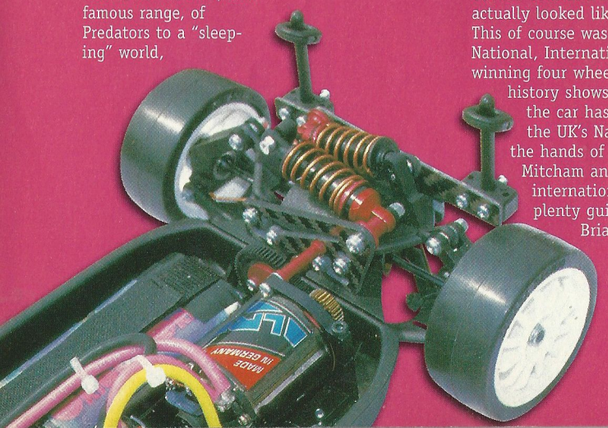
Chris Deakin

Predator DTMi Long Term R/V

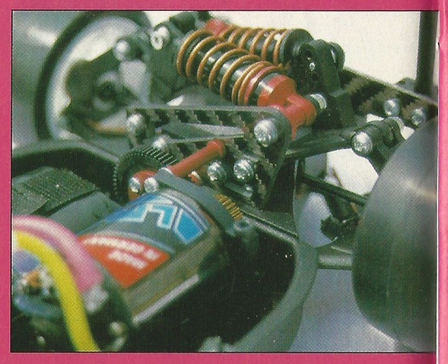
total technology

Richard Weatherley of TTech has gained a reputation for being at the cutting edge of model car racing, bringing a totally new dimension to our sport. When Richard first released the details of the first, now famous range, of Predators to a "sleeping" world, there were cries of "It'll never work", "too complicated" and "It's far too frail". Nobody gave Richard a chance.

The car he had designed was totally radical, a carbon tub, with gear driven diffs and a carbon propshaft, Formula One style inboard suspension, long slender wishbones, a unique layout for cells and radio gear, and wings that actually looked like proper racing car aerofoils. This of course was the first of the XL, National, International, FTD etc. Championship winning four wheel drive off road Pred's. As history shows Richard had the last laugh, the car has been totally dominant in the UK's National series, winning in the hands of Kevin Moore, William Mitcham and Richmond Rogers, also international results have come a plenty guided by the skilful fingers of Brian Kinwald.



The LRP motor gave loads of power.



The racing team spec teardown now comes with the pure carbon suspension plates. All the alloy parts are now anodised red.

Time for Tarmac

It didn't take long for the Predator to find its way on to the black stuff. Indeed, it's layout cried out for the conversion. With the growth of Touring car racing in the winter months, the transition from grass to black was very simple, add some body mounts, some stiffer springs and shock oils add a body shell and away you went. In fact it was RRC's own Dez Chand who was one of the first converts. The ultra "low loss" transmission giving the Pred rocket like speed and ballistic acceleration.

With the wind of change blowing away from the "home" spawned wide

touring cars to the more international scale saloons, Richard once more had to go back to the drawing board, sorry C.A.D. system, with interesting results.

Enter the DTM

Having already got a "winning" set of ingredients it didn't take long for Richard to create a purpose built scale racer, the carbon tub had gone, the chassis was now injection moulded with integral transmission housings, using the same type ball diffs and gear drive from the off road car. The suspension layout being the same push rod front and rocker arm systems, even the alloy shocks were the same.

Shorter wishbones of the same style supported the car front and rear. In its first winter series the car won the Scale class with Ian Foxwell at the sticks, supported by our own Mike Haswell.

Now the DTMi

So we come to the DTMi, as with all types of motor sport if you don't develop you die. From the outside it may seem that the "i" is not really any different from the previous cars, this is not the case. In fact TTech class this as their "Ultimate Racer", carrying all the refinements and "tweaks" that they have gleaned over the past three seasons. It's possible to buy the DTMi in four guises:

