

Radio Control Cars for

DIRT & TRACK

NUMBER 16

APRIL - MAY 1990

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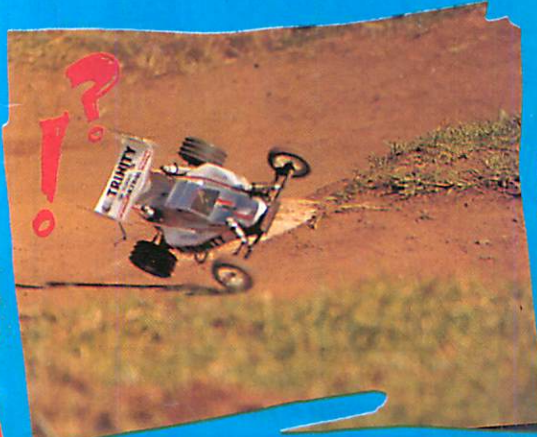
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SPORT PIN UP**

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**HOME GROWN
SPEEDY
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1/4 SCALE SPRINT CARS

**REVIEWS: LAZER
PROCAT
ELIMINATOR SPORT
BLITZ**



TRINITY

THE SAGA BEGINS...

"Far away, in a time yet begun, the Road Knights of the Trinity Triad strive to protect the Kingdom of Powurr and preserve the rights of the people, known as R-Ceas, to accelerate past the competition."

"Nye-Kadd... The powerful, electrical force that underlies the Kingdom of Powurr. When needed, Nye-Kadd transforms himself into Tri-Rex, the ultimate monster weapon of the Triad and feared by all who challenge the Trinity Kingdom."

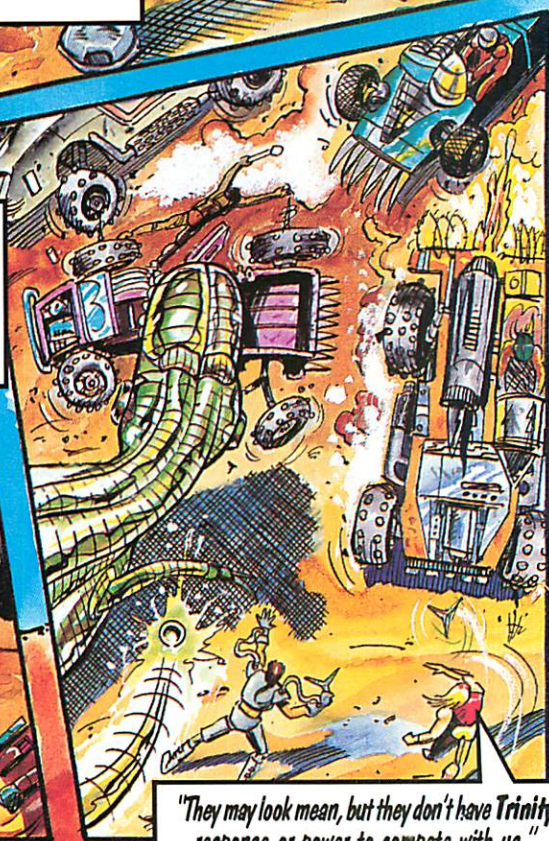
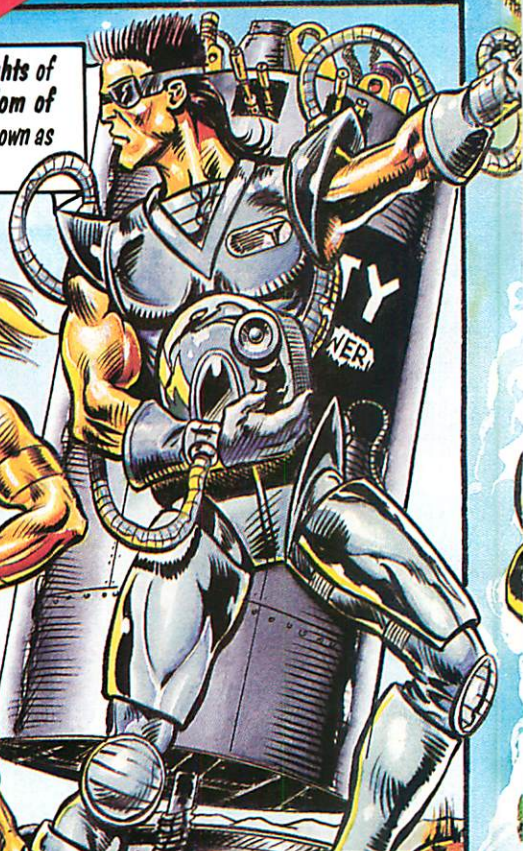
"Tork... The embodiment of Speedworks reliability and quality. He makes himself available to those needing help in the street."

"RPM... Brute force courses through his bio/mechanical veins. He is pure racing power and his mission in life is to win. He is Monster Horsepower."

"Watch out RPM, they look tough and attack in huge numbers, but they aren't Trinity powered, so they'll lose."

"You are right, Tork, they want to steal our power but I'm running a new 48,000 rpm, Monster motor so they don't have a chance."

"They may look mean, but they don't have Trinity response or power to compete with us."





"Go get 'em
Tri-Rex!"

"Well gang, it looks like they once
again found out who the competition
really is!"

"Too bad. If they'd
asked their hobby shop
for **Speedworks** or
Monster Horsepower
by Trinity,
they'd be winners.
Until they join us, they
are doomed to lose."

"Tork, go after the strays; I'm
running 7 Pushed Trinity/Sanyo cells
and Nye-Kadd just charged me up,
so I'll take on the leaders."

THE ROAD KNIGHTS OF THE TRINITY TRIAD TRASH THE COMPETITION

because they have tail-kicking, Trinity® power on their side. Trinity Performance parts: for motors, wings, pinions, spur gears, steering, sway bars, shocks, tools, springs, brushes armatures. For RC10, Yokomo, Hornet, Grasshopper, Frog, Blackfoot, Monster Beetle, Clodbuster, etc.

The **Speedworks Series**, championed by our hero Tork, is a series of stock or modified for those serious about winning on the street or in the classes requiring stock motors. These are also for the road warrior who's short of cash.

The **Monster Horsepower® Motors** used by RPM are hand wound, highly modified, go-for-the-guts motors for those who don't like coming in second. Stock, Reverse rotation stock (for Hyperdrive belt cars) Modifieds — 'Nuclear Assault' 9 turns down to 'Killer Force' 20 turns.

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TRINITY

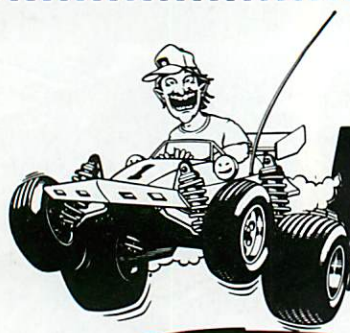
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DIRT & TRACK

CONTENTS

FROM THE DRIVERS SEAT	by Mel Gillott	6
YOU WANTED TO KNOW		8
LETTER'S TO THE EDITOR		11
BOLINK ELIMINATOR SPORT		12
BIRD TORQUE	by Paul Bird	15
D&T RACING IN OZ CALENDER		19
PROCAT REVIEW		20
WHAT'S THE DIFF?		22
KYOSHO LAZER REVIEW	by Rob Lewis	26
CENTREFOLD		28
MODIFIED MOTOR CLEANING	by Robert Ang	30
PURGE FORCE	by Steve Carruthers	31
1/4 SCALE RACING - WILLOW PARK SPEEDWAY		34
BOB'S TECH CORNER	by Bob Roach	37
AUSTRALIA GET'S NIKKO		39
BANGKOK WORLD CHAMPS RESULTS		41
D&T CLASSIFIEDS		41
1/8 CIRCUIT - KYOSHO BLITZ REVIEW	by Ashley Cox	42
TWEAKED AND DUMPED	by Jonathan Borthwick	45
WHAT'S NEW & WHAT'S DUE		47
SUBSCRIPTION/BACK ISSUES ORDER FORM		48
AROUND THE CLUBS		49
CLUB DIRECTORY		54

ADVERTISERS INDEX

Aussie Discount Hobbies.....	46	Micro Electronics.....	51
Australian Hobby Centres.....	5	Parma.....	44
Bolt-on Performance.....	41	PB Model Cars.....	10, 33
Bendigo RC Supplies.....	17	Pitstop.....	53
Custom Model Cars.....	9, 23	Plumtree Models.....	17
GM Trading.....	IFC, 3	Radio Control Car Club NSW.....	52
Hearns Hobbies.....	38	Radio Control Supplies.....	14
Hobbycraft.....	24	Robert Terence.....	36
Hobby World.....	16, 17	RSS.....	46
Hornsby Slot Cars.....	36	Soft.....	30, 40
Intac Engineering.....	32	Shepparton ZigZag.....	50
Kyosho Australia.....	OBC	Speedline.....	IBC
Master Instruments.....	11	Wings'N'Things.....	25

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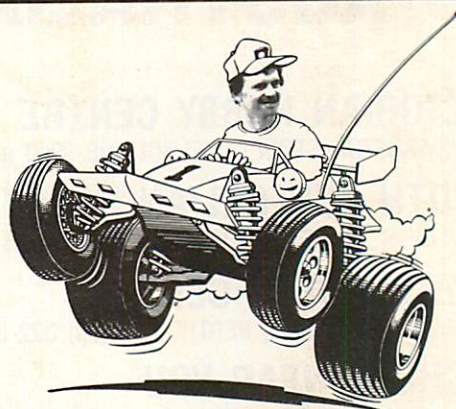
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- Text to be typewritten, double or triple spaced, with a wide left margin.
- Photographs to be either black and white or colour prints and accompanied by captions on a separate sheet of paper. Photographs will be returned only if a stamped, self-addressed envelope is supplied.

All material should be offered exclusively to Dirt & Track. If material is taken from other published works (newsletters, newspapers, magazines and books), permission to reprint should be obtained and the exact source of the material quoted.

5

FROM THE DRIVERS SEAT . . .



SYDNEY GOES SMOOTH

On road electric racing activity has been slowly expanding around OZ but until now not in Sydney. Last years off road world champs put paid to that idea as most of the sports drivers and administrators were either organising or practicing in the dirt. Sydney is now catching up quickly. Racers have three regular venues to choose from depending on their interests. All enjoy clean racing on a smooth track that doesn't wear out. Here's where you check out the action.

INDOOR CARPET RACING

This long established activity is now in the hands of the Kennedy Brothers, Phil and Scott, and takes place every Friday evening at Macquarie Boys High School Hall, James Ruse Drive, North Parramatta. Races are over 8 minutes duration with open motors and 6 cells. Most racing is with the traditional 1/12th scale class and TOJ bodies but they also hold race series with other bodies and are trying to get a 1/10 class going. Ring the brothers on (02) 869 1369 for more details.

VELEDROME RC CLUB

The excitement of Thunderdome oval racing can be found at Tempe Veleddrome on the second Saturday in the month (2 to 6 pm) and then the following weekend, eight days later on a Sunday from 12 to 6 pm. Get that? We have it on good authority that this weird timetable is an intelligence test from organiser Ray Wood but we figured out that the Sunday racing is not necessarily on the third Sunday in the month. The test continues when you have to nut out what class you want to race in. There's a choice of three: Class 1. Novice with less than 12 months in any club. Use any car. Class 2. Nascar bodies and 6 cells. Class 3. Nascar bodies and 7 cells. Open type motors are used but 1700 SCE cells are not permitted. All races are over ten laps with a rolling start. Ray reports that Class 3 cars average 80kph around the banked circuit. So ring Ray at Wings'N'Things (02) 816 2699 and talk speed.

1/10TH CIRCUIT

The famous Crossroads Mini Raceway on the Hume Highway at Preston is now the venue for some close Grande Touring Car Racing on the second and fourth Sundays each month. Rick Bartolozzi runs the electric racing which alternates with the gas cars who make a noise on the first and third Sundays. Ricks racing is currently for open motors with 6 cells which should easily last the 4 minute race duration. GTP type bodies are preferred although like all these classes nobody is turned away. Gearbox type cars (buggies) can also race in a separate class. Entries close around 9.30 am for a 10.00 am start and don't forget the covered pit bench's and nearby pub make for a very civilised days racing, assuming you stay sober of course. Over 30 entries registered for the first race day of 1990, so things look like really taking off this year. Ring Rick on (02) 94 3803 for more details and offer encouragement to hold our first Nationals.

AUSTRALIA SECOND IN WORLDS

It's true. At last years Off-Road World Champs in Sydney the Aussie Teams were second in both four and two wheel drive classes. But before I go any further it should be pointed out that this is strictly our interpretation — not the organisers. Although successful in nearly all respects, one whinge we had concerning this event was the over-emphasis on commercial teams at the expense of National Teams. Calculating the winning Nation (which is the norm in just about all other sporting

events) wasn't a part of the scenario, so without sounding too patriotic we have taken the liberty of calculating this ourselves. Here's our results:

4 WHEEL DRIVE

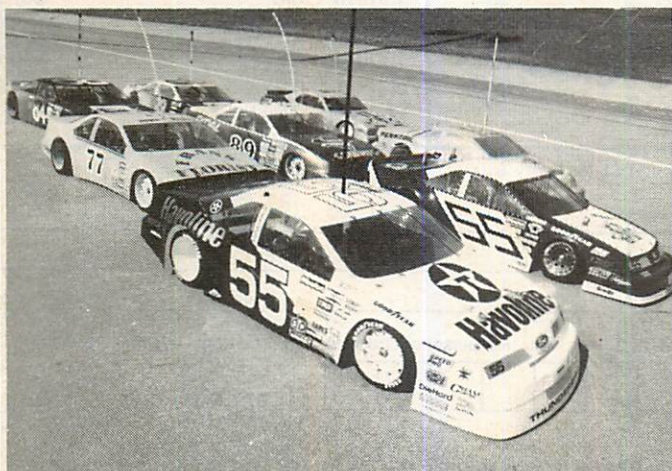
USA	2160
AUSTRALIA	873
JAPAN	622
GERMANY	538
GB	515

2 WHEEL DRIVE

USA	2665
AUSTRALIA	542
GB	413
GERMANY	280
JAPAN	120

How did we work this out? There are a few ways to do it but most give the same finishing order. It wouldn't be fair to take the whole field (120 drivers in each class) since Australia had many more competitors than any other Nation. Neither would it be fair to take just the 'A' finalists when the field is so close at the top. We compromised by considering the top 50 drivers (down to 'E' final) as being representative of the worlds best. We allocated 120 points to the winner, 119 for second and so on down to 71 points for fiftieth place.

The results are interesting. As may be expected, it was a walkover for the States, with Australia a fair way behind. In 4WD we still had a good lead on Japan, where most of the good four wheel buggies come from, and we killed the Poms. Great Britain got closer in 2WD but Japan only scraped into fifth thanks to one driver. And he's world champion!



Some of the great looking Nascars racing at Tempe Veleddrome.

This year we will be selecting a team to go over to North America in 1991. No one will beat the yanks on home turf but we should still be candidates for runner-up. I hope the organisers compute the winning Nations next time, but if not you can still rely on Dirt and Track.

OFF-ROAD NATIONALS IN SOUTH AUSTRALIA.

Very soon after reading this the ORRCA National Championships should be happening in Adelaide. The Off Road Radio Control Association of SA have really put together some impressive numbers to help make this a successful event. It will be held at an indoor venue and in conjunction with the Adelaide International Motor Show. ORRCA SA claim that the Titles will receive top billing in the Shows advertising campaign which hopes to attract 70,000 people. That should give it some atmosphere! The shows organisers are picking up the \$8000 tab for the hire of the International Pavilion and the Commonwealth Bank are major sponsors. Three hundred tonnes of dirt is being donated by a local quarry — I'm sure ORRCA Victoria will advise them how to hold it together.

The dates are March 29th to April 1st which has caused some concern because of the short notice. The sport should really be giving 12 months notice Of major events — not 3 months, however there is no arguing with the format the SA boys have put together or the boost it will give to the sport. They have most of the ingredients for a classic event which deserves your attendance. It's one that should not be missed and we wish them every success. Full report next issue.

QUICKIE

Seen on a bumper sticker, 'Keep your speed down or your licence may expire before you do.'

TRANS TASMAN INTERNATIONAL

As I write the euphoria from Australia's success at the Commonwealth Games (52 Gold, remember?) has yet to

die down. Watching the transmission from Auckland, I am reminded of the friendly Kiwi team at last years Off-Road World Titles in Sydney. According to them, buggy racing in New Zealand is quite strong and of a rapidly improving standard. Like us, they need more international exposure and experience to improve the breed.

After being involved with Australian RC competitions for around 14 years, your editor is very aware of our world standings and what needs to be done to improve them. We may be lacking in population but in my experience there is no shortage of talent. Neither do we lack the technical expertise or dedication required. The problem, in all facets of our sport is lack of international exposure and experience. It's one thing to do well at an Australian Nationals amongst familiar faces, but beating the world's best at an unfamiliar event overseas is something very different. Lack of confidence due to strange surroundings, different organisation techniques, weather conditions etc, can be ones downfall. But international success is needed for an individual to attract good sponsorship and hence good equipment and more success.

It's not easy to get international experience in our isolated part of the globe — but we are not alone. We have New Zealand and we also have other neighbours not too far to the north. We really should get together with them more often and hold our own Internationals. The Kiwi's agreed.

How about a Trans Tasman or South Pacific event? Every two years on the World Champs off years, and alternate between here and NZ for the venue. I don't think there would be any shortage of drivers willing to go across the Tasman to race. You can put me down for a start! I would envisage a main event for the official National Team plus a restricted open event for all-comers. It would need sanctioning but should not be more difficult to organise than, say a State Titles. One of our larger clubs could do it. Model car racing in Australasia should be mature enough to grasp this concept by now so who will start the ball rolling?

NOW FOR THE NINETIES

We begin the new decade in the same way we hope to continue — with a full issue featuring the latest in RC car action and honest information for all enthusiasts. Here's proof!

There are really only three world class 4WD buggies around at the moment and two of these have their latest releases reviewed this issue. Both the Kyosho Lazer and Schumacher Pro-Cat are significant new additions to the scene — watch out for the new Yokomo very soon. Also, check out the rapidly growing 1/10 on-road electric scene via Bolinks Eliminator Sports. An ideal introduction to real, unreal racing!

Additionally we have the low down on Ni-Cad batteries

and the definitive article on differentials. Readers should note these informative articles carefully since about ninety percent of all enquiries to the editor relate to questions already answered in recent issues. Don't just look at the pictures kids!

The worlds best electronic speed controller (Purge Force), Aussies in Japan, more new product tests, gas cars, the other regular sections and more all go to make this issue informative, varied, interesting and the forerunner of things to come in the nineties. That's what we think, but as always we solicit your comments. Above all we hope you enjoy.

NO MORE SURPRISES

Last issue may have come as a surprise to many. That is, it was a surprise it came so quickly. Although D&T is a bi-monthly publication, issue number 15 came hot on the heels of number 14 and just in time for the holiday period. I hope nobody missed out.

We had been slowly falling behind last year but made up the lost ground with the last issue. Now back on track, contributors and advertisers can help us (and themselves) stay on schedule in the nineties by sending copy on time. Please take note of the deadlines which we will now publish in every issue.

DEADLINES FOR DIRT AND TRACK #17

Contributions to the Editor, 23rd March 1990.

Advertising to the Managing Editor, 30th March 1990.



1/10th line up at Crossroads.



YOU WANTED TO KNOW?

Letters for this segment are always welcome. Full name and address must be given plus a telephone number if possible. We will endeavour to answer all queries but only those of general interest pertaining to 1/12, 1/10 and 1/8 scale RC car will be published. Please address mail direct to the editor at the address on page 4.

Q. In D&T#14 on page 33 you did a segment on painting the body of a car. In your last step you applied Dahm's Window Tint. Could you please inform me where I could purchase this product.

Marcus L. Carina Hts. Q.

A. We finally tracked down some Dahm's Window Tint at Project Products, PO Box 75, Ashburton, Vic. 3147, phone (03) 888 8023. They also keep some Dahm's bodies. At the moment only Blue Window Tint is available. Price is \$5.50 for a sheet big enough to do about two bodies.

Q. Could you please help me with a little problem I'm having. I have just purchased a second hand R/C car. I am not new to R/C cars but I'm not that good at them either. My problem is that the car I purchased is a Tandy 4x4 off roader and I was wondering if I could buy different motors for it or should I get rid of it (by the way it looks like a Datsun Big Bear R/C car). If I cannot purchase other engines and stuff for it, what R/C car would be the best for me to buy. I have between \$250-\$350 and I don't want an entry level and I don't want a super advanced one either, as I only intend using it for pleasure, but it has to withstand a fair bit of hard work.

Leon M. Wallaroo, SA

A. Firstly, I would like to thank all those that write with comments on the magazine. Most are complimentary and the best are carefully considered. We need your comments to help us formulate future content. Leon's Tandy 4x4 is a small scale toy type off-roader that is not made to be modified or repaired, refer to the notice at the head of this section. With \$350 you should be able to get a good deal (a deal usually refers to a car plus battery and radio control gear) on a 1/10th scale off-roader, or you might consider an on-road racing car. Don't be put off by the term 'entry level'. Cars at this level are designed to stand some abuse but still give performance far superior to the \$100 toys. Suggest you check out some of the ads in Dirt & Track.

Q. For the last three years I have owned a Tamiya Frog. I have had a little trouble with the diff but nothing which can't be fixed. A mate of mine owns a Falcon and I really like driving it. I want to up grade to a better car, but I don't know if I should get a Falcon. Is the Falcon better than the Frog? Could you please give me some advice on both cars and which one is the better out of the two. Also could you give me some hot up tips for the Falcon motor, wheels, and other accessories. Would a Technigold be suitable for the Falcon? By the way, you've got a great magazine.

Justin H. Townsville, Q.

A. The Frog has been around for some time and was the top buggy in it's day. It was made very strong but otherwise cannot compete with the performance of the newer machines such as the Falcon and others in that price range. Tamiya's Technigold motor has been discontinued but there may still be some in the shops. Many manufacturers now make budget priced open type motors, for example Reedy Esprit, Trinity Speedworks, Yokomo Twin Cam, MIY240. All would be suitable for the Falcon but give less run time than a standard 540. Here's some rev-ups for the kit Falcon. Fit ball races instead of nylon bushings — eliminate the four heavy pen cells and fit a BEC (Battery Eliminator Circuitry), better still get an electronic speedo. Fit new wheels to suit the more common 2 inch tyre size, try pin spike tyres on rear.

Q. I was thinking on buying a Kyosho Ultima Pro and wanted to know if it will accept a mechanical speed control as the electric ones are out of my price range. Also what would be the best motor in terms of speed and running time under \$100 as I have already got a soft Super 1200mAh.

Jeffrey P. Yangebup, WA

A. The Ultima Pro should have sufficient room on it's flat plate chassis to mount a mechanical type speedo. This includes space for the servo to drive the speedo. A top class racing buggy like the Pro should really be fitted with an electronic speed controller (ESC) so you might also consider the alternative of an Ultima Turbo plus ESC for about the same price as the Pro plus mechanical controller. The super fast motors really require 1700mAh type batteries to get a decent run time. With a 1200mAh pack you should be looking at a motor with 17-22 turns (wind) on the armature. There are quite a few available under \$100. Start by checking out the ads in Dirt & Track.

Q. I am saving up to buy an Ultima Pro. When I receive the Pro I will be putting a Mabuchi 540S in it. If I bought three battery packs and used them one after another do you think this would wear out the motor? Would it do it to any other motor?

Shayne F. Swan Hill, Vic.

A. The more battery packs you can afford to buy, the longer each one should last. It gives more time for the packs to cool between charges. There are two things to watch out for with continuous running — dirt and heat. Both are enemies of electric motors. In practice if you use a foam motor cover and allow the motor to cool a while between batteries then you shouldn't worry about motor life. Larger pinions and more powerful motors will generate more heat, therefore, longer cooling periods will be necessary. Obviously, the more you run a motor the quicker it will wear out. This applies no matter how expensive the motor.

Q. I own a Tandy Golden Arrow racing buggy. I would like to get a more powerful motor like a 540 Technigold by Tamiya. At the moment I have a Turbo 05 racing motor in it. If I got a Technigold motor would the 7.2 racing pack go flat faster? I also want to know if I should get a new battery as my 7.2 volt battery only lasts 10 minutes.

David W. Renmark, SA.

A. Imagine your battery to be a bucket full of water with a tap on the bottom. Turn the tap on slightly and you get a little water coming out for a long time until the bucket is empty. The more you turn on the tap the quicker the water will come out but the bucket will empty sooner. A more powerful motor is like turning on the tap more. You will get more speed but for less time. Ten minutes is not a bad running time, so your battery sounds in good condition. Go for the Technigold or similar motor with about 17-22 turns on time armature and expect running time to drop to around 7 minutes.

.....

Q. I have had my Tamiya Boomerang for over two years and it has been running superbly until now. The resistor frequently overheats and on my last run started to smoke. Should I get it checked out by my hobby shop or can the problem be solved easily? Also I was wondering if I could purchase a set of front shocks instead of the mono shock my car has been fitted with, is that a wise idea? Approximately how much would it cost? What type of rear and front tyres do you recommend for off-road 1/10 4WD racing other than oval-block tyres. What are motor brushes and how frequently do you have to clean them and how? Last but not least what other faster racing motor would you recommend for the 1/10 Boomerang other than the Technigold.

John D. Diznella, Perth, WA.

