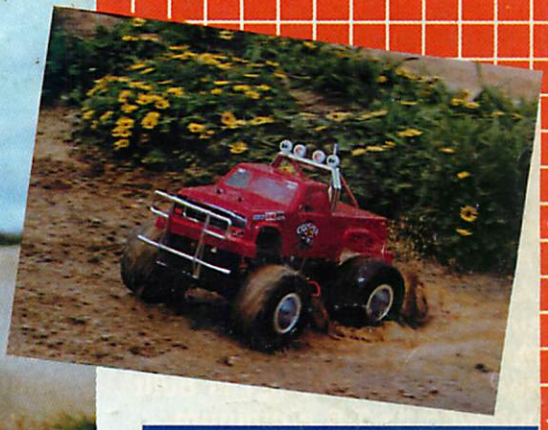
Radio Control Cars for DIRT & TRACK

NUMBER 15
JANUARY - FEBRUARY
AUSTRALIA: $3.20



PICCO P5 *Review*

PANDA CRUSHER

BIONIC GOLD

PAINT YOUR BODY

NICAD MATCHING ON THE CHEAP

PURGE DSP 150 SPEEDY

Registered by Australia Post Publication No. VBQ6237

TRAXXAS

BULLET

From its concourse good looks to its own line of TRX racing accessories, the TRAXXAS BULLET has it all. Out of the box, the BULLET is built tough with its T-6 aluminum chassis and shock towers. The BULLET'S four-wheel independent suspension has precisely calculated geometry to eliminate bump steer. The high-volume, oil-filled T-6 aluminum shocks are fully tunable to any track condition. They can be rebuilt many times and last for years. In addition, there is a new super strong gearbox, beefier variable length U-joint drive shafts, and a Mabuchi RS-540S motor.

For the race minded, add a TRX BULLET graphite chassis, a pair of graphite shock towers, and an XL-2 MOS-FET speed control to make a lightweight rocket that is ready to take on serious competition. For maximum traction, install the double-ugly-tough 48 pitch planetary differential or the new BULLET TRX ball differential. Both are drop-in accessories that require no modifications. Finally, don't forget that set of TRX ball bearings for those ultra-fast track times.

RADICATOR comes fully assembled and ready-to-run in two models. Model 1708 has a 300 amp MOS-FET FWD/BRK electronic speed control, while model 1706 has a 150 amp FWD/REV electronic speed control. RADICATOR is also available as a kit, model 1701. The inexpensive kit does not come with the radio system, motor, or speed control.

SLEDGEHAMMER!™

TRAXXAS' all new 2-WD pounder is built from the ground up to be all truck, not just another compromising car conversion with big wheels. The unique new chassis design is tooled from strong, lightweight T-6 aluminum. The ground clearance is exceptionally high in the middle, and when combined with the increased travel of 4-wheel fully independent suspension, SLEDGEHAMMER makes the roughest terrain seem easy. It takes some serious dampening power to keep a truck like this under control, so the SLEDGEHAMMER uses EIGHT high-volume, oil-filled, long shocks, with valved piston heads and adjustable spring retainers.

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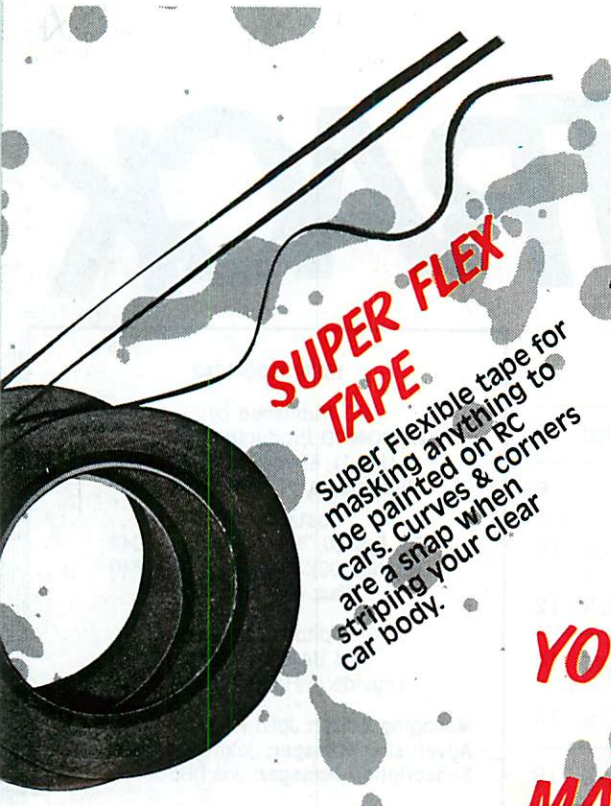

SUPER FLEX TAPE

Super Flexible tape for masking anything to be painted on RC cars. Curves & corners are a snap when striping your clear car body.

PIT MATE

Car Stand and Parts Organizer. No more parts rolling off your table when using the organizer trays. Handy motor containers and foam strips to hold car steady on stand.

I'LL BET YOU THOUGHT WE JUST MADE BODIES!

McAllister

WHEEL DISCS

Self sticking wheel covers in 1/10 or 1/12 scale for that last bit of aerodynamics or just great looks.

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Lots of great graphics in full color to finish off a great body. Original designs for a custom painted look.

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Our latest wing is extra wide to fit the new 1/10 GTP bodies. Check out our standard 1/10 & 1/12 scale wings too.

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Our driver comes with a separately molded helmet. No more tree trunk necks please!

We not only make a complete line of bodies for off-road or pavement, and one of the hottest 1/10 pavement car kits called "The Outlaw," but a complete line of accessories too. McAllister Racing continues leading the way in scale racing trends at your hobby shop today!

Send $1.95 for a complete catalog to . . .

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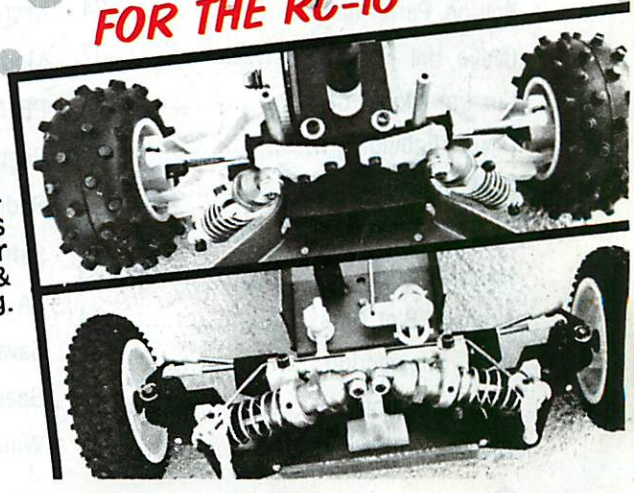
Complete front & rear shock Lowering Kit of precision injection molded parts, plus hardware. Converts RC-10 for dirt or pavement oval & roadracing.



DIRT & TRACK

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FROM THE DRIVERS SEAT

by the editor

TESTING TIME

Observant readers may have noticed a subtle change in our product reviews over the past few issues. We have endeavoured to make them tests and not just reviews. Its easy to write a review from the manufactures handouts, advertisements, box tops etc, but I believe the reader deserves more. As a potential customer the reader should know how the product performs in the environment that it was made for. Usually that means using and racing. This isn't always easy and we won't guarantee 100% compliance with this policy. Motors, for example are difficult to evaluate in just a few races whilst the comprehensive test data provided in Bobs Tech Corner (you will not find comparative tests in other mags so study Bobs results carefully) is probably more meaningful. The down side of this policy is that suppliers may be more wary of providing review/test items since there is more chance of us finding fault with the product. However, readers should note that if a major item, be it car, speed controller, charger or whatever, has not been revieved by D&T then it could be that the supplier has something to hide. If you've read it here, then that should be the way the product will perform for you. If you find otherwise then please let us know about it.

CLANDESTINE OPERATIONS

This page includes a couple of photcgraphs taken by our spy in the States. They were taken at an aviation and defence manufacturing facility somewhere in Orlando, Florida. This facility has a front going by the name of Composite Craft/Lynx racing headed by two smiling modellers, Jeff Davis and Dale Naley. That's Jeff clutching the CRF Ni-Cad holder produced by CC for arranging cells whilst being soldered etc. Neat idea. The other pic shows some intricate high tensile aluminium parts for the Lynx 1/10 on-road car. They were cut out with a highly secret machine that uses water pressure at eight times the speed of sound, yes mach 8, I kid you not. We have a photo of this machine in action but it cannot be published due to the official secrets act. Stick around in the nineties for more undercover scoops from the hotbeds of RC car activity worldwide.

FREE PUBLICITY

Not everyone is interested in major competitions, however the big events are an important part of our sport and the best place to see top drivers and equipment. That's why D&T always likes to support and encourage major events.

One way we can help is to give advance publicity. Just a paragraph or two, submitted to the editor well in advance (two months minimum) should give clubs and State bodies some free publicity in D&T. However we do insist on copy ready material and will not be extracting information from newsletters, entry forms and the like. Just tell us exactly what you want to say and we'll do our best. Because of space and other restraints, we cannot give guarantees, but we do guarantee that you will get no free publicity if you don't send us a press release.

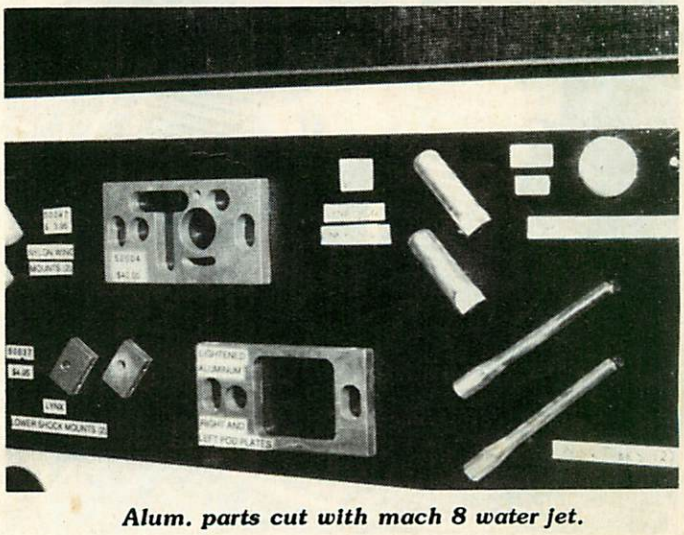
OZ CALENDAR

Speaking of free publicity, the National Calendar of Events mentioned in this space a few issues ago is one promise we have yet to keep. It was started, but there wasn't enough content to make it worthwhile. So clubs, organisations and Secretaries, here's your second chance. Plan your 1990 events year now and send me your list of significant events. We do not have the space to publish everyone's normal race day but if you are planning something special, as long as it's pertaining to RC cars, then put it down in writing and send to the editor. Send us the following information for each event; date, name of event, venue, organisers name, contact phone number. Watch out for the first OZ CALENDAR next issue.

WORLD CHAMPS VIDEO

It's taken a while to produce but the video of the buggy World Titles is now available — and it's been worth waiting for. This three hour production misses nothing. From the quagmire at the Invitational back in June to double World Champion Masami's speech at the presentation dinner, it's all here. All the important finals are captured, there are interviews with anybody who is anybody, full results and even some ex-

Cell holder spied at Composite Craft.



Alum. parts cut with mach 8 water jet.

citing shots from the drivers seat courtesy of Buggycam. A segment on slow motion spills adds to the spectacle. This is no Hollywood mega-movie but it is a lot better than most of this genre. Infinately better than the video I saw of the Romsey World Titles. Several cameras and some good editing ensure that nothing is missed whilst off the track action provides some welcome relief from the monotony of the many races. You won't be bored watching this one. Both good entertainment and good education, this video is a must for anyone interested in RC cars, and maybe even those who are not.

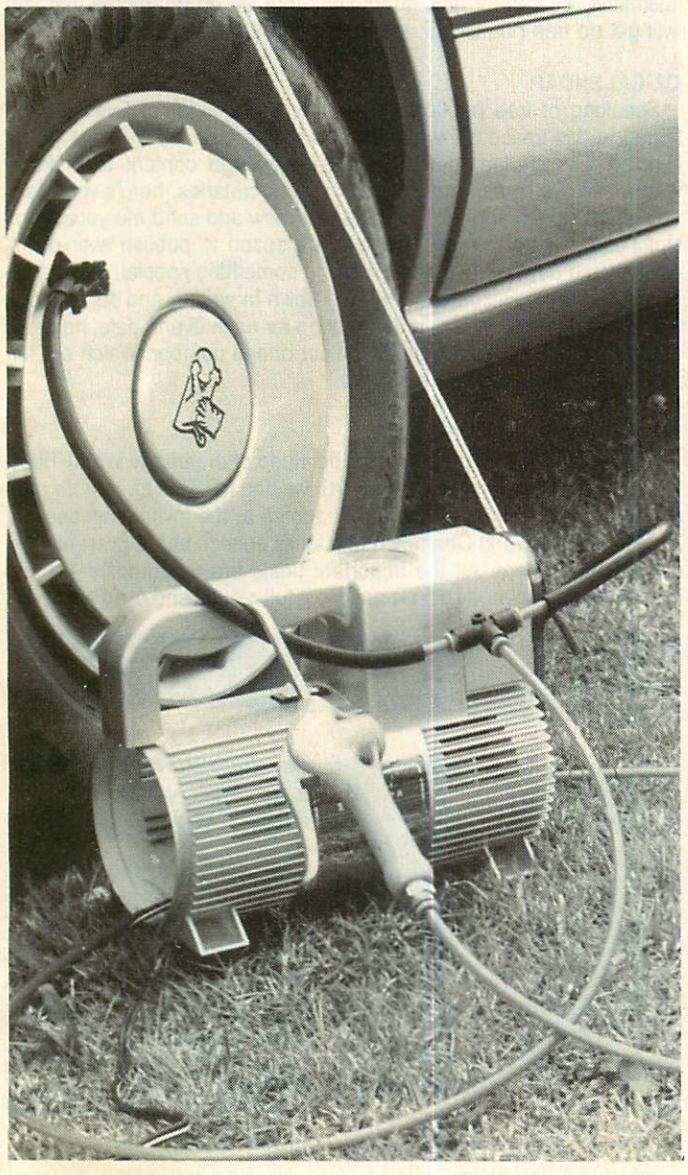
A lot of work by a small crew makes the $60 (+ $3.50 post) asking price seem cheap. Send to Dr Productions, 28 Kirra Rd, Allambie Hts, 2100. Phone (02) 939 6435.

PHOTO TIP

Spotted at the World Champs was yet another attempt to pack more into Ni-Cads. After discharging the whole pack, each individual cell is discharged with a ohm, ½ watt resistor. The pack is then charged normally, after which each cell is charged individually (a constant current charger is required). Repeak the pack just before racing. Is it worth all the trouble? Suck it and see!

PHOTO TIP

This arrangement for blowing cars down trackside belongs to Peter Sautelle but he's not claiming credit since he pinched the idea off someone else. Using a cheap 12 volt compressor as a power source is nothing new but look more closely at the picture. In the air line from the compressor is a tee fitting with a nylon hose going to the car tyre. The compressor is therefore using the tyre as an air reservoir which gives more pressure and volume at the nozzle of the air gun. Hence more blow for blowing down. When finished, the compressor is kept running a while to pump the tyre back up.



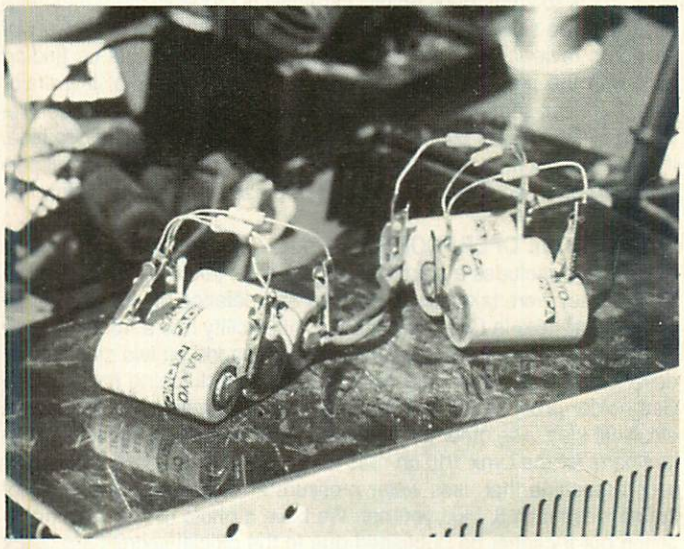
IT'S THAT TIME OF THE YEAR AGAIN

Not too long ago stamp albums and meccano sets were highest on a kids Christmas list. Stamps may still be desirable but high tech and high powered advertising has changed the concept of Christmas. Boys and girls nowadays are more likely to want computer games and radio control. With the latter a Jet Hopper type of toy is popular. Although a source of derision by serious racers these toys are responsible for many introductions to the sport despite their many drawbacks. We get many letters from youngsters who soon find the limitations of these toys and try to hot them up. Usually we cannot help.

Any reader over seven years old and presently contemplating their first buggy should aim for a 1/10 scale machine. Yes, they cost a little more but they perform much better, are repairable, may be modified and are worth something secondhand. There has never been a better time. Good used cars can always be found and a glance through the advertisements in D&T shows some bargain specials in new kits. Are you listening dad!

Of course, to get the most out of your new car do not forget D&T. Even the specialist articles usually contain tips for newcomers and we'll be helping you right into the 90's. But if you cannot manage a 1/10 car just yet then go ahead and have fun with your Jet Hopper. Anythings better than a stamp album!

Merry Christmas and a Happy New Year to everyone . . .



THE HOBBY HOTLINE

PERFORMANCE PARTS FOR YOUR CAR....

ANDY'S
LIGHTWEIGHT FRONT ARMS — RC10, Ultima, Optima Mid, Yokomo
LIGHTWEIGHT REAR ARMS — RC10, Optima Mid, Yokomo
NYLON FRONT HUBS — Optima Mid, Yokomo
BODIES — Apache (Yokomo), Elan (Optima Mid), Heathen (RC10), Half Breed (JRX-2), also Optima Mid Undertray, 1/10th Off Road Wing
SPOILER MATERIAL — 030 thick, 8 x 12 sheets
ANTENNAS — Chassis or side (receiver) mount

ASSOCIATED
All new parts for the RC10 Graphite now available. Upgrade your existing RC10 from these new factory parts:
WINGS — Clear lexan, High Downforce Competition Wings — 5½" or 7" wide
FRONT A-ARMS — New wide track
INLINE STEERING KIT — New steering blocks and front stub axles for more turning
FRONT SHOCK STRUT — Wide track (fibreglass)
GRAPHITE CHASSIS — Associated weave pattern
REAR HUB CARRIERS — 1½ degree toe-in
UNIVERSAL DOGBONE/STUB AXLE — No more lost dogbones!
HARD CHROMED SHOCK SHAFTS — All Associated sizes
SILICONE SHOCK OIL — 10W, 20W, 30W, 40W or 80W
BLACK IDLE GEARS —Precision, reinforced
REEDY ULTRA MOTORS — Pink Dot, Blue Dot, Gold Star etc
TQ FRONT AND REAR RIMS
BALL BEARINGS — All sizes RC10L cars and parts in stock, also RC12L

BUD'S RACING PRODUCTS
RC10/12 PINNED DIFF RING KIT
.125 SUPER DIFF BALLS
DIFF THRUST CONE — Eliminates blue thrust bearing in 1/12th cars
WINGS —Lexan, 1/10th Off Road (Big Fin), Super Bi-Level or Mini Bi-Level — suit most cars
HORIZONTAL WING WIRE MOUNTS and Pre-bent Wing Wire and Mount Buttons
LOCKING BODY CLIPS — No more lost body clips
14GA FLEXIBLE SILICONE WIRE — 5ft each red and black, the best available
SINGLE CELL BATTERY WRAP
SILICONE LUBE — Use on all types of diffs and gears
4-40 ULTRAGRIP SET SCREWS
NYLON LOCKNUTS — 4/40, 6/32 or 8/32
WHEEL WING NUTS

DAHM'S
CLEAR LEXAN BODIES — Raider, Warrior, Ultra, The Razer — also undertray to suit each body

DAN'S
BANANA LUBE — Great for reducing dust in ball bearings

EDGE RACING
COMMUTATOR CLEANING STICKS — Three types, one for Stock motors, one for Modified motors and the other a high polishing stick

JG MANUFACTURING
BUMPERS — Kydex, super strong, for RC10, Ultima, Optima Mid, JRX-2, Yokomo — small, medium or large
GRAPHITE CHASSIS — Ultima (saddle pack), Optima Mid (saddle pack, with or without battery cut outs, stock or long wheelbase), Yokomo, RC10
GRAPHITE SHOCK TOWERS — Ultima, Optima Mid, Yokomo
LEXAN GEAR COVERS — RC10, Optima Mid, larger than stock
LARGE ROD ENDS — For 4/40 or 3mm threaded rod (Pack of 4)
TRUCK CONVERSION KITS — Turn your RC10, JRX-2 or Ultima into a Monster Car Crusher. . .get ready for the next phase of R/C car racing!
HUGE RANGE of performance and protective accessories

KIMBROUGH
SERVO SAVERS — suit most servos
48P SPUR GEARS — moulded, 72, 75, 78, 81, 84, 87, 90 and 93T
48P STEEL PINIONS — 15, 17, 19, 21, 23, 25, 27T

NOVAK
SPEED CONTROLLERS — Latest Tempfet design, T4, T1 and T1X

PACTRA
Full range of sprays and bottles including fluoro, candies, metallics and solids

PARAGON
GROUND EFFECTS — World Champtionship winning tire traction
GEAR CADDY — Great way to organise all your pinion gears
MOTOR BLOCK — Ultimate protection for your valuable motor
LIQUID BEARINGS — The ultimate lubricant! Goes on wet, adheres and then dries in seconds. Use on gears, ball joints, differentials etc
ULTRLON — PTFE based lubricant, guaranteed not to attract dust. Can be used on practically any moving part
TURBO PAC — An on board reservoir that supplies a constant flow of performance fluid to your motor whilst racing
FORMULA 1 MOTOR SPRAY — More and more racers are realising this is the spray to use! Yields higher RPMs and lasts longer. Also available in pourable form allowing you to completely submerge your motor to rid it entirely of power robbing dirt, grime and impurities. Excellent for cleaning bearings and other moving parts too!
STOCK MOTOR — Yokomo based 27 turn 18° advance. This Pro Stock motor offers not only great torque and power in the corners — it's a rocket on the straights!