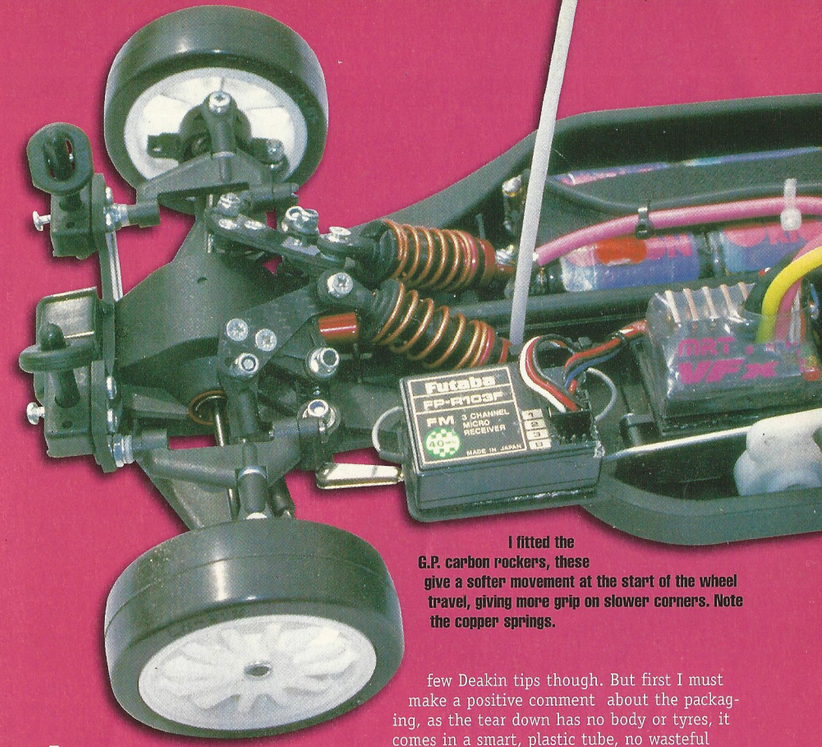
A. Standard Kit - rolling chassis, with body, wheels and tyres.

B. Fully Ballraced Complete Kit - As above but fully ballraced.

C. Racing Teardown - Rolling chassis fully ballraced but no body or wheels and tyres.

D. Team Spec Teardown - As above plus rear roll bar, turnbuckles, proto shocks, pure carbon mounting plates, ballraced steering and rocker arms.

All the cars now come with TTech new "Bud" drives, driveshafts. These are of the "Constant Velocity" type, are very smooth in operation, with no backlash and can cope with any angle of wheel movement for no increase in drag.



I fitted the G.P. carbon rockers, these give a softer movement at the start of the wheel travel, giving more grip on slower corners. Note the copper springs.

What have I got?

With a great deal of thanks to Richard and the boys, one of the first of the Team Spec kits was sent to me, plus one or two other little "extras" ie - Grand Prix front rockers - a must. Alloy diff bushes - they are more rigid, and they look good. Carbide diff balls - for the ultimate in smoothness. But what else is new?

Starting at the front, the tolerances for the diff housings and gear wheels have been closed up. This makes the somewhat noisy transmission, much quieter, thus even more efficient. Next, new front uprights carry larger, stronger ballraces, also the uprights design is stronger. Following on we have the aforementioned "Buds" drives. The "drive" point now runs through the king pins centre line, which should give more traction under power, ie more steering. At the rear the same tightening of tolerances is found and of course the new driveshafts.

Box to Roller

I'm not going to go blow for blow through the build, TTech's manual and supplement sheets cover nearly everything, I will pass on a few Deakin tips though. But first I must make a positive comment about the packaging, as the tear down has no body or tyres, it comes in a smart, plastic tube, no wasteful boxes and it's great for storing tyres in, nice one TTech.

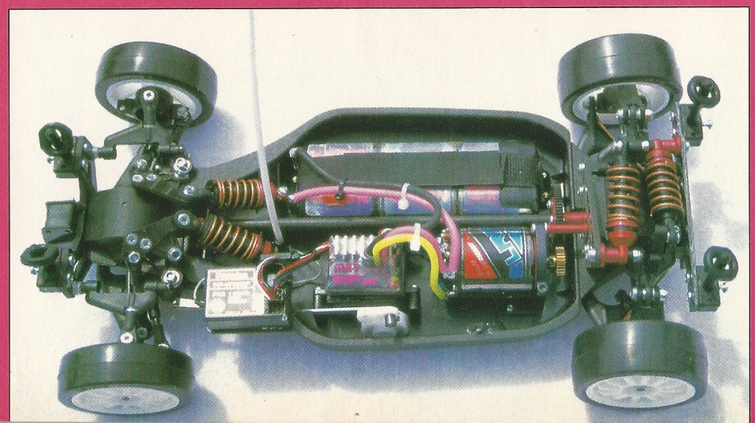
Before you start the build you do need to get a new No 2 Pozi-drive® screwdriver, as the DTMi has hundreds of posi-drive screws, well one or two and they can strip very easily.