A. Sounds like your speed controller is ready for an overhaul John. Clean it up with a rag and metho then check for wear on the copper track or worn out button on the moving wiper. In either case it's a new speedo required. If these are okay make sure that the wiper contacts every part along its track and that you a regetting full movement. Check that no wires have come adrift. If speedo checks out then the white ceramic resistor(s) are probably partly burnt out. Check for cracks in the ceramic, plugs not loose into resistors and that no shorting-out of wires has occurred. I would guess that you'll have to replace the resistor. Fitting Tamiya part number 50305 which includes a pair of shocks and all mounting parts (cost about \$34) is a good modification for the Boomerang. Spike tyres all round are the best starting point on most dirt tracks. Motor brushes are small pieces of soft metal that transfer the electricity to the rotating parts of the motor. In the case of a 540 type motor they are enclosed and cannot be cleaned, otherwise the springs may be removed and the brushes pulled out by their leads. Clean with a cotton tip soaked in lighter fluid. Use the same cotton tip, inserted down the brush-holders to clean the rotating commutator. Clean motors at least every five runs. Check out Justin H's answer regarding motors.

.....

Q. Could you please do a Ni-Cad assessor for the IBM Computer. Also what is the best method of cleaning motors? There is an ad

on page 22 of D&T #15 for Paragon Racing for Jump Jets which fit inside a shock cylinder. They were \$16.50 per pair. Are they worth it? There was also another ad for an undertray to save your graphite chassis. The price was \$14.50. Is that a good price?

Campbell E. Smyth, Vic.

A. For information on the IBM version of the Ni-Cad assessor see page 41 of this issue Campbell. How's that for service! We have not yet reviewed the new Paragon Jump Jets so cannot comment on performance — but their ads read well. A polycarbonate (Lexan) undertray will certainly protect any chassis from damage but should be matched to a body to seal out dirt and stones. It is up to you to assess whether the gains are worth the cost. As for motor cleaning, this is one of the many questions that have been answered in recent editions of Dirt & Track. Try and get hold of #11 and read the motor maintenance article.

.....

Q. Is a Striker a 2WD entry level off-road racer? What tyres are bigger than the Striker's but will fit on the Striker's rims, for the back? And what shell or body is more aerodynamic than the Striker's but will fit it?

Steve E. Albany, WA.

A. Tamiya's Striker is an inexpensive entry level buggy with a fair turn of speed. Suspension is only basic but the springs may be updated to oil filled shocks if required. Wheels are small (like the Falcon) but may be upgraded to the standard 50mm size with a fox plated rim set. I would have thought the Striker's racing car body slippery enough, but I don't know of other body styles that will fit except the Sonic Fighter.

.....

Q. For some time now I have been driving off-road cars, and now would like to start racing on-road cars. Is the Tamiya Porsche 956 Mk 7 a good car and would it be competitive? As I already have a Trinity Nuclear Assault motor I would like to know if the 956 could handle this motor. Also could you recommend some other on-road cars?

Cameron G., Roseville, NSW

A. The Tamiya Porsche 956 Mk 7 is a 1/12th 2WD racer that was discontinued over three years ago. Frankly it would not be competitive in today's racing scene. You should be looking at Associated's 12L, 12I, Schumacher C car or maybe the latest from Mugen or Kyosho in 1/12th scale. Alternatively there is plenty around in 1/10th scale — note the B-link reviewed this issue. You would need lots of traction for any on-roader to handle the nuclear assault motor and run time would be low.



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RW120	Velcro straps made to hold saddle packs in place	5.51
RW859	Yokomo ballraced bellcrank steering set	93.78
RW777	Lazer "ZX" ballraced bellcrank steering set	93.78
RW571	Topcat Ball set & balljoint tool	37.31
RW572	Propcat Ball set & balljoint tool	43.15
RW643	Motor screw set, 6 capheads & 4 washers	4.67
RW863	Yokomo transmission set, RW850 + RW857 + RW858	88.19
RW864	Yokomo transmission set, RW851 + RW857 + RW858	75.08
RW765	.6 mod spurs for Lazer ZX 86-92 + gear shaft	17.84
RW870	Yokomo 14 tooth spur adaptor, gives overdrive to front wheels	37.64
RW871	As RW 870 but with fixed drive	24.33
RW872	As RW 871 but with car spur fitting	24.33
RW873	Yokomo 34 tooth front diff pulley, gives overdrive to front wheels for better steering	22.39
RW874	Combined RW863 + RW 873	108.70
RW875	Combined RW864 + RW 873	95.72
RW858	Yokomo hard anodised aluminium centre pulley direct drive, no adjustable slip.	13.30

GENERAL

RW0600	.6 mod pinions 12t - 28t	9.41
RW3200	32 DP pinions 8t - 22 t	7.13
RW4800	48 DP pinions 13t - 32 t	9.41
RW6400	64 DP pinions 16t - 42 t	9.41
RW125S	1/8" high grade stainless balls .. 16	10.05
RW300S	3mm high grade stainless balls .. 16	10.05
RW618	Motor Brushes - Standard motors - pair	7.13
RW627	Turnbuckles pack of 6	22.34
RW125	1/8" high grade carbon steel balls .. 30	10.05
RW300	3mm high grade carbon steel balls .. 30	10.05
RW615	Capacitors pack of 9	4.27
RW616	Body clips pack of 10	2.27
RW620	Motor brush heatsink posts - pair	12.98
RW629	Motor heat sink plate	13.17

TAMIYA

RW205	M4 Front Suspension balls set of 4	12.00
RW209	Output cup sleeves set of 4	12.00
RW213	"Fox" / "Wild One" wheel adaptors set of 4	22.39
RW216	Alloy wheel drive hubs set of 4	31.12
RW218	Roller hubs (one way axles)	17.84
RW223	Tyre trueing arbor (for foam tyres)	14.92
RW306	"Falcon" pin drive conversions	56.46
RW118	"Beetle" pin drive conversions	56.46
RW119	"Fox" pin drive conversions	56.46

PB MINI MUSTANG & MAXIMA

RW821	Ball differential - 2	90.21
RW802	Ball raced alloy belt tensioner	22.39
RW803	* Wheel adaptors - Fox - 4	22.39
RW804	* Cat Tufinol gear .. adaptor	14.92
RW805	Hard steel servo posts	20.44
RW809	* RC10 Tufinol gear..adaptor	14.92
RW811	Alloy shocker pistons (firm) 4	14.92

* These items also fit PB's new race-winner the ACE

ASSOCIATED

RW905	64DP Tufinol spurs 90t - 120t	17.84
RW910	48DP Tufinol spurs 75t - 92t	17.84
RW502	Servo-saver Hardened post kit	19.74
RW504	5mm front axles	11.03
RW507	Adaptor to fit Fox wheels on rear	22.39
RW508	Standard front axles .. larger thread	14.92
RW512	Wide track 5mm front axles	21.41

RW514	Double ballraced diff tube	45.10
RW515	Hardened steel idler gears (pair)	22.39
RW517	Front wheel Yokomo adaptors (pair)	22.39
RW518	Rear wheel Yokomo adaptors (pair)	22.39
RW519	Machined Tufinol idler gear (pair)	22.39
RW522	Centre steering front axle 5mm	18.49

SCHUMACHER TOP CAT

RW559	Tyre trueing arbor (foam tyres)	14.92
RW561	Gear adaptor Tufinol Cat spurs	14.92
RW562	Gear adaptor Tufinol RC10 spurs	14.92
RW567	Hard steel suspension balls ..4	10.05
RW568	Hard steel steering balls ..6	15.90
RW569	Hard steel steering pivots 2	13.30
RW570	Ball joint tool. A must for all Topcat owners	14.92
	Direct fit aluminium wheels front and rear	
	Gold and Silver pepper pot style per pair	43.15
	Clear anodised, no holes per pair	37.31

SCHUMACHER CAT

RW550	Wide track spacers not XLS	14.92
RW551	64DP Tufinol spurs 108-122	17.84
RW555	Left & right threaded track rods	16.87
RW556	Hardened steel suspension balls 8	19.79
RW557	Hardened steel steering pivots 4	14.92
RW558	48DP Tufinol spurs 80t-92t	17.84
RW559	Tyre trueing arbor (foam tyres)	14.92
RW560	"C" car Tufinol spurs 64DP 90t-108t	17.84
	Direct fit aluminium wheels front and rear	
	Gold and Silver pepper pot style per pair	43.15
	Clear anodised, no holes per pair	37.31

TEAM LOSI JRX-2

RW350	Heavy duty front axles per pair	18.49
RW351	5mm front axles per pair	20.44
RW352	Hard steel steering posts - per pair	20.44
RW353	Fox rear wheel adaptors	15.90
RW354	Gear adaptor for Cat Tufinol spurs	14.92
RW355	Gear adaptor for RC10 Tufinol spurs	14.92
RW356	Rear wheel adaptors. Yokomo wheels	22.39
RW359	Front wheel adaptors	22.39
RW358	Tufinol differential gear	18.82

YOKOMO DOGFIGHTER

RW850	Spur gear adaptor RC10 spurs one way	37.64
RW851	Spur gear adaptor RC10 spurs fixed	24.33
RW854	Wheel adaptors to fit Tamiya wheels 2	22.39
RW855	Roller hubs per pair	60.03
RW857	Tufinol diff. gear set	45.10
RW627	Left & right threaded rods 6	22.39
RW738	Alloy posts. Houge bellcrank	14.92
RW858	Centre pulley hard anodised alloy	13.30

OPTIMA MID

RW755	.6 module nylon spur 70t-87t	17.84
RW728	Hard steel servo saver posts per pair	20.44
RW729	Spur gear adaptor for Tufinol Cat spurs	12.00
RW730	Hard alloy final drive gear	14.92
RW731	Tufinol idler gear	12.98
RW732	Wheel adaptors to take Fox wheels per pair	11.03
RW733	Spur gear adaptor for Tufinol RC10 spurs	12.65
RW738	Alloy posts for bellcranks	14.92
RW744	Wheel adaptors to fit Yoko wheels per pair	22.39
RW745	Tyre trueing arbo for circuit foam tyres	12.98
RW747	Hardened pivot balls with "e" clips 8	29.85
RW750	Roller hubs	63.92
RW753a	Alloy thrust pads with hard rings for Option House ball difts per pair	22.39

RW702	Alloy wheel adaptors, Tamiya wheels per pair	15.90
RW706	Roller hub front axles	18.49
RW713	Moulded nylon wheel adaptors Tamiya 4	14.92
RW627	Turnbuckles for easy adjustment 6	22.39
	Aluminium wheels, front and rear	
	Gold and silver pepper-pot style	
	Rear wide track per pair	37.31

OPTIMA & TURBO OPTIMA

RW702	Aluminium wheel adaptors Tamiya per apir	15.90
RW703	Roller clutch front diff	82.42
RW705	Steel final drive pinion	13.95
RW750	Roller hubs	63.92

RW706	Roller hub front axles per apir	18.49
RW710	Tufinol layshaft gear & shaft Compound gears as in Optima price lists	19.79

ULTIMA

RW702	Alloy wheel adaptors Tamiya wheels per pair	15.90
RW709	Tufinol/steel compound gear 39t-42t	25.96
RW712	64DP Tufinol/steel c/pd gear 76t-84t	27.25
RW713	Moulded wheel adaptors Tamiya 4	14.92
RW714	48DP/48DP Tufinol C/pd gear 57t-63t	27.25
RW715	48DP/32DP Tufinol c/pd gear 57t-63t	27.25
RW716	48DP layshaft gear	14.92
RW732	Wheel adaptors to take Fox wheels per pair	11.03
RW725	Hard aluminium final pinion	14.60
RW726	Tufinol layshaft gear	14.60
RW727	5mm front axles per pair	17.84
RW728	Hard steel servo posts	20.44
RW734	5mm wide track front axles	18.49
RW739	Tufinol diff gear 32 DP	18.49
RW740	48DP diff gears (RW741 & RW742)	33.74
RW741	48DP Tufinol diff gear	18.82
RW742	48DP final pinion	14.92
RW744	Rear wheel adaptors Yokomo wheels per pair	22.39
RW748	Alloy posts for Houge bellcranks per apir	14.92
RW517	Front wheel adaptors Yokomo wheels per pair	22.39
RW727	Turnbuckles for easy adjustment 6	22.39

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LETTERS TO THE EDITOR

Dear D&T

First of all a compliment, I love your magazine and hope you continue your great previews. I was wondering if the magazine might have a pin-up of the Ultima Pro, in the near future. Also if you could ask people to send in a snap shot of their car, bike or truck. Just an original shot with a little text under the photo about the car etc. and what it is like. Hopefully when I receive my Ultima Pro I will send in some photos.

Shayne Fraser, Swan Hill, Vic.

We encourage readers to send in details and photographs of their cars, but the pics must be good quality. Because of the printing

process the magazine photos never look as good as the originals, so we need good focus and contrast in the originals. Otherwise send in your colour prints and we'll do our best. Ed.

Dear D&T

In reference to Jeffry P. Yangebup, Perth, letter in 'You Wanted To Know' D&T#15. The problem in the gearbox of his Grasshopper could be a result of the hexagonal head on the driveshaft stripping out the inside of the nylon bevel gear. Usually caused by flying forward and slamming into reverse. The only solution is to replace the bevel gear and to not hit reverse so hard.

C S Hawkins, Newcastle, NSW

Dear D&T

Some of my friends and I were planning to race 1/8 scale off-road but in Victoria there are no clubs. Recently the owner of Eastern Hobbies (Peter Russell) was trying to organise a track. He put an advert in D&T#12 but didn't get a response at that time. If anyone is now interested, please ring Eastern Hobbies on (03) 729 4170. Adults in particular are needed to get a club going.

Dear Mel,

I am writing because of comments from readers about your centre photo. My idea is to have a photo of the month, for the most spectacular or unusual R/C car in action. If your magazine can handle it, pay the sender (winner for the month) for his or her photo.

Darryl K. Partridge, Pt Pirie, SA

With Christmas just over, the funds are looking rather sick Darryl. In fact Santa sent the Grim Reaper around on the 25th. Seriously – we like your idea of reader supplied centrefolds but any pics supplied must be of top quality and suitable for enlargement. Most of our centre spreads are taken by professionals with due regard for correct composure, lighting and focus. However, we would certainly consider photos submitted by readers which, if published, would be eligible for a present from Santa. Only model car pin-ups please! Ed.

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TRADE AND DIRECT ENQUIRIES WELCOME FOR ALL NICADS

AN HONEST ELECTRIC RACING CAR AT A BUDGET PRICE

BOLINK ELIMINATOR SPORT

One tenth scale on-road or circuit cars. You've seen the racey looking bodies, the fibreglass chassis and the fast foam slicks and would like to get behind the wheel. It's easy with radio control. As for choice, there's certainly no shortage of kit cars for this increasingly popular segment of our sport. Most have high levels of inventiveness using high quality materials and high price tags to suit. But what if you just want to bomb up and down the road or dodge witches hats in a nearby car park. Or maybe try out tarmac, carpet or veledrome racing without aiming for national championship status. At least not yet. Take a look at the Eliminator Sport.

Drawing on their twenty year involvement in the hobby, Bolink have taken their successful (winner of two national champs in the USA) Eliminator 10 and carefully replaced some of the more expensive bits, but still left enough for the competitive racer on a tight budget. Naturally you can later upgrade the Sport to full race specs as your wallet and driving experience dictates.

CHEAP BUT NOT NASTY

You still get a good quality glass chassis and front suspension, both identical to the 10. Front end utilises spring loaded kingpins like most other circuit cars and these are mounted on the front suspension plate that is in turn fixed above the chassis. This is a good front end set-up that can be adjusted for camber (wheels leaning in), caster (lean back) and ride height. Wire steering links and collets for adjustment are included but no ball joints or servo saver. One can live without the ball connectors but you should buy a Kimbro servo saver.

Moving to the tail end we find a T shaped fibreglass plate which carries the motor and rear suspension. This plate is suspended below a raised radio tray that's firmly fixed to the chassis. Rear axle movement relies entirely on the controlled flex in the T plate and its rubber grommet mounting in the radio tray. Cheap, crude and mildly effective.

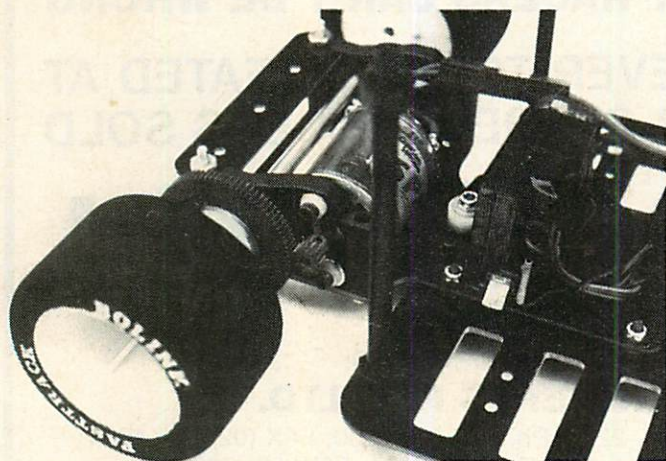
Rear axle is a solid stainless steel bar mounted on thick plastic motor blocks via oilite type bushings. Drive hubs are quite adequate in plastic but the piece de resistance is Bolinks standard eight ball differential

that works very well and accomodates the common Associated type spur gears. A 48 tooth, 32 dp gear is provided. All wheels come ready fitted with trued sponge tyres of an unknown soft compound.

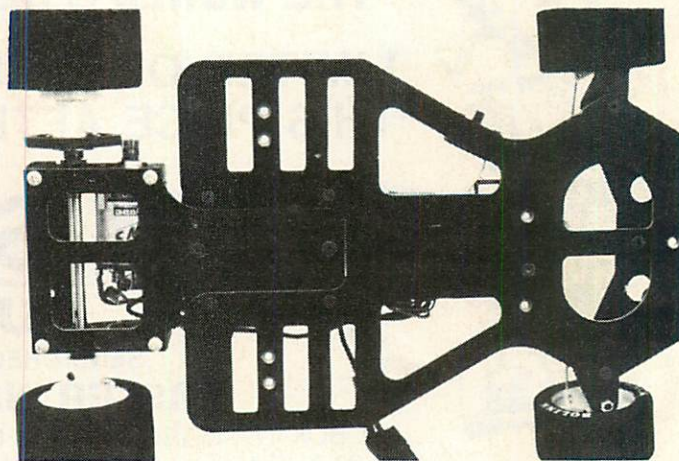
Joining the front to the back is the aforementioned FRP chassis plate. Like all the fibreglass parts this is very cleanly cut out. Slots are provided for saddle pack (three each side) Ni-Cads although one could use stick type packs if the centre radio tray is kept devoid of radio. Bolink supply a pair of their nylon battery mounts which are only of use with one saddle pack since they must be intimately integrated with a pack. Sexy eh! You also get a glass aerial, nice light polycarbonate body of the 1988 Buick Regal, decals and a big sticker which reads, 'The difference between men and boys is the price of their toys'. Ah well, whatever turns you on.

ASSEMBLY LINE

Putting this type of model car together is one of the least demanding parts of our hobby and the Eliminator Sport is no exception. It goes together quickly and easily, helped by a good instruction book that covers most things a beginner could want to know. This includes setting up the car but excludes any guidelines for gear ratios. Clear diagrams are available for the semi-literate followed by photographs of the completed machine. However, no matter how smart you think you are we urge you to read all the instructions. Tips? All we can think to add are some chamfers in the battery slots so that the cells fit more snug and slightly lower, and to file a small flat on the steel axle to locate and hold the grub screws for the two nylon hubs. And if you've read the definitive article on differentials (elsewhere this issue) you will know to epoxy and not super glue the diff drive ring. Problems? We always manage to find some, but we only found one in the Eliminator. The long rear motor block bolts should have been 6-32 threads but were supplied 3/16 which is larger. They fitted the car okay but we had to find a couple of larger nuts. On a positive note we liked the extra C clips, nuts and washers that were supplied as spares. We finished our Buick in Pactra



Eliminator Sports includes a ball diff and trued tyres.



Underside view shows rear 'T' plate and smooth bottom.



Eliminator Sports is a real racing car at a budget price.

flourescent yellow, orange and metallic burgundy (it looks so good we might take out a copyright) and headed for the street.

LAYING DOWN THE RUBBER

Even with oilite bushings instead of ball bearings there is not much to hold these cars back. They all go fast, especially compared to an off-road buggy. We used an old Kyosho 240 SPA motor, 16/83 gearing (48 dp gears fitted) and was amazed at the straight line speed. You wouldn't want to hit anything or anyone at flat chat. We were confident enough to enter the circuit races at Sydneys Crossroads Circuit (see From the Drivers Seat this issue for details) but didn't expect to compete on an equal footing with the fully race tuned cars with hotter motors. Hard cornering on high traction surfaces such as tarmac shows up the inadequacies of the simple rear suspension by producing chatter or hop but the car stays on line and would only worry serious racers. This problem does not arise on more slippery surfaces such as concrete and could be cured with harder compound rear tyres and rear shock absorbers. A rear wing would help too. These are all things that could be easily added to the Sport if desired. Never the less we had fun at Crossroads and the standard car circulated very nicely. I urge all purchasers of these cars to give organised racing a try — your knowledge and driving skills will take a quantum leap forward and you'll find some new friends.

IMPROVING THE BREED

Many buyers will be perfectly happy with the standard kit. It will impress and satisfy straight from the box. If you want to go further then the path to take has been well proven by Bolink. You can option your Sport right up to the classy Gold Edition and then take on anybody. Competition parts such as ballraces, aluminium motor mounts, Eliminator 10 rear end, aluminium hubs, 2 inch wide rear wheels and tyres, carbon fibre axles and more are all available. All you need is the desire, the cash and the Eliminator Sport for starters.

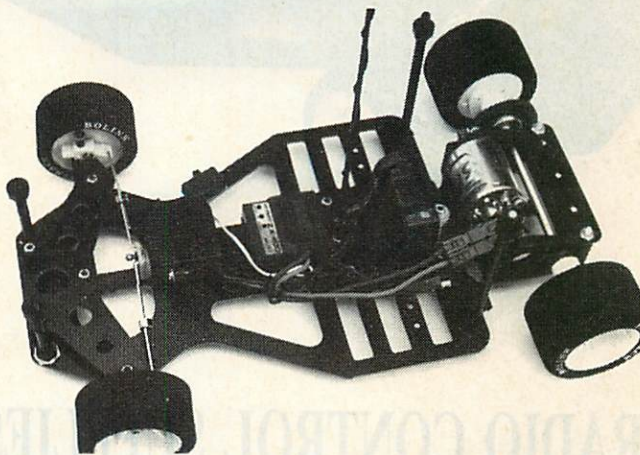


REVIEW AT A GLANCE

Quality of instructions	★★★★
Ease of construction	★★★★★
Quality of materials	★★★
Motor supplied	No
Chassis type	FRP plate
Suspension type	F, flex/coil spring. R, controlled flex T plate
Shock type	Nil
Sway bars	No
Bearings	Oilite bushes
Motor accessibility	★★★★
Battery accessibility	★★★★★
Speed controller	Not supplied
Body shell	Clear polycarbonate
Weight as tested	1.25 kg
Handling as tested	★★★
Speed as tested	★★★★
Value for money	★★★★
Rec. retail price	\$180



Competition front end is adjustable via five locknuts.



Plenty of space for radio gear on the Bolink's glass chassis.

WIMPY MOTORS

The Force to be reckoned with

Wimpy motors have swept all before them since their release (see review in D&T#11). Available in 17 turn triple wind for 2WD and 15 & 14 turn double winds for 4WD.



GONZO NI-CADS

From the USA, these two packs are (left) the SC1200 race pack computer matched and top of the line super high quality cells. The economy pack (right) is slightly below the computer matched pack in performance, but is still above most other SC packs and some SCR's.

NEW
RELEASE

ELIMINATOR *Sport*

BY
BOLINK



TAKE A LOOK INTO THE FUTURE OF ELECTRIC R/C CAR RACING

The **ELIMINATOR SPORT** is Bolink's lowest price version of our Eliminator 10 that has won two ROAR National Championships and many other races across the country.

It uses the same chassis and front suspension as the Eliminator 10, but with strong nylon motor mounts and a controlled flex fiberglass T-Plate. Like the Eliminator 10, it comes with Bolinks nylon battery holders, a stainless steel rear axle with ball type differential, hardened steel kingpins and front axles and fasttrack racing tyres.

The Eliminator 10 parts and racing accessories can be added to the sport to make it into a seriously competitive racing machine.

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BIRD TORQUE

by Paul Bird

Questions from readers such as "What is the correct procedure for charging 7.2 volt 1200 & 1700 mAh R/C batteries?" and "When the batteries are charged, what voltage reading should they have?", have prompted me to compare various means of charging Ni-Cads and recap points covered in this column some time ago to help newcomers to this sport of ours.

Firstly, to make charge method comparisons more accurate, the same pack was used for each test, and then discharged at a constant 10 amps on a Lavco Cell-Mate to obtain a pack duration in seconds.

For the test, I used a six cell pack of Sanyo 1200 SC cells, and in each case the charger was powered using a 12 volt car battery.

All Ni-Cad specifications quoted are supplied by Sanyo.

CHARGING METHODS

There are four commonly used charging methods: Quick-charge or resistive leads, clockwork timer chargers, peak detection units and thermal chargers.

Commonly used types of Ni-Cad packs include 1200 SC cells, 1200 SCR's and 1700 SCE cells. Each cell has different charging and discharge characteristics and must be charged carefully to avoid damaging the pack.

It's interesting to note that the only cell Sanyo provides a fast charge rate for is the 1200 SCR and that's at a rate of 1.8 amps, not the 4 or 5 amps we're all used to! Sanyo also recommends charging SCR cells to a temperature of 45 degrees centigrade.

SCE cells can be charged up to a temperature of 30-40 degrees C, but should not be charged at more than 3.5 amps, or you risk damaging the cells.