PROLINE
FRONT AND REAR WHEELS — Super lightweight, suit most 2WD and 4WD including RC10, JRX-2, Ultima, Yokomo, Optima, Tamiya range

R/C PERFORMANCE SPECIALISTS
TITANIUM HINGE PINS — RC10, Ultima, Optima Mid, JRX-2 or Yokomo, full set

REVTECH
BRUSH AND COMM DROPS
13GA SILICONE WIRE — 3ft each red and black
MOTOR SCREWS — 3 x 6, 8 or 10mm
ULTRA BATTERY BRAID

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The most complete range of machined 48P pinion and spur gears available!
48P STANDARD ALLOY PINIONS — 12T to 30T
48P METRIC PINIONS — 12T to 24T, suit standard Kyosho and Tamiya 48P
48P STAINLESS STEEL PINIONS — 12T to 30T, ultra precision
REAR TRACKERS — Adjustable rear toe-in brackets, suit RC10, JRX-2, Ultima, Optima Mid
MACHINED 48P RC10 SPUR GEARS — 72, 75, 78, 81, 85, 87, 90 or 93T, has ⅜" I.D
ULTIMA/OPTIMA UNDER AND OVERDRIVE GEAR SETS — 58, 60, 62, 64 or 66T
MACHINED OPTIMA MID SPUR GEARS — 81, 85, 87, 90 or 93T
GEAR ADAPTORS — Yokomo (includes one way bearing) and JRX-2, enables you to use any spur gear with ⅜" I.D
MACHINED YOKOMO CLUSTER GEARS — One way bearing/belt pulley included, 81, 85 or 87T
SHOCK OIL — 5, 10, 15, 20, 25, 30, 40, 50W
NEW! 64P MACHINED SPUR GEARS — 96, 100, 108, 115, 120, 125T
MACHINED CAT SPUR GEARS — 81, 85, 87, 90, 93T
JRX-2 SIDE BULKHEADS — Fibreglass, eliminates flex in rear bearing carriers

TEAM LOSI
Full range of JRX-2 parts in stock, including new hot up items. New LWB version of car and parts available soon.
RC10 BALL BEARING DIFF TUBE
SUPER HARD DIFF BALLS — ⅛ or 3/32
48P PINION GEARS — 14T to 30T
48P SPUR GEARS — 78, 82, 86T
REVOLUTION STOCK AND MODIFIED MOTORS
SILVER SHUNTED MOTOR BRUSHES — Stock, Cut or Soft
PRE-BENT MOTOR SPRINGS
RC10 BALL BEARING STEERING BELLCRANK ASSEMBLY

TPS
RC10 LIGHTWEIGHT SCREW KIT — Can save up to 2 ounces in weight! Also kits for JRX-2 and Cat
JRX-2 SLIPPER CLUTCH — Also for RC10, Top Cat
JRX-2 TITANIUM ADJUSTABLE CASTER LINKS AND TOE-IN LINKS — Can also be adapted to suit Yokomo
RC10 COMPLETE DIFF REWORK KIT — Gives smoothest diff operation available
RC10 BALL BEARING DIFF TUBE
RC10 CHAIN DRIVE TRANSMISSION — Now comes with slipper clutch, full parts back up available. Also for Ultima and JRX-2

TEKIN
TEMPFET SPEED CONTROLLER — 300 Pro-T or 600 Pro-TX, also 250R Budget Mosfet Speed Controller

THORP
JUST RELEASED! Optima Mid front and rear ball diffs. Now in stock
OPTIMA MID COUNTER GEAR SET
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ULTIMA/OPTIMA FINAL PINION GEAR (Steel)
JRX-2 MAIN DIFF GEARS AND TOP GEARS AND SHAFTS

TRINITY
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MOTOR BRUSHES — Cut, timed, new hard brush (full face or cut)
MOTOR BRUSH SPRINGS — Light or heavy tension
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48P SPUR GEARS — 78, 81, 86 or 90T
COMPUTER MATCHED 6 CELL SCR OR SCE PACKS/CELLS
OPTIMA MID GEAR ADAPTOR — Allows use of any ⅜" I.D. spur gear
"HOLE SHOT" POWER BOOST SPRAY — Get that "unfair advantage" off the line with a squirt of this!
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BATTERY SHUNTS — Still the best available
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WING BUTTONS
1/12TH TWEEK BOARD

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HAND WOUND ARMATURES — 12 turn to 23 turn, available in single, double, triple or quad. Motor building service to your specs.
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PRO WRENCHES — Hundreds sold already! In 4/40, 1/16 and 1.5mm sizes for all types of pinion grub screws, also suitable for small Losi screws (1/16)

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We carry all the major ROAR approved stock motors —
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- Trinity etc.

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These are top quality precision ball bearings to suit most cars, including hard to get 10 x 15mm (Yokomo) and ⅜ x ⅝ (RC10 Outdrive). Bearings to suit all Tamiya cars plus Optima, Ultima, Yokomo, RC10, Losi etc. Ring for details.

GRAND PRIX MODELS
Super parts for Optima Mid and Yokomo in zinc alloy or nylatron/graphite
BALL BEARING STEERING BELLCRANK ASSEMBLY — Alloy or Nylatron, for RC10, Optima Mid, Ultima or Dogfighter
BALL BEARING HUB CARRIERS — Alloy, for Optima Mid or Yokomo
MOTOR COOLING PLATE — Alloy, suit most motors, fits between motor and motor mount for increased air circulation and cooling
FRONT SUSPENSION ARMS — Optima Mid, alloy or nylatron. Rear arms give 6mm longer wheelbase can be used for 5mm wider rear track. Alloy arms also available for Yokomo
TITANTIUM TURNBUCKLE TIE RODS — 32mm or 44mm length
FRONT AND REAR SHOCK MOUNTS — for Optima Mid, soon for Yokomo, zinc alloy, lightweight and strong
MACHINED ALLOY FRONT BULKHEAD — for Yokomo, also available front and rear alloy gearbox protectors

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WE SELL ONLY THE BEST!
- Associated RC10
- Associated RC12
- Associated RC10L On Road
- Kyosho Turbo Optima Mid SE
- Kyosho Turbo Ultima
- Losi JRX-2
- Yokomo Super Dog Fighter
- Kyosho Motorcycles

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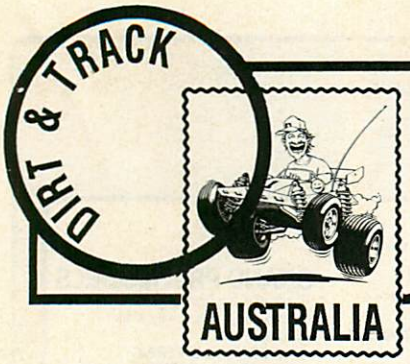


YOU WANTED TO KNOW?

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 cars will be published. Please address mail direct to the editor at the address on page 4.

Q. Which faster motor and finer gears could I get for my Metro 'Jet Hopper' or would it be better to sell my car and batteries and start from scratch? Also I have a tip for you. Get a big orange juice container, cut out half of the opposite side to the handle and you have the perfect holder for all of those small parts you don't know where to put, and you can put labels on the top near the lid.

Peter D. Canberra, ACT

A. Thanks for the tip, Peter, but we can't really help you with the Jet Hopper. D&T is a hobby and sport magazine whereas the Jet Hopper is a toy. Like most toys they are disposable and not meant to be altered or 'hotted-up'. They become boring — as you have found out. If you are still keen on RC cars then the ads and articles in this mag should help you choose. There are quite a few bargains around, particularly with the slightly older, but still good, models.

Q. I am thinking of buying a Tamiya Fox and was wondering what speed it does without modifications. What motor under $70 would be best suited to the car in terms of speed and running time. If possible could you do a review on the Fox? What motors would fit a Fox?

Nathan P. Modbury Heights, SA

A. About half of all letters we receive ask the same questions. Questions about speed. Many of our readers must be obsessed with speed! Unfortunately our answer is always the same. We don't know! There are so many variables, it is nearly impossible to predict the top speed of an RC car. This is not just a cop out, even a new car will have a top speed that varies with battery charge, motor condition, accuracy of assembly, even the air temperature and humidity.

Taller gearing (eg bigger pinion on motor) might give you an ultimate top speed approaching that of an F/A 18 — providing you had a very steep hill and a strong tailwind! For more on the different types of motors, check out 'Get Down & Buggy' last issue.

An article on the Fox can be found in D&T#7. It's a fast machine, as are other racing 1/10 buggies in the same price range or above. I don't think you'll be disappointed Nathan.

Q. Can 7.2v RC batteries be charged via 240v AC, through your original RC car charger? Does quick charging these batteries shorten their life span? I would have thought slow charging would be much better. Also I have seen many types of single 7.2v chargers but no Multi 7.2v chargers is there one available? Or perhaps there would be a market for a 240v AC model. This would enable 4 batteries to be slow charged the night before a race meeting.

DKP, Port Pirie, SA

A. Your query remains charging of Ni-Cads was answered last issue in the letters section. No, there are not many mains chargers around for four Ni-Cads — especially for multiple charging. The Ni-Cad manufacturers will claim up to a 1,000 cycle life for their products but this is under ideal conditions. What we do to batteries is not ideal! 100 to 200 cycles is a more realistic lifespan for our 7.2v packs when charged at the normal 3 to 5 amps, and then quickly discharged. Slower charging will certainly prolong their life but it will decrease performance in the RC car. Both run time and speed will be less.

Q. Is it proper for a 7.2v battery to give off 10.3v after its charged? I use a Schumacher PC3 and my car is extremely fast! It also dumps very suddenly. Also what do com. drops do? I've heard they're also good for cleaning. Could you tell me how to apply them, both for racing and for cleaning stock motors.

Robert A. Dalkeith, Perth

A. A peak charge voltage of 10.3 is not unusual for a 7.2v battery although your pack could be getting towards the end of its life. A pack that dumps suddenly shows well matched cells and is something that competitive racers try to achieve. Enjoy and don't worry! Revtechs BDC drops are intended for running-in new brushes and as a performance boost. A few drops down each brush holder before a run can give a power increase and help clean the commutator. The drops tend to attract dirt so keep motor protected. They don't seem to work on the small slot car type endbells. Full instructions should come with the drops.

Q. I recently purchased a Kyosho 1/10 scale 4WD Shadow with a SPA 240 WS sprint motor. I have assembled it and it runs beautifully and quickly. I want to know which motor is the most reliable, strongest and fastest no matter what the price and where I can purchase it from. I want a motor that my buggy can handle without many problems. I would like you to also give me some hot-up tips.

Fernando P. Endeavour Hills, Victoria

A. The Kyosho Shadow is an entry level car with shaft drive and quite good performance. Couple this with the potent spa 240 motor and you are probably extracting close to the safest top speed out of this buggy. If you dare to go for more then we would suggest:

1. Wind the motor timing up to number six and fit a motor pinion with 2 less teeth,
2. Fit Option House gold shocks all around,
3. Buy an electronic speed controller.

You could fit an even faster motor (say down to 14 turn) of any brand but experiments with gear ratios would be needed to realise the full potential. That's as far as we recommend you go Fernando. ABC Hobby Shops will help you with Kyosho bits.

Q. Being the owner of a new Kyosho Double Dare, I wish to know which size metal ball bearings fit inside it. I am asking you this as my local dealer doesn't have the slightest idea.

Shanan E. Mackay Qld.

A. It's difficult for local dealers to have all spare parts information on the many RC cars on the market. Always check your assembly manual first for spare and optional part numbers, then get your retailer to order them.

The standard Kyosho bearings (also found in Optima and Ultima) will fit the Double Dare. Generally these are 5 x 10mm or 8 x12mm on the differential. Your local hobby shop, local bearing supplier or any ABC Hobby Shop should be able to help. Thanks for the neat letter Shanan.

Q. I have recently bought a Tamiya Hornet and am enjoying driving. Is it possible to get bigger tyres for the back to increase the speed. Is cleaning your motor in metho advisable? Can you tell me of any hot up tips for the car? What kind of motor would be my next step? Is there any way of hardening the bumper bar so it does not snap as they are $10 a pop?

Ashley L. Southport, Qld

A. Great to read that you are enjoying the Hornet, Ashley, you don't need an expensive world beating car just to have fun. Bigger tyres will give a car a higher gearing and probably more speed at the expense of acceleration and running time. See 'Get Down & Buggy' #14 for more on gearing and motor selection. Cleaning in metho is okay and was covered in D&T#12 (Motor Maintenance).

The Hornet bumper has always been a problem. Actually, I think it breaks because it is too hard and brittle. There's not much you can do except replace with a pro-line nylon (can be colour-dyed) bumper at $8.95 each. While you are dipping into the pocket money, the Tamiya Fox rear rims with tyres and adaptors to fit Hornet (also Falcon and Striker) are available as part number 5257 for $22.50. Your local hobby shop should help or try Plumtree Models (042) 26 1555.

Q. I have recently purchased a second-hand Grasshopper and there is something wrong with the gears. It goes backwards OK but when it goes forwards the gears slip a lot. I have had a look inside the rear pod and cannot see anything wrong with the teeth on the gears. Also, do you know a hotter motor which will fit into my car, as I already have a Mabuchi 540.

Jeffrey P. Yangebup, Perth

A. A mechanical problem like yours is always difficult to answer without seeing the car Jeffrey. You should really take it to a good hobby shop or an expert at a RC car race meeting. At a guess we would say that the support bearings for the gears and idler shaft are worn. Going backwards might push the gears into alignment whilst forwards pushes them away from each other. Driving a car in this condition will only make things worse. Fortunately repairs are not too expensive. A new gear case is about $9 and gear set about $13.

A quicker motor will only accelerate the wear again so I wouldn't advise more than a Johnson 540 or any of the racing stock motors.

Q. I was wondering if it would be at all possible to convert a Tamiya Fox from 2WD to 4WD. If so approximately how much money would I need to spend. I know that this would be quite a difficult job to do as there wouldn't be much room for a front gear box and the shaft from front gear box to rear. I am willing to drill out my body. I have a Technituned motor and was wondering if I would need to upgrade it to a better one if I convert my Fox to a 4WD. I hope you can answer my questions.

Michael Y. Brighton-Le-Sands, NSW

A. I think you have answered your own questions Michael. Anything is possible but by the time you purchase new front axles and differential, belt drive and rear gearbox parts, then work out how to get the drive around the electrics and steering servo in the tub chassis and butcher the car to suit — you idea would be costly and impractical. Better to save for a new 4WD or look for a good used example. The technituned motor is OK for two or four wheel drive. Has any reader tried a Fox 4WD conversion?

Q. A friend says that when you flip you car 135 degrees you can come out of it just by spinning the back tyres, is this true? I want to beat a Kyosho Raider with original motor. I own a Big Bear, is this possible? Do I need an electronic speed controller or do I need a faster motor than the 540 as well a a new pinion gear? What motor and pinion gear would suit my needs. Also how can I make the Shadow go faster than the Raider?

Peter R. Aspley, Queensland

A. Your questions are difficult to answer because of all the many variables. I'm not sure what you mean by flipping the car 135 degrees, if your friend says he can do it then watch him and see how he does it.

Monster Truck (eg Big Bear) will generally not beat racing buggies (eg Raider), either in speed or handling. You wouldn't expect to see a real Ford F100 beat a racing Ford Sierra, would you?! Electronic speedos would smooth out the driving but would not increase speed much. Something like a Kyosho 20 Stock Motor is a good idea together with a 2 teeth less pinion than the one you use with the 540 motor. Same thing applies to the Shadow. The last issue of D&T had a full article on motor selection. Suggest you read very carefully.

TUNING TO WIN A WORLDS

by Geoff and Reece Birtles, Team Yokomo Australia

With a string of prestigious international victories that culminated in a second World Title (that's 2 out of 3!), Yokomo can undisputably claim that they produce the world's most successful 4WD 1/10 off-road racer — The Dogfighter!

Domestically, the Dogfighter's record is no less impressive, with Victorian & South Australian Titles to its credit immediately following the Worlds.

There is little doubt that 1989 saw Yokomo's 'Dog' mature from a rather pudgy (albeit immediately successful) street brawler into a lean and mean fighting machine.

This 'leaning' has been a fast-track but evolutionary process. Fast-track because it all happened in less than 15 months, evolutionary because the car that Masami raced at The Worlds is very much based on the car you can buy from your favourite hobby store.

We say 'based on', rather than 'the same' because obviously you cannot purchase an 'exact duplicate' just as you cannot purchase an exact duplicate of any other top competitors car. (This is no different to the real car racing scene. Can you imagine Dick Johnston or Wayne Gardner making their machines available to the opposition!)

Let's be quite clear on this. Any claims by a manufacturer that their Team Drivers drove widely available 'out of the box' unmodified cars in The Worlds are absurd.

This will come as a shock only to those naive souls with a 'cheque book mentality' to winning, ie. those who chuck dollars at the problem by buying the latest 'flavour of the month' and expect it to win, 'no sweat'! Disappointment inevitably follows, just as inevitably followed by another car and/or whinge about sponsored drivers.

Obviously some cars have the potential to win (eg. The Dog, The Pro-Cat and The Laser) and others do not. We would argue that the Dog's domestic and international record over the past 18 months amply evidences that it has more potential than others.

The simple fact is that winning toy car teams, just like real race car winning teams, spend hundreds of hours (as distinct from hundreds of dollars) on research, development and tuning.

Masaki Hirosaka (father of World Champion — Masami) is in our view the smartest toy car race tuner/developer in the world. His only competition is probably Roger Curtis, co-owner of Associated, who is probably the smartest car designer. Masaki is a genious. He has taken the 'out-of-the-box' Dogfighter and so highly tuned it that the opposition starts bleating, 'unfair'! Hey! When a munufacturer hears this, he knows he's got the opposition product beaten!

Let's now overview Masaki's tuning tweaks to his son's World Championship winning car so that you too can 'tweak the ears of your dog' and set about winning. (Remember — we'll be tweaking ours and trying to stop you!)