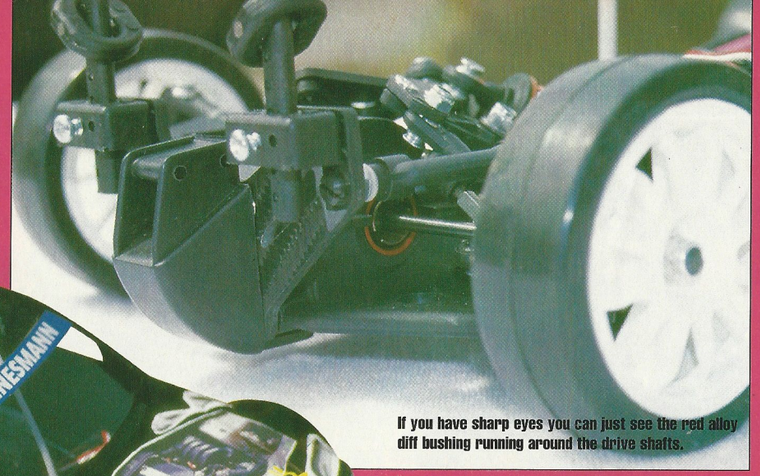
Tip Time

When you come to assemble the propshaft, make sure that the pinions have their bearings pushed all the way home, you may need to relieve the back of the gear, also remember to leave a little end float as the instructions suggest. As for glue I used Pacer Z-Poxy, a five minute bond, part of the Zap range of products, available from most model shops.

Next, TTech being the nice people they are, build both diffs for you, but as I was adding carbide diff balls I stripped and rebuilt them. The drive plates are "keyed" to the diff halves for positive location, no more super glue needed here. Also I ballraced the centre of the gear, mega smooth operation. When re-building the diffs don't get grease on the adjusting bolt as this may encourage the diff to loosen when running, try blowing through the threads with a little motor cleaner first, also through the threads in the diff halves. Also I did add a little flexible silicone sealer, the type used on

Ready to run, all space used to the best advantage.





If you have sharp eyes you can just see the red alloy diff bushing running around the drive shafts.

plumbing joints, on the bolt threads.

At this point I changed the standard diff bushings for the hard anodised ones. Now don't panic if your drive system feels very tight, even notchy, mine did. After a quick chat with R.W. it became clear this in fact was a good thing, and as the transmission ran in, it became very smooth and totally quiet. All part of TTech's tolerance programme.

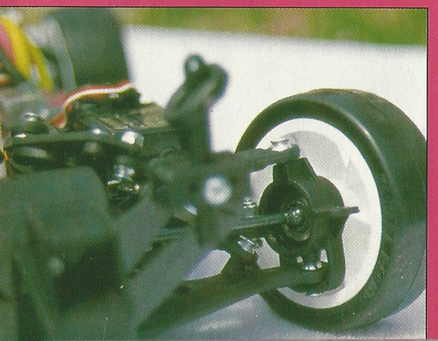
As you build up the rear suspension, it's a good idea to add the upper wishbone point to the mounting plates, before mounting them on the diff cover, also fix on the stiffening brace for the motor mount to the front plate.

By now you should be at the stage to fit the alloy in one go. Go through them all and make sure they are a "free" fit. If not squeeze the ends of the plastic ends till they are. This is the single most important point of the build. If not done correctly you may have stiff steering, or suspension which will not be smooth. The Pred's super stiff chassis relies on the wheels being controlled correctly. My last "tweak" came from the set up sheet that Richard had sent with the kit. In testing it had been found that by raising the rear roll centre the car handled much better, giving more weight transfer to the front (as long as you use the rear anti-roll bar as well) and thus more steering and grip.

To achieve this you have to use the lower hole in the rear upright. But you have to first remove 1 mm off each face. If not done the rear wheels foul the mounting screws. It's very simple to do really, measure the width of the upright with a vernier first, deduct 1 mm, file down one face to that measurement. Then deduct another mm and file the other face, keeping them parallel of course.

At the front the only changes were the addition of the GP front rockers. These rockers change the rate the tension is fed in the springs/road wheels, giving a softer initial movement, but stiffening up as the car rolls more (more "bite" in slow corners - without changing the high speed handling).

All the DTMi now come with the "Buds" drive shafts.