All Ni-Cads can be charged using a clockwork charger or a peak detection unit but if you're using a thermal charger you'll need to be careful with SCE cells.

CHARGE LEADS

First let's look at quick-charge or resistive leads. These often come with package deal kits. Basically they're two pieces of wire, with alligator clips at one end and a plug to suit the Ni-Cad at the other.

But this is special wire with a high resistance, which reduces the amount of current flowing to the Ni-Cad to about 4 amps. After all, if you hit a 7.2 volt Ni-Cad with all the current of a car battery, you'd blow up the Ni-Cad.

Normally, a totally flat pack will be charged for about 15 minutes. The disadvantage of this method is that you're only getting about 75% of the battery's capacity.

CLOCKWORK CHARGER

A clockwork timer charger is similar to the resistive leads, but safer as it's harder to overcharge the batteries.

Provided you only charge each flat pack for one timer cycle, you won't risk overcharging. The normal charge current is 4 amps for 15 minutes.

After charging the test pack in this way and discharging it on the Cell Mate, we get a reading of 198 seconds. That means if the pack was in an R/C car, which used the power at a constant 10 amps, the Ni-Cad would power the car for 198 seconds — not long enough for a five minute race!

PEAK DETECTION CHARGER

The Peak Detection charger is an electronic unit, which uses special characteristics of Ni-Cad cells to make it work.

When Ni-Cads reach their maximum charge, the pack voltage drops very quickly. The charger senses that and switches off, having detected 'peak voltage'. That peak voltage will depend on the pack's condition, but under charge can vary from 8 to 11 volts — the norm is about 10.25 volts.

Some peak chargers have variable current output, but most will charge a totally flat 1200mAh pack in about 20 minutes. 1700 mAh packs take a little longer, because they have a greater capacity.

After charging the test pack using this method, the Cell Mate reading came out at 403 seconds, which is a 50% increase on the clockwork timer system.

Obviously, peak charging is a far more effective way of charging batteries and getting longer running time from them.

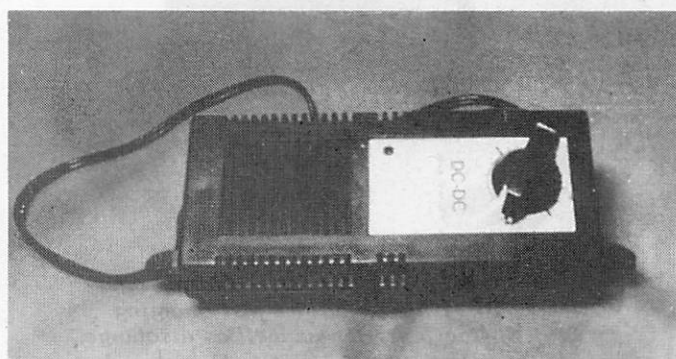
THERMAL CHARGING

Thermal charging has become the popular method of charging Ni-cads, and most racers use it, no matter what the type of cell being charged.

The basic principle behind thermal charging is based on an interesting characteristic on the Ni-Cad. As the pack starts to reach maximum



The Peak Plus charger from Novak Electronics. This is a good peak detection charger, in keeping with what we've come to expect from Bob Novak.



A clockwork timer style charger. It's quite reliable but won't give as good a charge as peak or thermal chargers. Then it doesn't cost anywhere near as much either.

capacity, its ability to accept a charge at a high current (4 amps) drops away. As a result, the surplus charge is dissipated as heat. Of course, if the packs get too hot, cells will vent or explode as a result of internal pressures building up.

A Ni-Cad cell has a built-in pressure relief valve which is designed to prevent actual explosions, but if the valve operates, corrosive material can be sprayed everywhere! Thermal chargers use a special temperature probe attached to the pack to prevent overcharging. Usually, the charger is calibrated to charge the pack to a certain temperature; 30-40 degrees Celsius for SCE packs, 45 degrees for SCR's and about 30 degrees for SC packs.

Thermal charging also provides a capacity increase over peak charging. In the case of our test pack, it rated 458 seconds on the Cell

Mate, a 13.6% increase.

Of course, there's a trade-off. While thermal charging increases capacity, it also shortens the life of your Ni-Cad pack. Ni-Cads don't really like being pushed to the limit all the time.

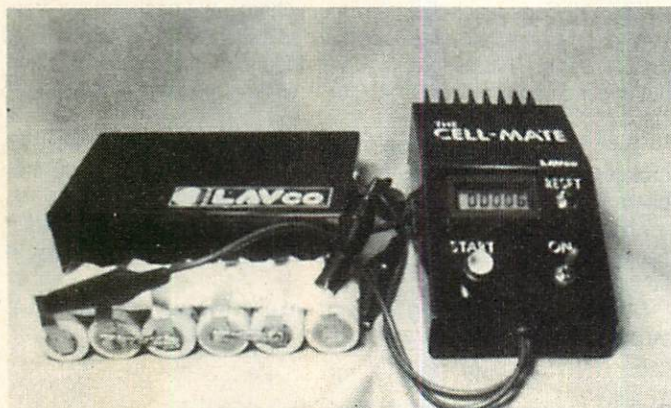
IN CONCLUSION

How you charge batteries is a matter for your personal taste. Almost every racer has his or her own pet method, and almost every racer is convinced that method is the only 'correct' way to charge batteries.

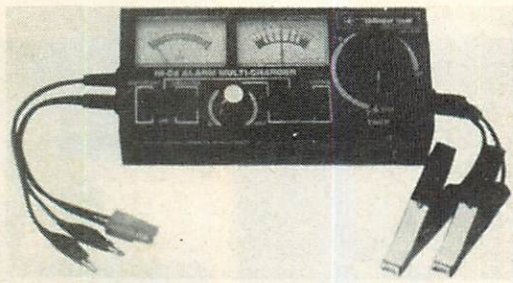
But remember, the proof of the pudding is on the track. If your batteries are in good condition, but dump before the end of a race, have a good look at your charging method.



The Bullet Mosfet Pulse Charger a robust peak detection charger with good looks and most of the functions you could possibly need.



From Mike Lavacot, the Lacvo Cell Mate and adaptor box. If you want to measure your Ni-Cad capacity accurately, this is the only unit to have.



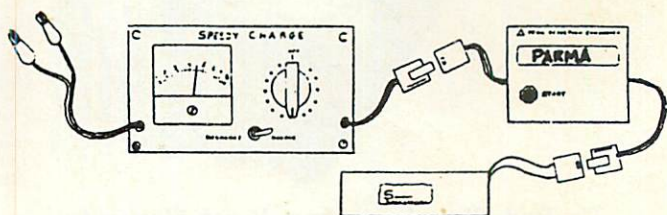
The Thunder Tiger Alarm Multi Charger allows fast charging of Ni-Cad batteries as well as discharge, together with the ability to rest and time your motor for more efficient running as well as read the RF output of your transmitter.



Operation of this charger couldn't be easier. Connect the input to 12v battery, the output to your Ni-Cad pack and hold down the button for 5 seconds. An indicator lamp will glow. When your pack is fully charged the unit will automatically switch off and the lamp will blink. The charged pack should be just warm to the touch.



The Parma Peak Detection Converter is a brilliantly simple device that will convert your clockwork timer into a 'Peak Detection Charger' (see diagram below).



**SALE
SALE
SALE**

BENDIGO REMOTE CONTROL SUPPLIES

28 Wallan Street, California Gully Victoria 3556
Phone (054) 46 8339

**SALE
SALE
SALE**

STOCK CLEARANCE

We are clearing our shelves to make way for new stocks. These items are strictly limited, first in, first served.

	WAS	SALE		
Parma 1/10 Chenoweth Buggy Body.....	\$24.00	\$12.00	Optima front shock mount.....	\$10.00 \$5.00
Parma 1/10 AMC Spirit Mod Body.....	\$24.00	\$12.00	RC10 graphite shock mount.....	\$28.00 \$14.00
Parma 1/10 Subaru Brat Body.....	\$30.00	\$15.00	Hotshot front shock mount.....	\$14.00 \$7.00
Parma Chenoweth Body for RC10.....	\$24.00	\$12.00	Optima rear shock mount.....	\$12.00 \$6.00
Parma Chenoweth Body for Yokomo.....	\$24.00	\$12.00	Ultima rear tall shock mount.....	\$14.00 \$7.00
Parma 1/10 Outlaw Wedge Body.....	\$30.00	\$15.00	Front stabiliser bar mounts.....	\$8.00 \$4.00
Parma Frog Jumper Body.....	\$24.00	\$12.00	Optima clip suspension ball set.....	\$12.00 \$6.00
Parma Desert Dog Body for Optima.....	\$24.00	\$12.00	Optima slip clutch kit.....	\$28.00 \$14.00
Parma Mid Optima Body.....	\$24.00	\$12.00	Optima Posi-lock front diff set.....	\$56.00 \$28.00
RC10 Front Wing.....	\$5.00	\$2.50	RC10 rear bumper.....	\$6.00 \$3.00
360 Motor heat sink.....	\$12.00	\$6.00	Mid Optima front bumper.....	\$8.00 \$4.00
Front foam slicks for RC10.....	\$20.00	\$10.00	RC10 roll bar kit.....	\$20.00 \$10.00
Optima slicks (4).....	\$38.00	\$19.00	Knock off wheel nut set.....	\$4.00 \$2.00
Wide spike front tyres.....	\$20.00	\$5.00	Nylon wing hold downs.....	\$4.00 \$2.00
Kyosho pattern hard rear tyres.....	\$20.00	\$5.00	Parma 19 quad Cyclone modified motor.....	\$128.00 \$64.00
Loose soil rear Kyosho pattern tyres.....	\$20.00	\$5.00	Parma 23 double Cyclone modified motor.....	\$128.00 \$64.00
Front adjust track wheels.....	\$20.00	\$10.00	Parma 24 double Cyclone modified motor.....	\$128.00 \$64.00
Rear adjust track wheels.....	\$20.00	\$10.00	Parma 19 double Cyclone modified motor.....	\$128.00 \$64.00
Parma short shock kit.....	\$16.00	\$8.00	Parma 20 double Cyclone modified motor.....	\$128.00 \$64.00
Aluminium shock coil over adjusters.....	\$10.00	\$5.00	Aerotiger electric plane kit.....	\$220.00 \$130.00
			Aerosprint ARF electric plane kit.....	\$210.00 \$125.00

MAIL ORDER Please supply me with the following goods. I understand that these goods are limited quantities and my cheque/money order will be immediately returned should the goods be sold out. Add post and packaging to order: Bodies add \$2.50 per order, Plane kits add \$5.00 per order, all other items add \$2.00 per order.

ITEM	QUANTITY	PRICE	P&P	TOTAL

28 Wallan Street, California Gully Victoria 3556

AMOUNT ENCLOSED.....

**PLUMTREE
MODELS**

Plumtree Models

Phone: (042) 26 1555

RC BUGGIES IN STOCK

Koala.....	\$232.00
Raider.....	\$160.00
Clod Buster.....	\$399.00
JRX2.....	\$390.00
Dragster 1/12 Scale.....	\$290.00
RC10 Graphite.....	\$399.00

PACKAGE DEAL PRICES AVAILABLE

RADIOS

Shine Home.....	\$80.00
Challenger 250.....	\$119.95
Dash II.....	\$144.00
KO Kopro EXII.....	\$229.00
Adspec 27 meg with CPR unit.....	\$399.95

CLEAR LEXAN BODIES BY PARMA AVAILABLE

M&Y MOTORS IN STOCK

18 turn single.....	\$89.95
15x7 single.....	\$132.00

SPARE PARTS AVAILABLE FOR YOKOMO, KYOSHO, TAMIYA, TEAM ASSOCIATED, TEAM LOSI, SCHUMACHER

PLUS A LARGE RANGE OF OPTIONAL PARTS BY PARMA, TRINITY, BULLET, PB

50% OFF PARTS TO CLEAR OUT FOR: DOGFIGHTER, SAMURAI, GALAXY, BISON F10, ZERDA, HUNTER, JET HOPPER, MINI HOPPER, PB MINI MUSTANG

Aluminium 4WD chassis
(make your own lightweight).....\$59.00

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POSTAGE RATES: \$5-\$9.99—\$1
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\$100 and over \$5p
plus \$8 for kits and heavy items

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ENGINEERING & MANUFACTURING CO.

ADVANCE ENGINEERING

"The Best Competition Yet"

MAGNUM 8 1/8 on road car, oil shocks, 4-link suspension, fixed rear axle, can run up to 10 cells with Trinity 1700 or 1701 radical speed and control. Includes body, NASCAR, Ford Capri, TOJ.....

\$395.00

MONSTER TRUCK Conversions for RC10 JRX2 & Ultima.

Includes wheels, tyres and body.....

\$145.00

CONCOURS ALUMINIUM WHEELS suits all popular cars set of 4 wheels includes universal adaptor.....

FR \$63.90 RR \$69.90

COMPLETE \$120.00

UNIVERSAL WHEEL HUBS for fitting BBS wheels and aluminium wheels specify your models.....

\$29.90

CUSTOM STREET MACHINE including body of your choice and new Yokomo motor.....

\$239.00

ANDYS

RRP SALE

REAR ARMS RC10.....

\$28.50 \$18.50

FRONT ARMS RC10.....

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BUMPERS wide RC10.....

\$14.50 \$10.50

BUMPERS wide ULTIMA.....

\$14.50 \$10.50

BUMPERS mini ULTIMA.....

\$12.50 \$10.50

ASSOCIATED

RC10L ON ROAD.....

\$255.00 \$225.00

BEARINGS 3655 1/12 pair.....

\$18.50 \$15.50

BEARINGS 6902 1/10.....

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BEARINGS 6897 1/12 & 1/10 pair.....

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Spare parts for RC12, RC10G, RC10L also available

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DIGITAL PULSE PEAK CHARGER.....

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BATTERY HOOK UP WIRE (3mm wide) 1m.....

\$5.95 \$4.50

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"Hi Performance: Track Proven Reliability"

DEATH ADDER 4WD 1/8 GAS OFFROAD BUGGY 3 diff's shaft drive w/muffler, header low profile tyres & body.....

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OPTIONAL STEEL SPUR GEAR Suitable for use with High RPM Engines.....

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OS 21 EXB ENGINE (6 port).....

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MMA AUTO MAGIC MUFFLER.....

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TEFLON MUFFLER & HEADER JOINER.....

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HEADERS (all bends and angles).....

from \$12.50

SILICONE MUFFLER & HEADER JOINERS.....

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Full range of Death Adder Spare Parts always in stock!



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CUSTOM SCALE COMPONENTS "AXELS"

"The Axle" TELESCOPING UNIVERSAL AXLES for that SMOOTHER TRANSMISSION. The Axles that give you the edge!

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\$126.50 \$113.95

K18 for ULTIMA — GRAPHITE for 5mm Output Shafts.....

\$88.50 \$79.95

K17 for RC10 MIP — GRAPHITE.....

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For Wild Offroad Motors please use GRAPHITE AXELS!

Full Range of "AXELS" Spare Parts always in stock!

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HEATSHRINK 35mm Red, Black, Yel, Wh, Clear for single stick 2m.....

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HEATSHRINK 75mm Red, Black, Yel, Wh, Clear for Saddle Packs 2m.....

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SILICON WIRE — HEAVY DUTY MULTI STRAND 14AG per metre.....

\$8.50 \$7.95

SILICON WIRE — STANDARD MULTI STRAND 16AG per metre.....

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SILICON LUBE — SILICON SPRAY LUBE 500ml.....

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SILICONE SHOCK OIL — #5 to #50.....

\$3.50 \$2.50

ELEC. MOTOR BRG OIL — withstands Extreme Temp.....

\$5.95 \$4.95

DISCHARGE RESISTOR — DC1 SLOW DISCHARGER Ensures cells are discharged prior to use 7.2, 8.4 or 9.6v.....

\$6.50 \$5.50

DISCHARGE RESISTOR — DC2 RAPID DISCHARGER w/sink can DC up to 9.6v.....

\$28.50 \$25.50

DISCHARGE RESISTOR — DC3 TX NICAD DISCHARGER Slow discharge cells safely includes LED Indicators.....

\$4.95 \$3.50

DISCHARGE RESISTOR — DC4 RX NICAD DISCHARGER includes LED Indicators.....

\$4.95 \$3.50

MOTOR CLEANER — LECTRA CLEAN 500ml Aerosol.....

\$10.50 \$9.50

FAST FLUX Soldering Flux.....

\$6.95 \$5.95

FIBREGLASS SHOCK TOWER various shock mounting points REAR RC10.....

\$18.50 \$10.50

REAR ULTIMA.....

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FRONT RC10.....

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FRONT ULTIMA.....

\$16.50 \$10.50

GRAPHITE SHOCK TOWER various shock mounting points ULTIMA FRONT.....

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\$175.00



HYPER DRIVE

HYPER 10 — The most technically Advanced 1/10 Scale Race Car in the World. GRAPHITE chassis.....

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HYPER 10 TYRES — Mounted, Trued & Glued on RIMS High Traction Ultra Long Wear.....

FR pair \$29.50 RR pair \$39.50

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SPECIAL if purchased with Hyper 10 kit.....

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HYPER BALLS 1/8 balls fits RC10, Ultima, Yokomo and TPS Slipper Clutch.....

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"The Winners Choice" RRP SALE

JRX2 2WD w/NEW Spec Shock Seals.....

\$395.00 \$355.00

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6104 MONSTER TRUCK.....

\$138.50 \$109.50

6040 REVOLUTION II.....

\$128.50 \$99.50

6046 REVOLUTION IV.....

\$128.50 \$99.50

6054 REVOLUTION OVAL.....

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6060 SUPER STOCK.....

\$49.50 \$39.50

PROFORMANCE CHASSIS KIT w/JR's CHOICE.....

\$295.00 \$225.00

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\$24.50 \$18.95

SUPER HARD DIFF BALLS 3/32.....

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NEW LOSI TYRES REAR (Cushion Carcase) 6 Rows HT.....

\$22.50

5 Rows HT.....

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4 Rows HT.....

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\$19.50

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PROLINE Chromed Dish Rims.....

pair \$14.50



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R/C CAR MODELLERS YOU WILL NEED THESE . . . SALE

BEARING CLEANER MODULE — Cleans bearings quickly & efficiently.....

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PORTABLE PARTS WASHER — Great for fiddly bits works from 7.2v batt.....

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set \$4.50

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RRP SALE

SPORT 4WD 1/8 GAS OFFROAD BUGGY Body and Low Profile Tyres incl.....

\$580.00 \$499.00

OPTIONAL STEEL SPUR GEAR.....

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OPTIONAL ENGINES & MUFFLERS See Death Adder Accessories

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SANYO 1200 SCR High Output Fast Charge..... \$69.50 \$49.50

SANYO 1200 SC Longer Duration Fast Charge..... \$59.50 \$49.50

SANYO 1200 SCF Std Output Fast Charge..... \$56.50 \$49.50

SANYO 1700 SCE Longer Duration Slow Charge..... \$69.50 \$49.50

SANYO 1700 SCE Saddle Pack..... \$69.50 \$49.50

TAMIVA 1200 Std pack Fast Charge..... \$59.50 \$49.50

All above come as 7.2v packs and SCE Saddle Pack

SANYO 700 mAh AA Tagged Loose Cell..... \$6.95 \$5.95

SANYO 200 mAh AAA Tagged Loose Cell..... \$6.75 \$5.75

SANYO 600mAh AA Tagged Loose Cell..... \$5.95 \$4.95

SANYO 500mAh AA Tagged Loose Cell..... \$4.95 \$3.95

SANYO 1200mAh SUB C Loose Cell SCR, SC, SCF..... \$10.50 \$8.50

SANYO 1700mAh SUB C Loose Cell SCE..... \$11.50 \$9.50

SANYO 1800mAh SUB C Loose Cell SCR..... \$15.50 \$12.50

SANYO 4000mAh D Loose Cell SCR..... \$22.50 \$18.50

SANYO AA Alkaline PK4..... \$3.95 \$2.95

9 Volts Alkaline..... \$2.95 \$1.95

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PARAGON "All the Mods to make you the Winner"

JUMP JETS — JJ's fit inside of existing shock cylinder to increase the shocks response over all types of terrain. The Hottest new device for off-road shocks.

Works in ASSOC, KYO, LOS, SCHUM, TAM.....

pair \$13.50

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LEXAN WINGS - 5" COMPETITION VEE	\$6.95	\$4.95
LEXAN WINGS - 6"	\$6.95	\$4.95
LEXAN WINGS - 7"	\$7.95	\$5.95
LEXAN WINGS - 8"	\$8.95	\$7.95
UNDERTRAY - JRX2 & ULTIMA SAVE YOUR GRAPHITE CHASSIS!	\$16.50	\$14.50
LEXAN SHEET - Make your own Wild side dams! 250mm x 250mm specify thickness .005/.010/.015/.020/.025/.030		\$5.50

SCHUMACHER

	RRP	SALE
Excellence In High Tech Design		
TOP CAT - 2WD OFFROAD PURFORMANCE BUGGY	\$325.00	\$275.00
PRO CAT - 4WD OFFROAD PURFORMANCE BUGGY	\$545.00	\$475.00
ORIGINAL SCHUMACHER TYRES		
3 ROW FRONTS.....\$28.50 \$12.95		
5 ROW REAR.....\$28.50 \$12.95		

SERPENT

	RRP	SALE
SPIRIT - 4WD 1/8 GAS OFFROAD BUGGY SHAFT DRIVE w/low Profile Tyres & body	\$695.00	\$595.00
QUICK FILL - INSTANT FILL FUEL BOTTLE for all gas models w/pop up or screw off fuel tank caps.	\$18.95	\$16.95

TAMIYA

	RRP	SALE
HORNET 2WD OFFROAD BUGGY (Entry Level)	\$159.00	\$149.00
MONSTER BEETLE 2WD MONSTER TRUCK OFFROAD	\$265.00	\$225.00
ASTUTE - 2WD ULTRALIGHT OFFROAD RACER	\$365.00	\$345.00
EGRESS - 4WD PERFORMANCE RACING BUGGY	\$595.00	\$550.00

	RRP	SALE
CV SHOCK SET -		
FRONT SHOCKS COMPLETE	\$29.50	\$26.50
REAR SHOCKS COMPLETE short	\$32.50	\$29.50
REAR SHOCKS COMPLETE long	\$32.50	\$29.50
TECHNISPORT - TX/RX WHEEL RADIO SET	\$129.50	\$109.50
240V MAIN CHARGER 30 min	\$76.50	\$66.50

TRAXXAS

	RRP	SALE
THE CAT OFFROAD BUGGY	\$199.00	\$149.00
RADICATOR - 2WD OFFROAD RACING BUGGY (Entry Level)	\$289.00	\$245.00
BULLET - 2WD PERFORMANCE OFFROAD RACING BUGGY	\$325.00	\$295.00
SLEDGEHAMMER - 2WD OFFROAD MONSTER TRUCK	\$325.00	\$295.00
VILLAIN IV - TWIN STERN DRIVE SURFACE PIERCING ELEC. CRUISER	\$350.00	\$325.00
XL2 - ELECTRONIC SPEED CONTROLLER FET TYPE 100/300 AMP CAPACITY w/HEATSINK	\$139.50	\$119.50
XL1 - ESC FET TYPE w/REVERSE 25/100 AMP CAP. w/HEATSINK	\$119.50	\$105.50
MAX PEAK II - PULSE PEAK CHARGER 0-6.5 AMP	\$119.50	\$109.50
FULLY ASSEMBLED KITS INCLUDING ESC & PISTOL RADIO		
RADICATOR.....\$495.00 \$445.00		
BULLET.....\$599.00 \$499.00		
SLEDGEHAMMER.....\$599.00 \$499.00		
VILLAIN IV.....\$625.00 \$595.00		

TRINITY "ELIMINATE THE OPPOSITION"

MOTORS

	RRP	SALE
#2000 NEW MONSTER STOCK MOTOR		\$39.50
#1700 NUCLEAR ASSAULT (9 TURNS)		\$129.50
#1701 BIG DADDY II (10 TURNS)		\$129.50
#1702 TOP FUEL II (11 TURNS)		\$129.50
#1703 GODZILLA 2 (12 TURNS)		\$129.50
#1704 KING KONG (13 TURNS)		\$129.50
#1705 MAXIMUM OVERDRIVE (14 TURNS)		\$129.50
#1706 BEHEMOTH (15 TURNS)		\$129.50
#1707 GARGANTUA (16 TURNS)		\$129.50
#1708 MAGIC SPEED JOEL JOHNSON (17 TURNS)		\$129.50
#1709 HEAVY METAL THUNDER (18 TURNS)		\$129.50
#1710 TYRANOSAURUS REX (19 TURNS)		\$129.50
#1711 KILLER FORCE (20 TURNS)		\$129.50
#2030 MATCHED MADNESS TWIN MOTORS FOR FAST ELEC. BOATS pair		\$139.50
#0002 SPEEDWORKS 427 4WD		\$59.95
#0003 SPEEDWORKS 350 2WD		\$59.95
#0555 TONY NEISINGER SIGNATURE 14 QUAD		\$69.50
#0444 MAGIC SPEED STOCK JOEL JOHNSON 34 DEG		\$49.50

REPLACEMENT ARMATURES

	RRP	SALE
#3030 9T DOUBLE FOR #1700	\$56.50	\$49.50
#3013 10T DOUBLE FOR #1701	\$56.50	\$49.50
#3021 11T DOUBLE FOR #1702	\$56.50	\$49.50
#3022 12T DOUBLE FOR #1703	\$56.50	\$49.50
#3010 13T DOUBLE FOR #1704	\$56.50	\$49.50
#3009 14T DOUBLE FOR #1705	\$56.50	\$49.50
#3006 15T DOUBLE FOR #1706	\$56.50	\$49.50
#3014 16T DOUBLE FOR #1707	\$56.50	\$49.50
#3016 17T DOUBLE	\$56.50	\$49.50
#3008 18T DOUBLE FOR #1709	\$56.50	\$49.50
#3007 19T DOUBLE FOR #1710	\$56.50	\$49.50
#3031 20T DOUBLE FOR #1711	\$56.50	\$49.50
#3032 13T TRIPLE	\$56.50	\$49.50
#3033 14T TRIPLE	\$56.50	\$49.50
#3034 15T TRIPLE	\$56.50	\$49.50
#3035 16T TRIPLE	\$56.50	\$49.50
#3036 17T TRIPLE	\$56.50	\$49.50
#3037 14T QUAD	\$56.50	\$49.50
#3038 15T QUAD	\$56.50	\$49.50
#3039 16T QUAD	\$56.50	\$49.50

ALL REPLACEMENT ARMATURES

are pre-balanced and ready to run!
Armatures are also packed in nylon tubes
that come in handy for safekeeping
transport to and from the track!