Chassis geometry of the 'Worlds Racer' is exactly out-of-the-box. Battery configuration is different (4 by 2) but car length and bulkhead mountings are exactly the same.

Battery mounting configuration is a tuning option available to anyone. A '4 by 2' layout provided a very narrow chassis with consequently more twist. The Americans didn't like this and discarded it in favour of a conventional chassis. The 'upside' is that the car is more lively (which suits Masami's driving style) the downside is that the car is much harder to drive, suspension tuning more critical and the battery configuration a nightmare. In spite of this we liked it and will continue to use it.

Front and back differentials and drive train arrangement are exactly the same except that fine pitch belts are used without a belt tensioner. The chassis has been slotted so that both the rear bulkhead and motor mount can be moved forwards or backwards to adjust front and rear belt tensions. Once again a tuning mod available to anyone and something we did to our car months ago.

(Be careful — chassis alignment is a major problem once you do this — not for the novice!)

We understand that after-market fine pitch belts (and drive pulleys) have been available for some time. Our experience is that they do not last long and are prone to stone damage. Be sure you really want them. (There's nothing wrong with the kit items.)

Front and rear shock towers have been marginally altered to run Associated 'long' shocks (P/N. 6448 & 6446), front and rear. We still (like Masaki) believe that Yokomo shocks work well but have to admit they are a pain in the butt to maintain. Masami ran his shocks in a much more upright position than previously which made spring rates and dampening oil selection more critical but gave the car more dash. A flatter shock angle is softer and safer but don't take it too far.

A 'top-plate' was used to eliminate all front to back flex but not longitudinal twist. These are a very simple home construction mod that most serious Australian racers have copied since we first started using them some 8 months ago.

Greater front and rear track widths are the important difference between a fit car and Masami's car. Even this is within the better club racers capability given the imagination to conceive the idea and the energy to make it happen. You too can widen your Dog with over the counter parts from Yokomo and Associated but you really don't need the hassle and the car works just fine in standard configuration. (Refer D&T#13 for tuning a stock car.)

Masami's car, like many others, featured a new Yokomo rim and tyre configuration. O/D of the rim was greater with the same external dimension of the wheel maintained through a lower profile tyre.

Supplies of these tyres were reasonably limited but widely available (in small numbers) to all World qualifying Yokomo drivers including Australian Reece Birtles, Michael Geddes, Rick Bartolozzi, Guy Evans and others. Obviously they were not made available to the opposition! Tough luck!

The tyre scene was more of a psyche (that worked) than a real competitive edge. We had our Yokomo totally dialled in with TF8 & TR9's prior to obtaining the new tyres and to quote Mike Reedy our car was 'awesome'!

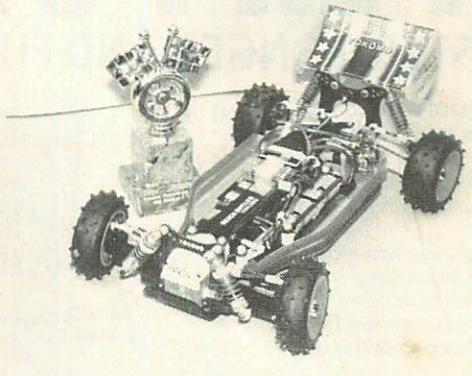
Larger rims and lower profile tyres seemed to work marginally better at St Ives but so far we haven't found this to be true on our rough home tracks. (We used TF5s and TR8s to TQ and win 3 out of 3 A Finals in the Victorian Titles in spite of having supplies of the new tyre.) In any event they should soon be widely available even to Cat drivers as Andrew Bolton (on returning from Japan) reported they are now on sale 'everywhere'.

Masami's car featured other little 'tweaks' like ball raced hub carriers (do it yourself, it's easy) and plastic steering blocks (to eliminate slop) available for ages from SRS (try Model Race Car World — Sydney) and soon to be available as a stock Yokomo item. He also ran a separate battery supply for radio and servo (this little tweak arguably cost Reece the B Final) and of course, the new Reedy Green Dot (113T Double) motor and Reedy Gold Batteries. (An awesome combination!)

The car looked different, it certainly went better, but essentially the car featured nothing that one could not do for oneself starting with a basic Dogfighter. Which brings us back to where we started. Throwing dollars at a problem does not win races. (Try throwing your mind at it!)

A good understanding of vehicle dynamics (which you can get by reading and observation — not by listening to self-opinionated gurus), imagination, product knowledge (industrial espionage!) and constant modification and trialling (with a stopwatch) will provide a competitive edge for any reasonable driver with any one of the top 3 buggies.

Couple this with the worlds greatest buggy (The Dog), the worlds greatest motor (Reedy) and the worlds greatest driver (Masami) and you have a World Championship.



Reece's Dogfighter which qualified 13th in the Worlds and won the 1989 Victorian Title. Note the 4 by 2 battery configuration ('Yokomo' batteries), top plate, Associated Shocks and Reedy Gold Star Motor.

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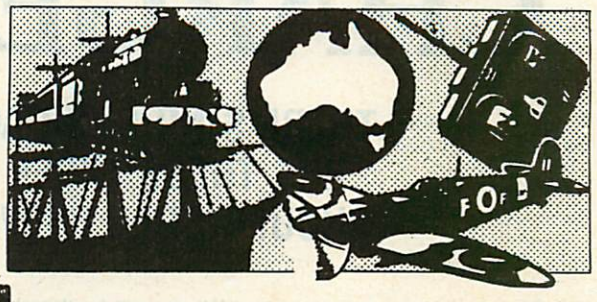

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CHARGERS GALORE!

THERE'S NO SHORTAGE OF NI-CAD CHARGERS NOWADAYS BUT THESE THREE NEW MODELS FROM ROADRUNNER SHOULD STILL PROVE VERY POPULAR, HERE'S WHY . . .

Oh, no — not more chargers! Where will it all end? This sport must have more chargers than the local cop-shop. Isn't there enough on the market already? Recently we've had Megachargers, Multichargers, Turbochargers and even one with a Hi-IQ. What's so special about this batch? All good questions that we will answer in due course.

These three chargers (actually three and a half if you count the add-on display) all have this in common:

1. Automatic cut-off through peak voltage detection.
2. User variable constant charging current.
3. Pulse type charging for best results, but with a soft pulse so as not to damage SCE type cells.
4. Attractive appearance.

Very nice, you might say but nothing unusual so far. What is unusual is the all important price. Read on to see that they offer exceptional value for the competitive racer.

ROADRUNNER SSC-C1 MOSFET

Nothing complicated about this one. The charge current may be adjusted in three switchable stages (1.5 amps, 3.0 amps for SCE's, or 4.5 amps.) or it may be steplessly adjusted up to 6.1 amps via a rotary knob. Apart from that it's just a matter of pressing the Start button for five seconds and away it goes. A little red light (I know a street that has lots of these - but that's another story) glows solid to signify a fast charge and this eventually changes to a slow blink to show that slow charging (at 180mA) is taking place. The charger will work up to a seven cell pack and it carries an easily replaced fuse to protect against reversed input.
PRICE — $79.

ROADRUNNER SSC-C2 MOSFET

Take the C1 and add an LCD (liquid crystal display), and a couple of slide switches and you have the C2. The LCD will show either charge current or pack voltage by flicking one of the switches. Neat. If you're at a loose end you can watch the Ni-Cad voltage rise to a peak before the fast charge terminates. The other switch is marked 'Memory' and is a new idea (to me) on a Ni-Cad charger. When on, the LCD will freeze at the last reading just before fast charging was terminated. This will either be volts or amps, depending on the position of the other switch. If you like to know when the cell(s) peak or gauge Ni-Cad condition by the final charge voltage (generally the lower the voltage the better the Ni-cad) then this is a good idea.
PRICE — $149.

PRO-12 MULTIFUNCTION MOSFET

The others have a durable silver flake coating but the Pro-12 comes in any colour you like — as long as it's black. Circuitry is along the same lines as the other two, but features are slightly different and include discharging with auto cut-off.

Two switchable charging rates of 3 or 4.5 amp are employed in addition to a variable rate of a massive 12 amps. The latter is suitable only for a last minute boost charge for SCR type cells before racing and is guaranteed to fry a pack if left for more than a very short time.

After a run, a flick of a switch will enable the Pro-12 to discharge your pack down to a pre-determined level ready for the next charge.

Instructions for all these chargers is okay but nothing sensational. For the Pro-12 the sheet gives a novel 'competition charging' method that I haven't come across before. You'll have to buy one to see what this is — no sneaking a look at your mates instructions!

The Pro-12 will charge up to an 8 cell pack but when set to a high current you can expect the amps to be non constant. Otherwise all these chargers check out to hold a good constant current. Price for the Pro-12 is $139.

TL-12 LCD DISPLAY METER

The black Pro-12 doesn't come with a display screen but you can choose to add one in the form of the TL-12. Hope you're keeping up with all these numbers!

This gadget has four leads which plug straight into the Pro-12, or may be adapted to other chargers. It may also be screwed to the front of the Pro-12 to make one unit. Of course, the other alternative is to use an ordinary multimeter, if you have one, plugged into the Pro-12.

Once connected, and a 9v battery inserted, the display can be switched to show either charging amps or Ni-Cad voltage. If the Ni-Cad isn't connected then the display will show the input supply voltage. Price of this black box is $49, or $188 if you add it to the cost of the Pro-12 charger.

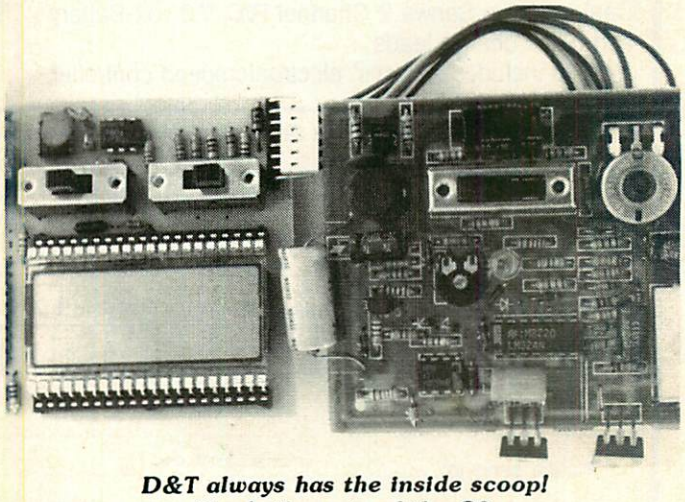
FIELD DAYS

As is our policy, we used these chargers trackside and also handed them out for others to use. It's the best test you can apply.

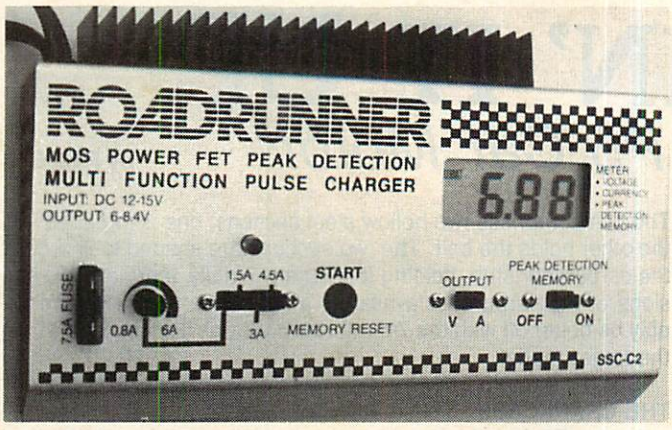
Nobody managed to break a charger or damage a Ni-Cad. They all worked as advertised. The bane of most peak detection chargers — false cut-off in the early part of the charge — was present in these three although it wasn't as pronounced in the Pro-12. You just have to be handy to reset the quick charge during the first few critical minutes, until the pack voltage stabilises. Otherwise no problems. I particularly like the low profile and physical stability of the Roadrunners. Under bonnet charging with the car engine running doesn't cause it to imitate a Come Dancing contestant like many chargers do.

Why buy one of these products? They offer most of the sought after features for reliable and competitive Ni-Cad management without frills, but look attractive and robust without a fancy price tag.

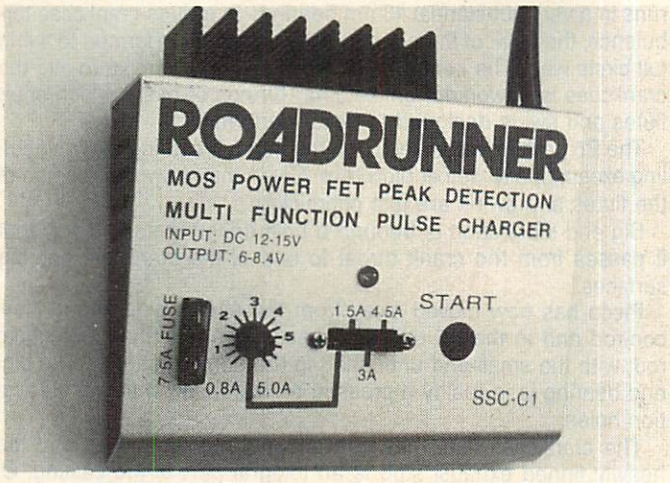
Obtainable from Model Race Car World (02) 892 1463 who don't really need all this free publicity since these units are already selling like hot cakes! Would make nice Christmas presents if you're not too late.



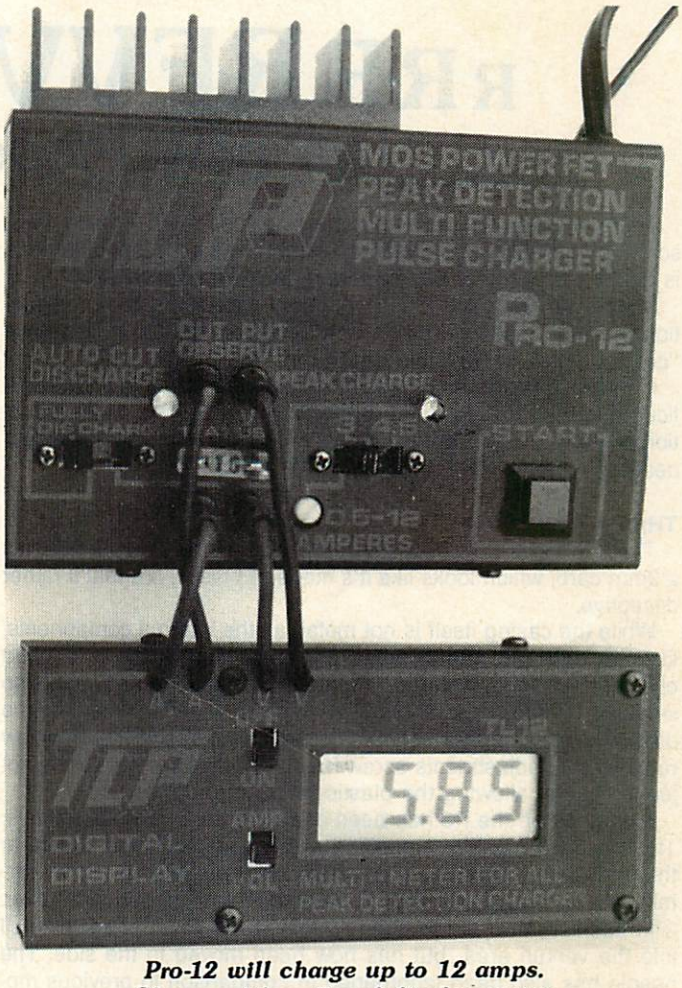
D&T always has the inside scoop! Here's the guts of the C2.



Large readout is the main feature of the Roadrunner C2.



Roadrunner C1 is a good value auto charger with variable current.



Pro-12 will charge up to 12 amps. Shown with optional display meter.

RRREVVIN' IT UP

The new Picco P5 Car Motor

by Paul Bird

There are many 21 size gas motors on the market these days, some are for buggies and some for cars. The essential difference is that a buggy motor has more torque than a car motor.

The Italian company Picco has been making internal combustion motors for years, but it's only recently that it's motors have "come of age" in 1/8 scale circuit cars.

In the past, Picco 21 engines have had a reputation for rather difficult to set-up for maximum performance. But with the introduction of the new P5 F1 engine, those problems seem to have disappeared.

THE CARBURETTOR

The key to the P5's success seems to be in the carburettor. It's a 9mm carb, which looks like it's made of plastic, but that's rather deceptive.

While the casing itself is not metal, all the internal components, like the slide, jet and needles are all metal. Plastic is a good choice for casing material, because it's light, robust and also serves to hold the adjusting screws in place very firmly; ending the days of mixture screws vibrating loose. I should add that the slow running stop adjustments screw is fitted with a spring, so it's not just a case of allowing the plastic housing to do the work.

The carby on the P5 has been changed from previous models. The slide end has been modified — it's now machined square at the end, rather than being rounded, and this change alone permits you to ensure that you do have the latest model carburettor.

In addition, the jet has been relocated. Earlier, it projected well into the venturi area, but has now been moved to the side. The needle has also been lengthened in comparison to previous models, which were unusually short and cleared the jet before the throttle was one third open. Now, to clear the jet, you must open the throttle well past half way.

At a guess, I'd say the reason for this change is to allow better mid-range mixture control. If it is the reason, it's worked well.

The carburettor certainly makes the P5 easy to set-up for optimum performance at all speeds and right across the rev and load ranges. With any two stroke motor, a good crankcase seal is critical and the Picco carburettor is sealed, like most, with an O ring. But rather than placing the ring on top of the crankcase carby hole, it's located in such a way that it that it will seal well down the carburettor shaft. The seal is so good that it's not necessary to use any silicone.

Another impressive component is the carby pinch bolt. This has been so well designed that it's almost impossible to overtighten. The bolt comprises two hollow steel sections; one is threaded and the other holds the bolt. The two sections are shaped to fit around the carburettor stub, holding it securely. Finally, there are two versions of the carburettor available; a 7mm or a 9mm. You'd probably be better off with the 7mm throat carby, as it's less thirsty than the larger model.

THE CRANKCASE

As the P5 is a high performance engine, you'd expect good crankshaft bearings, and you won't be disappointed. The crank runs in a very substantial 13mm bearing. To reduce crankcase turbulence, the back of the counter balance weight is formed to a thin full circle web. The central hole which carries the mixture into the crankcase is unworked, unlike other brands of motor which sport flutes and swirls designed to boost performance.

The P5 performed brilliantly on the track, breathing well and pulling exceptionally well at high revs. Given that, I wonder if some of the flutes and swirls are just gimmickry.

Big end lubrication is through a hole drilled in such a way that it passes from the crank throat to one of the crank pin bearing surfaces.

Picco has now moved away from the earlier type forged steel con-rod and in the P5 utilise a conventional machine aluminium rod, with the small-end unbushed in the normal manner. The big-end bearing is in reality a pressed bronze insert with two lubrication holes.

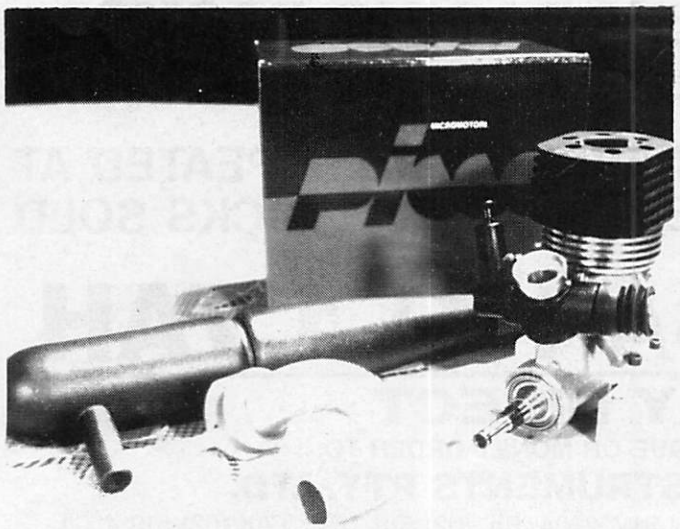
The crankcase itself has conventional mounting lugs and the heavily finned exhaust stub is an integral part of the casting. Of course, this means using a slip-on type manifold rather than a bolt down one. The security of the manifold is largely a matter of personal taste, I know people who don't like the spring retained manifolds, although I've never experienced any problems with them.