Get Set - Go

At this point you should have built your car, fitted radio gear etc., nothing difficult at all, now you need to set it up, but before you do, do one last check, remove the shocks and make doubly sure that all the "corners" drop under their own weight, and have no tight spots from full droop to full bump. Before re-fitting the shocks check the overall length of each pair, make certain they are the same.

With the time and care that TTech took in designing and manufacturing the DTMi, it's important that you take your time over setting it up, don't rush it, this is a precision "tool" after all.

Find a flat surface to work on, I use the glass cover from the top of my cooker, but I don't have anybody to moan at me, so check with the wife or mum first: fit your choice of tyres.

1) Adjust ride heights to spec using the push rods and spring spacers at the front and just the spring spacers at the rear.

Check the amount of droop front and rear (droop - the amount of suspension is unloaded before ride height).

At the rear the only adjustment you can make is by screwing the ball joint on or off the shock shaft. Longer shock length = more droop.

The front is a little more complex, you may have to change spring packer and pushrod length to get the correct droop and ride height.

I needed a larger spring packer, and shorter push rod length, but this may not be the same on all cars, and off course spring types.

2) Adjust cambers front and rear. Top joints on both ends. Use plastic spacer washers on the front to support the joints. Don't worry if you have a different amount of washers side by side at the front.

3) Adjust tracking front and rear. Adjust the front first so the wheels are parallel. Then adjust each rear wheel using a straight edge and measure in from the outside of each front wheel, adjust the front track.

Re-check all camber angles - reset if needed

Re-check all ride heights - ditto

How's it Go?

TTech at present give two basic choices of bodyshell with the DTMi, either a Racecraft Audi A4 or a Merc "C" class, both come with moulded rear wings. Most of the team drivers use the A4, but having seen Ian Foxwell race the "C" class at West London, I went for that, along with the Ellen Lohr "spare parts" livery ie Black stickers. As with was to be a long term test the car was tested in the Birmingham Triangle - Ashby, Bedworth and Stafford. Also as a "control point" only one set/type of tyre was to be used. This would allow proper results to come from the chassis tuning process.

First Stop Ashby

Ashby being my "home" track became the base line for the test set-up as per sheet supplied by TTech. Motor choice being an LRP Generation X Psycho 10 x 6, this would test the efficiency of the drivetrain. Two types of tyre were at hand, Yokomo Beltecs, standard width rears and narrow front, and Yokomo soft Beltecs, same widths as other set, both moulded rubber, these tyres seem to work nearly everywhere.

Several runs were done to loosen up the transmission and test the tyres. The softer tyres being the best, so they became the "control".

Ashby has quite a range of corners, slow, quick and tight. At first I couldn't get on with the "reactive" nature of the steering, the toe-out and short steering arms being ultra responsive. Reducing the toe out made this a lot more manageable.

Speed was very good and duration was not a problem. Handling wise once I had adjusted the steering response the car was great, turn in was very positive and power could be applied very early in the bend, on most of the slow corners. Through the tight chicane the car was a little "slow" at first, adding a 2 mm spring pack front and rear and resetting the ride heights cured that. The biggest problem was the banking. The steeply angled front on the Merc gave far too much down force and thus steering. To be fair I had expected this and had a cure at hand. A different body shell, a Parma Renault Laguna, sorry about the colour! This did what I expected, the flatter front and Trinity wing gave a much better balance.

Having run three 17 lap runs, a good RRC "A" final pace I was happy, time for the next corner of the triangle.

Part 2 Stafford

Now Stafford is a smaller, much tighter track than Ashby, the corners adding up to most of the lap length, so more steering is needed here, mostly slow speed, so mostly mechanical grip. Also good punchy acceleration. As the Merc had given more steering this went back on. After just a few laps it was clear in the "Ashby" spec the DTMi had too much rear end grip. As I felt the overall grip was low, I changed the front springs for softer black ones. At the rear 1 mm extra was added to the spring packers. So we had a softer front and a stiffer rear, with a raised rear ride height, which would put more weight on the front.

The "Pink Panther" sorry Parma Laguna, this handled better at Ashby, but not at Stafford. The Trinity Touring Car wing gave a lot of down force.

Job done, well almost, most of the understeer had gone, but the car felt a little lazy, a shade unresponsive. At Ashby I had reduced the amount of toe out because the car felt too responsive, so the cure was obvious, put the toe out back. Once more the car was on the pace. Other than one pair of springs the car needed nothing else. Nothing had broke, although I did try hard to break it, promise!

A copper rear anti-roll bar comes with this spec kit. Also a full set of turnbuckles.