#7132F PURPLE PLUS POWER SHOCK SYSTEM (COMPLETE SHOCK AND SPRING ASSEMBLY)	\$59.95	\$49.95
#7132R PURPLE PLUS POWER SHOCK SYSTEM (COMPLETE SHOCK AND SPRING ASSEMBLY)	\$59.95	\$49.95
NEW LASER ARMS FRONT AND REARS HEAVY DUTY NYLON STIFFER, STRONGER, LESS FLEX, 'A MUST FOR ROUGH AND BUMPY TRACKS'		
#7170 FRONTS.....\$18.95 \$16.50		
#7171 REARS.....\$18.95 \$16.50		
TRINITY WORLD CHAMP PERFORMANCE		
2.2" DIAMETER TYRES CUT OR MINI SPIKE/STIFF OR HARD & COMP	\$22.50	\$18.50
2.2" DIAMETER WHEELS RC10, JRX2, ULTIMA/WHITE OR FLUORO	\$15.50	\$12.95

COMMUTATOR TRUING & SHAFT ALIGNMENT MACHINE
STAY TUNED

DIRT & TRACK

RACING IN OZ

CALENDER

NOTE: Clubs and Associations are invited to send
details of their major events for publication in this section.
Notice must be received at least two months and no
more than 12 months before the event.

MARCH 10th & 11th

EVENT: Victorian Titles 1/10
VENUE: Shepparton
CONTACT: L. Bone
PHONE: 03 743 1153

MARCH 30th - APRIL 1st

EVENT: National Titles 1/10
VENUE: Adelaide
CONTACT: W. Currie
PHONE: 08 382 0380

APRIL 8th

EVENT: Central Coast Cup
VENUE: Bateaux Bay
CONTACT: G. Spain
PHONE: 043 92 7181

APRIL 13th - 16th

EVENT: NSW Titles 1/8
VENUE: Crossroads
CONTACT: L. Campfield
PHONE: 02 481 0432

APRIL 29th

EVENT: NSW Shield Round 1
VENUE: Illawarra
CONTACT: R. Foord
PHONE: 042 96 5591

APRIL 29th

EVENT: NSW Cup Round 1
VENUE: Lansdowne
CONTACT: D. Smith
PHONE: 02 892 1463

MAY 4th - 6th

EVENT: Queensland Sed
Champs 1/12
VENUE: Brendale
CONTACT: G. Day
PHONE: 07 350 3495

MAY 5th & 6th

EVENT: Bormac GP 1/10
VENUE: Lansdowne
CONTACT: D. Smith
PHONE: 02 892 1463

MAY 6th

EVENT: Victorian Shield Round 2
VENUE: Wodonga
CONTACT: R. Sawyer
PHONE: 060 24 3415

JUNE 9th & 10th

EVENT: Queensland Titles 1/10
TBA

JUNE 9th - 11th

EVENT: NSW Titles 1/10
VENUE: Coffs Harbour
CONTACT: F. Paskin
PHONE: 066 42 4853

JUNE 24th

EVENT: Victorian Shield Round 3
VENUE: Knox
CONTACT: L. Bone
PHONE: 03 743 1153

JULY 15th

EVENT: Enduro, 1/10
VENUE: Wodonga
CONTACT: R. Sawyer
PHONE: 060 24 3415

JULY 29th

EVENT: NSW Shield Round 2
VENUE: St. Ives
CONTACT: B. Bolton
PHONE: 02 451 7775

JULY 29th

EVENT: NSW Cup Round 2
VENUE: Ryde
CONTACT: J. Thorn
PHONE: 02 80 1717

AUGUST 19th

EVENT: Teams Champs 1/10
VENUE: Lansdowne
CONTACT: D. Smith
PHONE: 02 892 1463

AUGUST 26th

EVENT: Victorian Shield Round 4
VENUE: Keilor
CONTACT: L. Bone
PHONE: 03 743 1153

SEPTEMBER 30th

EVENT: NSW Shield Round 3
VENUE: Lansdowne
CONTACT: D. Smith
PHONE: 02 892 1463

SEPTEMBER 30th

EVENT: NSW Cup Round 3
TBA

OCTOBER 7th

EVENT: Victorian Shield Round 5
VENUE: Warrnambool
CONTACT: L. Bone
PHONE: 03 743 1153

DECEMBER 2nd

EVENT: Victorian Shield Round 6
VENUE: Hamilton
CONTACT: L. Bone
PHONE: 03 743 1153

PRO-CAT™



THE two statements on the front of the instruction manual best sum up the latest offering from Schumacher. 'Advancing the Sport — Improving the Breed'. The Cat has always offered a high level of design and material technology to the market. The Pro-Cat continues this by incorporating many new features developed under race conditions.

The second statement 'Performance and Technology that you can buy', was relevant at the recent World Titles held in Australia. The Cat was the only out of the box product on the grid of the A final. (Actually most had minor mods. — Ed). Clearly the Pro-Cat is able to compete with the best in the world — what better recommendation than that.

CHANGE ONLY FOR IMPROVEMENT

This article intends to review the Pro-Cat. However, as much has been written about the original Cats, we will attempt to examine the changes only incorporated in the Pro-Cat compared to the 'XLS-Cat'.

The most noticeable change is the new saddle-pack chassis incorporating battery retainer clamps. The clamps are simple to use and very effective in retaining the batteries — in a word 'brilliant'. With the chassis is a new body with a modern, flowing appearance. A large decal sheet is included to highlight the body.

Major changes have taken place at the rear end with Top-Cat style lower 'A' arms and adjustable turnbuckle top links. Two variations of the 'A' arm are available to vary the effective wheelbase. The pivot bracket is now a one piece item making assembly easier.

The transmission has had major re-design for the Pro-Cat. Gone is the integrator which in theory was brilliant but in practice far too hard to adjust effectively. The Pro-Cat has a 14 ball, high torque diff front and rear, connected by a new drive belt. The layshaft is now a fixed unit with the spur gear (48 pitch) held in place by a small 'O' ring for ease of changing. All care must be taken when assembling the small thrust races into each diff unit — the balls are very small and the ball carrier easily broken. Being a little sceptical, I elected to epoxy the diff thrust washers to the washer carriers rather than use the supplied friction paper (refer 'What's the Diff?' article this issue for more on differentials).

The front diff housing has been modified to incorporate a tension bar to make drive belt adjustment easier. The front bumper is smaller and has two holes to provide access to the tension bar screws.

As you can see, the Pro-Cat is considerably more than a new body and wheels. Basically, I think the Pro-Cat is providing a chassis which is suited to both top level racing and entry club level racing. There is no need to modify, this chassis is competitive out of the box. The Pro-Cat is easier to build, however a beginner would be wise to seek the help of an experienced car builder before tackling this kit.

ON THE TRACK

There is no doubt the new rear suspension makes the handling more consistent. There is however, still a tendency for the rear end to come off-line when full power is applied in anything

but a smooth corner. This will, in time, be corrected as more experience is gained in setting the car for our dry Australian tracks. The transmission was particularly smooth and free, and easy to find the right balance between the front and rear diff settings. With the new transmission I would think the Pro-Cat will prove to be even more reliable than its predecessors.

The front end still incorporates the clever crash-back feature, but the rubber bands have been replaced with black 'O' rings making for a neater appearance. The steering trackrods now incorporate turnbuckles for easier adjustment.

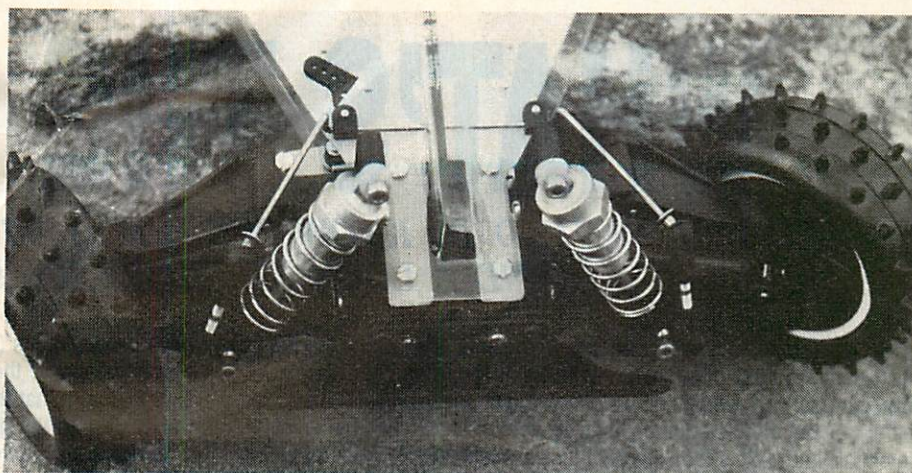
TEAM IMPROVEMENTS

The benefits of team drivers to product development are more than obvious in Schumacher products. With this in mind I contacted a number of the Australian Schumacher Team to seek their advice with the Pro-Cat. I thought you might be interested in some of their ideas.

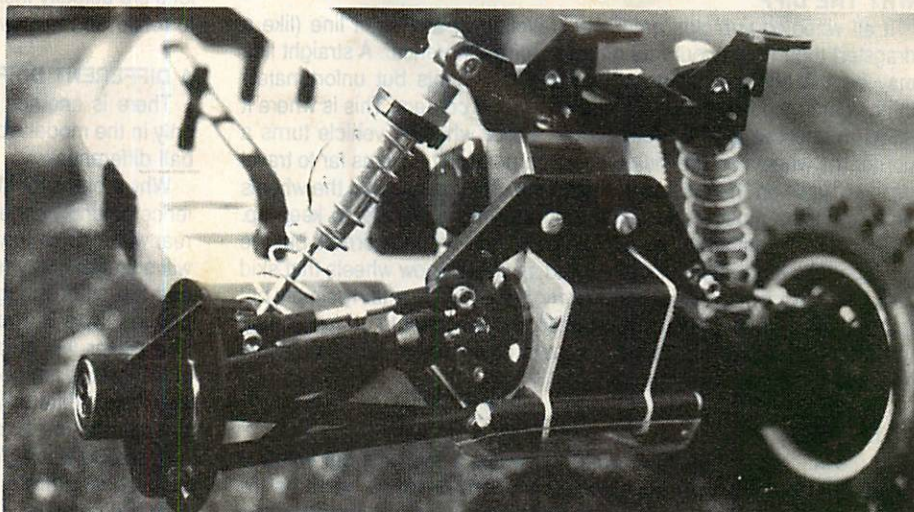
- Two drops of light oil in each of the large bearings before assembly will lengthen the period before rebuild is required.
- The silicone grease supplied with the kit could be replaced with 'KC High Temp' grease. This has been found to give the best results.
- When assembling the shocks — push the piston end of the shaft through the seal assembly rather than the threaded end. This makes assembly of the piston more difficult, but will prevent damage to the seals.
- The diff thrust races, when mounted in the drive hubs should be encased in grease. This will trap dirt on the outside and help keep the small thrust race clean.
- The rear wheel hubs require approximately 2mm trimmed off the outside diameter. The wheels deflect in rough conditions and rub on the hubs unless this clearance is enlarged. The new 'braced' wheel, as yet untested, will help with this problem. See photo.
- The rear hub pivot pins should be cut short just enough to allow '4/40' grub screws to be self tapped into the hub in place of the protruding pin. This is to prevent the pin from working its way out during racing.

CONCLUSION

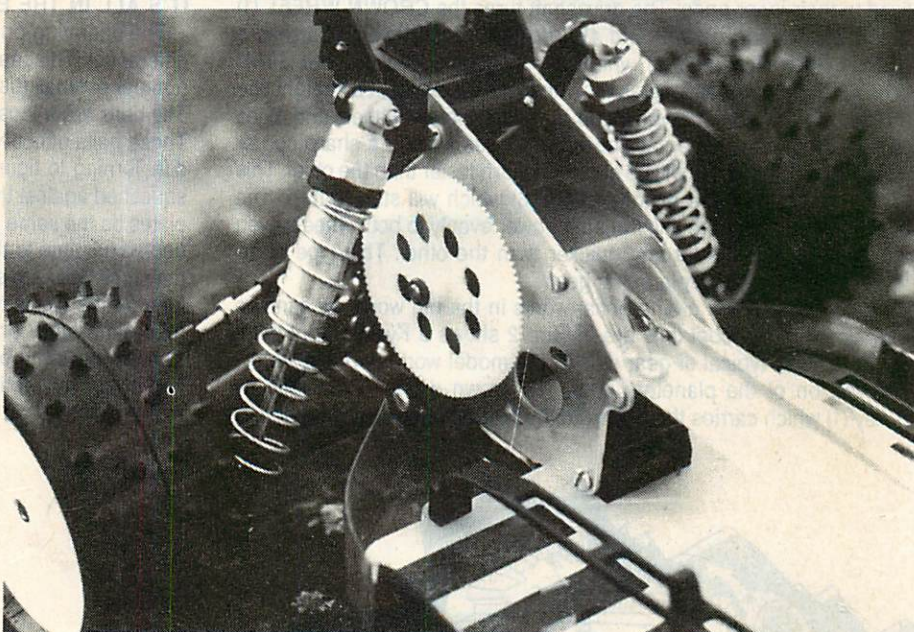
The fact that I had previous experience with the Schumacher Cat makes the review of the Pro-Cat more relevant. Like many, I became frustrated at the degree of difficulty in 'setting-up' the



Front end changes showing new bumper and belt tension adjustment.



New rear 'A' arm with turnbuckle top link.



Spur gear is removed easily with small 'O' ring. Battery straps a brilliant idea.

chassis to be competitive. The experience required was not present at all levels of buggy racing.

The Pro-Cat has answered this criticism without losing anything from the original brilliant chassis design. I found the transmission easy to set and was impressed by how it maintained its

smoothness throughout a full days racing without need for adjustment.

Beyond any technical specification, I believe Schumachers reputation plus this extra reliability will be the success of the Pro-Cat. My thanks to Pitstop RC Cars for the supply of the review kit and much helpful advice.

WHAT'S THE DIFF?

ALL YOU WANTED TO KNOW (WE HOPE) ABOUT DIFFERENTIALS AND A LOOK AT THORP BALL DIFF

Newcomers to four wheel vehicles, and some drivers who are not so new, seem to treat differentials as a black art. They know that if you spin a model cars wheel one way, then the opposite wheel will spin the other way but that's about all. Let's try and unravel the mysteries of differentials and look at the different types available for RC cars, including the highly developed ball diffs from Thorp.

WHY THE DIFF

If all wheeled vehicles only ever travelled in a straight line (like a dragster) then there would be no need for a differential. A straight line may be the shortest distance between two points but unfortunately things get in the way so we have to go around corners. This is where it starts to become a little tricky. When a four wheeled vehicle turns a corner the wheels on the inside of the corner don't have as far to travel as the wheels on the outside of the corner. This means that the wheels on the outside must rotate faster than the inside wheels, to keep up. Without a differential the vehicle would still go around corners but the driving wheels would be skidding, and as we all know wheels that skid take longer to go any place. Fortunately, by using some fairly simple but rather ingenious mechanics we can allow one wheel to go faster than the other and still get all the motors power down to terra firma. Enter the differential.

IN THE DIFF

In the full size automotive world there are a few different types of geared differentials with fig 1 being common. Briefly, it works as follows: The **DRIVESHAFT** (2) comes from the engine and the other two shafts, or **AXLES** go to the wheels and have **STAR WHEELS** (7 and 8) fixed to their inner ends. The driveshaft turns the **CROWN WHEEL** (1) which has holding bars (3 and 4) fixed to it. Each holding bar has a **BEVEL PINION** (5 and 6) which are engaged with the two **STAR WHEELS** (7 and 8). As long as the vehicle is travelling in a straight line the two pinions do not revolve and therefore the starwheels and axles all turn as one. However, as the vehicle goes around a sharp corner one axle and starwheel will be allowed to turn faster than the other. This is accommodated by the pinions (5 and 6) which will start to turn. The driveshaft will therefore still transmit power evenly to both wheels even though one wheel is turning quicker than the other. This type of arrangement is called a planetary gear.

Now we know how a differential works in the big world we can see how similar our model diffs are. Figure 2 shows a Kyosho front differential. This is typical of gear diffs in the model world and is a simplified version of the planetary gear. The crown wheel is replaced by pulley (1) which carries the belt from the rear diff, but otherwise we still

have bevel pinions (5 & 6) fixed to the pulley and star wheels (7 & 8) which connect to the dog bones and hence the wheels. A rear diff is similar except that the pulley has an adjacent gear wheel which takes the drive from the gearbox and motor.

Tamiya have another way of doing it. Figure 3 shows a Fox differential which is typical for most Tamiya buggies. Again, the principal is the same, it's just the arrangement that differs. In this case the bevel pinions are actually inside the big crown wheel with all three of them free to rotate on their own little axle.

A DIFFERENT DIFF

There is another kind of differential that, to my knowledge, exists only in the model world. I have never heard of a full size car sporting a ball differential.

Why a ball diff? Most of us have been unfortunate enough to experience getting bogged in a car. Have you noticed what happens? In a rear wheel drive vehicle when power is applied, usually one rear wheel will spin like crazy (splattering mud over those trying to push you out) and the other (bogged) wheel remains stationary. Result — you stay bogged. This is the disadvantage with an ordinary gear differential. The power will always take the line of least resistance which is the wheel that is not bogged. On full sized vehicles they have limited slip and locked differentials to overcome this problem, in RC land we have the adjustable ball diff.

If traction was high and the wheels always stayed on the track then a model gear diff would be fine. This is rarely the case which is why ball diffs are popular.

IT'S ALL IN THE BALLS

The operating principle of a ball diff is quite different to a planetary differential. The gear or pulley that takes the drive from the motor has a number of small (usually about 3mm) ball bearings inset. See figure 4. The balls are a loose fit in the web of the wheel and are free to rotate. These balls effectively take the place of the bevel pinions in the gear diff. Turning to figure 5 you will see a pair of metal plates (2) that are squashed against the gear wheel and bear on the ball bearings. These plates do the same job as the star wheels on the gear diff and are connected full time to the drive shafts and road wheels. During operation, the small balls are stationary (like the bevel pinions on the gear diff) as long as the car is travelling in a straight line. On cornering, the balls rotate and allow one road wheel to go faster than the other but still transmit power to both wheels. So far this is no different to the operation of the conventional gear diff. The clever part is that the pressure of the plates (2) on the balls can be adjusted to give varying amounts

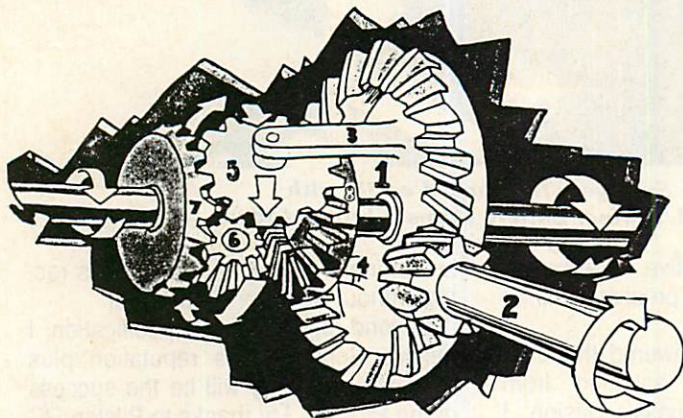


FIGURE 1

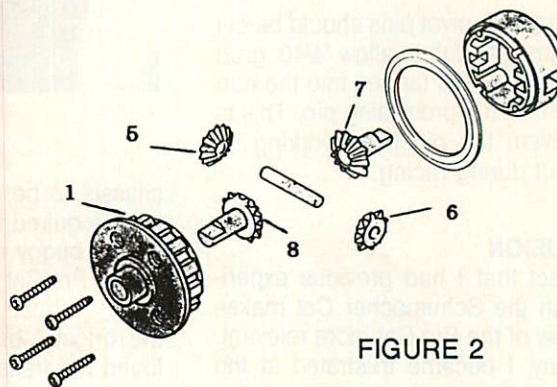


FIGURE 2

of limited slip. The more pressure the less the diff will slip. If our bogged vehicle had a limited slip diff then both wheels would rotate to help us drive out of the predicament.

In order for the ball diff to work there is an added complication. To hold the parts together and provide a means of adjustment a **THROUGH BOLT** is used. This bolt is quite critical. Not only is it in tension but it must also allow the diff parts to rotate un-equally to accommodate the differential action. This is achieved by means of a small thrust bearing and spring washers under the head of the bolt, see parts 5, 6 and 7 in fig 6. This bearing is a common source of trouble in ball diffs and must be properly assembled and maintained — see later.

THORP — BALL DIFFERENTIALS EXTRAORDINARY

Still with us? Good, now you should be able to figure out what makes a good diff and recognise one when you see it. Take a look at fig 7. Thorp from the USA have been making and developing ball diffs from year dot and this is their latest expression of the art. There are more parts and the diff is a little more complex than usual but everything has a purpose. For example, the ball thrust washer (11) and adjusting screw (9) are all protected from damaging dirt by the plug-in nature of the left hand side dog-bone carrier (1) into the LH pressure disc (4). Just pull out the dog-bone carrier to gain access to the adjusting through bolt.

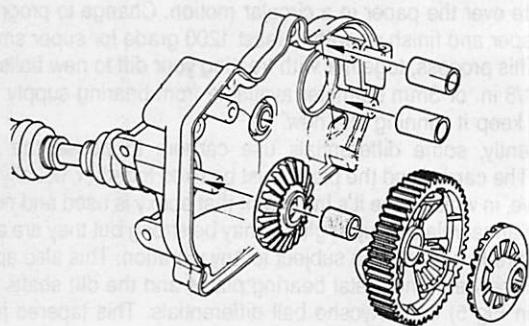


FIGURE 3

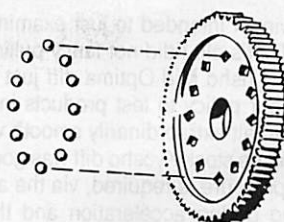


FIGURE 4

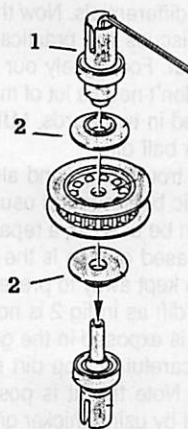


FIGURE 5

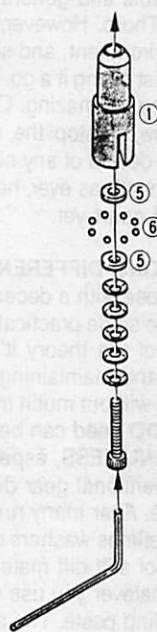


FIGURE 6



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The hardened steel balls are smaller than usual (3/32 in dia.) but there are more of them (12 no.) than usual. Workmanship on all parts is exemplary.

When offered this differential for review I intended to just examine, then write about it's special features. That's all. I did not fancy pulling out our reliable and generally smooth Kyosho Mid Optima diff just to try out the Thorp. However, since it's our policy to test products in a working environment, and since this diff felt extraordinarily smooth we couldn't resist giving it a go. We thought the stock Kyosho diff was good but the Thorp is amazing. Only slight pressure is required, via the adjusting screw, to stop the diff slipping during acceleration and this gives a feel devoid of any notchyness. After about thirty races the unit is still as smooth as ever, has not required any adjustment, and hasn't been pulled apart yet.

THE WORKING DIFFERENTIALS

So, for those with a decent attention span who haven't dozed-off we now come to some practical aspects of differentials. Now that we know something of the theory it's time to discuss the practicalities of assembling and maintaining a differential. Fortunately our model diffs go together without much trouble and don't need a lot of maintenance. What they **DO** need can be summarised in two words, **LUBRICATION AND CLEANLINESS**, especially in the ball diff.

The conventional gear diff is mostly trouble-free and almost maintenance-free. After many runs the plastic bearings are usually the first to go. Sometimes washers or shims can be used as a repair otherwise it's a case of stiff diff mate! Silicone based grease is the usual lubricant but whatever you use dirt must be kept away to prevent it turning into a grinding paste. The sealed type diff as in fig 2 is no problem in this respect but the Tamiya type (fig 3) is exposed in the gearbox. In a buggy such as the Fox one must be careful to stop dirt entering the gearbox when the motor is changed. Note that it is possible to get some limited slip action from a gear diff by using thicker grease on the gears — but don't expect too much.

Smoothness is the key word for ball diffs. What we are looking for is enough friction in the mechanism to prevent a raised wheel spinning aimlessly, but still allow one wheel to rotate faster than the other without that notchy feeling. Any lack of smoothness will translate to uneven power transmission to the track which means lack of traction. Once smoothness is achieved, the diff stiffness can be adjusted to suit track conditions. Generally run as loose as possible (without the whole drive slipping noticeably) for slippery conditions or tighten up for high traction surfaces.