The crankcase backplate is made from a very light alloy, but is chrome plated, which reduces both friction and engine wear.

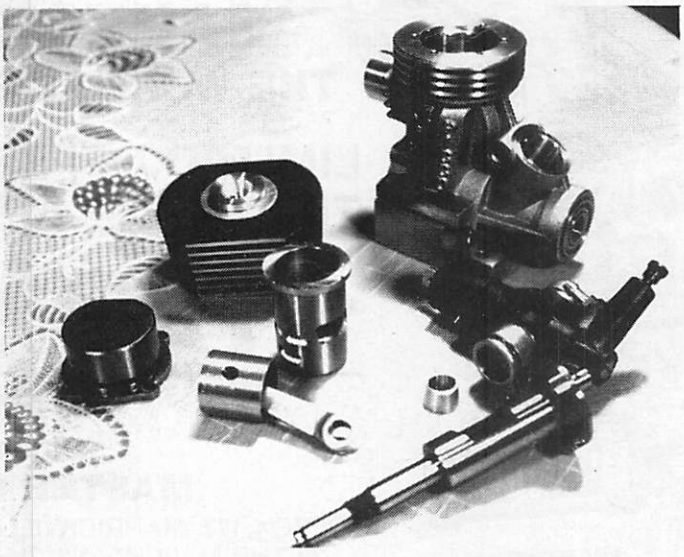
THE HEAD

The heat sink head is quite large and includes as an integral part, the combustion chamber, which ensures adequate cooling no matter what the ambient temperature. Mind you, a good airflow is still important so be careful when using sedan type bodies.

The head also has several shims fitted to it. The engine comes two of 0.2mm and one 0.1mm, which combine to give a squish band clearance of 0.64mm.



Picco's new P5 motor, shown here with manifold and tuned pipe. The engine mounts shown in the photo are not supplied with the motor.



The component parts. Note polished end plate, chrome plated brass liner and well finished crank.

PORTING

As you'd expect from the P5 designation, the liner has five small inlet ports. One is opposite the exhaust port and the other four are arranged symmetrically around the centre port. A new version of the P5 is available which has seven ports! I'm told that the the 7 port liner and appropriate piston will be available soon. Those extra two ports certainly add to the efficiency and performance of the motor.

The piston and liner are in keeping with other brands, in that Picco has chosen an aluminium piston running in a chrome plated brass liner, thus it's an ABC motor.

SPECIFICATIONS

The Picco P5 F1 motor, while designated as a .21 cu engine is actually 3.44cc, putting out 1.6 horsepower at 25000 rpm. It weighs in, with carburettor, at 300 grams.

THE TEST DRIVE

The P5 was fitted into my RC500 two wheel drive and run-in in the normal way. Even while running in, it showed that it's a gutsy motor with plenty of power.

It's also a fairly large engine and I had to get the Dremmel out and mill away part of the rear bulkhead so I could get proper pinion mesh adjustment.

Once run-in, I put the P5 through its paces at the Chirnside circuit in Melbourne and the engine lived up to expectations.

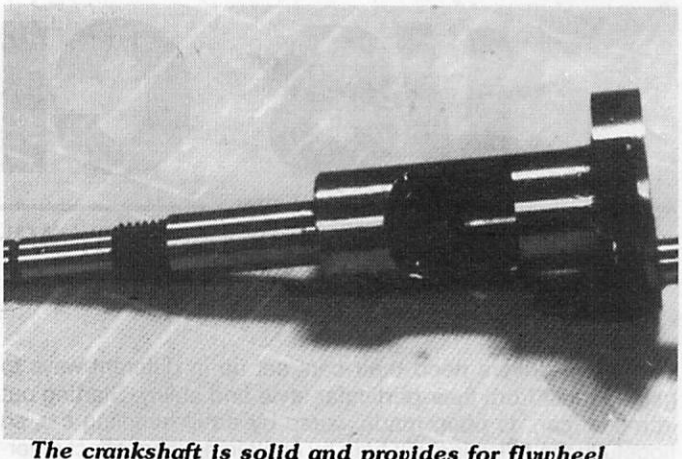
It revs and breathes well not even appearing to peak at full throttle on the long main straight. Out of the corners it's very responsive, with the power coming on quite early. That is a trap for the unwary though, it's easy to get a two-wheel drive car sideways.

I'm very happy with the P5's performance — it powered my 2WD car to victory in club racing over several 4WD machines and you can't ask any more than that!

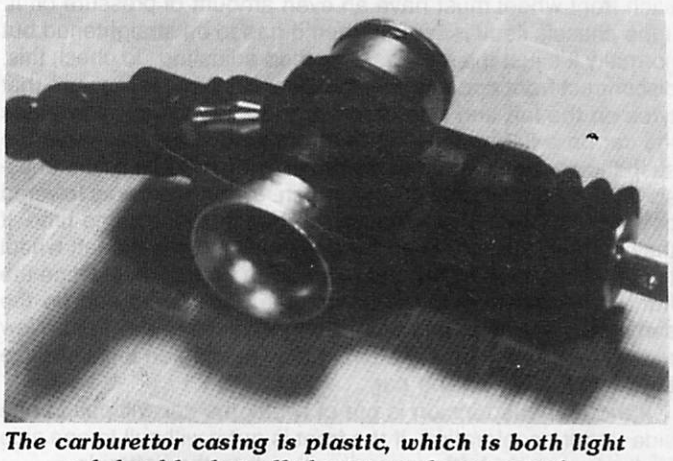
The Picco P5 should be available from your neighborhood hobby shop, and if it's not, the shop keeper can contact the wholesaler, T.E.S. Wholesale in the Melbourne suburb of Box Hill, or the importer, Keith Baldwin, at Finescale Models in Colac, Victoria. A Picco P5 will set you back somewhere in the vicinity of $350, depending on where you buy it, discounts etc, but it's a motor worth having.

For the record, the test motor was a five port, fitted with a 7mm carburettor. Thanks Keith for supplying the review motor, complete with manifold and tuned pipe.

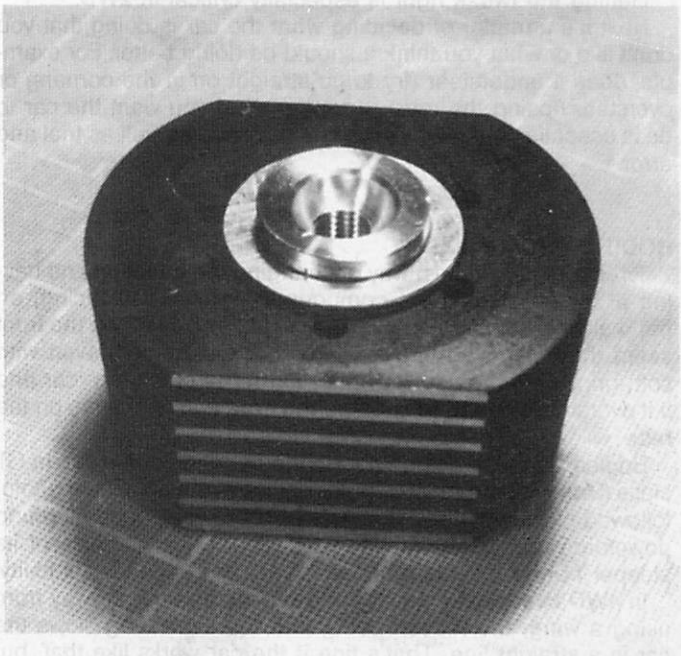
The P5 itself. It has clean lines, although is perhaps slightly larger in external size than other 21 motors.



The crankshaft is solid and provides for flywheel attachment with either a clutch nut or a spring clip, which ever is appropriate.



The carburettor casing is plastic, which is both light and durable, but all the internals are metal.



The P5 head is black coated alloy, with a healthy in-built combustion chamber.

1/8 CIRCUIT

BY ASHLEY COX

Different drivers need their cars set up in different ways to get the most from their particular style and ability. Starting out in model cars is often made worse by an ill handling car, so hopefully the following will help by explaining what effect different adjustments make.

The first step is to check the tweak. Each rear wheel and each front wheel must have an even amount of pressure on it. If the chassis itself is twisted then it has to be straightened but normally it's just the springs that need adjusting. To check this, disconnect front and rear roll stabiliser bars and make sure that tyres on the left and right sides are the same size. Now place the car on a flat bench with the front near the edge, settle the suspension, then with a screwdriver in the middle of the chassis lift the front wheels off the bench. When the car is lowered both front wheels should touch the bench at the same time. If they do then the rear suspension is OK, but say the left wheel touches first, then stiffen the rear spring on that side. Once the front touch at the same time turn the car around and do the same from the rear, this time though adjusting the front. Now make sure the roll bars are straight by placing on a flat surface before replacing on the car.

If the rear suspension is out of tweak the car will pull to one side under acceleration, if the front is out it will pull to one side under brakes. In both cases it will pull to the soft side.

Getting the tweak right is especially critical in 2WD.

Next it's a matter of deciding what the car is doing that you don't like or what you think it should be doing better. For example, does it understeer (try to go straight on in the corners) or oversteer (losing the rear). Knowing what you want the car to do is essential and may take some patience as well as trial and error.

BODIES AND TYRES

Tyres are the simplest way of changing the handling and having a couple of different compounds (for on-road racing) on hand always helps. SILVERS on the rear and JAPS on the front seem the most liked choice. If the car understeers even with soft, grippy tyres on the front, try harder tyres on the rear and if it oversteers with hard tyres on the front try softer tyres on the rear.

Bodies also play a large part in the handling of the car. In GT class (Can-Am) the most popular choice is the Lola, (see photo) followed closely by the Elfin. The Lola provides good all round downforce and good stability where the Elfin, because of its steeper front, provides more steering but a little less stability.

In 4WD over recent years there has been a trend away from using a wing, the reason being that the extra drag slows the car in a straight line. That's fine if the car works like that, but if all else fails and it needs a wing, use one, you stand to make more ground round the corners than down the straight.

In Saloons it has to be the Corvette, and in FI the new Benetton looks good. I haven't run one yet but it has a large steep front wing which is what's needed. Before buying a body that simply looks good consider whether you will get more enjoyment looking at it than driving it.

Shocker dampening needs to be reasonably heavy on the front, (for 1/8 on-road) softer will make the car unstable, particularly under brakes, where the rear needs to be fairly soft. Softer springs provide more grip: on the front that means less stability but on the rear will improve stability. Harder springs do the opposite, giving less grip, which on the front means more stability while on the rear less stability. On some cars which use torsion bar type springs, softer/harder springs may not be available so the right dampening of the shockers becomes more important. The preload on the springs should be adjusted to give even tyre wear. If the tyres cone toward the inside increase the load on the spring, or if the tyres cone toward the outside decrease the load on the springs.

The ride height of the car should be set as low as possible without the car bottoming out excessively, normally about 4mm. Ride height can be adjusted by spring tension or, on some cars, with specific ride height adjustment. If the car is too high it will be very unstable and may even roll over in the corners.

Changing the roll bars, either by replacing with different size wire (piano wire in various sizes is available from model shops), or by changing its length, the shorter you make it the harder (less roll) it becomes. The heavier the roll bars are, the flatter the car will be in the bends which means the car will slide more, giving the effect on the rear of more steering, while stiffening the front would give less steering.

CASTOR & CAMBER

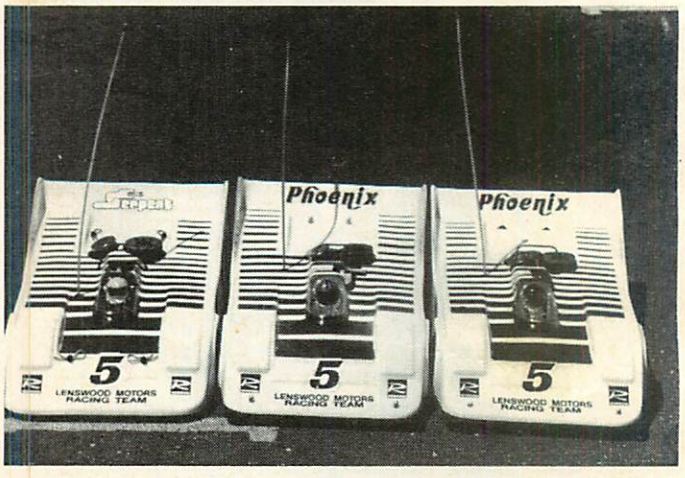
All cars have castor adjustment on the front wheels (the angle of lean-back of the king pin). Maximum castor angle will give more straight line stability and also more turn into the corner. Minimum castor gives more power-on steering.

Some cars also have camber adjustment, which is the angle that the tyre sits in relation to the road. Negative camber (in at the top of the wheel) gives more traction, where positive camber gives less. This also has an effect on the tyres coning.

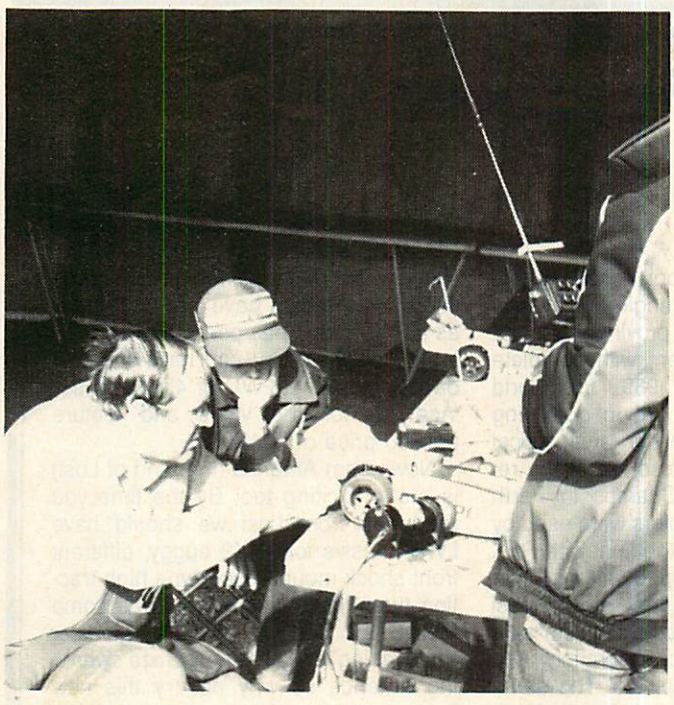
DIFFERENTIAL

Tightening the diff. (in the case of ball diffs.) makes the rear of the car more steady, giving the effect of more steering; running it as free as possible gives the car more rear traction. Never let the diff. slip under power as this may cause damage.

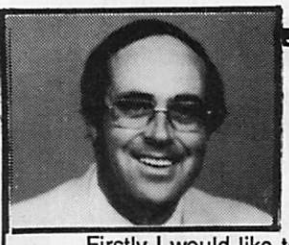
Setting up a car to suit a particular track and driver takes time and Practice. Knowing what you want the car to do is the only way the right adjustment can be made. When the car goes well the time spent will have been worthwhile.



Lola bodies are the most popular choice for handling, ahead of the Elfin. Pic taken at the 1988 500 lap teams race in Adelaide.



The Reades at work on their PB. Rob Reade is one of the originals in 1/8 gas.



NEWS & VIEWS

Rob Reade

Firstly I would like to thank all of you who supported our product lines during the year and wish you all a Merry Christmas and a happy and Prosperous New Year.

A lot of exciting things are happening here at PMBCA so read on because there will be something to interest you.

PRO 10 ELECTRIC CIRCUIT CLASS

The PB Sizzler is the big winner here in SA having won 5 out of 6 of the Nascar oval race days and at the end of November completely dominating qualifying and winning the SA Champs (Sports GT). It is also currently proving a hit in the fiercely competitive American market. Shortly we will have a range of options available for even better performance and these include an arrow rear track conversion, graphite chassis, ballraced hup carrier diff end and instructions for mounting the rear shocker upright (aids stability and traction). Call us for details and where to buy our 'Sizzler' or options.

I/8 CIRCUIT PB PHOENIX

This racer in its 1989 form is probably the most underrated 4WD 1/8 kit currently available in Australia. It is the most winning car in SA and WA. It's packed with features like universal joint drive axles all round, 2 speed auto gearbox, quick change rear wheels, a very efficient 2 belt transmission system (most other cars have 3 belts), adjustable limited slip differential, fully adjustable 4 wheel independant suspension all round and much more. The on track performance is there, the features are there and best of all the price is right! Currently stock is available at $648.00 and this includes a Group C Sauber Mercedes bodyshell and 5 extra pair of front and rear rims as well. PS. We also have some graphite after market parts available for Phoenix.

Secondly that world wide favourite, the Serpent Sprint is now available on a special deal. With a rec retail of $725 this 4WD 2 speed auto kit now comes with a spare set of front and rear wishbones, spare 5 piece belt pulley set, extra set of 3 sp gears and the right tyre combination of Arrows Silver rear and 'Jap' front tyres. Order now while current stocks last. For those who would like to compete in a 2WD class, we have stock of the latest Serpent Sprint 2WD kit. Details upon request.

NOVA ROSSI AND
REX 3.5cc ENGINES

We are direct factory import agents for these very special engines. The new Rex motor is certainly proving the motor to have at the moment with complete domination at the 1989 1/8 World Champs (1st, 2nd & 3rd in qualifying and 1st, 2nd & 3rd in the race!). Local results back this up also like at the recent 1/8 Australian Champs in Perth Nova Rossi or Rex motors were used by EIGHT out of TEN in the final with REX motors taking out top qualifying spot and 1st place in the final. Nova Rossi make a range of 3.5cc motors in side and rear exhaust configuration and plane and boat motors too. The same quality of manufacture applies to Nova Rossi accessories like glo plugs (all heat ranges), mufflers, manifolds, fuel filters, air cleaners, clutch systems for PB Phoenix and 1/8 scale tyres. Details upon request.

ARROWS TYRES

We are Australian direct factory importer for the most popular range of 1/8 scale tyres in the world. These include Arrows 10 (pink) and 7 (silver) rears and long life 56 and 57 fronts. By the time you read this, we should have the new 11 (purple) rear tyres. The Arrows 56 and 57 front tyres also work very well on the front wheels of the PRO 10 electric circuit car. Yes, they are expensive for these cars but they do last a long long time on these light 2WD cars. Available from most good hobby shops.

MIXING YOUR OWN FUEL
FOR GLO PLUG ENGINES

We are Australian direct factory importers for EDL oil, a very special synthetic oil for use in mixing your own fuel. It has proven to have superior lubrication properties and is by far the most popular choice of 1/8 scale racers here. Highly favoured also now by model flyers, both plane and helicopter and boat racers as well. Tech sheet available on request. From the same source (Model Technics), we also have a special after run engine oil (250ml tin).

1/10 BUGGY CLASS

Plenty to tell you about here. The ever popular PB MINI MUSTANG at $199.00 (not a msiprint) is the cheapest 4WD fully ballraced competitive buggy available (winner stock class 89 NATS). Real value for money from PB! The new PB 'ACE' 4WD buggy is now in stock (Review last D&T). As it is a rear engine 4WD some racers have already tried it as a 2WD and it has performed exceedingly well. Now you can have the best of both worlds of 2WD or 4Wd with the 'Ace' all for the value and feature packed price of $349.00.

News from America (the land of Losi) is pretty exciting too! By the time you read this from Losi we should have LWB chassis for JRX2 buggy, different front shock mounts, new type high traction tyres, new wind motors and some MONSTER TRUCK JRX2's. Monster truck racing is the hot new craze sweeping America so why not try this new form of exciting and entertaining buggy racing now.

GENERAL

We have a complete range of the superb bodyshells made by Kevin Frewer in New Zealand. In 1/10 this includes Sierra, Commodore, Porsche, BMW, VW Jaguar and more as well as body mount kits, wings, gear covers, undertrays, tyres and the new Frewer SLICK BUGGY TYRES. Talking bodyshells, we also have from Sarik Vacform in UK in 1/8 scale body shells, VDS Lola, Sierra, Zakspeed F1, Benetton F1, Group C Porsche 962 and Group C Sauber Mercedes.

Left over from a huge STM shipment of goodies we had for the 1/10 Buggy World Champs in Sydney are some very high power SCE 1700 battery packs, some Model Motor Sport items for the Top Cat and quite a few other special items to improve your buggy performance. We also have plenty of 64 DP pinions and spur gears left over at give away prices. All items must be cleared so check with us for details.