Last Stop Bedworth

Bedworth was the final point in the triangle, although the almost tri-oval track looks very simple and short, it's actually neither. This is mostly because of the three slow hairpins on the track. So again steering and traction is needed and of course brakes. But there is one "fly in the ointment", at the end of the main straight is a very quick right hander. If you give your car a lot of steering on the slow corners, this quick one can be a nightmare.

Straight from Stafford, thank god for the weather, the car seemed to only have two problems, one, under braking the "tail" would spin out and "that" corner was a real problem, again a lack of rear grip.

Both problems needed more rear grip. A change to softer springs gave a partial cure, but now the turn in was poor and a large amount of understeer could be felt mid corner. A change back to the copper rear springs, but this time with softer oil and the "pink" body shell made all the difference. Softening the damper oil, allowed the back to squat under braking, and also allowed the rear to roll a little more. The body shell just gave less front down force. So once more after careful thought the Pred was adjusted to suit the day. No bits were needed, nothing broke or "left".

Fastrack wheels and Yokomo tyres were fitted for the test.

Living with your Pred

To date the DTMi has done several hours of running. With a "sealed" drive system no work has been needed on it. After its initial tightness, the transmission is smooth and quiet. Two adjustments have been needed to the diffs as they ran in.

The shocks have stayed leak free and have no sign of aeration, the alloy shafts do have some signs of scratching, so they may require charging soon.

All the ball joints are now quite loose, but not sloppy yet. The turnbuckles make setting up and any changes very quick. I did find after the first run at Ashby a reset was needed, but this was to be expected. To date I have had no breakage's or problems, other than cleaning and going over with a screwdriver, maintenance has been nil.

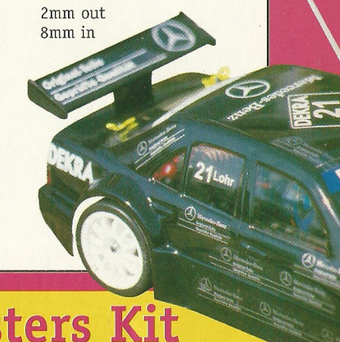
Last Lap

The current DTMi is totally developed, all the previous problems TTech had are long gone. Manufacturing a car of this quality does take time to perfect and TTech is only a small company, but they have achieved a lot in a very short time. No car will be perfect at every racetrack, but TTech have built in enough adjustments so you will be able to get very close to the right set up without any major changes to the car. In fact the changes I have made have all been small, so TTech must have it right. RRC

Set Up Sheet DTMi

Dry set up Rubber tyres

	ASHBY	STAFFORD	BEDWORTH
TYPES			
Front (22mm)		Yokomo Soft Beltec	
Rear (25mm)		Yokomo Soft Beltec	
SPRINGS			
Front	Copper	Black	Black
Rear	Copper	Copper	Copper
Rockers (Front)	GP	GP	GP
SHOCKS			
Pistons		2 hole/2 groove	
Oil front	30wt	30wt	30wt
Oil rear	25wt	25wt	20wt
TRACKING			
Front	1mm out	2mm out	2mm out
Rear	8mm in	8mm in	8mm in
CAMBER			
Front		1 degN	
Rear		1 degN	
Caster		Max	
RIDE HEIGHT			
Front		5mm	
Rear		7mm	
Anti Roll Bar		Copper	
Lower bar wishbone pick up			



Testers Kit

Radio	JR X756
Receiver	Futaba 40 meg mini
Servo	KO1004
Speedo	MRT VFX (torque 40/60amps ramp 30 brakes 50min 100max)
Motor	LRP Generation X 10 x 6 (Pinion 28-spur 70)
Nicads	Orion/Reedy Zapper
Tyres	Yokomo Soft Beltec 22mm wide/25mm wide
Bodyshell	Racecraft "C" Class Mercedes Parma Renault Laguna (Trinity Touring Car wing)

Quick Spec

4WD. Ballraced. Moulded composite chassis. Shaft drive. Twin ball diffs. Alloy motor mount. Carbon propshaft. Carbon suspension mounts. Fully independent suspension. Double wishbone front and rear. Front push rod operated coil-over oil filled damper. Rear rocker operated coil-over oil filled dampers. Buds drives. Full adjustable suspension geometry. Stick pack nicads.

Likes

Just about everything.

Dislikes

Stick pack nicads - saddles can be fitted if you make parts. Position of receiver - could get very dirty/wet. Linkage for steering to/from servo - it's from the ark.