During assembly, cleanliness is paramount. Any hairs or bits of grit in the balls will destroy our smooth diff I always clean down the work area and assemble the parts over a sheet of white paper. Now, if I could only find someone to hire me a sterilised operating surgery!

Choice of lubricant will affect the operation of the ball differential. Personally I have only used a thin silicone grease or the purple Losi grease which has a consistency a bit like chewing gum and must be used sparingly. The silicone seems to work in all ball diffs. whilst I have only had success with the Losi stuff in Kyosho and Losi differentials. The beauty of the Losi grease is that some stiffness is imparted by the grease itself — you don't have to tighten the diff so much to stop it slipping. This translates to smoother action and longer life.

Owners of ball diffs. soon find out that the small thrust bearing is a real pain. The microscopic balls sometimes come captive in a carrier (as in the up-market Thorp units) but usually they are loose. This makes diff maintenance rather tedious as the almost invisible balls soon get lost amongst the household debris. Assembly of the thrust bearing is almost a job for a brain surgeon, but is usually accomplished by piling silicone grease on the thrust plates, lots of swearing, and using tweezers to carry and position the tiny balls on the plate.

Apart from regular cleaning, maintenance of the ball diff mainly involves inspecting the parts for wear and replacement of worn parts. In particular check that the gear teeth are not worn (flat topped not pointed teeth) and that the bearing plates (parts 2 in fig 5) are not grooved. The latter can be remedied with wet and dry type sandpaper used wet. Place a piece of, say 600 grade wet and dry over a dead flat and smooth surface such as glass (I use a small hand mirror) and move the plate over the paper in a circular motion. Change to progressively finer paper and finish up with at least 1200 grade for super smooth results. This process, together with treating your diff to new balls (mostly either 1/8 in. or 3mm diameter available from bearing supply houses) should keep it running like new.

Incidentally, some differentials use carriers to house the bearing plates. The carrier and the plate must be fixed together, usually with an adhesive, in which case it's important that epoxy is used and not super glue. Cyanoacrylates (super glues) may be strong but they are also brittle and break easily when subject to any vibration. This also applies to the joint between the metal bearing plates and the diff shafts (parts 1 and 2 in fig 5) in all Kyosho ball differentials. This tapered joint has been the undoing of many racers since it is not mentioned in the Kyosho instructions. The tapered seats must be epoxied together during assembly of the diff or else this joint will slip during acceleration.

DIFF DEFYING DEED

Now that we are all experts on differentials (say what!) there should be no excuses for shoddy work. We want to see properly assembled units that last for ages. There's no need to be defeated by the diff. Just assemble carefully in a clean environment, pay attention to proper lubricants and clean and check regularly.

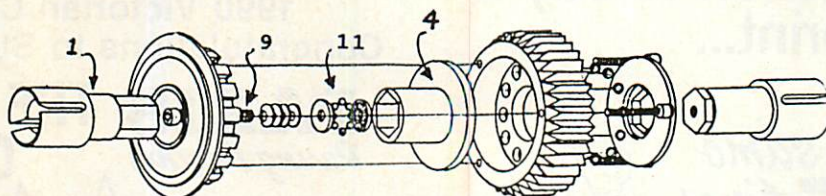


FIGURE 7

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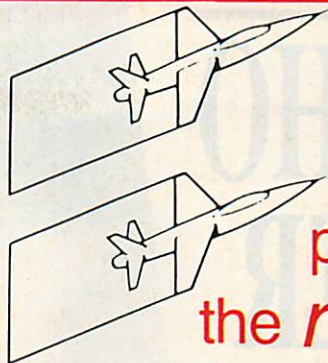
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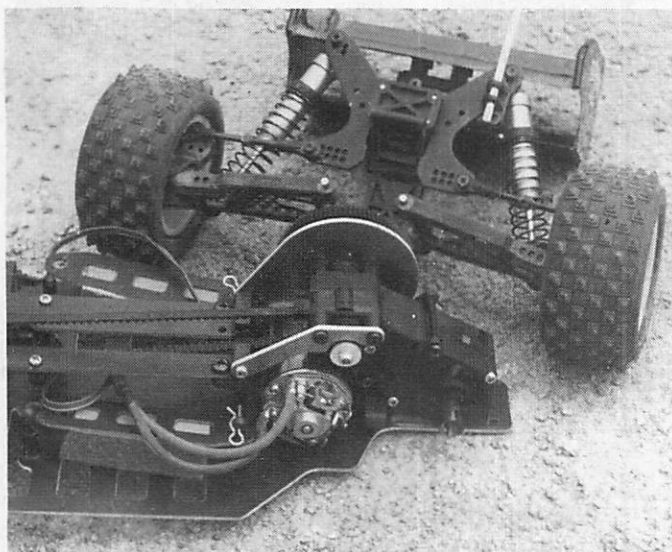
by Rob Lewis

*Lazer ZX is successor
to Kyosho's very popular Mid.*



The world of 1/10 off-road racing has become a battlefield for the major RC manufacturers. This culminated in the IFMAR World Championships held in Sydney last September. This event is more than just a race, it's a proving ground for new technology and eventually much of this technology finds its way to the consumer. Kyosho unveiled to the world its hope for taking out this event, the Lazer ZX. The race results for this car, finishing third overall, were not as good as Kyosho had hoped, but impressive enough when you consider that the cars were produced just weeks before the event.

The production kit is now available through your Kyosho stockist and you can buy the technology previously only available to the lucky ones who competed at the World Titles.



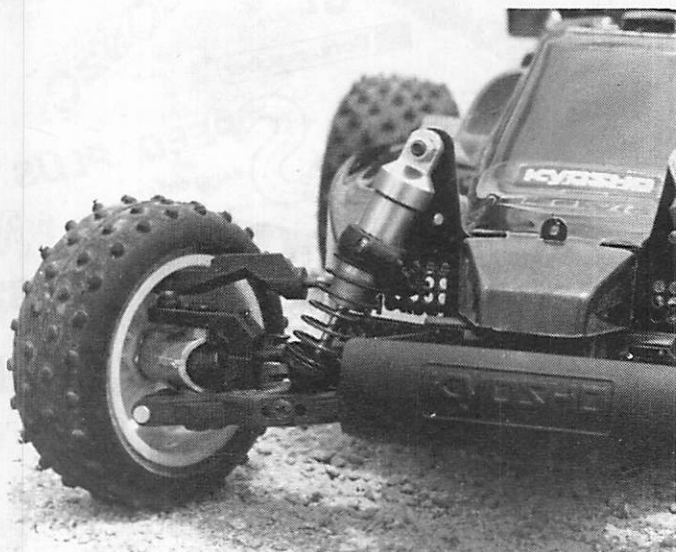
In just 60 seconds you can have a two part Lazer.

NEW PHILOSOPHY

This car is completely new, not just a revamp of the Optima Mid or any of its derivatives but a radical and brave departure from Kyosho's previous marketing philosophy, it's a race car from the ground up.

The backbone of the Lazer is a flat FRP chassis with provision for either saddle or stick pack batteries. A stiffening top plate is added to this, mounting between the front and rear gear cases. This upper plate is also needed for mounting your receiver as there is not a lot of space elsewhere.

Drive is achieved through a two belt system with a ball differential on the spur gear shaft to divide power between front and rear. The front belt is driven via a one way bearing allowing the



*Lazer thinks it's a bigger car in handling
department thanks to extra long suspension arms.*

front wheels to freewheel on over-run on this model. Gear type differentials are used both ends and ball diffs are an option. Actually the centre diff is a cunning move; as this arrangement will transfer drive to the unladen end of the car. For example, during acceleration on a slippery track, the front of the car will become lighter so the diff will transfer less drive to the rear and help prevent fishtailing.

The suspension arms are something else. They are very long! The outer pivot point is way inside the wheels, this allows the wheels to scribe a very long suspension arc and adds to the stability greatly. One criticism here, those arms are heavy and should be lightened to reduce unsprung weight. This work was carried out on the review car prior to assembly and is not difficult, I used a 4mm drill and went to town!

QUICK STRIP

All of the rear suspension is mounted to a bracket which attaches to the chassis and rear gear box with three screws. The entire unit can be removed in less than a minute leaving just four more screws to remove the left gear box half. To remove the rear diff takes less than five minutes in all and makes maintenance a breeze. Similarly the front suspension is attached to the front gear box half and can be removed as a unit by undoing just four screws and removing the steering rods from the bell crank.

ON THE TRACK

Having been lucky enough to have one of the pre production cars I set the review car up similarly to the way I had my original Lazer.

The car has a predisposition to oversteer so the oil used in the rear shocks is thinner than that supplied in the kit. I used a light silicone based oil with two hole pistons at the rear and medium oil with two hole pistons at the front. Standard kit springs were used on the gold shocks. To improve traction at the rear I have reversed the rear suspension arms and placed 2mm packing under the block that supports the rear pivot pins. This shortens the wheelbase and increases the castor of the rear wheels. These tips may prove helpful if you run modified motors or if you drive stock or Mabuchi class, higher cornering speeds are achieved by setting the car up as the instructions.

When first built, my car was very tight and needed several batteries through it before things started to free up. The front

belt will become very slack and this is as it should be. No belt tensioner is utilized and in fact is not needed, the belts cannot jump as they are held on to the diff gears with small rollers, neat idea! I also have not fitted the main belt covers and have not yet had a failure. Speaking of failures, the car has not had to withdraw from a race due to breakage, so Kyosho should live up to their reputation of unsurpassed engineering and reliability.

PROOF OF THE PUDDING

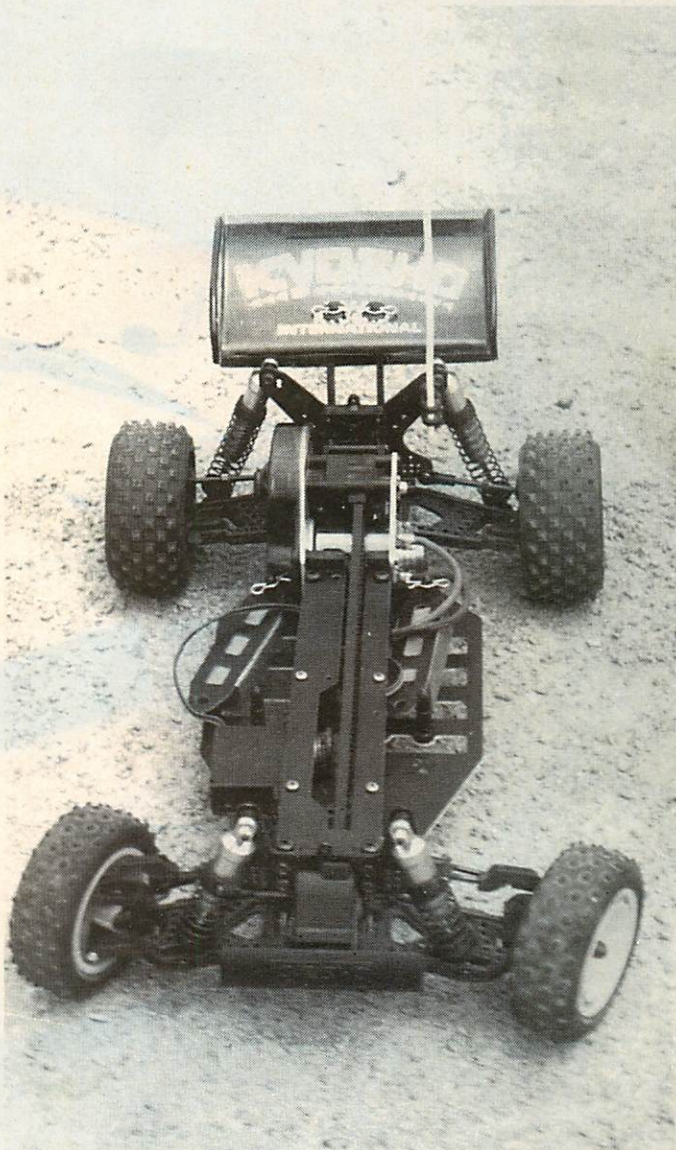
Now that the Lazer has had a bit of track time, results are beginning to show this car's true potential. A win in the NSW State Championships and new track records in South Australia, Victoria and New South Wales are just the beginning.

The writer even managed to TQ in unlimited class at the last Victorian ORRCA Shield round with the review car. Unfortunately the Lazer ZX was stolen (no bull!) before the finals. The car is now returned, after the idiot thief tried to flog it back to an ABC Hobby Shop.

Who knows, with a bit more time under it's belt, the Lazer may have improved it's third place at the World Champs. There will be another race in less than two years and this car truly is World Championship material. All you will need is your Lazer and the ability to out drive Masami. At least the Kyosho Lazer ZX is now available, the ability to out drive the current World Champ is not so readily available!



New Lazer features a centre differential behind spur gear.



Under wraps for quite a while, Kyosho's new world class buggy is now revealed.



DIRT & TRACK





BOLINK
ELIMINATOR *Sport*

MODIFIED MOTOR CLEANING

THE RIGHTS AND THE WRONGS

by Robert Ang

I'm sure most of you have had this feeling. You buy a brand new modified motor with the hard earned cash that you managed to scrape up, and try it out for the first time on your local track. You are amazed at the difference the new motor brings to your car: it just rips through the corners and burns at the straights. At the end of the day you think you are a proud owner of a motor that will end the worries of only qualifying for the 'F' final.

But then the worst happens. After a few more of those thrilling runs, your car seems to die down a bit. What must be wrong? You check your car over and over, but find nothing obvious, so it has to be the motor. Upon opening the motor, it seems to have lost the sparkle and 'newness' that you saw before running it. What can you do?

There are several things that could be wrong with your prize possession. In D&T#7, the article called 'Racing with a Modified Motor' talked about the headaches that bearings can give. To check if you do have problems with your bearings, run the motor and listen to the sound it makes. If you can hear a rumbling sound, compare it to a new motor and hear the difference. You can also disassemble the motor and spin the rotor on both bearings (one at a time, of course) and listen for the dreaded bearing rattle. If you do, replace the bearings immediately. Bearing rattle is wear caused by too much running, dirt and grit, or too high revs that make the balls inside the bearing loose and distorted. They produce a 'rattle' when either the balls or the rotating part of the bearing knocks on the casing. These could be the friction points that you have been looking for.

If it's not this, have you cleaned your motor before? What! You haven't because you don't know how? Motor cleaning is crucial to the performance of your motor. Motors with dirty commutators or foreign objects inside them will not run as well as clean, brand new motors. When cleaning your modified motor, first take it apart, and brush all the dirt off the windings with a toothbrush. Next, carefully clean the commutator with a solvent such as lighter fluid. But beware! Stop straight away when your commutator is totally clean. More black dirt will seem to be appearing on the cloth you are wiping on, but it might be the copper you are rubbing off.

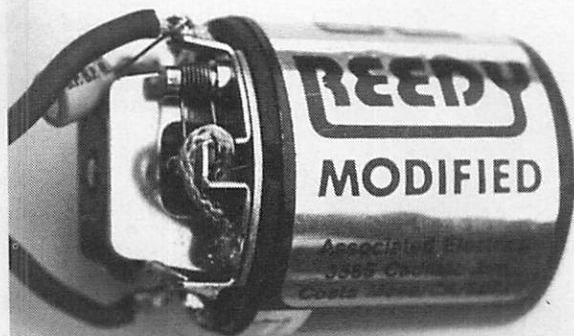
After this, it will help to spray your armature with an electric solvent or motor cleaner (you will find these at your hobby or electronics store). This will remove any residue left by the solvents you used earlier. Never

simply spray your motor with WD-40 or any other lubricant sprays. This will not do any good for your motor. If your bearings feel very gritty blast out the dirt with the spray cleaner (it will not affect them because it evaporates quickly) and soak them in very thin oil.

When dismantling your motor, be careful not to lose the washers and spacers that are on the armature. They are there for making the armature the correct length, as well as to rest solely on the ball bearings at each end.

Now re-assemble the motor, put it in your car, and see the difference. Amazed? If you maintain your motor in this way, it will have a longer useage life and a higher power output.

If you talk to your local hobby shop owner or racer at the clubs, they might have other ideas on how to get your motor really clean. Talk with them, and experiment in a few methods. See which one suits you and your motor. You will also find a comprehensive article on motor maintenance in D&T#11. Happy racing!



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MONEY CAN
BUY AND
IT'S HOME
GROWN

BY STEVE CARRUTHERS



*Aussie Racers now have no excuse.
If you want the best then this is it.*

HOT on the heels of the Purge DSP 150 reviewed last issue is a new ESC from Brisbanes Intac Engineering. Also discussed in Borthwick's column last time, the new Force is an all-out attempt to produce a superior speedo that will handle anything you can throw at it. First signs are that this innovative company have succeeded in their attempt.

Just take a look at the specs. Now, if you can, compare the Force with the other top controllers in our ESC shootout in D&T#14. The Force scores in nearly all departments. It's cheaper, smaller, lighter and equals the best in voltage drop (a good measure of efficiency). The current rating of the combined seven mosfets is not as high but doesn't need to be due to the efficient current handling capabilities of the digital control system. Never the less, Intac scoured the world to find the best mosfets available. This new big final stage output married with the now proven microprocessor control system makes the Force very special and since the DSP 150 review was somewhat disjointed, we will look into this marriage in a little more depth.

TECHNICALLY SPEAKING

The Purge Force retains the advanced 8 Bit 8 Mhz CMOS processor of the DSP 150. It also keeps the surface mount technology (photo last issue page 41) which improves reliability. The unit should be robust, both mechanically and electrically. Other technical features include:

- Resonator locked precision measurement of motor speed telemetry accurate to a tiny fraction of one second.

- Automatic rate and end point adjustment. There are no adjusting pots. To let in dirt or cause a weak link. The Force is set up from the transmitters throttle control when required and the calibration constants subsequently retained even during power off.
- Battery Elimination Circuit (BEC) supplies 5.8 volts to the receiver and steering servo.
- Unparalleled linearity and repeatability.
- Negative output taken direct from mosfet heatsinks and very thick wires employed for less voltage loss.

THE PLAIN ENGLISH VERSION

As explained last issue, all the wizz bang electronics are not just hi-tech for the sake of hi-tech. Unlike conventional speedos the digital Force is fully proportional for over 95% of throttle travel. It doesn't have that 15 to 20 percent deadband that changes during the course of a race. Control is smooth and linear (unless adjusted otherwise at the transmitter) from stand still to full throttle. The motor doesn't jerk to a start — check that with your existing ESC. It operates more efficiently in mid throttle which keeps the FETS cooler as well as using less battery.

Setting of neutral position, full speed and brake position is easily accomplished from the transmitter when required and the Force will work just as good with any radio, even the cheapies. Lack of mechanical adjustments means the case is sealed and better resists ingress of water and dirt.

Even if you cannot work out our plain english description then a decent read of the instructions that come with the

new Purge should answer all your questions. They are almost the best in the business and cover installation, wiring, calibration, trouble shooting and performance hints. The service guide reminds you that any repairs are easily carried out by the local manufacturer and usually only take one working day. For those many racers that have been frustrated by service delays this alone could be the best selling point.

ON THE TRACK

The Purge Force is very smooth to drive. To get the most out of it the driving technique is slightly different to the usual point and squirt. With a little forethought and concentration the new technique is easily mastered thanks to the consistency of the speedos operation. Operation that doesn't change with increasing heat and decreasing battery voltage. It is the same at the end of a race as the start.

We ran the Force in a 4WD car with a very hot 13 double motor and guess what? At the end of the races the battery and motor were too hot to handle but the speedos mosfets were only warm.

GET YOURS QUICK

Competative racing at the higher levels demands the very best equipment. Whether you are into 1/12, 1/10th scales,

on road or on dirt there is now no reason to avoid considering the Purge Force. It is the best. Even the price is lower that predicted. I'm sorry to say the most common reason for not buying this and other locally manufactured products is the mentality that says imported must be best. This mentality also exists overseas, that's why you will soon see most Purge's being exported. Already this has the overseas competition worried and there are many rumours of frantic R

and D projects by other ESC manufacturers. I would get with the Force quickly before they all go O.S.

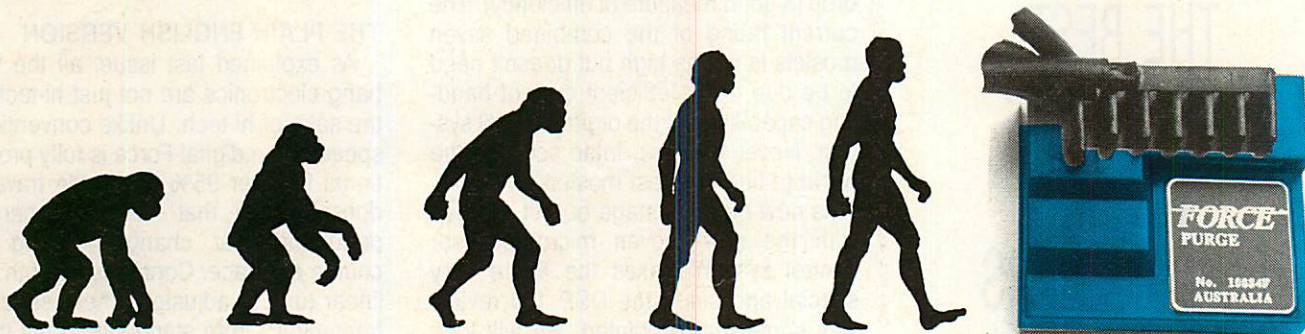
Once you are the proud owner remember these words of wisdom from the owners manual. Using the Force to maximum advantage means:

- Fluid throttle motion
- Pick and maintain speed for corners
- Maintain traction
- Have fun.

REVIEW AT A GLANCE (more stars the better)

Name	Purge Force
Recommended Retail Price	\$288.50
Size	40x35x19mm
Weight	35g
Reverse	No
Brake	★★★★★
	60A cont, 240A peak
Switch	Yes
Adjustments	Auto-see text
Max. cont. current	360A
Peak current	1440A
Measured volt drop at 12A	0.04 v
Smoothness	★★★★★
Instructions	★★★★

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THE FORCE TO RECKON WITH

Intac Engineering Co Pty Ltd



NEWS & VIEWS

by Rob Reade

STOP PRESS . . .
PB PHOENIX CARS/REX ENGINES
DOMINATES, TOP QUALIFIES
(NEW RECORDS)
AND WINS 1990 1/8 SA CHAMPS

This issue I have lots of the latest information for you as well as some bargains too!

Firstly, I want to clear up rumours concerning PB UK. There is no change to the existing operation. At one stage a move of the production side to a new factory in France was arranged with the UK factory becoming a design and development centre. This plan did not proceed and all production will still be from PB UK.

This is the 21st year of PB in the market place and in the 1990's you will see some exciting new products from PB.

LATE NEWS

Ashley Cox with his new 4WD PB Phoenix (Rex power) wins 2nd round of SA Inter Club Champs! PB is on the move again!

PB 'MINI MUSTANG' 4WD 1/10th BUGGY

We still have a few left at the bargain price of \$199.00. Remember the Mini Mustang won the stock class at the '89 Nationals, it is a fully ball-raced competitive 4WD kit and has an excellent reputation for reliability.

PB 'ACE' 2WD & 4WD 1/10th BUGGY

The Ace has a lot of different design features and we are just now beginning to fully understand it. A development team has been quietly working here in South Australia and some very good results are now coming through. We have found also that, with some minor modifications, it is working well in 2WD configuration. RRP 2WD kit \$299, 4WD kit \$349 and remember these kits have all the wanted features like adjustable ball diffs, universal joint drive shafts and high efficiency drive systems.

PRO 10 1/10th ELECTRIC CIRCUIT CLASS

The PB 'Sizzler' continues to achieve excellent results. It is now available in wide and narrow track form. Accessories available include carbon fibre chassis, ballraced diff tube, nylon ballraced spur gears (48DP and very quiet running), body mount kit and wing mount kit. Special deals available from participating hobby shops — call us for details.

PB PHOENIX 1/8th CIRCUIT CAR

PB is definitely on the move! Recent track results of the Phoenix indicate that it is now a very competitive car. For instance, at the recent Victorian champs, 7 were entered and 7 made the finals (4 in 4WD and 3 in 2WD), now that has to be some sort of record! Ashley Cox, 'Dirt and Track' contributor, was driving a Phoenix for the first time in Victoria and was absolutely delighted with the car, holding 2nd place at the 25 minute mark in a 30 minute final, only about

a half a lap down on the leader, Stewart Grant, when a radio problem dropped him to 5th. (Phoenix's were 2nd, 5th, 7th and 8th in the 4WD final). Ashley followed this up 2 weeks later with a win at the first round of the South Australian Inter Club Championship with Chris Reade backing him up. (PB 1 & 2). The current Phoenix is a very much under-rated car, it is reliable, efficient, strong, easy to set up, competitive out of the box and the best value for money kit available.

It is PB's policy to update their 1/8 cars on an annual basis. Current model certainly has some performance advantages over the previous model and the word from overseas is that with the 1990 update kit fitted, the handling is even further improved. 1990 could well be the 'Year of the Phoenix'.

1/8th CIRCUIT CARS

This class is really expanding and with purpose built tracks in WA, Qld, NSW, Tas and SA, there are plenty of opportunities to race. These cars are capable of over 100 kmh and 4WD 2 speed auto cars accelerated to this speed in 3 to 4 seconds. They are as exciting to drive as they are to watch. We have been competing at the top level of this sport longer than anyone in Australia. We have the knowledge, the experience and the products to put you on the right track if you want to enter this class. Call us now if you are interested. We can provide you with equipment which is equal to the best in the world. We produce special lightweight carbon fibre parts and can undertake specialist modification work and we also stock after-market performance accessories. From time to time we also have good second hand equipment available.