Another fun machine we have is the MARDAVE MINI 1/12 stock car. Very fast for this scale and very exciting. Comes with motor and speed controller. Rec Retail $120.

From time to time, we come across very good second hand equipment. At the time of advert preparation, we have 2 PB Maxima 1/10 buggies, 1 PB X3 Mustang 1/8 4WD off roader, 1 1989 Pb Phoenix 1/8 4WD circuit racer and 1 PB 9S Omega 1/8 2WD circuit racer. All are in 'as new' condition. Call us for details.

Happy racing
Rob Reade

This edition of Bird Torque might well be called 'Counting the Cost.' Gas car racing or 1/8 scale is slowly regaining its popularity here in Australia, but the initial reaction from most people, especially those involved in electric racing, is that it's too expensive. Well, I thought it could be a useful exercise to devote this edition's column to examining the cost differences.

As a start, I've had to make some basic assumptions for cost comparison. The first is that the costs are based on a club racer who, while not a world beater, does like to win a few races and have a shot at a State Championship. And the second is that the said racer will replace items as they wear, rather than waiting until the break, or totally collapse. For the purposes of costing, I'm leaving out the cost of a two channel radio system, as it's common to both 1/8 and 1/10 and because anyone changing from one scale to the other will usually keep their radio gear.

The first step is to buy a kit. Let's look first at setting up a 1/10 scale 4WD off-road buggy. By the way, as much as possible I've taken prices from D&T ads, although in some cases I've had to ring shops or wholesalers for retail prices.

Car Kit	$450.00
Modified Motor	$160.00
Electronic Speed Controller	$185.00
Ni-Cad Packs (4 needed for racing)	
@ $108.00 each	$432.00
Charger $135.00	
TOTAL SET UP PRICE	$1362.00.

Naturally, it's possible to buy cheaper items by shopping around, and I deliberately haven't mentioned brands because of the significant difference in prices, although I've tried to take an average price for average quality products which are available from almost every hobby shop.

Now, let's check out the cost of getting started with a 1/8 scale 4WD off-road buggy.

Car Kit	$425.00
Buggy 21 Motor	$150.00
Tuned Pipe	$30.00
Starter	$50.00
Glo-Driver	$25.00
Fuel	
(10% Nitro x 2 Litres)	$21.00
TOTAL SET UP PRICE	$701.00

Frightening, isn't it? The gas buggy works out at almost half the price of the electric car.

What about on-road or circuit cars? Once again 1/10 scale first, and the car kit price includes ball races.

Car Kit	$310.00
Body	$30.00
Modified Motor	$160.00
Electronic Speed Controller	$185.00
Ni-Cad Packs	
(4 needed for racing)	
@ $108.00 each	$432.00
Charger	$135.00
TOTAL SET UP PRICE	$1252.00

Now here's the equivalent in 1/8 scale.

Car Kit	$600.00
Body	$32.00
Buggy 21 Motor	$150.00
Tuned Pipe	$30.00,
Starter	$50.00
Glo-Driver	$25.00
Fuel	
(10% Nitro x 2 Litres)	$21.00
TOTAL SET UP PRICE	$908.00

Not as great a difference, but still cheaper to race 1/8 circuit. Ah, you might say, what about the running costs, after all with an electric car I only have to recharge the Ni-Cads before each meeting. Well, that's true, up to a point. And this is where is gets down to just how competitive you want to be. Top electric buggy drivers will change motor brushes every two races, at about $6.00 per pair of brushes. Some racers will have three or four modified motors at $160.00 each. Then there's tyres, which do wear out and can be replaced at about $10.00 per pair. Ni-Cads also wear out and need to be replaced, probably twice a year.

So, running costs become harder to calculate, because they depend on the individual. From the gas car side, you'll need tyres on a regular basis, especially for on-road and they're about $20.00 per pair. You'll also need to buy more fuel, which can be calculated on the basis of using about 1.25 litres per meeting of four heats and one 30 minute final; or about $13.00 per race meeting.

Of course, none of these comparisons include replacing broken parts, or worn out parts; it's just the starting out costs, assuming you already own a two channel radio set.

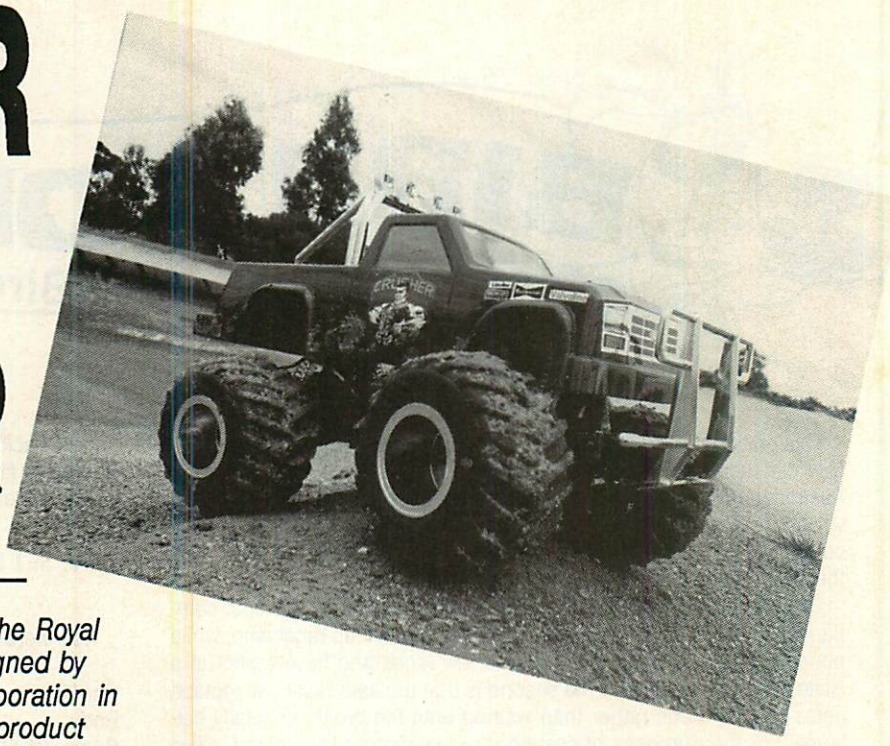
Something else which needs to be considered as well is the closeness of the appropriate track and club to race at. Gas racing might not be as cheap by the time you've included travelling costs!

Whatever your choice, visit you local hobby shop to check prices, kits etc. Without the support of our local hobby shops, the sport won't survive.

I know it can be tempting to order products from overseas, using the phone and a credit card but it's a risky business for several reasons. Firstly, just because a product is advertised in an overseas magazine at a cheaper price doesn't mean that it will be cheaper by the time it arrives in Australia. As an example, I know someone who decided to buy a new off-road electric buggy from England, rather than an Australian shop, because the advertised price was quite a bit cheaper. But by the time he paid airmail postage, customs duty and sales tax, he finished up spending more on that buggy than he would have paid for it in an Australian shop! And you can't expect the local shop to carry spare parts for buggies and cars that he doesn't sell.

That's it for this edition, and if you've got any helpful hints to pass on to other racers, send them in to me at Dirt & Track for inclusion in Bird Torque.

CRUSHER it's a MONSTER



Here's one for all you monster truck fans, The Royal Crusher. That doesn't mean it's been designed by Charles and Di. It comes from the Royal Corporation in the United States. And it's nice to have a product other than Japanese or English, for a change.

by Paul H Bird

FEATURES

Royal's Crusher features ABS resin chassis and suspension components, two wheel drive with four wheel steering, mechanical speed controller and 540 motor.

INSTRUCTIONS

The first thing about the instructions which is unusual is that they actually recommend boiling certain suspension parts to improve flexibility and toughness! The instructions are generally well prepared, with good illustrations using the exploded assembly technique. I found the text section alongside each drawing rather irritating as it refers to each part by a number, rather than describing the part itself. This usually means turning to the back of the book to find out what you're supposed to be putting where. That aside, the kit goes together very well.

PUTTING IT TOGETHER

Assembly is very straightforward, starting with the differential and rear gear box housing. Make sure you use plenty of grease here! I felt the grease supplied was a little thin, and there wasn't enough of it, so I used a plastic grease instead, which seems to have worked well.

Motor installation into the housing is similar to some of the Tamiya cars, using a system of spacers to locate the mounting bolts to allow the correct gear mesh. It's worth taking a bit of time here to get the mesh right, otherwise you'll either strip gears or bind up the motor.

The front and rear gear boxes (the front's empty because it's a two-wheel drive) also serve as suspension arm mountings and hold the body posts too.

Make up the servo savers next. These are good heavy duty items, and should work well. The front and rear suspension/gearbox units bolt onto the ABS resin main tub chassis, and everything else is added.

RADIO GEAR

The radio gear is installed into the chassis itself, and onto a top plate. I chose to use Challenger gear for this test, and while everything fits, it is a little tight. Connecting up the gear isn't difficult, but take a little time. To set the steering up, switch on the radio gear and bring the servos to their central point. Make sure that the front and rear axles are parallel and adjust the links so that everything's right.

Setting up the mechanical speed controller supplied is just as easy. It's simply a matter of loosening a grub screw and sliding the linkage bar along until you get the right length.

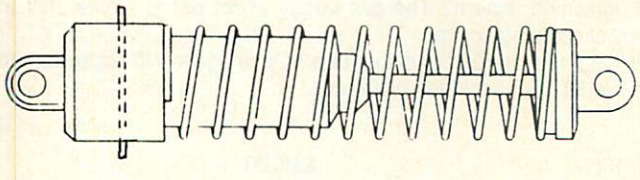
ON THE ROAD

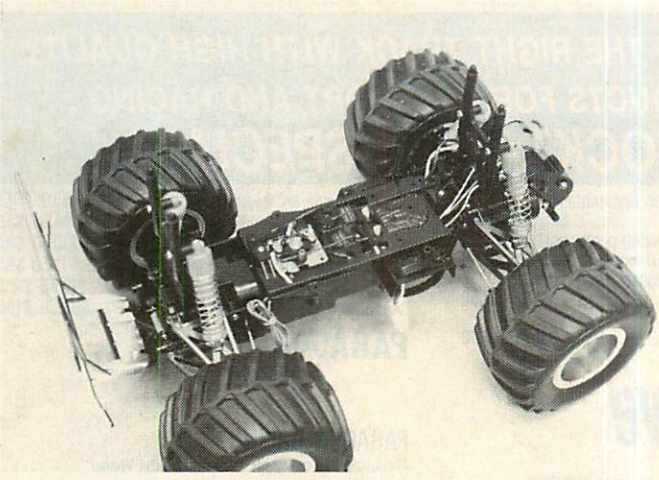
The body shell is clear Lexan, although the finish looks rather rough. But don't be deceived, it's actually a great idea. The body's external surface is protected by thin film of plastic, which you peel off after painting and cutting out.

Having fitted everything together and installing two-channel radio gear, it's time to charge a battery and have some fun! This thing moves very quickly! It also turns on a 5 cent piece because of the four-wheel steering. The high ride height and long throw suspension combine to make it capable of climbing over most obstacles, including other R/C cars. My son wasn't overly impressed when I ran over his twelfth scale pride and joy, but that's what car crushing is all about!

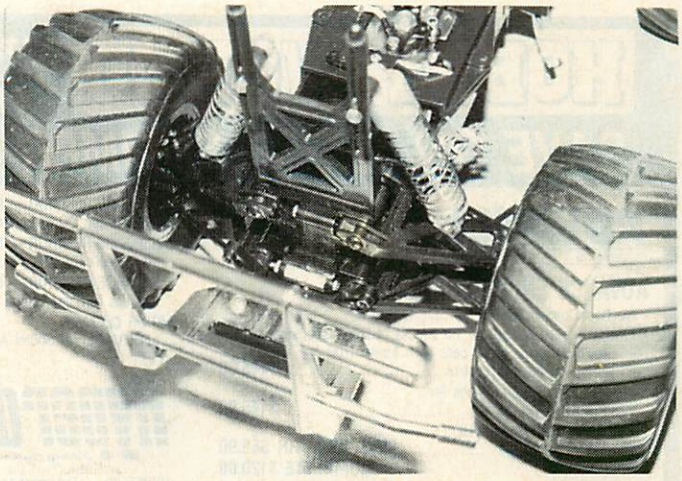
One point that I feel needs fixing is the coil over springs. These are too light. To remedy this problem is simple. Just S T R E T C H the spring by about 4cm's. To stop the top of the shock coming off with the increased spring tension, drill a 1mm (or similar size) hole through the top of the shock where the two sections join and fit a 1mm piece of wire through the holes to stop the pieces coming apart. (See Diagram). My son wasn't overly impressed when I ran over his twelfth scale pride and joy, but that's what car crushing is all about!

Basically, I'm impressed with this kit. It's easy to build and should provide lots of fun for the person who wants an R/C car to punt around the back yard. Of course, you could go down to the local race track and run over all those buggies, couldn't you? Finally, thanks to Tony Duggan at Radio Control Supplies for the review kit, which is available through your local hobby shop.

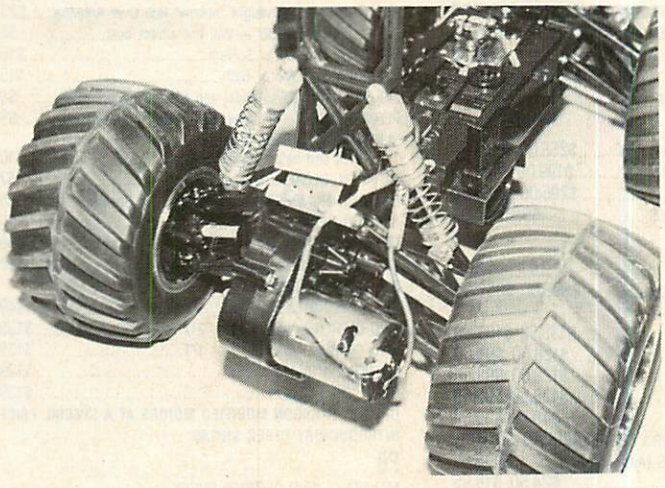




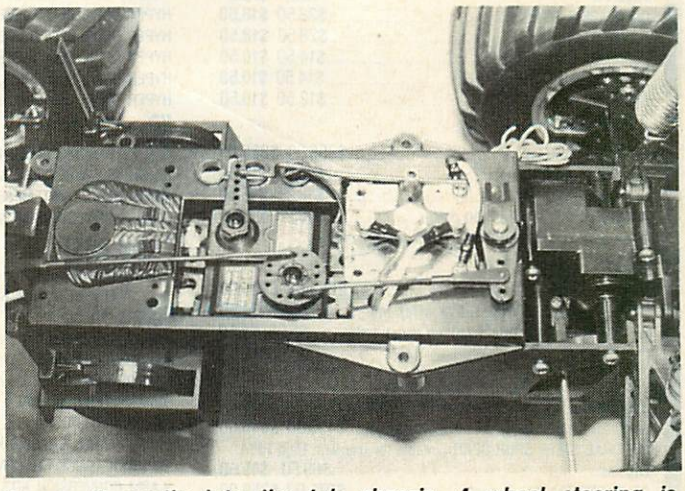
The Crushers chassis is a one piece moulded tub which gives the vehicle strength and can be built quickly by almost any modeller.



View of the front end. Shocks could be modified (see text and diagram) and springs re tensioned.



Motor is outboard at the rear and needs to be protected from the mud and dirt by a filter.



Servos fit neatly into the tub chassis. 4 wheel steering is accomplished with one servo.

REVIEW AT A GLANCE

Quality of instructions	★★★★
Ease of construction	★★★★
Quality of materials	★★★★
Motor supplied	Yes, 540
Chassis type	ABS resin tub
Suspension type	Independant arm
Shock type	Coil over friction
Sway bars	No
Ball races supplied	No
Motor accessibility	★★★★★
Battery accessibility	★★★★★
Speed controller	Yes, mechanical
Steering servo saver	★★★★
Body shell	Clear Lexan
Balance of car	★★★
Handling on track (as tested)	★★★★
Ease of setting up	★★★★

HOBBY WORLD

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RC10L ON ROAD	$255.00	**$225.00**
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DIGITAL PULSE PEAK CHARGER	$255.00	**$225.00**
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OPS 21 COMPETITION (6 port).....$275.00 **$255.00**
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KO

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TEAM LOSI

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SANYO

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LEXAN WINGS — 8"	$8.95	**$4.95**
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SHOCKING NEWS

FOR ASSOCIATED DRIVERS

by Geoff and Reece Birtles
Team Associated Australia

We went on record in the August '89 (#13) issue of Dirt & Track. Associated would win the Worlds 1, 2 & 3 or we'd take the Kyosho sticker off our dartboard!

The Kyosho sticker is still on our dartboard and 'Staircase' (Ian Bannister, of Dawn Trading) is still smiling and you don't see that too often!

And just to prove that it doesn't require a special RC10 to beat the opposition, Reece immediately followed this up with a TQ, Templestowe track record and Victorian Title, using an RC10 Graphite, just like you can buy from your local hobby store.

The bad news for many new Associated owners is that they have got their shocks set up all wrong. Get them wrong and you've got shocking performance (Awful isn't it!).

Roger Curtis (co-owner of Associated) was good enough to take half an hour out of his busy Worlds schedule to talk shocks and spring rates with us. During this time he explained the correct use of the many shock angle options available on the new RC10.

The RC10 shock tower has four mounting options. The front A arms have two options. Theoretically this provides a total of eight choices. In fact, you have only three choices with kit shocks, which can be increased to four using optional longer shocks.

Diagram 1 shows your mounting options using kit ('short') Associated shocks (P/N 6449). Note that the shock length restricts you to use of the inside A arm hole. (Use of the outside hole does not provide sufficient 'droop' due to the short shock length.)

Another important point to note is that the outside hole option (marked*) on the shock tower, is the old RC10 mounting position which seems to work for no one but Masami, who favours it from time to time. We'll keep it simple by stating that the geometry is all wrong in this mounting position. It provides good exiting stability but the car will be very unpredictable on entry.

This now narrows your choice of mounting positions to two, for short shocks. Do not despair — both positions work just fine.

(L) on the diagram shows your only option for Associated 'longs' (P/N 6448). Use of the inside hole on the A arms or other tower mounting positions results in too much 'droop', which will make your car want to lift its nose, always at the wrong time.

It is important when setting your RC10 suspension to remember two fundamentals:

1. A more vertical shock will provide a more rising 'rate' suspension, ie. very soft when extended, notably increasing to very stiff on compression (ie. Very progressive).
A flatter shock angle has less 'progression' and feels 'softer and slower' than a vertical shock, given the same spring and dampening oil. (It's a much 'safer' option than a vertical shock, much easier to set and drive.)
Track conditions and driving style will determine which combination works best for you.

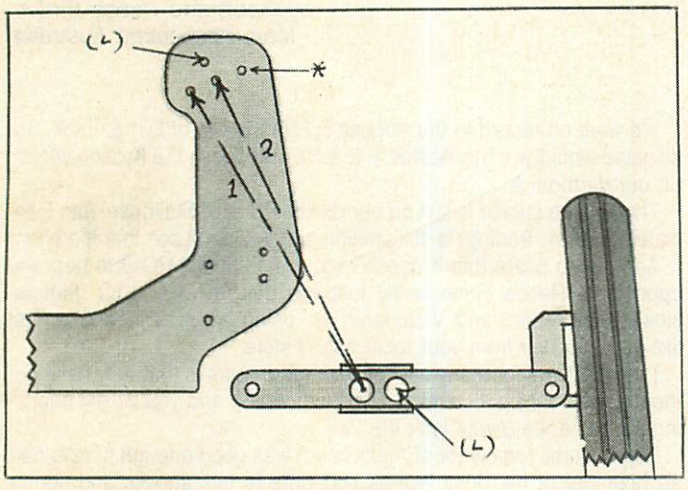
2. Spring compression does not change spring rate, ie. it doesn't make the suspension stiffer. It simply raises the ride height of the car. If you want a softer suspension, go to a softer spring and readjust your spring compression for correct ride height.

