 6x20 (T694) work for me and as the track gets a little more bare I switch to the (T679) 15x12 minispike. On mud (yuk!) I have run the 4x20 (T687) as anything else just slides around on the surface.

On dirt and clay tracks, if they are packed down, it's a choice between T679 and Losi 'X' pattern depending on the track and car set-up.

Do you run anti-roll bars? How do they work?

In recent times I have only used them on my Pro Cat. On the front in high grip conditions (ie grass tracks in good condition) to prevent the car from 'hooking' into the corner as you turn in, but if you run on a deteriorating track with bumps and ruts and the grip is low, use no front roll bar. This makes the car run through the obstacles better without 'washing-out' into

understeer. The rear anti-roll bar on bumpy tracks can make the rear end a little lively, popping off line through corners, but it makes the car feel very positive on high grip tracks. On low grip tracks the use of a rear anti-roll bar without a front one will increase the 'turn-in' as you would expect but will also make the car's front tyres work more to pull the car through the corner allowing you to get on the power sooner.

How much toe-in/toe-out, caster and/or camber do you run?

Toe-in at the front of the car, I run 0° and camber at around 2°. Too much camber makes the car 'darty' (changes direction sharply). Toe-in at the rear is the max! Run around 2°, too much toe-in makes the car unresponsive and understeer. I run about 2-3° of camber.

How do you set up your shocks for different tracks?

I use the standard shocks all round, ie 1mm pistons up front and 2mm at the rear. For most tracks I find the use of 20W silicone oil for the front works well. With the standard springs at the rear I feel the R2 spring is probably the best all-round spring with between 20 and 30W silicone shock oil.

I try to set the car up to be as easy to drive as possible. On some tracks that contain a lot of jumps for instance the car must jump (and land) well and a compromise in cornering can be tolerated, but in general a smooth car that is

progressive in changes from understeer to oversteer is going to be easier to drive.

Which modified parts do you use on your Pro Cat?

I use Super Diffs and 24-hole alloy eccentric bearing housings for the reasons explained earlier. Black side plates improve heat dissipation and look good!

I use a slipper clutch because it makes the car drive more smoothly and reduces the loads on the transmission and diffs making them last longer between needing servicing.

Do you change the wheelbase at all on your car?

The Pro Cat, I find, does not need to be changed in wheelbase as it keeps a good balance on a variety of surfaces. However, with the Cougar I find myself changing between the T268 (kit standard) and T200 long wheelbase wishbones. The T268 gives good rear end traction on slippery surfaces but too much power understeer when used on high traction surfaces which improves the power-on steering and 'turn-in'.

What radio gear do you use?

JR Apex transmitter and receiver, KO PS87 FET servo, Tekin 411P speed controller (at Euros) or Schumacher Traco or Novak 410. Reedy motors, Gale Force cells (at Euros), and Flashpoint (Schumacher) cells.

How do you charge/discharge and store your cells?

I will normally charge my SCE cells at 4 amps to 38°C cut-off temperature on Schumacher's PC5 charger. Discharge after a race is through Schumacher's nicad capacity meter (around 10 amps). I will then store them shorted with a 27ohm resistor.

Finally, how do you look after your motor?

To clean my motors I use a commutator cleaning stick after two or three runs, giving the brushes a little clean at the same time. I never spray "motor cleaner" through an assembled motor as this takes all kinds of debris that accumulates within a motor possibly into the bearings whilst at the same time taking away the grease that the bearings need. It's better to disassemble the motor and wipe out the motor using a tissue soaked in the cleaner.