NOVA ROSSI & REX 3.5cc ENGINES

What can I say here. The evidence is overwhelming that the Rex 3.5cc car engine made by Nova Rossi is the choice of champions world wide. Why? Perhaps because it possibly delivers better all round performance than any other 3.5cc car engine currently available (and there is more to come, so read on). Track results like completely dominating the 1989 World Champs (1st, 2nd and 3rd) and here in Australia at the recent Nationals and 1990 Victorian Champs. Not only was Rex engine the winner and top qualifier at both these events, but was also used by eight out of ten finalists on both occasions including a driver who claims sponsorship of another brand of engine! Such is the success of this engine world wide, we cannot always get the quantity we want but a large shipment is imminent and this will include a full range of Rex motors in their

different versions for both car and buggy.

Now for the BIG NEWS! As ever, Nova Rossi are always working at improving performance, so what follows is the text of the latest press release from Nova Rossi. Translated from Italian, it reads — 'The Nova Rossi factory, after many years of experience in the model field and above all, in speed, is distributing a special patented glo plug able to increase from 5 to 15% the power of the engine. It represents a big improvement and it is the result of many tests made at bench and also during competitions both from our best engineers and drivers. Turbo Glo Plugs helped us to win the World Championship in Holland in 1989'.

The performance increase comes from the Turbo Glo plug itself but it does need a special head so Turbo Head kits will be available as an option together with a full heat range of turbo glo plugs.

The Rex 3.5cc engine range will now consist of Rex 3.5cc competition car motor, Rex 3.5cc competition buggy motor, Rex 3.5cc super competition 6 port car motor with optional Turbo head kits available for all. As well, in limited quantity, there will be a Rex 3.5cc Super Competition Turbo Special. This is the most powerful Rex engine of all, it is expensive and not for the faint hearted! Price lists available on request.

Nova Rossi/Rex also have an excellent range of top quality regular glo plugs, air filters, manifolds, various types of tuned pipes, fuel filters and 3.5cc marine and plane motors.

We can also supply Nova Rossi/Rex engines and parts modified by American expert engine builder, Steve O'Donnell. His work is superb and attention to detail is meticulous. We stock complete modified engines, special mufflers, special crankshafts and high port piston and liners. Call us for details.

GENERAL

Remember, we are Australian importers/distributors for Arrows tyres, EDL oil for use in model fuel, 1/8th and 1/10th Sarik Vacform Lexan bodies and importers/distributors for Frewer International's excellent range of 1/8th and 1/10th bodies, tyres, wings and wing kits. I am sure that all of these additional product lines are the right ones to complement the high performance kits we sell. They are highly recommended items.

STOP PRESS

Nova Rossi/Rex Engines dominate 1990 World 1/8 Buggy Champs Bangkok Feb 1990. Positions 1, 2, 4, 5, 9 & 10.

Good Racing, Rob Reade.



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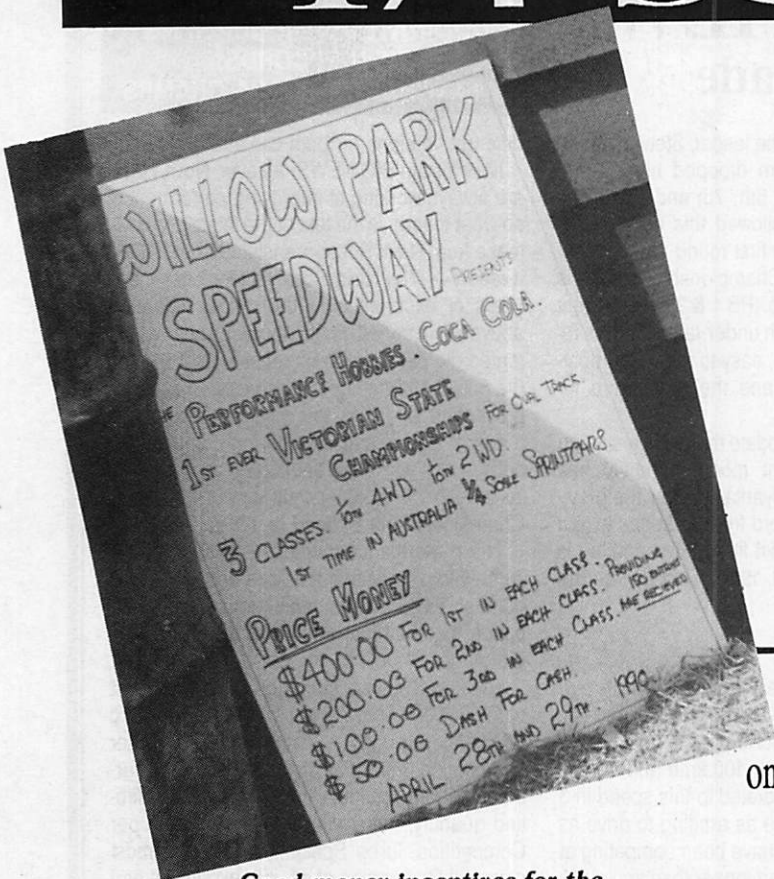
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NOVAROSS

1/4 SCALE

WILLOW PARK SPEEDWAY



Good money incentives for the first ever Victorian Oval Track Champs. Everything has a price, but what price is money?

If you wish to experience sprint car racing on a smaller scale and a budget to go with it, why not try quarter scale? It's much less expensive



1/4 scale sprint cars are designed and constructed along the same lines as their big brothers. Chassis is jig built welded and stress relieved, with all the radius and steering arms having rose joints as standard. Power is from a chain saw motor of up to 35cc.

WILLOW Park Speedway, located just outside Stawell (Victoria), is currently the only purpose built quarter scale oval track in Australia. It has been constructed on property owned by enthusiast Geoff Doman. The 108 metre track is six metres wide on the straights and seven metres on the corners. The banked oval surface is a mixture of clay and granite sand providing excellent traction. The track has a concrete pole line, grassed centre safety fence and spectator fence. The complex will also be used for the smaller 1/10 scale cars. Most of the sprint cars have been constructed by Chris Dalby, who has been engineering parts for models for a number of years and because of the interest in speedway decided to venture into sprint cars.

The cars are designed and constructed on the same lines as their big brothers, the equivalent to 3/8" chrome moly tubing is used in the chassis which is jig built, welded and stress relieved with all the mounting points for the Jacobs Ladder, shocks, nerf bars, radius arms etc being added at this stage.

A Hi-Bar frame is used with Torsion bar suspension, while chrome side and nerf bars adorn the front and rear of the cars, offering maximum protection. The cars have moulded fibreglass body with the tail section housing the fuel tank and comes ready to paint in your own colour scheme.

Computer designed wings give maximum down force with low drag characteristics and are fully adjustable to suit all track conditions. All radius and steering arms have rose joints as standard equipment. All hubs and wheels are lightweight alloy with knock off spinners.

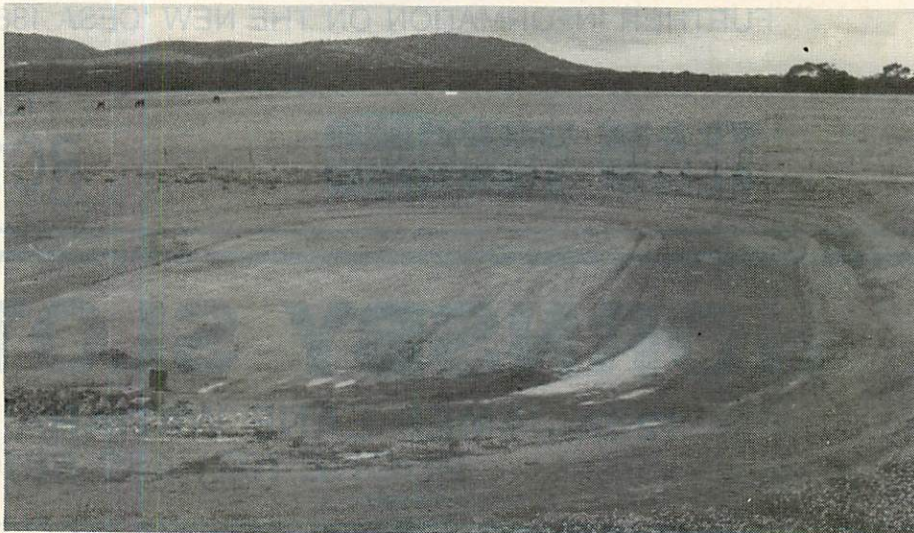
If you wish to experience sprint car racing on a smaller scale and a budget to go with it, why not try quarter scale? Its much less expensive.

On April 28th and 29th Willow Park Speedway will host a Victorian Title for both 1/10 scale Oval and quarter scale oval cars. The meeting will be conducted for prize money totalling more than \$2,000 providing 150 entries are received. The meeting will run 2WD, 1/10th scale cars on the Saturday (Heats and Finals). 4WD cars heats and finals on the Sunday and for the quarter scale sprint cars heats on Saturday and heats and final on Sunday. Entry fee \$18.00 for 1/10 and \$28.00 for quarter scale. Each class will be competing for a \$400.00 first prize, second will receive \$200.00 and \$100.00 for third. Each driver competing in the A final will receive \$30.00. The B final drivers will compete for \$30.00 for first place, \$20.00 for second and third will receive \$10.00. All finals will be a bump up system.

If anybody would like an entry form you can write to Geoff Doman RMB 2120 Stawell 3380 Victoria. To those who already have an entry form, I must apologize for a small mistake, the form reads 'for the 1/10 scale rules as 7 cells only', it should read 'up to 7 cells'.



Not your average RC cars. These quarter scale beauties are powered by chainsaw motors of up to 35cc and after using methanol fuel. Most cars have a centrifugal clutch while some opt for direct drive. Steering servo is a beefy Futaba S114 (sail winch) servo in the 14g torque range.



Willow Park Speedway in the early stages of construction. The size lends itself ideally to all forms of RC oval racing. Facilities will include banking for spectators, BBQ area and plenty of room for kids making for a family atmosphere.



Pictured at the Rushworth (Victoria) full size sprint car track are four quarter scalers who put on a demonstration for the full size boys.

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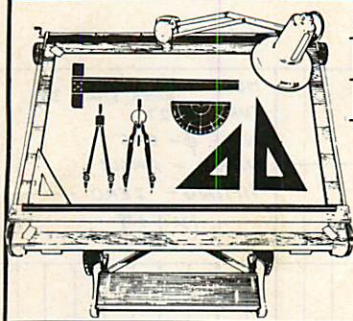
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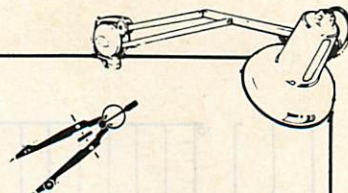
Hornet.....	\$125.00	Grasshopper II.....	\$99.00	Tamiya 7.2 volt	
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PLEASE ADD \$10.00 FOR POST/PACKING



BOB'S TECH CORNER



The next two motors are both from Kyosho, being their new Super Stock 20 and 34. This means 20° and 34° of advance timing and also corresponds to +6 and +9mm can rotation. Previously I have advanced most modified motors about +6mm, as to go more, only used more amps but did not increase revs or power much (though this of course can vary between motors.)

These super stock motors do not resemble the standard Mabuchi 540 SH motor. They have open end bells with replaceable brushes just like a normal modified motor but have tabs to hold the end bell on. The bearings are self lubricated bush but unlike the 540 SH they are pre timed an amount by the factory. In this case 20° and 34°. It is interesting to check this with the Twister Stock motor tested earlier as it was advanced +11mm which is about 41°.

These motors have VERY strong magnets reading 25 on my scale which is the highest I have tested and I would say the most important variation to their increased power. Both motors come in a nice plastic carrying case (as all motors should be). The other nice thing is I believe the price is about \$40 which is a very good buy indeed.

Note that the 34 model carries a box warning stating it is a high speed racing motor and has a very limited life (how long is 'LIFE'? Your guess is as good as mine.) It does show however that Kyosho are responsible and honest and advancement above +6mm (or 20°) is really only for important races and/or those with deep pockets.

How did they perform? Well they are both a lot better than the Twister (I expect this is because of the strong magnet). Both are stronger than the 540 SH (only to be expected). Both have high ratio numbers ie. are low on amps and very good power output. The 34 is better in both cases, though max revs is about the same. When extra load comes on the 34 is quite a bit better. Check the revs at say 18000 (which is max for even a twisted 540), the 20 has a torque of about 18 Nmm where as the 34 is about 28 Nmm (the 540 SH is about 10 Nmm). The results are supplied in graph and table form for you to review.

ON THE TRACK

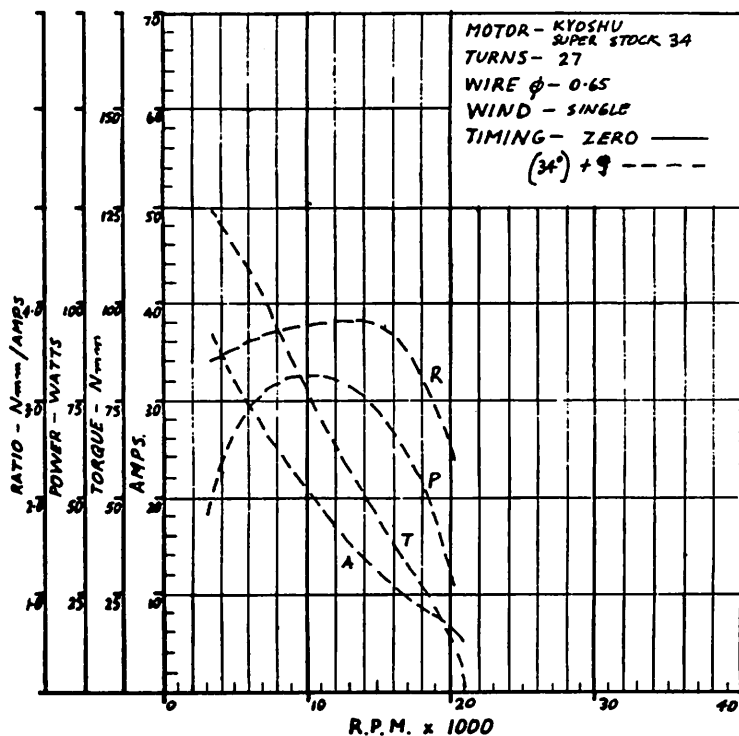
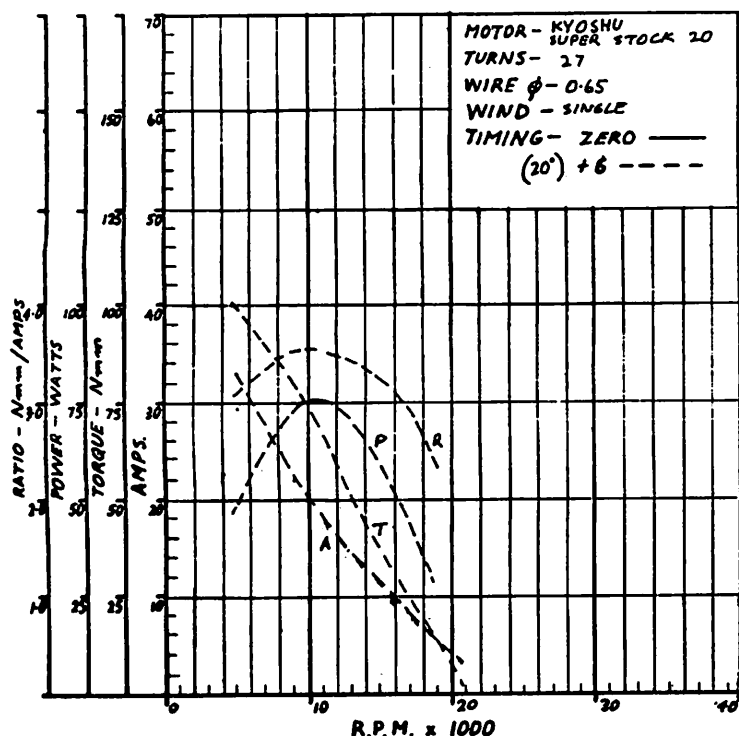
The M&Y was installed in an Optima Mid and racing performance was very impressive. Using SCE cells and timing on 4 both top speed and acceleration were good and it was particularly smooth to drive. Good enough for a local track win in fact.

The two Kyosho stocks have found instant success in Sydney racing. Our test results show why.

Bye for now.



MOTOR	M&Y 240 RSP SPRINT	KYOSHO SUPER STOCK 20	KYOSHO SUPER STOCK 34
COST \$	75	30	30
TURNS		27	27
WIRE DIAMETER mm	0.9	0.65	0.65
WIND	5	5	5
AIR GAP mm	0.3		
MAGNET TORQUE Nmm	12	25	25
BEARING	BALL	BUSH	BUSH
FREE RPM	ZERO	29.7	
X 1000	+6	36.1	23.7
FREE AMPS.	ZERO	1.9	
+6	2.1	2.0	2.5
PEAK POWER	ZERO	87	
WATTS	+6	100	75
PEAK POWER	ZERO	11	
RPM x 1000	+6	17	10
AVERAGE RATIO	ZERO	2.2	
+6	2.1	3.3	3.7
TORQUE @			
Nmm			
5K	ZERO	115	
+6	130	100	126
10K	ZERO	80	
+6	86	72	78
15K	ZERO	55	
+6	63	37	43
20K	ZERO	30	
+6	45	9	13
25K	ZERO	10	
+6	30		
30K	ZERO		
+6	15		
35K	ZERO		
+6	0		
40K	ZERO		
+6			
AMPS @			
5K	ZERO	49	
+6	57	33	32
10K	ZERO	36	
+6	39	20	21
15K	ZERO	26	
+6	29	12	12
20K	ZERO	15	
+6	22	4	6
25K	ZERO	6	
+6	14		
30K	ZERO		
+6	8		
35K	ZERO		
+6	3.8		
40K	ZERO		
+6			



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AUSTRALIA

GETS NIKKO

FINALLY it has happened, the Nikko Range of Radio Control Cars is now being imported into Oz. Grenenger Enterprises Pty Ltd (Pitstop) acquired this franchise at the end of September, and have wasted no time in setting up Authorised Service Centres throughout Australia covering all States (see Pitstop ad this issue).

Nikko the name needs no introduction to most readers, and as most retailers will tell you it is one of the best ready to run RC products on the market, but has suffered in the past with little or no back up service. Pitstop has remedied this. Welcomed both by retailers and buyers alike with prices as keen as a razor a very large market void will be covered.

Ready to run 2WD 1/10th scale buggy at \$250 with 7.2 volt Ni-Cad race pack, charger and radio with a top speed of 35kph will get a lot more beginners interested in our sport. It's called the Aero Thunderbolt and really looks the part.

The same can be said for the 1/10th scale 959 Porsche and Pontiac GT complete with charger 7.2 volt race pack and radio. These units will be released in March and will retail around \$300 complete. This will be of great interest to a lot of Juniors interested in, but not being able to afford the costs of 1/10th circuit racing. The Porsche rally car comes with an extra set of wheels and lug tyres if you want to run it off road and full suspension all round. The Pontiac, built for circuit running comes only with slicks with very hard and minimal suspension travel.

A very interesting development from Nikko is their entry into the 1/10th off road racing scene. As you may know they were represented at the recent 1/10th World Titles with one entry driving their latest creation and top of the line buggy known as 'The Brat'. The car performed creditably and finished 63rd in 4WD in a field of 120. This car since the Worlds has won several major meetings in Japan as well as in Singapore and neighbouring countries.

Also in the off road race scene they have two other buggies namely Dandy Dash and Super Sprint. These three buggies should be released at the International Toy and Hobby Fair in April, and once again will be very keenly priced. They are all 4WD and come in kit form to enable the racer to use his own accessories such as speed control radio etc. Spare parts are available but it will be a couple of months before a complete range is stocked. However we have been assured that even in the case of a shortage of a part, 14 days sees it in store. Review of kit cars will follow as soon as they are available.

A good range of accessories are also available from Nikko. 'AA' chargers, 7.2 volt chargers, batteries etc., all very competitively priced. One item in particular took our eye, a battery tester that checks 'AA', 7.2volt, 'AAA's and 9 volt batteries and tells you whether they are good, bad or indifferent. Very handy to have around.

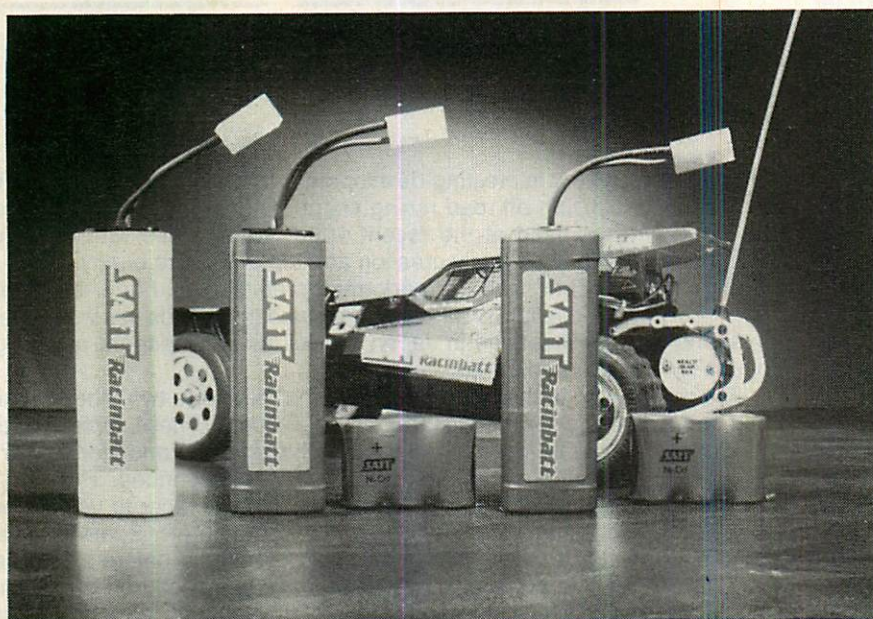


New Nikko Pontiac on-road car.



New range of power accessories from Nikko.

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For Sale — Schumacher Cat XL XLS Converted, MMS ball diff, restored to as new condition, heaps spares, \$200.00. Challenger 2PX radio gear — \$100.00 extra, Nosram ESC \$120.00. B. Trinder (02) 44 5700.

Schumacher CAT XLS with saddle pack chassis, 64 pitch gears, Wasp belts, Deans plugs, Futaba trigger controls, Kitts magic speed controller, Reedy motor and 3 SC batteries. \$650 or sold separately. Phone (070) 53 4317.

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★ RESULTS 1/8 OFFROAD WORLD CHAMPS BANGKOK ★

K. Sanada	Japan	101	1.00.00.48	Mugen
T. Aizawa	Japan	101	1.00.14.54	Mugen
Y. Kanai	Japan	97	1.00.08.87	Kyosho Burns
K. Kodama	Japan	97	1.00.27.39	Kyosho Burns
F. Veyseyrre	France	95	1.00.33.12	Yankee
K. Yoshida	Japan	94	1.00.38.88	Kyosho Burns
K. Sakimoto	Japan	76	1.00.35.81	Mugen
O. Danieri	France	68	53.30.68	Kyosho Burns
P. Gueye	France	52	39.53.60	Kyosho Burns
T. Sasai	Japan	19	42.20.55	Kyosho Burns

Dirt & Track hopes to bring you a full update on this event next issue.

NI-CAD ASSESSOR PROGRAM TO SUIT IBM AND COMPATIBLES

Last issue we presented details of Ni-Cad matching on the cheap using a constant current discharger circuit and a computer program to assess the results. This has proven to be a popular feature and already we have had requests for an IBM version of the program to supplement the Commodore version. Together with requests to transfer the program directly to your media.

If anyone would like a copy of this program for VIC 20 or Commodore 64 or IBM any format, please send a self addressed stamped package with 5.25" disc or data cassette to Mathew Prentis, 12 Sparkes Street, Pt Augusta, SA 5700.

NOTE: Please note error in program last issue. Line 170, the second colon (:) should be a semi colon (;).