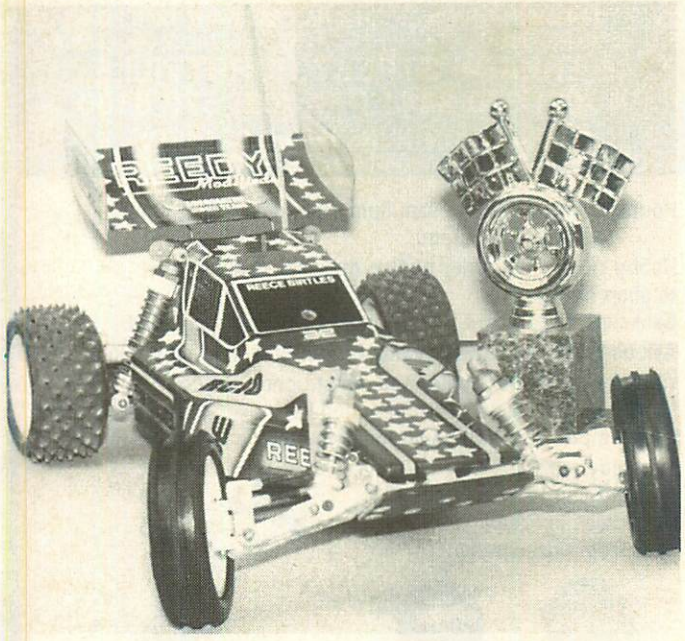
One curious fact we've noticed with our new RC10, is that it likes a front roll bar when using short shocks on a good grip track. More observant racers will have noticed that we did not run a roll bar at the Vic Titles. That's because we ran long shocks on the outside A arm hole.

Finally, commence tuning with Associated 20 WT oil. This is just about right for most conditions. For some inexplicable reason Australian racers are pre-occupied with over dampening. If you get the chance try Associated's new Silicone oil. It is infinitely superior to any other product we've tried and we noticed all the top teams at the Worlds (not just Associated) were using it. Try it, you'll get a shock!

STOP PRESS! STOP PRESS! STOP PRESS! STOP PRESS!

We believe Dawn have finally buckled under pressure and are soon to land a shipment of Associated oil.





Above: Reece's RC10 Graphite alongside his Victorian Title TQ trophy. Front of car is set up for a medium/good grip track using short shocks. A roll bar (not pictured) can work well with this set up. Paint job courtesy of Mark Winsdor.

Left: Stock (short) shock mounting options for RC10 Graphite. Do not use hole marked * unless you are really dialled — see text. The only option for 'long' aftermarket shocks is indicated by (L).

NICAD MATCHING ON THE CHEAP!

by Mathew Prentis

Build our discharger and use our computer programme for your own Ni-Cad evaluation.

For those that can afford it, there is no shortage of little black boxes for finding the discharge capacity of a Ni-Cad or battery pack. The process can also be done manually with a stopwatch and resistor but it's not very accurate and takes forever.

Following is a semi-automatic method that should give very accurate results. It is in two parts. Firstly the construction of a constant current discharger and then a computer programme which will take the results of a discharge and calculate total energy. If you can put together a simple electronic circuit (discharger) and programme a Commodore 64 or similar (Ni-Cad assessor) then here's a way to achieve professional results at a fraction of the cost.

CONSTRUCTION

Assemble all components on vero board except for the 2N3055 transistor and the 0.5 ohm resistor, as these must be mounted on a heat sink. All connecting wires must be kept as short as possible and the wire used should be similar to that on your Ni-Cad packs, if these wires are too long or too thin the current drawn will fall off near the end of the discharge.

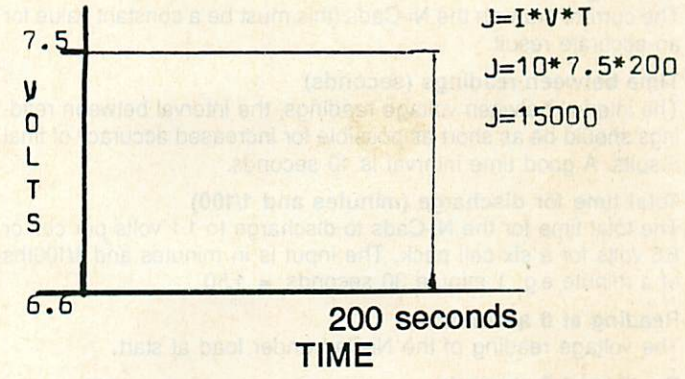
To set up the discharger

Connect discharger to 12 volts D.C. and connect a volt meter across the 0.5 ohm resistor with volt meter set to read 5 volts, connect the Ni-Cad pack to the discharger and adjust 5K pot to desired setting (see table below).

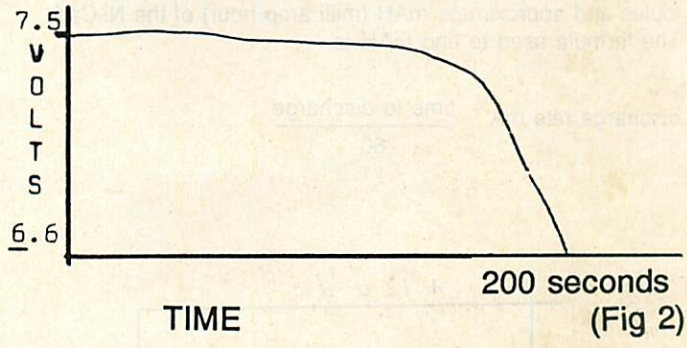
Voltage drop across resistor	Discharge rate (amps
five (5) volts	10 amps (maximum)
four point five (4.5) volts	9 amps
four (4) volts	8 amps

Low discharge rate can be achieved by increasing the 0.5 ohm resistor to 1 ohm this will halve the current drawn e.g. five (5) volt drop will be 5 amps.

The high wattage resistor can be purchased from Radio Spares or you can make one up by using five (5) 10 watt 2.4 ohm resistors in parallel.



(Fig 1) 10 Ampere constant current



(Fig 2)

NI-CAD ASSESSOR

by M. Prentis and S. Kittel

If we graph the discharge of a Ni-Cad on a constant current load, using time as the x axis and voltage as the y axis we can calculate the total energy (Joules) released from the Ni-Cad pack.

What is a joule you may ask, well a joule in electrical terms can be explained by the following formula

1 Watt = 1 Joule/second

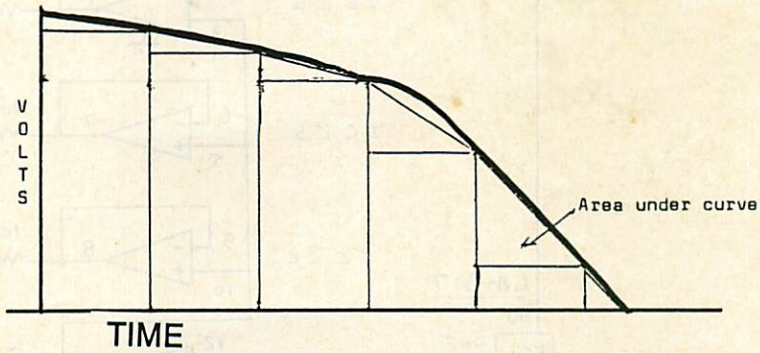
therefore a 50 Watt light bulb will use energy at a rate of 50 joules every second.

To calculate the energy released from a Ni-Cad we need to transpose the formula to suit the information we have available.

Watts = volts * current

Joules = Current*Voltage*Time (seconds)

We need to calculate the variables (Voltage and Time), which is the total area under the curve and multiply by the constant current discharge rate. If the Ni-Cad discharge graph looks like figure (1) it would be a simple task to calculate total Joules. But the discharge of a Ni-Cad is not a straight line but a curve (figure 2).



(Fig 3)

One method to calculate the area under a curve is called the Trapezoidal rule, which basically means you convert the area under the curve into rectangles and triangles (the smaller the better). Figure (3) and calculate the areas of each rectangle and triangle then add all the areas together.

To do this we use the formula

$$\text{Area} = \int_b^a f(x)\,d(x) \qquad \frac{b-a}{2n}[f(x0) + 2f=(x1)+\ldots\ldots 2f(xn-1+f(xn)]$$

The computer program has a form of this formula as the main part of the program, the rest of the program is information gathering and display.

THE PROGRAM

The program is written in basic and will load into a Vic 20 or Commodore 64, after loading the program type "run return" and you will get several questions you must answer.

Discharge Rate
The current draw on the Ni-Cads (this must be a constant value for an accurate result.

Time between readings (seconds)
The interval between voltage readings, the interval between readings should be as short as possible for increased accuracy of final results. A good time interval is 10 seconds.

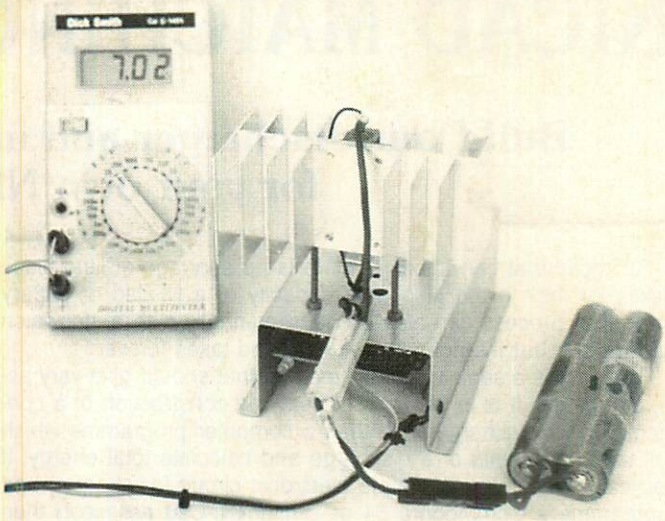
Total time for discharge (minutes and 1/100)
The total time for the Ni-Cads to discharge to 1.1 volts per cell or 6.6 volts for a six cell pack. The input is in minutes and 1/100ths of a minute e.g. .1 minute 30 seconds = 1.50.

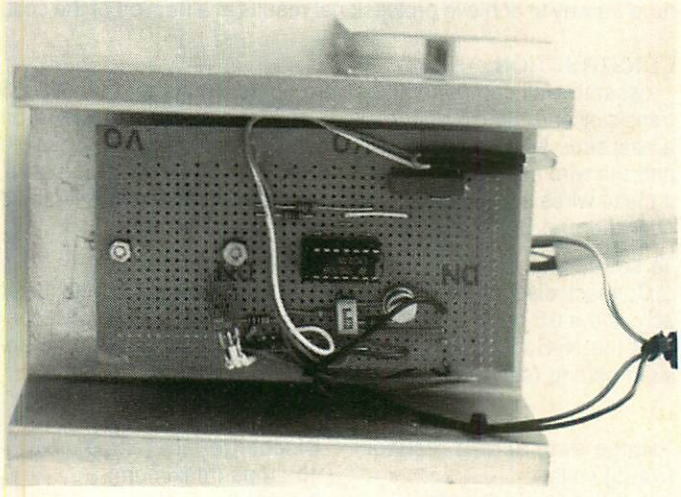
Reading at 0 seconds
The voltage reading of the Ni-Cad under load at start.

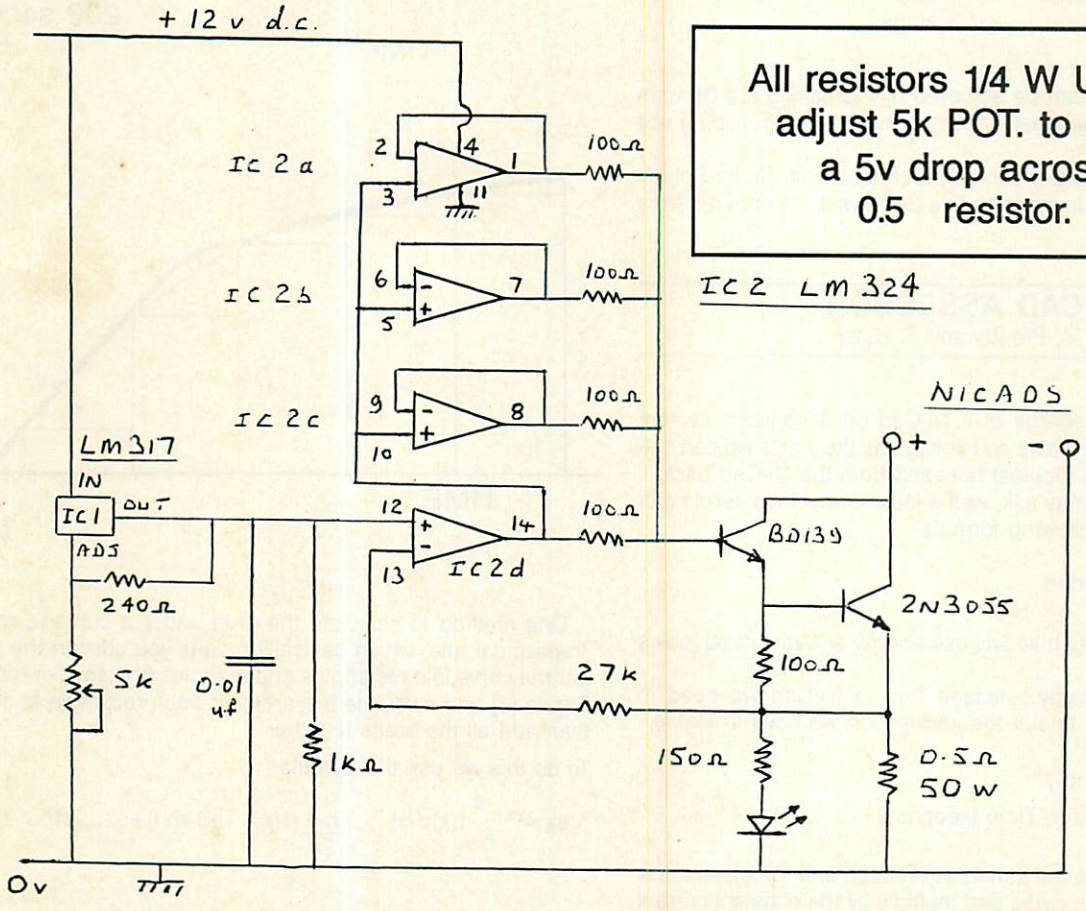
Reading at ? seconds
The voltage reading of the Ni-Cad under load at ? seconds.

After entering all the data the computer will display total kilojoules and approximate mAH (milli amp hour) of the Ni-Cad. The formula used to find mAH is

$$\text{discharge rate mA} * \frac{\text{time to discharge}}{60}$$







All resistors 1/4 W U.N.O. adjust 5k POT. to give a 5v drop across 0.5 resistor.

Ic 2 LM 324

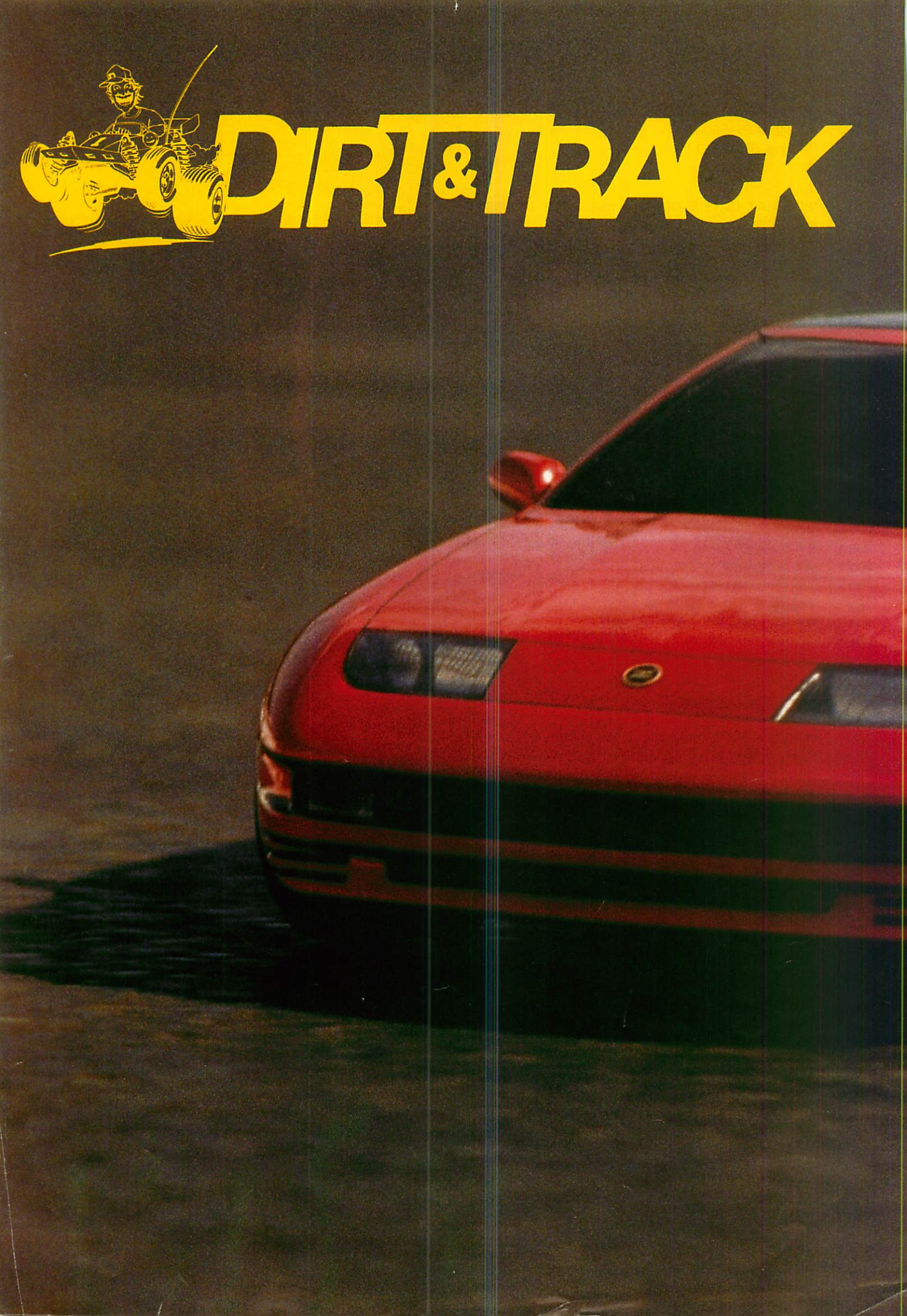
CONSTANT CURRENT DISCHARGER, 10 AMP

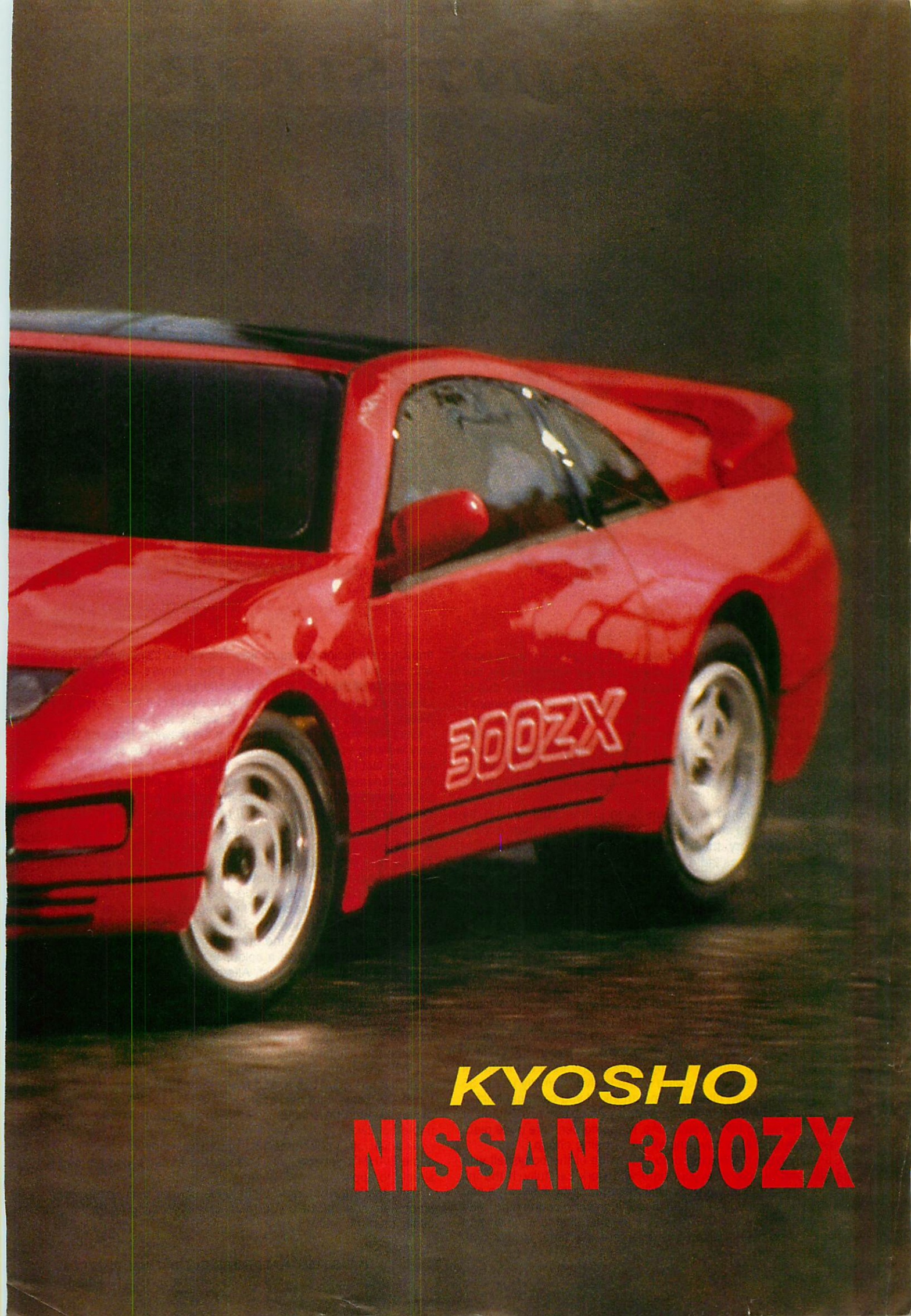
NI-CAD ASSESSOR PROGRAM TO SUIT VIC 20 & COMMODORE 64 COMPUTER

```
10    ?" ♥ "          shift clr
20    ?" NICAD ASSESSOR"
30    ?" by M.PRENTIS"
40    ?" and S.KITTEL"
50    ?
60    ?
70    ?" WHAT IS THE DISCHARGE RATE (AMPS)"
80    INPUT P
90    ?" WHAT IS THE TIME BETWEEN THE READINGS (SECONDS)"
100   INPUT T
110   ?" WHAT IS THE TOTAL TIME FOR THE";p;"AMPERE DISCHARGE (MINUTES & 1/100)"
120   INPUT L
130   I=L/(T/60)
140   DIMA (I)
150   FOR C=0 to I
160   ?" WHAT READING AT"
170   ? ;C*T:"SECONDS"
180   ?"_____ "
190   INPUTA(C)
200   NEXTC
210   S=0
220   FOR C=1 to (I-1)
230   S=S+2*A(C)
240   NEXTC
250   S=S+A(0)+A(I)
260   M=(L*60)/(2*I)
270   J=(M*S*P)/1000
280   ?" ♥ "          shift clr
290   ?"        NICAD ASSESSOR"
300   ?
310   ?
320   ?" ENERGY EQUALS"
330   ? ;J;"KILO JOULES"
340   ?"_____ "
350   H=(p*1000)*(L/60)
360   ? ;H;"MAH"
370   ?"_____ "
380   ?
390   ?" ANOTHER ASSESSMENT Y/N"
400   INPUT B$
410   IF B$="Y" THENRUN
420   ?
430   ?" HAPPY RACING"
```

P.S. ? is short form for PRINT

DIRT&TRACK

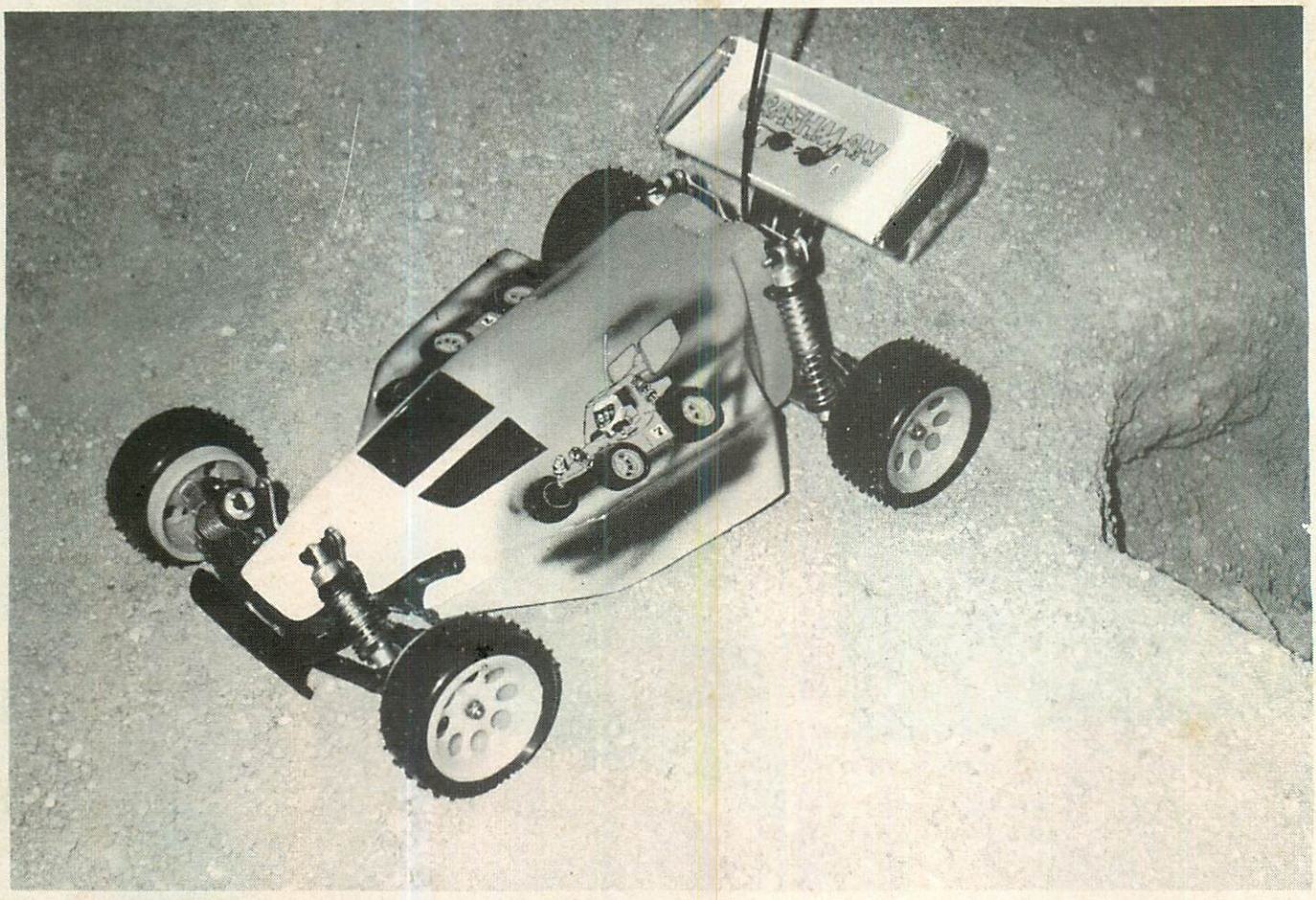




KYOSHO
NISSAN 300ZX

THE PAINT SHOP

by Tony Gray



Most of us have wished that we could create a stunning paint job on our cars, something to really amaze our friends. Sadly, few of us have the confidence to tackle such a job, principally due to lack of knowledge of where to start. Surprisingly it is remarkably easy to achieve a good result, with very little effort. A 'cartoon' type mural always draws admiring glances, and in its simplest form is easy to do. This particular DAHMs 'Ultra' bodyshell, done for Graham 'Crashman' Dettman of the Melton Club in Melbourne, features a simple caricature of a racing buggy, with 'Crashman' lettered on the wing.

The car body should first be prepared in the usual fashion, by thoroughly washing the inside with detergent and then drying. Once completely dry, mask off the windows with a good quality masking tape such as 3M. Don't use cheap tape, as the paint will creep under the edges and ruin the look. At this point I always sand the inside of the body all over, to give a key for the paint to grip to. Use 600-800 grade wet/dry paper and sand lightly. Don't worry about sanding the body, it will not harm it. With the body prep complete, it's time to start painting.

You'll need to find a drawing or cartoon of what you want in a book or magazine or perhaps you can draw it yourself. Trace the original drawing onto tracing paper or greaseproof lunchwrap and try to keep your linework as clean as possible. Once you're satisfied with the tracing, tape it securely to the outside of the body in the position that you want it to be. Make sure that it sits flat against the body, as much as possible. If you've done everything correct, you will be able to see the tracing quite clearly from the inside of the body. To transfer the drawing to the body I normally use a .35 Rotring technical pen filled with Indian ink. If you can't get hold of one of these (they're expensive), any pen which can hold Indian or Technical Drawing Ink will work fine. Mapping pens are quite readily available and also have the virtue of being cheap.

Carefully copy the tracing onto the inside of the bodyshell with the pen and please take your time and work carefully. If the ink doesn't take to the surface too well, resand the problem area and this should fix it. If you're duplicating the drawing on the other side of the car, remove the tracing when the first side is finished and place it in the new position but reverse it this time, so that both drawings are facing the same way. Repeat the transferring process with the pen and ink for the other side. Remove the tracing from the outside of the body and you should be able to see the drawing clearly from the outside. Its important now to let the ink dry completely, I would advise leaving it at least 2 to 3 hours.

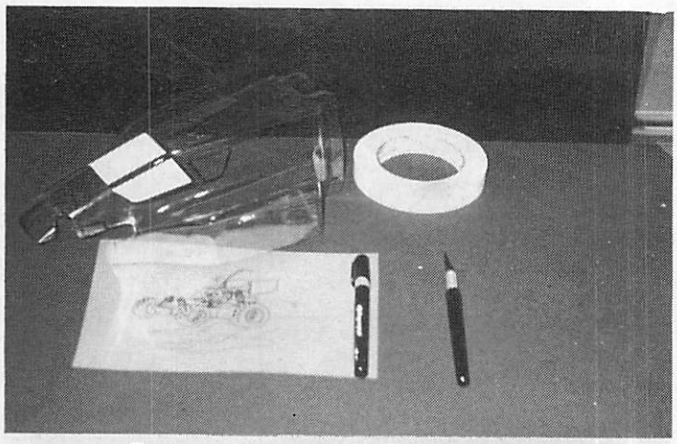
Once dry, you can start to colour in the drawing. Because you're only working in a small area, its not critical to use special Lexan paint, in fact I normally use either Tamiya Acrylic or Testors Modelmaster enamel. Either of these work fine but be sure to 'dab' the paint on rather than brush it, as the ink can still be dissolved by the paint and may start to run. If at all possible, paint right up to the lines just like in a colouring book. When you're happy with the final result after doing all the colours, paint the entire drawing with Tamiya PC-I White, to bring out the colours and to protect it. Once again, be careful when painting on the ink. Stop now and admire your handiwork from the outside. Looks great doesn't it!

Now for the final touches. The simplest background is just to spray a light 'mist' around the outside of the car, with a Tamiya PC spray can. This will 'lift' the drawing from the base colour of the car. Make sure to choose a colour that contrasts with the rest of the car, light colours are best. Alternatively, you can create a real artwork by painting an authentic background, with dirt etc surrounding the car. You can do this by brushwork or if you have the facilities, with an airbrush. The rest of this car, with the sky fading into the earth, was done with Tamiya PC spray cans.

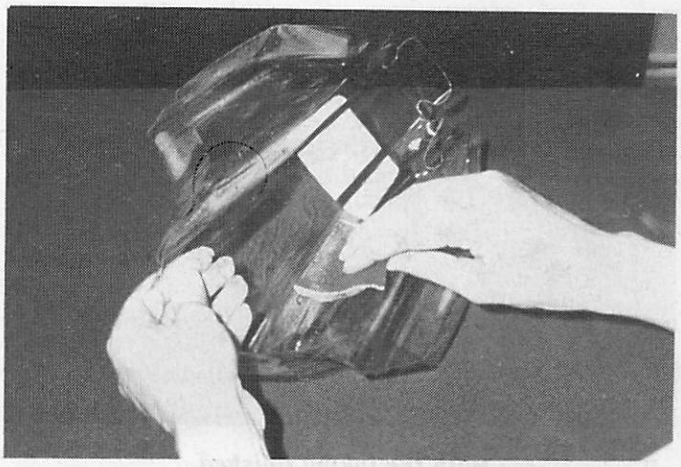
When the painting is completed, I always spray 2 to 3 coats of PC White over the entire inside of the shell. This protects all the work that has gone into it, and really brings out the bright colours. I also use some light packaging tape on the inside of the shell in places likely to be subject to wear, once again to protect the valuable paintwork.

To finish off, rather than just paint the windows black, I used some DAHM's window tint. This stuff is incredibly tough and is simple to apply.

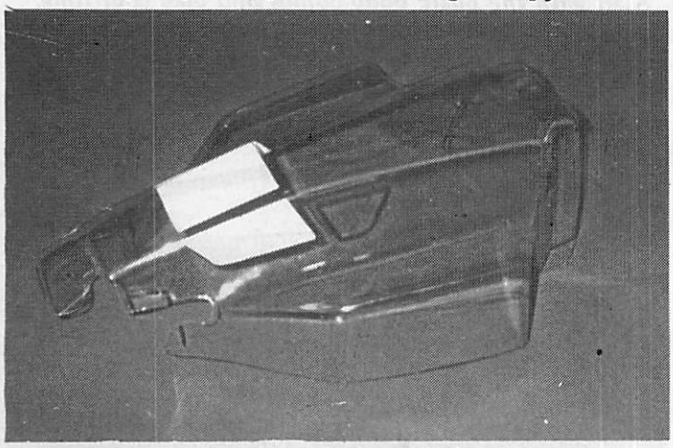
Well, that's it, the same techniques can be used for lettering, stripes etc and can help you to achieve something just a little bit better than the rest.



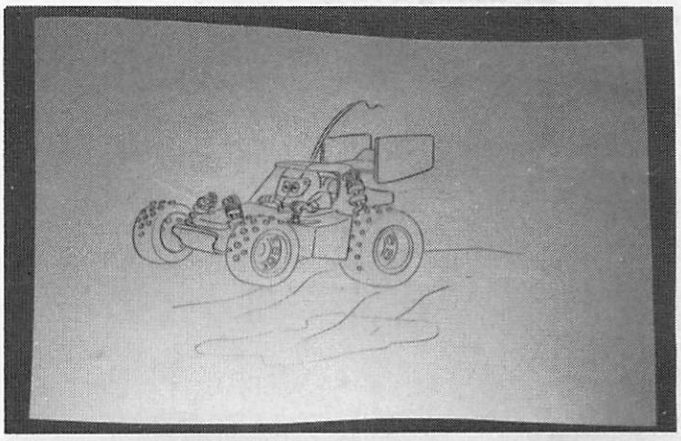
Basic equipment: Masking tape, hobby knife, ink pen and drawing to copy.



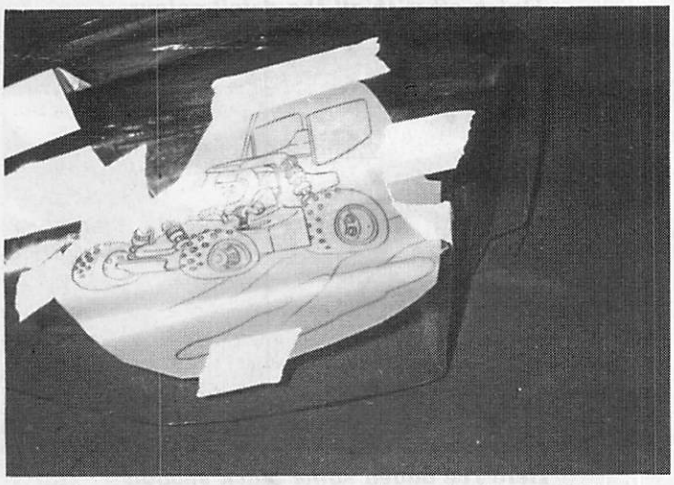
Sanding the shell in preparation for paint.



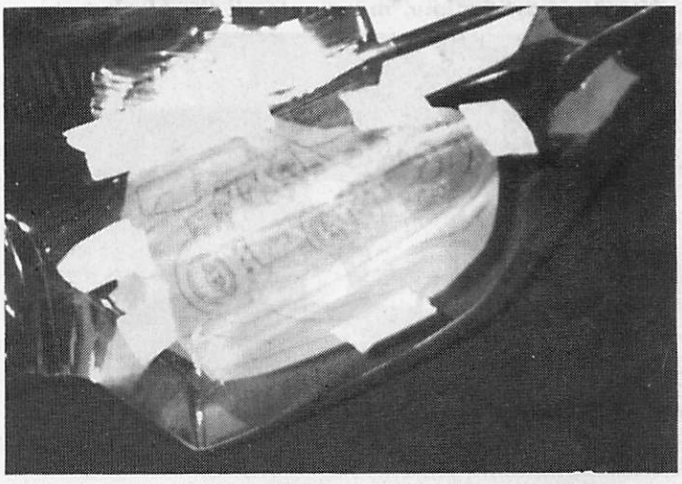
Fully trimmed and masked, ready for painting.



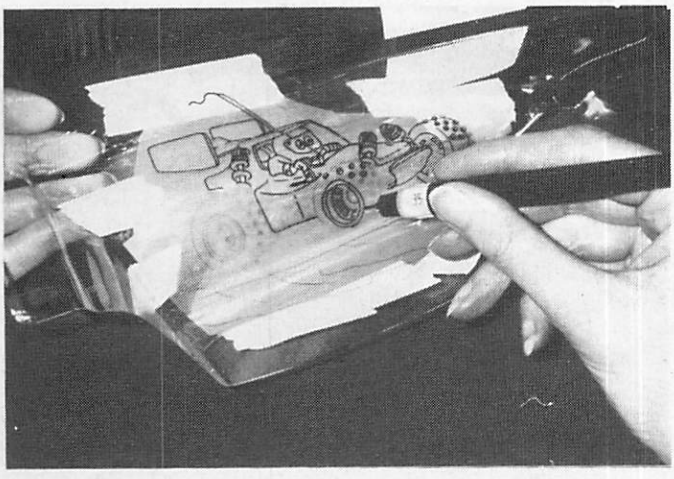
This is the drawing which I prepared for use on this bodyshell.



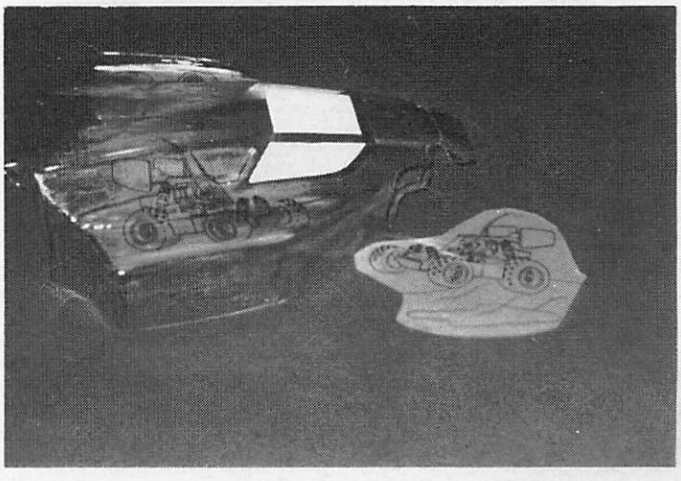
The tracing is taped securely on to the outside.