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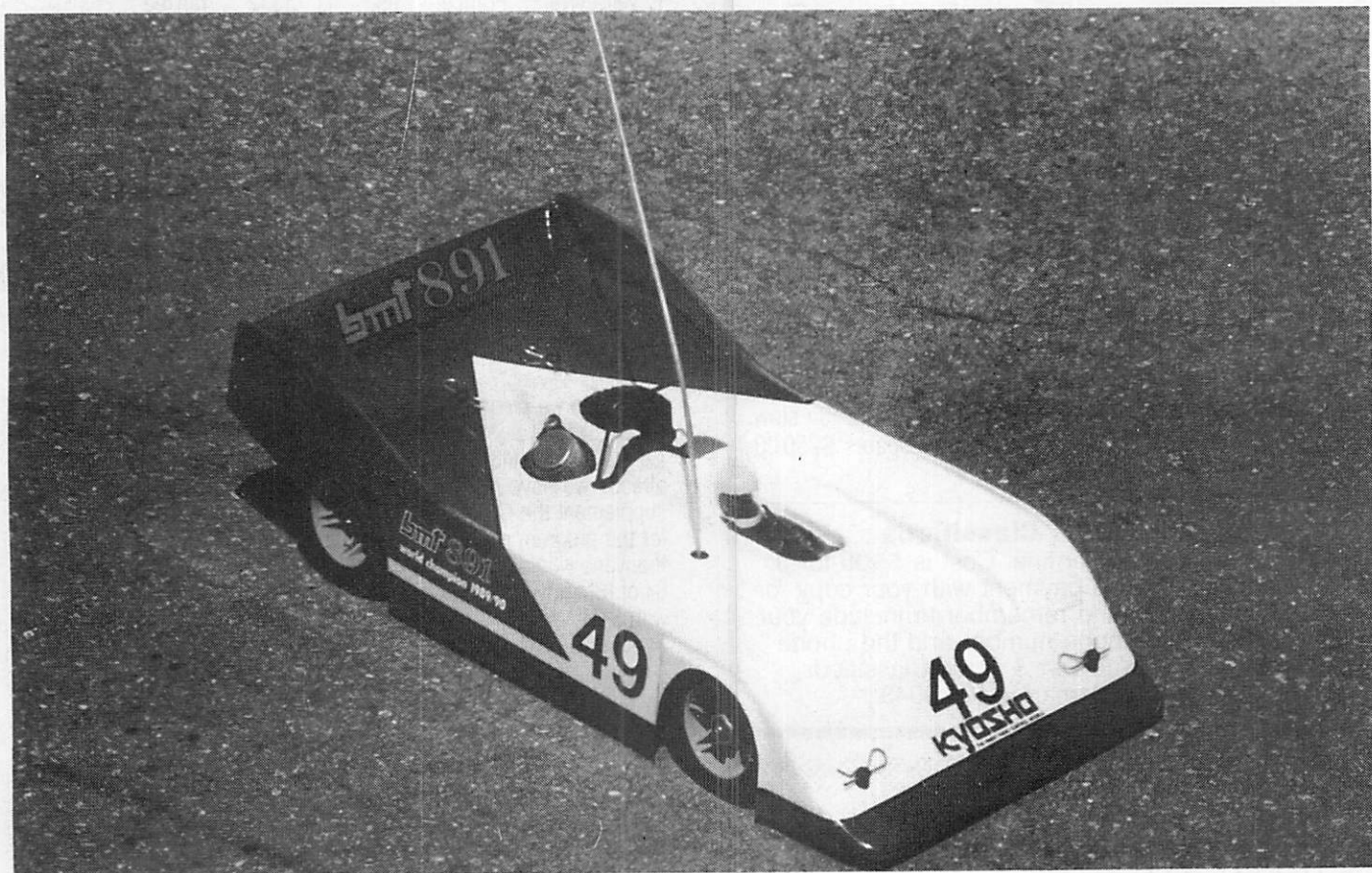
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1/8 CIRCUIT

BY ASHLEY COX



Blitz 4WD is new world champion in 1/8 gas.

KYOSHO BLITZ

REVIEWED

ANY car that is capable of winning the World Championship is bound to find some friends and that has been the case here with a number of Blitz cars now racing locally. The car itself has some unique features allowing almost infinite adjustment of the suspension.

The first part to assemble is the rear suspension. The differential comes factory assembled and pre-set, and although it looks the same as all ball type diffs it is adjusted differently. The split ring that would normally be unclamped and turned to adjust the diff is left in its pre-set position, and it is just a matter of tightening or loosening the bolt on the split ring to get the desired pressure.

The top rear wishbones are mounted to the bearing blocks using large ball joints, these pass through the bearing block and are screwed into the wishbone, an aluminium ring is screwed into the bearing block behind the ball joint to retain it in place. Conventional pivot pins are used to mount the bottom wishbones to the bearing block, these pins

also hold the rear springs. The axle blocks are fitted with a pivot pin to the top wishbone. Another ball joint is used to fit the lower wishbone to the axle block. These three ball joints allow easy adjustment of the camber, toe-in and even some track (width).

Mounted to the top of each axle block is the body/wing mount which ensures that all the down force generated by the body is transferred straight to the rear wheels instead of the chassis as would normally be the case.

Aluminium ball-and-pin type drive shafts are used to drive the quick change axles.

The rear suspension assembly is finished with the gear-box. This is also factory assembled and differs from normal in that instead of the two shoes it uses one steel lever which engages one of two pins that go across the outer drum, to which second gear is mounted. The change point is adjusted using one screw against a spring on the lever.

The forward layshaft is next, sited in front of the motor. This takes drive via a

short belt from the gear-box to the long belt that drives the front axle.

The disc brake is all fitted to this shaft, using a fibre disc with steel pads, braking is through both the side and rear belts to the rear wheels. There is an optional disc brake available using fibre pads and a steel disc which, if braking is a problem, could be worth a try.

The front suspension is quite different from usual. Again the same type of ball joints as used in the rear suspension are used, this time to mount the axle blocks to the wishbones top and bottom and again this gives both camber and same track (width) adjustment.

The wishbones are mounted to the front bulkhead by normal pivot pins, but the top wishbone is angled down towards the front of the car. This causes castor change with suspension travel. With the suspension depressed, as it would be under braking, the castor is reduced (axle block becomes more upright). This has the effect of making the car turn-in more aggressively, while under acceleration the front will rise giving more castor and thus more power-on steering.

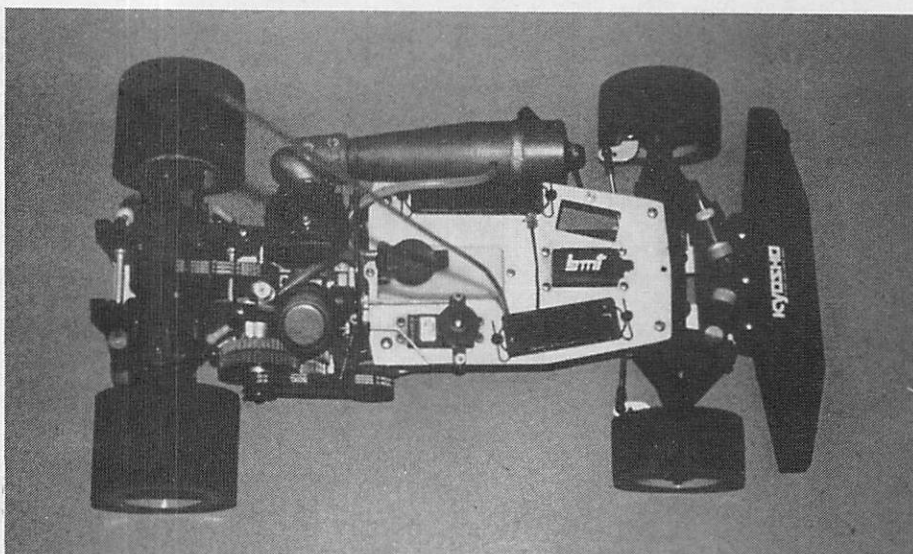
The one-way roller bearing used in the front drive are fitted to the front axles and driven by ball and pin type drive shafts, this time made of steel. Both front and rear suspension use the same shockers. These are constant volume using a rubber membrane at one end to compensate for the displacement of oil by the shaft as it is depressed. A selection of pistons is provided with a varying number of holes in them to allow different levels of dampening using the same oil. Once assembled these shockers are very smooth and work well.

Both radio and engine installation is quite straight-forward and well covered in the instructions, the clutch provided is of the four shoe Nova-Rossi type, which works exceptionally well.

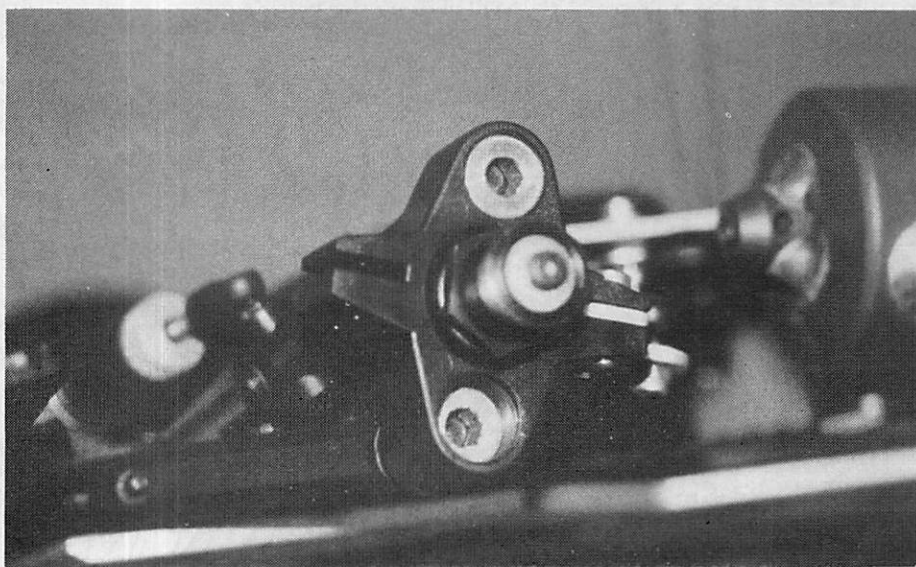
The instructions are good, relying mainly on exploded diagrams of each stage of assembly, and are easy to follow and prove no problem. The disappointing aspect of the instructions is that no advice on set-up is given, on a car that features so many adjustments I find this a little strange.

On the track the Blitz proved competitive straight away, top qualifying at its first race day in the first heat with a minimal amount of sorting, only to be dogged by engine trouble for the rest of the day. On its second outing it won the day. A lack of track time meant it was raced both days basically as it was built, even so its handling was impressive. One of the cars features is its adjustability, giving this car a lot of potential.

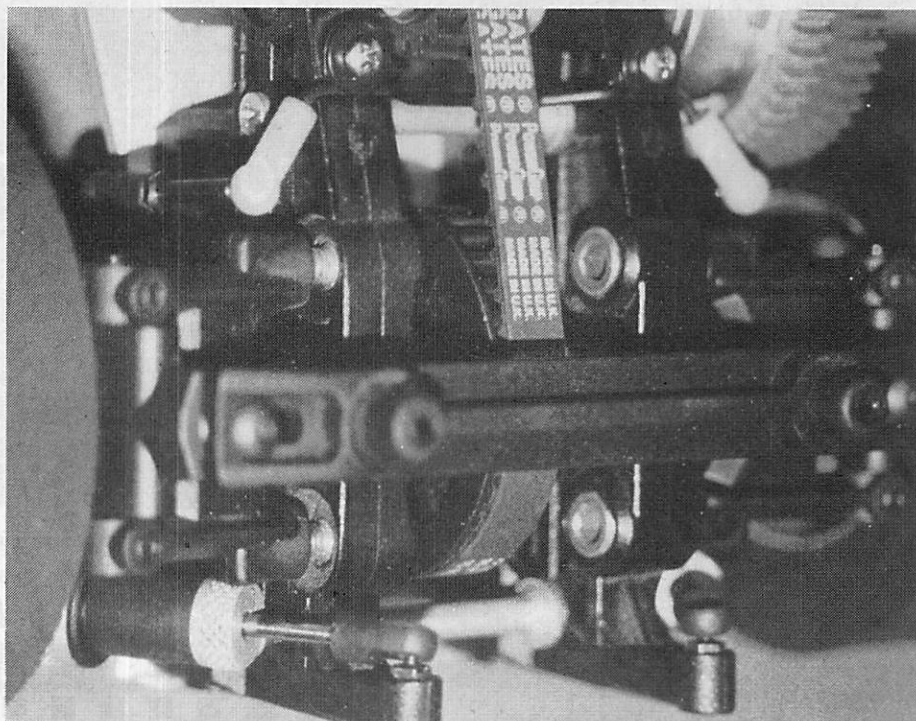
Test car by courtesy ABC Models.



New Blitz has a lot of potential.



The adjustment for the camber/track can be seen in the axel block.



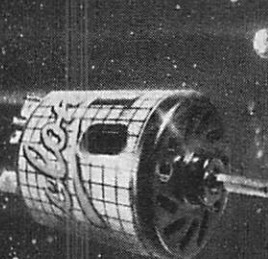
The unique ball joint suspension and the body mount onto the axel blocks can be seen in this shot.

parma

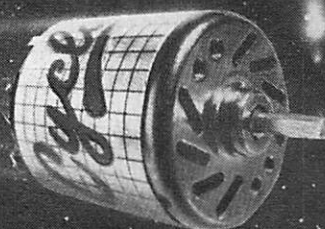
Cyclone II

**MOTOR
SERIES**

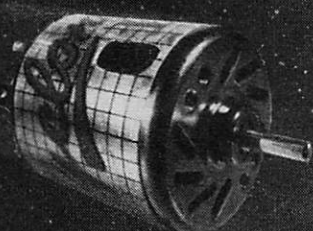
THE NEXT
GENERATION



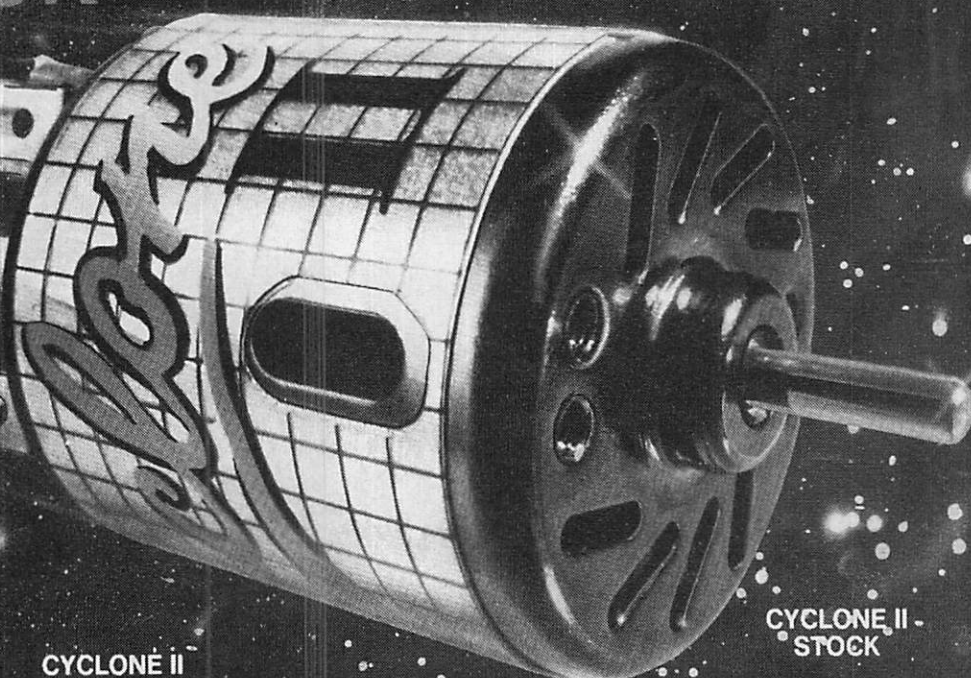
CYCLONE II
SUPER STOCK



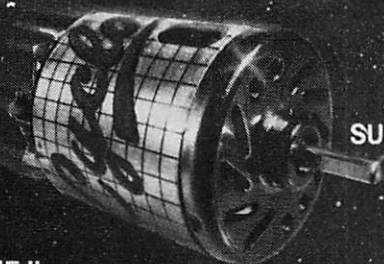
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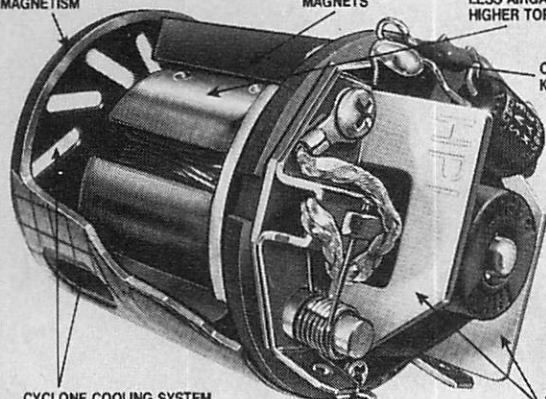
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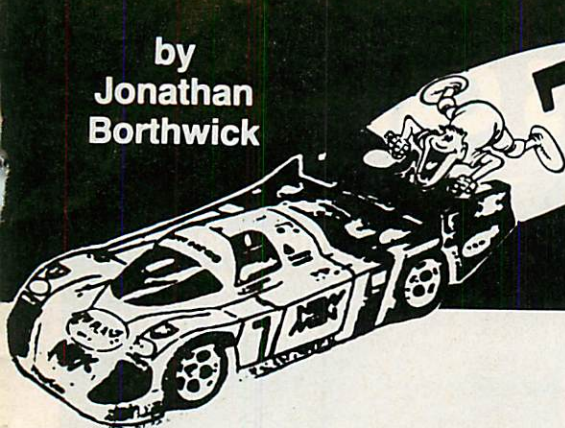
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by
**Jonathan
Borthwick**



Tweaked & Dumped

1/12 SCALE ON-ROAD ELECTRIC RACING

SUCCESS AT LAST!

It would appear that I am on something of a roll after my plea a few issues ago for non-Associated items to review in this column. Last issue saw a review of the very fine 'Purge Force' speed control, and this issue we introduce a new car with an Australian connection which will be a feature next time around with a full review and track test.

On a less positive note, some bad news concerning our sport which is great cause for concern.

COMPOSITE CRAFT/TRC LYNX II

To the average person, the State of Florida conjures up images of Miami Vice, Alligators, Disney World and Epcot. To model car buffs it equates to the famous Lake Whipoorwill Raceway, while to someone who has been in the sport a zillion years, D&D Graphite comes to mind. Who.....?

The D&D story becomes more interesting when one discovers that one of the principals, Kim Davis, has an Australian mother. I first saw ads for D&D in US magazines and it was obvious that here was someone adding a great deal of innovation to our sport. D&D were synonymous with turning carbon fibre/graphite into all manner of objects, from guitars and model car chassis, right through to consultancy work for the NASA space program.

I met Kim at the 1986 World Titles in Las Vegas and found him a great bloke who can eat a 'Sloppy Joe' (not the clothing variety) with the best of them.

Since that time, D&D have produced just about every carbon fibre chassis for most of the US manufacturers (at least the good ones!), changed their name to 'Composite Craft' and now brought a very nice 1/10th on road car in conjunction with TRC. Additionally they make some great bodyposts and one of the best rollover antennas I have seen with a whole bunch of accessories on the way. Refer also page 5 of D&T#16 under 'Clandestine Operations'.

I recently received a phone call from Kim's cousin, Paul Newton who is a director of the company as well as a marathon runner of some note. He was surprised that I knew his stateside cousin and started to tell me what Kim had been up to. Hence my introduction to the new Lynx II. While a full review will appear next issue, I have included a photo to tease you and believe a few preliminary comments are in order.

The pedigree of the car is most evident with some beautiful machining of both carbon fibre and alloy. Like the Associated RC10L (review in D&T#12) why do manufacturers like Composite Craft spend so much time on the chassis and then leave it to the modeller to file the battery slots? Apart from the problems involved in filing and sanding carbon fibre, it is critical to all saddle pack chassis that the batteries be properly let into the chassis. This job can be better accomplished by the manufacturer.

Enough of that, because the car looks great. The rear end is quite radical and features a single pivot point tied together with a roll bar and links. Damping is as per the RC10L and uses a

nicely machined single shock absorber. At the front a beam axle featuring adjustable caster is employed, following the style Delta first introduced to the World on its 1/12th Phaser back in 1980. The model I saw was already built and looked a treat on its TRC wheels and tyres. If Kim Davis is tops in graphite routing, I guess TRC's Tim Morton is tops in producing a great wheel/tyre combination.

The instructions are very similar in concept to its major competitor, but unlike Associated, Composite Craft have not yet amalgamated the words and 74 photos into one booklet. No doubt that will follow.

For Trade Enquiries only, please contact Paul Newton via Fax on (07) 357 8737. In the meantime, stay tuned for a full review and road test next issue.

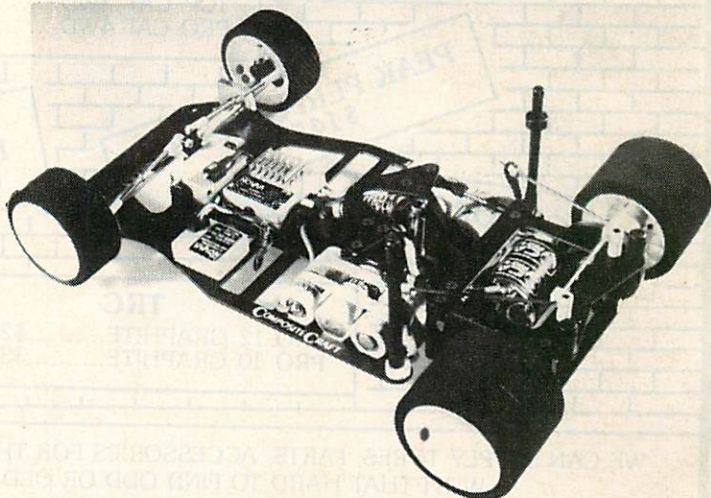
BAD NEWS

It seems there will not be a 1989 1/12th Nationals, the first time in 10 years that this R/C car event has not been held. And the bad news is that 1990 doesn't look all that promising either. There is no point allocating blame except to say that it is time racers supported National events and their organisers.

The only comment I can make is that a Nationals cannot be organized in two months if you want every possible racer to attend. With this in mind, I would like to make the following recommendation and offer (after consultation with my editor) to the 1/12th division of the AARCMCC:

- That notification of a National Title race must be advertised in this magazine a minimum of four months prior to the event.
- To encourage this procedure and possibly attract more racers to the 1/12th Nationals, the management of D&T Magazine will, in this column, provide at no cost a 1/8th page for advertising the event.

Now I believe you can't get any fairer than that so as of now no excuses. And besides, if anyone is serious about competing (especially interstate) at a Nationals, they need at least three months and possibly more notification. How about it?



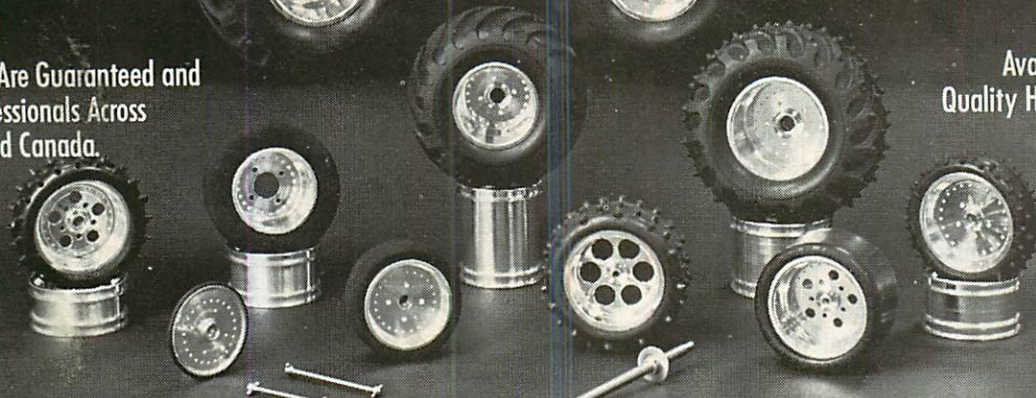
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WHAT'S NEW & WHAT'S DUE

Radio controlled cars are a today activity. High tech, radical and always something new. Definitely not for the faint of heart! Here at Dirt and Track we are lucky enough to see most new releases and try many of them. That's where the big product tests and reviews come in. But there are many accessories and smaller items that do not warrant a full review — neither should they be overlooked. Here's where we look them over, in the Components And Recommendations Section. CARS!

WHEELIES

TARTAN is the brand name that brought us copycat tyres. Copies of the popular big name tyres that work nearly as well for a fraction of the price. You can get Tartan copies of many good tyre patterns for 1/10th off-road use — and now you can get the wheels to go with them. These new release rims are not copies but good wheels in their own right. They are light, strong, slightly flexible and come in Hot Pink, Hot Green, Chrome and Gold. They present a smooth face with no holes to trap dirt and make cleaning a chore. We checked them with the standard Kyosho Mid wheels and found the Tartans to be 20g lighter per set of four. We also found the Mids rear track increased about 3mm and the front lost about 8mm, so take note if you go club racing. Available for Yokomo, RC10, Kyosho and Avante for around \$10-\$12 from good retailers who should contact Model Engines (03) 429 2925 for supplies.

BODY SHOP

Ever tried to repair a polycarbonate (lexan) body? Most adhesives are a bit like an ashtray on a motorbike. Useless for this job. But did you know you can now get a super glue (cyanoacrylate) especially formulated for lexan? We've tried it and it sticks like the proverbial brown stuff to the wall. In some cases it will repair a crack in a body just by gluing up the split but it's better to glue a scrap of lexan over the crack on the inside of the body or wing. It usually works over polycarbonate paint too. Now you can patch up that old body and keep driving while you save many pennies for a new one. Don't go looking in supermarkets and hardware shops for this product, even ordinary super glues here are usually inferior to the ones formulated for model use. Ask for either Poly Zap or Pic at your favourite hobby shop.

SUNGLASSES REQUIRED

Now you can get that bright flashy paint job that you admired on the overseas cars. The full range of PACTRA paints for RC cars is in stock at Model Race Car World (02) 892 1463. There are 29 colours in the range including fluorescents, candies and metallics. Don't forget that when used on the inside of bodies all fluoros and candies require a backing coat of white or silver for best effect. To avoid eye damage don't look at your bright, newly painted body out in the sun without wearing sunglasses!

EVEN HIGHER IQ

True to their word, Victor Engineering (of USA) have released what they call Enhanced Main Software (EMS) for their HI-IQ, (reviewed in D&T#14). For about \$30 US they sent us a replacement EPROM chip which is simply plugged into the printed circuit board. This gives the unit a new memory with more features. These include:

- The ability to increase or decrease the current in the middle of a charge or discharge function.

- An extra command which enables you to repeat the previous function with one keystroke instead of up to a dozen. This takes care of our main whinge concerning the HI-IQ.
- New key combinations which allow the beeper to be turned off/on, or the display to be temporarily frozen, or the after charge trickle to be cancelled.
- Average nicad voltage after any full discharge, is now displayed. This is in addition to all the other information displayed and is in line with the Turbocharger also tested in D&T#14.
- Cycling now ends with a discharge instead of a full battery and the timed charge overrides the peak cut-off. Therefore dodgy cells can now have a short timed charge until the voltage stabilises and then continue with a charge to peak.

In our original review we said that the HI-IQ was state-of-the-art and the ultimate. The trouble with using superlatives is that it subsequently doesn't leave you anywhere to go! This update has been tested by us and makes the unit even more useful and user-friendly. I guess the ultimate just got better.

LIONS VACUUM FORMER

Here's something we haven't actually laid our hands on but it still comes under the 'recommendations' section. Lion Electronics over in Perth have installed an industrial vacuum forming machine for modelling parts. For the uninitiated this machine will heat a sheet of thermoplastic then apply a vacuum to suck the softened sheet over a mould. This is how our RC car bodies are made from polycarbonate sheet, but the process will also work with PVC, acetate, ABS and many other materials. Lions machine will handle a mould up to about 60x600x125mm deep. Why are we telling you all this? Well, apart from trying to satisfy our readers unquenchable thirst for knowledge Lion advise that they will make products, even in very small quantities, from customer supplied moulds. If you ever had a desire to run with your own designed body then now you can do it. Of course one would have to make a good male mould first. Contact Gary Ayers at Lion (09) 274 4519 for more details. Who will be the first to come out with an all Aussie kit (maybe 1/10 th on-road) with a local body to boot?



New lightweight range of wheels fits popular buggies.

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AROUND THE CLUBS

VICTORIAN CHAMPIONSHIPS

The Australia Day long weekend at the end of January is traditionally the Victorian Championships and this year's event attracted a class field of 46 entries, 32 in Open (4WD) and 14 in Restricted (2WD), 28 of these being from interstate.

Saturday's qualifying showed how competitive the racing was going to be. In 4WD the first round saw Andrew Reade score the fastest time of 15 laps in 304.12 seconds, followed by Stewart Grant on 15 in 506.05. Those who missed a good time in the morning struggled to put up a good score in the afternoon's hotter conditions. At the end of Saturday the top four were:

Andrew Reade	15	304.12	5 min 04.12 secs
Stewart Grant	15	306.12	5 min 06.12 secs
Stephen Burgess	15	314.18	5 min 14.18 secs
Chris Reade	15	314.34	5 min 14.34 secs

Sunday's two remaining rounds of heats in the mornings cooler conditions promised to be faster and that's what happened. Stewart Grant TQ with his first round on Sunday, scoring 16 laps in 316.67. Just to prove it was no fluke, Stewart backed it up in the next round with the second fastest time of qualifying. Although not improving on his previous day's time Andrew Reade hung on to second. Ron Prins proved the class of the local competitors moving into third position. So the top 6 to go through to the final were:

Stewart Grant	16	5 min 16.67 secs
Andrew Reade	15	5 min 04.12 secs
Stephen Burgess	15	5 min 07.17 secs
Ron Prins	15	5 min 09.43 secs
T. Warren	15	5 min 10.21 secs
A. Cox	15	5 min 11.12 secs

In 2WD the qualifiers were a little more spread out, however Kym Griffiths got it all together to TQ. The top 4 were:

Kym Griffiths	14	5 min 12.44 secs
David Hyde	13	5 min 0.66 secs
Andy Bishop	13	5 min 1.71 secs
Chris Brooks	13	5 min 2.72 secs

Things went wrong for Kym in a practice session before the final when his car went 'off air' and slammed into a concrete kerb at full speed. Although hasty repairs were made the car wasn't to the same standard as it had been in qualifying.

In the 2WD final Andy Bishop took the lead early and started to draw away from the rest. Joe Charabie moved into second at the 10 minute mark, putting Mark Chaston back to third. Kym Griffiths drove a consistent race with an ill-handling car to take fourth. The rest of the field suffered many problems — David Hyde, making a come back to racing had no fewer than 7 flame outs on his way to 5th — but it was a local, Andy Bishop, who cruised to the finish in first.

The start of the Open final saw one of the worst first laps of all time. Stewart Grant, off pole, got away cleanly in first spot but three separate accidents in the first quarter lap left only one other car untouched, that of Ashley Cox starting off position 8. These two drivers had a clear lead at the end of lap one. Andrew Reade recovered quickly and rapidly caught and passed Ashley for second, then started overhauling Stewart only to slip back to fourth behind Grant, Cox and Warren as his front tyres started to peel off the rims. At the 15 minutes mark five cars remained on the lead lap. Just before the 25 minute mark, Tony Warren slipped to fourth behind Andrew Reade who then moved into second as

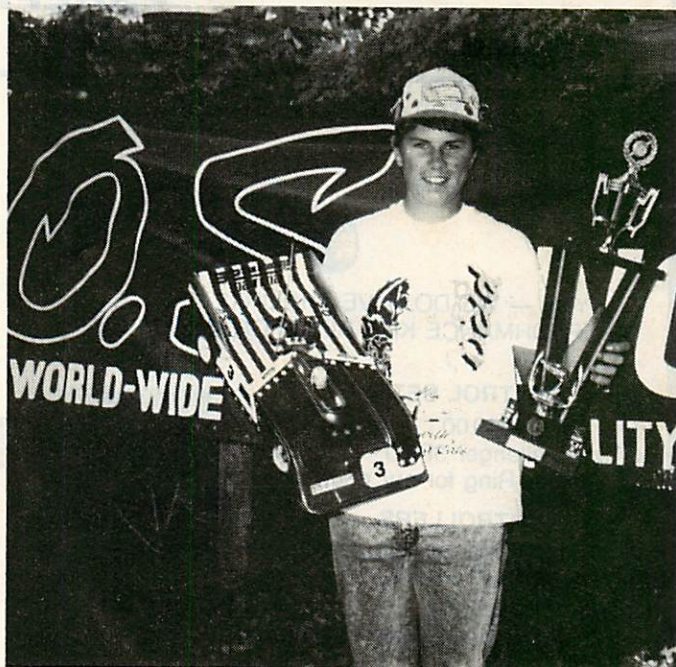
Ashley Cox's car left the track in spectacular fashion with radio problems and although repairs were made struggled home fifth. At the finish Stewart showed he still has the edge with a flag to flag victory, although the competition is getting closer.

RESULTS 4 WHEEL DRIVE

S. Grant	NSW	Serpent	86	30 min 07.01 secs
A. Reade	SA	P.B.	84	30 min 02.98 secs
T. Warren	Tas	Blitz	84	30 min 13.41 secs
R. Prins	Vic	Serpent	84	30 min 17.75 secs
A. Cox	SA	P.B.	82	30 min 04.45 secs
P. Giles	Vic	Serpent	80	30 min 01.44 secs
R. Beaumont	SA	P.B.	80	30 min 16.24 secs
C. Reade	SA	P.B.	79	30 min 06.11 secs
L. Campfield	NSW	Blitz	71	30 min 34.9 secs
S. Burgess	NSW	Serpent	60	22 min 31.49 secs

RESULTS 2 WHEEL DRIVE

A. Bishop	Vic	73
J. Charabie	Vic	70
M. Chaston	SA	69
K. Griffiths	SA	68
D. Hyde	SA	61
G. Hein	Vic	58
A. Corsaro	SA	50
A. Magnusson	SA	33
C. Brooks	SA	18
F. Puccinelli	Vic	17



Pictured is Andy Bishop winner of the Victorian 2WD 1/8th Scale on-road Championships 1990. He was using the new 'Blue Head' OS Max 21EX-R ABC engine in an Associated RC500 car, and very nicely finished Parma Can AM VDS Loca T530 body.

AROUND THE CLUBS

FEATURE CLUB WODONGA RADIO CONTROL CAR CLUB



Good facilities in nice surroundings at Wodonga's Off Road Track.

This club races at their Willow Park track in Wodonga. The track can be varied from 90 to 150 metres, by moving a piece of fire hose filled with gravel.

The most popular layout is the longest, it's full bore for about half it's length with a long straight, sweeping and banked corners, the other half is tight 'esses' and a hair pin corner. Three jumps are strategically placed to add to the spectacle.

We have Club race days the first Sunday of each month, and a trophy meeting on the third Sunday of each month. We run a Novice event, any car any motor, the only limit is the driver's ability. We have a Mabuchi class, this is very popular with the younger drivers on a limited budget. Two and four wheel drive Stock is well supported but the entries for Modified are generally disappointing. Occasionally, we move another hose to form an oval of approximately 90 metres. Spectator interest is at it's best with this one, at flat chat, bingles are a plenty.

As a learning process, last October we ran our first two hour Enduro.

Six teams of four drivers from within our club contested. We had a few shortcomings, but overall the reaction was sufficient to warrant a repeat in the New Year. We are planning a three to four hour Enduro, inviting other clubs to compete, a date is yet to be set.

With the purchase of better equipment, improved facilities, improved track and a bigger and safer stand, 1989 has been a very successful year for our club. Our club membership at present numbers sixty.

1990 looks like being even better. Through the generosity and energies of the Belvoir-Wodonga Rotary Club, an under cover pit area is nearing completion. It will house benches with 240 volt power for the convenience of our younger drivers. Already our big achievement for 1990 is Round Two of the ORCA Vic shield set down for May 6th at Willow Park in Pearce Street Wodonga. We feel certain, that after sampling the warmth and hospitality of The Rural City of Wodonga, visitors to our area will be anxious to return.



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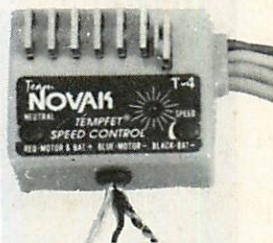
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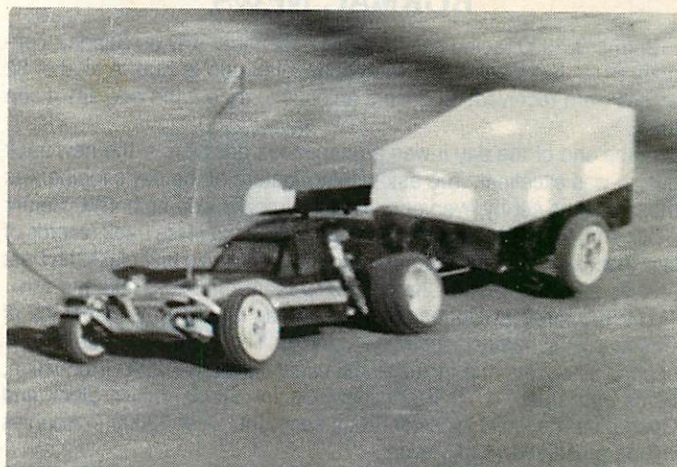
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AROUND THE CLUBS



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KEMPSEY R/C OFF ROAD CHAMPIONSHIPS

'Run-what-ya-brung, but most of all have fun' is the motto being adopted by the organisers of the 1990 Kempsey Radio Control Off Road Championships to be held on Sunday April 29.

Since the local Radio Control Car Club folded midway through last year, organisation of race meetings has been taken over by the management of the Kempsey Squash and Recreation Centre who are keen to nurture the sport on a friendly, fun basis.

The 1990 Kempsey Radio Control Off Road Championships is the only Sunday event for this year (regular race meetings are held Tuesday nights) and will be held indoors on the centres Skate Rink facility.

Track details are: Concrete Surface, Timber Ramps/Jumps, Sand-filled Fire Hose Barriers, and a Timber outside safety wall. Competitors must register by 9.30 am on the day, with a \$10.00 Entry Fee.

The organisers wish to point out that Competitors do not have to be a member of a Club or ORRCA.

Rod Thurgood is the Squash Centres Model Motor Sport Representative and he can be contacted on (065) 62 8209 before 12 noon for full details of the event.

CLUBS JOIN FORCES

by Russell Harris

Effective 12/9/89 The Glenroy Electric Car Club and The Broadmeadows Electric Off Road Car Association have formally amalgamated to form — 'The Glenroy Electric Car Club'.

Whilst Glenroy Electric Car Club is primarily an indoor racing club, racing each Monday night plus each alternate Friday night at the Pro-

gress Hall, Ulmurta Ave, Coolaroo (Melways Map 7 A2) and Broadmeadows Electric Off Road Car Association race only outdoor, Horne St, Campbellfield (Melways Map 7 H7), racing at 9.30-10.00 am every Sunday, it was considered by both Club's Executive Committees that the amalgamation of the two clubs could only strengthen both.

Both the indoor and outdoor will continue to operate as they have in the past and will be controlled by a new combined Executive Committee.

So come on all you so called good indoor and outdoor drivers, let's see how good you are. Have a go at something different, visit the Glenroy indoor or outdoor venues and join us in a great days/nights fun. Glenroy Electric Car Club is the only club in the Melbourne Metropolitan area which have both indoor and outdoor facilities.

For further information contact Mr Rowie Watt (President) (03) 309 1859, Mrs Leslie McKenzie (Secretary) (03) 306 0170.

TAREE RADIO CONTROL CLUB OUR FIRST YEAR

Our club was formed in February 1989 and after a few teething problems competition racing started on the 21st May 1989. We have thirty registered club members of which twenty-four drivers participated in our last Club Point Score.

Andrew Powys (PB Mini Mustang) remained 'A' Grade Champion for 1989 with Regan Betteridge (Turbo Optima Mid SE) winning 'B' Grade and Robert May (Big Whip) winning 'C' Grade.

At our 'Plaza Video Trophy Night' we held a 'Co-Operation Race'. The race was run over eleven minutes and required our 'A' Grade drivers to have a battery and tyre change using two pit crews chosen from either the 'B' or 'C' Grade drivers. This event was won by Chris Maggs (Boomerang) with Andrew Powys close behind, just point three of a lap. This event was run as a fun event and was enjoyed by drivers, crews and spectators.

We are a young club with the majority of drivers being adolescents and we are looking forward to some inter-club competition to gain more experience.

Our race meetings are held every Sunday at 4pm at the Taree Police Citizens Youth Club, Commerce St, Taree. The race surface is polished wood (basketball court) and requires foam tyres (Bradflex Commercial Insulation) coated with silicone (Selleys Bathroom/Kitchen Sealant). (Spare tyres are available for visitors wishing to compete.)

For more information telephone Glenys Powys, Secretary, (065) 52 7579.

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AROUND THE CLUBS

BORMAC NEWS

Bormac's 1990 racing season finally got under way on Sunday, February 21 — two weeks later than scheduled due to rain. A total of 82 entries were received, all drivers anxious to try out the new 141 metre track.

At the end of the day it was a unanimous decision — the new track design was excellent. The astonishing feature of the day's racing was the fast times set by everyone. Jason Juroczko won both 4WD Senior Stock and 4WD Open with scores better than the class track records of last year. Jason's 4WD Open record incidentally was first class, he beat no less than five World Championship team drivers to take the win.

The big news at Bormac is the Bormac Grand Prix and Race of Champions scheduled for May 5 and 6. The Bormac Grand Prix is open to all drivers and includes the usual classes — 2WD Production, Stock and Open, 4WD Production, Senior Stock, Junior Stock and Open plus a special Monster Truck segment. Over \$3000 in trophies will be presented at this event.

The Race of Champions is similar to the Reedy events held in the US where the very best of the country's drivers come together to compete in a series of 2WD and 4WD races to determine the Champion of Champions. Only ten drivers will compete in this prestigious event, all of them by invitation.

The ten invited drivers to compete in the Race of Champions are Rick Bartolozzi, Michael Geddes, Andrew Nelson, Darrin Campbell, Guy Evans, Andrew Reade, Reece Birtles, Neal Millard, Greg Brooks and Andrew Bolton.

Both the Bormac Grand Prix and Race of Champions are shaping up to be two of the biggest events in Sydney this year. Full details will be forwarded to clubs in early March — if you have not received any information please contact Dave Smith on (02) 892 1463.

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FOOD FOR THOUGHT

by Jack Grenenger

With our sport at the moment in the doldrums, poised as it were, on the brink of either taking off next year and/or going the other way and collapsing into chaos, I for one am very concerned, as are many others and the disquieting thing about it all is that proper guidance is not coming from those people responsible for the well being and correct direction that our sport should take.

I have been preaching for ages the necessity of fostering the new chum and the juniors who will be our top drivers of tomorrow.

Recently in NSW we held the State Titles for Stock and to my horror ORRCA not only sanctioned but solicited modified drivers to compete in this event, with the result that in 2WD stock the eight drivers in the 'A' Final were all World Championship contenders.

I was told it was done to boost entries — how short sighted can you be, they certainly got a few more entries, but what a victory for a top driver, mind you I am not knocking the week in week out stock driver, what I am saying is that it is no different than a Lendl or McEnroe entering the Seaside Championships held every year in Manly for all the 'A' grade tennis players.

I don't really have much time for the drivers that entered, I know their excuse is or was it was a chance to run, but really why not leave stock for those that persevere all year round in this class, it is their class and so should the State Titles be theirs. It should not be put on for Trophy hunters who do little or nothing for the sport who in the main are sponsored drivers and get all their gear in some cases for nothing and/or next to nothing.

Now more than ever before, our controlling body should be looking at the position our sport is in attendances down at meetings, club memberships down. Ask anyone the reason and they will tell you, our sport has become too expensive, we must concentrate on the average Joe, and the juniors, give budget priced racing. You must have the top end if we are to progress — if we want to compete at world level, but not at the expense of our sport in general.

The way is open for suggestions so let's see some.

PERTH RADIO ELECTRIC CAR (1/12) CLUB INC. 1989 CHRISTMAS CUP MEETING

Twenty-six drivers contested the Christmas Cup in three grades. With the exception of 'C' grade in which Gavin Reynolds was outstanding and unbeatable, the racing was the keenest and most competitive seen by the club since moving to the carpet track five months ago.

In 'A' Grade Kim Anning continued his dominance with three wins from the three heats but Alan Hurst pressured him all the way especially in heats two and three where one mistake by Kim would have let Alan in for a worthy win, unfortunately for Alan this did not happen. Karl Hashfield showed improved form to fill the third place overall from Paul Baartz, by the narrowest of margins. Simon Wedd and Graham Reddin were both plagued with mechanical and radio problems and did not threaten the leaders as they were expected to do.

'B' Grade resulted in the closest racing of the three grades with different drivers winning each of the three heats. Consistency paid off for Rex Wedd who ran out the winner by a very slender margin from Greg Bailey, while Allison Smith was in third place but the racing was so close that had she enjoyed a little luck in the final heat she would have run out the overall winner.

In 'C' Grade Gavin Reynolds won easily from Graham Renn followed by Gary Borbelly. Newcomers Daniel Roberts and Craig Stewart performed creditably and were only just behind the placegetters. Justin Page and Darren McKee tried hard but could not match the reliability of the others.

The unseasonal cool weather did not deter a good number of members from enjoying a barbeque after the racing and trophy presentations.

Forthcoming events: The Annual Club Championships will be held on 27th March (Qualifying) and 3rd April (Finals). Club racing continues on every Tuesday evening at the clubs track in the recreation hall of the Para-Quad Association in Shenton Park.

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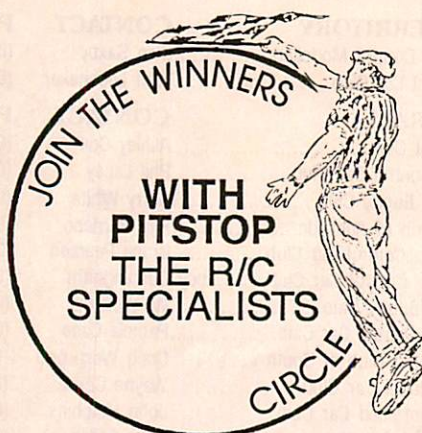
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1"	1"	8	#108	
1"	1"	9	#109	

Stylish 1 1/4" black numbers with a matching custom white background for 1/12, 1/10 & 1/8 scales. Compatible to 100 Series numbers.

Order	Size	No.	Stock #	Description
1 1/4"	1 1/4"	0	#120	Stylish #s w/matching white b/g
1 1/4"	1 1/4"	1	#121	
1 1/4"	1 1/4"	2	#122	
1 1/4"	1 1/4"	3	#123	
1 1/4"	1 1/4"	4	#124	
1 1/4"	1 1/4"	5	#125	
1 1/4"	1 1/4"	6	#126	
1 1/4"	1 1/4"	7	#127	
1 1/4"	1 1/4"	8	#128	
1 1/4"	1 1/4"	9	#129	

Bold 1 1/4" black numbers on a rectangular custom white background for all R/C scales-designed for fast tracks using single-digit numbers.

Order	Size	No.	Stock #	Description
1 1/4"	1 1/4"	0	#140	Bold #s on rectangular white b/g
1 1/4"	1 1/4"	1	#141	
1 1/4"	1 1/4"	2	#142	
1 1/4"	1 1/4"	3	#143	
1 1/4"	1 1/4"	4	#144	
1 1/4"	1 1/4"	5	#145	
1 1/4"	1 1/4"	6	#146	
1 1/4"	1 1/4"	7	#147	
1 1/4"	1 1/4"	8	#148	
1 1/4"	1 1/4"	9	#149	

Bold 1 1/4" black numbers on a rectangular custom white background for 1/8 scale and full type cars in 1/12 and 1/10 scales.

Order	Size	No.	Stock #	Description
1 1/4"	1 1/4"	0	#160	Bold #s on rectangular white b/g
1 1/4"	1 1/4"	1	#161	
1 1/4"	1 1/4"	2	#162	
1 1/4"	1 1/4"	3	#163	
1 1/4"	1 1/4"	4	#164	
1 1/4"	1 1/4"	5	#165	
1 1/4"	1 1/4"	6	#166	
1 1/4"	1 1/4"	7	#167	
1 1/4"	1 1/4"	8	#168	
1 1/4"	1 1/4"	9	#169	

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- STOCK #
- #701-BLK
- #702-WHT
- #703-GLD
- #704-RED
- #705-BLU
- #721-BLK
- #722-WHT
- #723-GLD
- #724-RED
- #725-BLU

Combined thick and thin double strip- ing with 124" of scraight lines and over 200 various matching curves and angles.
Multi-striping with action S. Contains a wide assortment of flairs, angles and curves.

REC. \$6.45 RETAIL

Stripe Kit

NEW "Mini Sheets" See special order form
"MINI" DECALS OF YOUR FAVORITE R/C MANUFACTURERS.

Order	Item	Stock #	Description
	Coca-Cola	#601	Red-White-Black-Green
	SKOAL BANDIT	#602	Black-White-Red-Green
	VALVOLINE	#603	Lt. Blue-DK. Blue-Red-White
	Miller HIGH LIFE	#604	Gold-Red-Black-White
	7-ELEVEN	#610	Blue-Red-Black-White
	PEPSI	#611	Lt. Blue-DK. Blue-Red-White
	PENNZOIL	#612	Red-Black-Pennzoil Yellow
	USA	#801	Blue-Red-Black-White

Multi-colored theme sheets containing the logos of major sponsors who are active in full-size car racing. Each sheet contains enough various sizes of logos to duplicate the full size race car or design a special custom layout.

Designer Series SPONSOR DECAL SHEETS

Order	Item	Stock #	Description
	SIGNMAKER	#501-BLK	Casual hand lettering style
		#502-WHT	
		#503-GLD	
		#504-RED	
		#505-BLU	
	RECLINER	#521-BLK	Bold gothic lettering style
		#522-WHT	
		#523-GLD	
		#524-RED	
		#525-BLU	
	MEARS	#541-BLK	540 Series - 3/8"
		#542-WHT	
		#543-GLD	
		#544-RED	
		#545-BLU	

The Sign Kits are used to personalize cars with a letter style used by actual sign painters on full size cars.

Sign Kit DECAL LETTERING SHEETS



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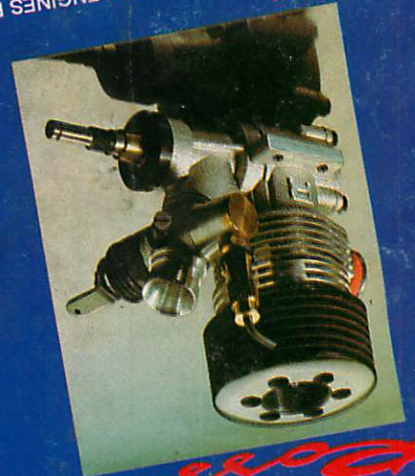
THE 1/10 SCALE ULTIMA PRO 2WD HAS ALL THE FEATURES OF A WORLD CHAMPIONSHIP COMPETITION BUGGY! IT HAS EXTENDED-LENGTH SUSPENSION ARMS FOR EVEN LONGER BUMP-ABSORBING TRAVEL, WITH ANTI-SWAY BARS FRONT AND REAR AND TOP QUALITY METAL BODY OIL-FILLED PRES-SURE SHOCK ABSORBERS. THE CHASSIS IS STIFF AND LIGHT (FIBRE REINFORCED PLASTIC) AND KEEPS THE SUSPEN-SION ALIGNED CORRECTLY. A FULL SET OF 14 BALL BEARINGS REDUCES FRICTION TO THE MINIMUM.

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ROSSI CAR AND BUGGY ENGINES FEAT-URE THE PATENTED 'ROSSI U3+2' TRANSFER SYSTEM WITH NEWLY DE-SIGNED EXHAUST AND TRANSFER PORTS WHICH INCREASES POWER AND ACCELERATION WHILE REDUCING FUEL CONSUMPTION AT THE SAME TIME. OUTSTANDING EUROPEAN QUAL-ITY AND PERFORMANCE.

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