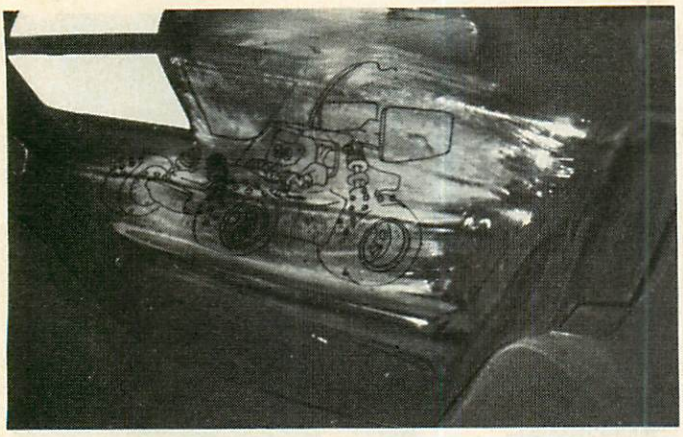


Looking through the inside, you can easily see the tracing on the outside.

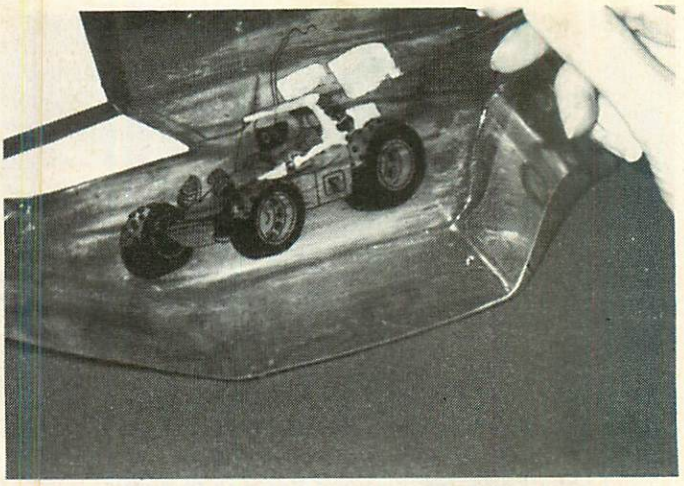


'Inking in' the tracing on the inside of the bodyshell.



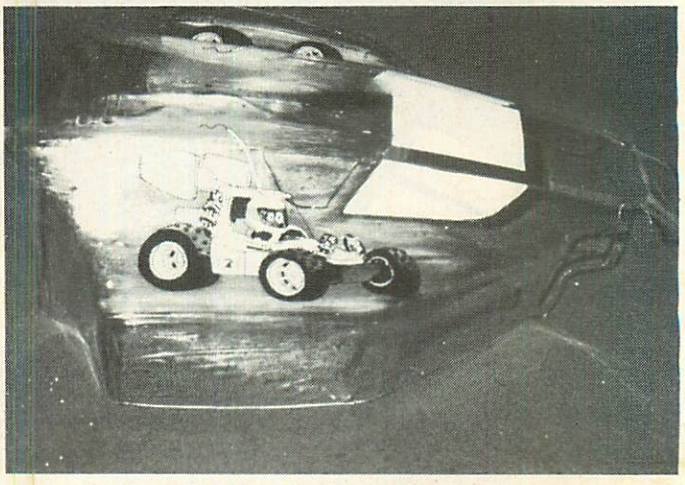


With the inking finished, the drawing is ready to be coloured.

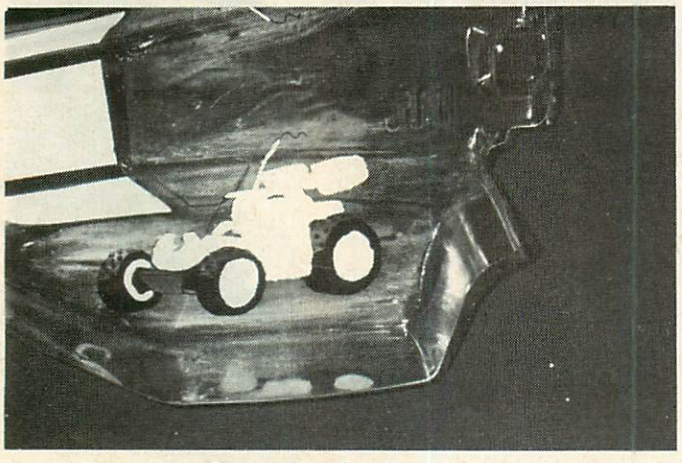


Start with the basic body colour and take your time.

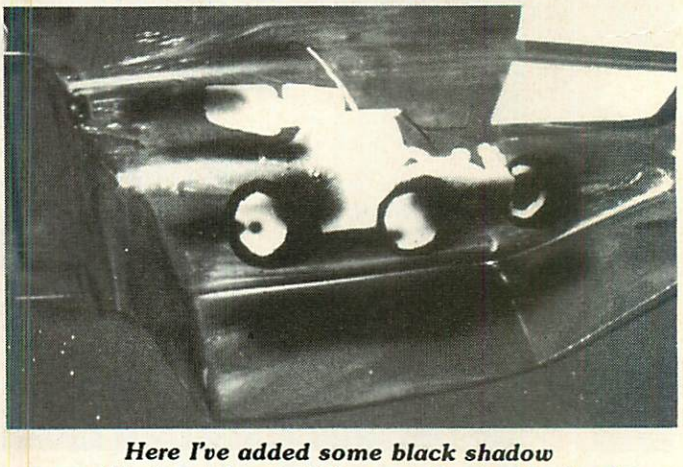
After the basic colour, move onto all the black areas.



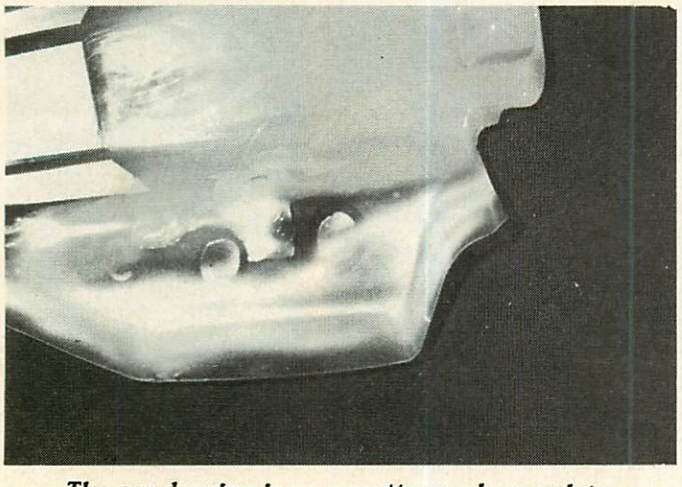
Finish off with all the detail colour.



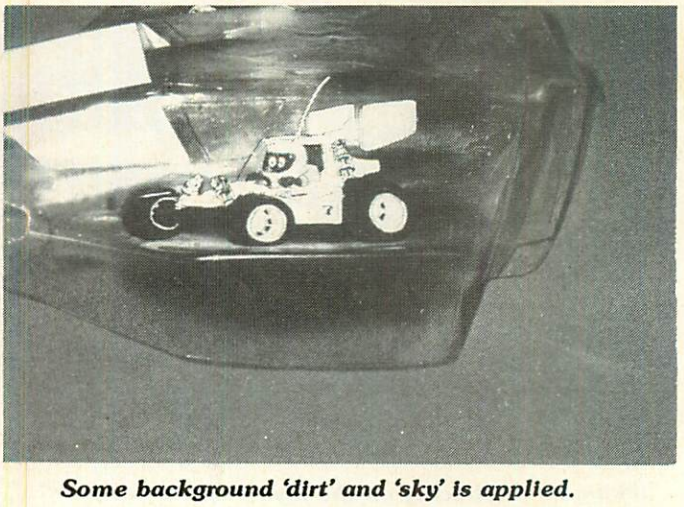
Bring out the depth of colour, by painting white over the whole area.



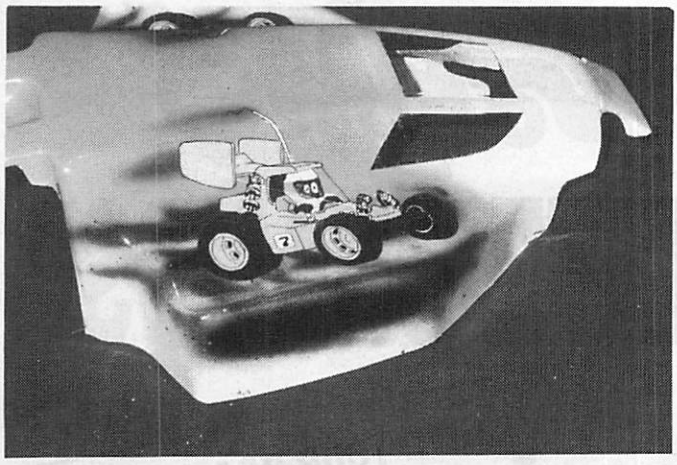
Here I've added some black shadow areas with the airbrush. Bring out the depth of colour, by painting white over the whole area.



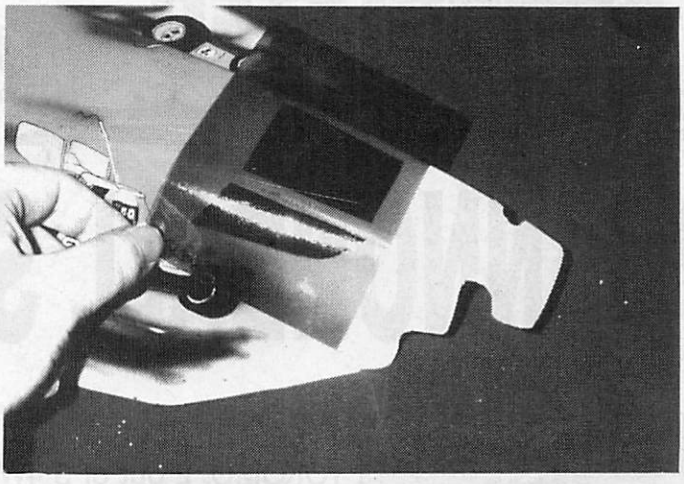
The car drawing is now pretty much complete.



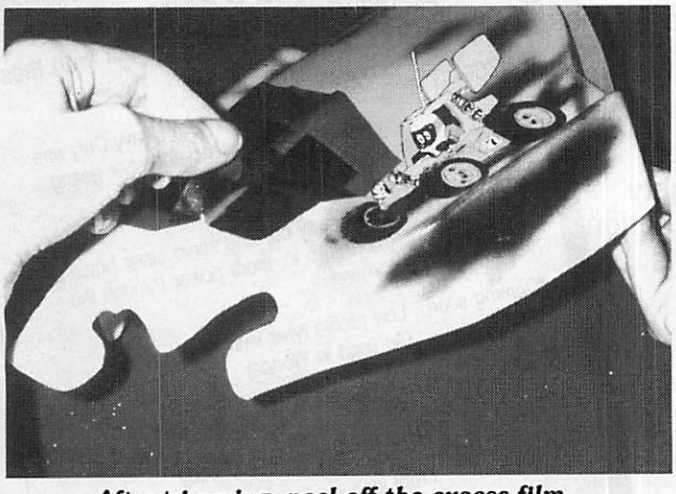
Some background 'dirt' and 'sky' is applied.



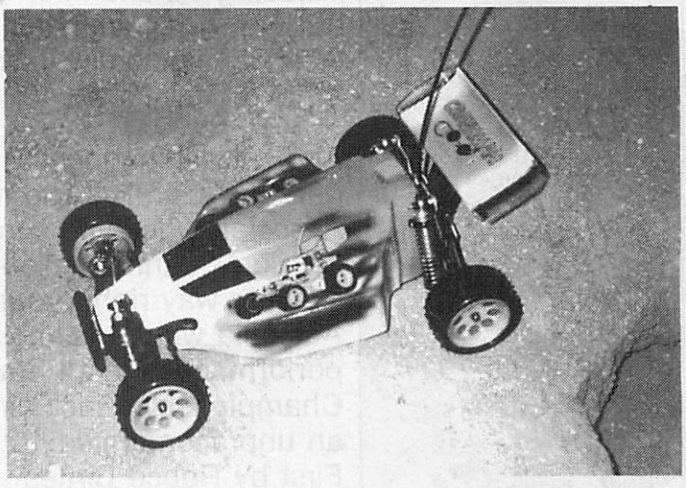
Some more blending of spray can colours and the painting is complete.



Applying the Dahm's window tint to the outside.



After trimming, peel off the excess film.



ASSOCIATED & YOKOMO

"CANNONBALL STATE CHAMPS"

STATE CHAMPS 1989

VICTORIA
4WD Modified — A
1. (TQ) Reece Birtles
2. Gregory Collings
3. Michael Chard
6. Craig Kermond

2WD Modified — A
1. (TQ) Reece Birtles

2WD Stock — A
1. Stephen Ferriggi
3. (TQ) Mathew Roberts
6. Glen Grinter

2WD Mabuchi — A
1. (TQ) David Ferriggi

A.C.T.
4WD Modified — A
3. Adam Davey
4. Scott Kennedy
5. Andrew Nelson
8. Daniel Gillogly

4WD Stock — A
1. Mark Mason
2. David Catchpole
5. Dennis Hawkins

2WD Modified — A
1. Andrew Nelson
2. Ross Kramer
6. Rick Nelson

2WD Stock — A
3. Mathew Brown

WEST AUST
4WD Modified — A
1. Nathan Hodder
2. Chris Bozich
3. Chris Davies

4WD Stock — A
1. Guy Condor
2. John Bennett

SOUTH AUST
4WD Modified — A
1. Gregory Collings
5. Gary White

4WD Stock — A
2. Dean Fisk
3.(Jnr) Darren Hobby
7. Martin Dykers
8. Bruce Cameron

2WD Stock — A
1. Jamie Lewtzka
6. Andrew Morphett

N.S.W
4WD Modified — A
3. (TQ) Michael Geddes
4. Ricardo Bartolozzi
6. Reece Birtles

YOKOMO, 2 out of 3 4WD "Worlds" including TQ and First 1989.
ASSOCIATED, an incredible 8 times World Champion including TQ and First 1989.

And it's still happening right here in Australia. The mighty Associated/Yokomo combination has just "cannonballed" its winning way right around Australia with outstanding performances in all State Championships including an unprecendented TQ and First by Reece Birtles in both 2 and 4WD Victorian modified classes.

GIVE YOUR DOG MORE SNARL!

The Super Dogfighter is a winner right out of the box. But you can go even faster with these new Factory hot up parts.

#ZC641G	Spur gear adaptor with Heavy Duty one way clutch (for Associated style gears).
#ZC641S	Heavy duty centre clutch hub
#Coming soon	Front sway bar and servo saver brace kit (more turn in, more power through the corners)
#Coming soon	Low profile tyres with new rims (As used in Worlds)
#ZC201	Bearings for servo saver cranks
#YZ10	U.S. style undertray and body
#ZC405	Front long suspension arm kit (Quicker response, more turn in)
#ZC5431-2-3M	Magnesium (light weight) hubs for front and rear.
#DM8186	81 & 86T, 48DP precision Spur gears (for ZC641)

REEDY GOLD STAR
Not for the faint hearted!

YOUR RC10 CAN BE A "10" TOO!

Update your old RC10 to cannonball status with fully compatible RC10 "Graphite" parts.

#6217 & 6218	In-line steering blocks and axles (Greater cornering force, more stability)
#6206	Wide track front A arms
#6231	Front shock strut — Improved roll centres and shock angles
#6259	Turnbuckle set
#6366	Rear hub carriers (more toe-in)
#6371	Universal drive shafts (smooth!)
#6614	Precision, reinforced idler gears (No glitch)
#6305	Graphite chassis — the Toughest!
REEDY BLUE DOT	Awesome 2WD power!

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TRADE ENQUIRIES ONLY

PURGE DSP 150

Purge yourself of those old fashioned Electronic Speed Controllers — the new generation digitals are here!

GET DOWN AND GET DIGITAL

This is all very well, you might say, but what has it to do with the price of eggs? Intac Engineering are in a similar position to Mazda the car maker, they knew they had something good in their new four wheel steering cars but couldn't easily describe it. Here goes anyway.

The most obvious advantage is the very small deadbands. Have you ever wondered why the final 20% or so of throttle travel is not used with conventional controllers? Only the first 80% is used for speed variation, the last part of throttle travel just maintains full speed and is therefore wasted. The reason for this is that as the speedo warms up and the Ni-Cads lose some voltage the transfer characteristics of the conventional ESC change. That 20% will be greatly reduced, so it is required in order that full throttle remains available towards the end of a race. Similarly, the throttle trigger characteristics change during a race and the driver has to compensate accordingly, and usually without being aware of what's happening. None of this happens with the Purge. The microprocessor adjusts for the many variables and the throttle characteristics remain constant throughout the whole race.

The other thing that hits you on the Purge is the complete lack of any adjustments. What you get is just a small sealed controller with no holes for dirt or liquids to get in and foul up the works. Despite this the Purge is fully adjustable. How? Very cunningly. It's all done automatically from the transmitter.

After connecting the Ni-Cad and switching on you simply move the transmitters throttle control to both extremes (full forward and full brake) then back to neutral. That's all. The Purge memorises these positions and stores them even when switched off. Next time, provided you don't move the throttle during the first second after switching on, the stored settings will be re-activated. After one second the motor will give a little kick and you can start racing. Of course, you must remember to keep your itchy fingers off the throttle during the first second or the Purge will think you are going to re-programme and strange things may happen when you start driving.

TRACK TIME

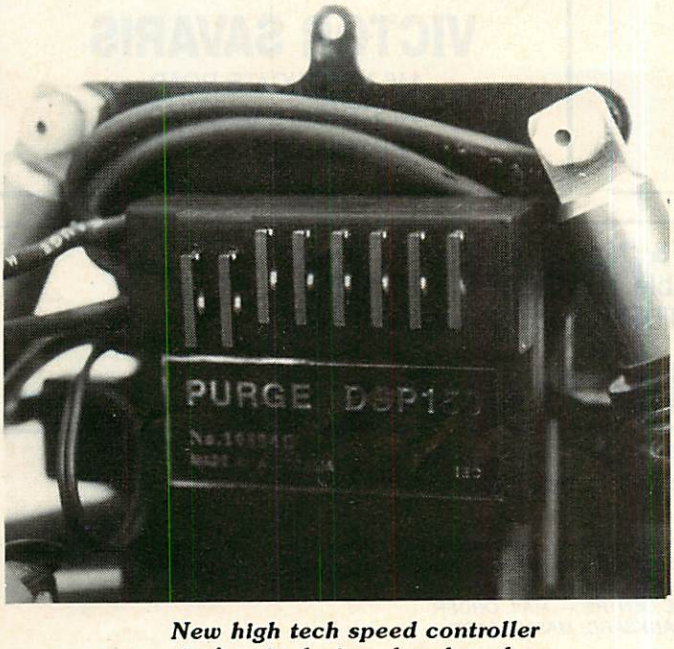
The proof of the pudding is in the eating, as they say, so the Purge was stuck in a Losi JRX2 and tested under many racing conditions.

Driving with this speed controller is different. Smooth, is the operative word. It starts the motor very smoothly, puts the power down smoothly, and is smoothly proportional from neutral to 95% of available throttle travel. A true speed controller. How do you make the most of this in racing? A good example is the throttle blipping technique used by many racers during cornering. The throttle is blipped because of that 20% dead band required by conventional controllers. With the Purge you can move your throttle finger smoothly and proportionally, knowing that the motor will obey every movement. It doesn't have that 20% zone where nothing happens. Result, more controlled, less dramatic cornering with less wheelspin and wasted battery. It's a different technique and you may have to adjust your driving to suit. Show-offs need not apply.

The Purge also has a very powerful brake. In fact Intac give a brake rating of 50 A continuous or 160 A pulsed which puts it up with the best. In use I found braking as smooth as acceleration.

In our review of the CX-1 speedo two issues ago, we said that the choice amongst top level controllers was not that large. That is still the case — but the situation is about to change. First we had the transistor and relay type ESC, then MOSFETS were all the rage, now comes the microprocessor controlled digital speed controller. There's no halting progress and technology!

The credit card sized Corally from Holland is one such ESC, Schumacher has one in the UK but it's been too big and expensive to import and there's also a couple in the States that haven't really caught on yet. The PURGE also has all the advanced features of the new technology plus one other unique feature — it's made right here, actually in Brisbane. Intac Engineering (phone 07 857 6508), in conjunction with the Qld. RC car racing Association, have applied their industrial expertise and technology and come up with a compact, lightweight, well packaged unit that's up with the best of them. Worth knowing more.



New high tech speed controller is Aussie designed and made.

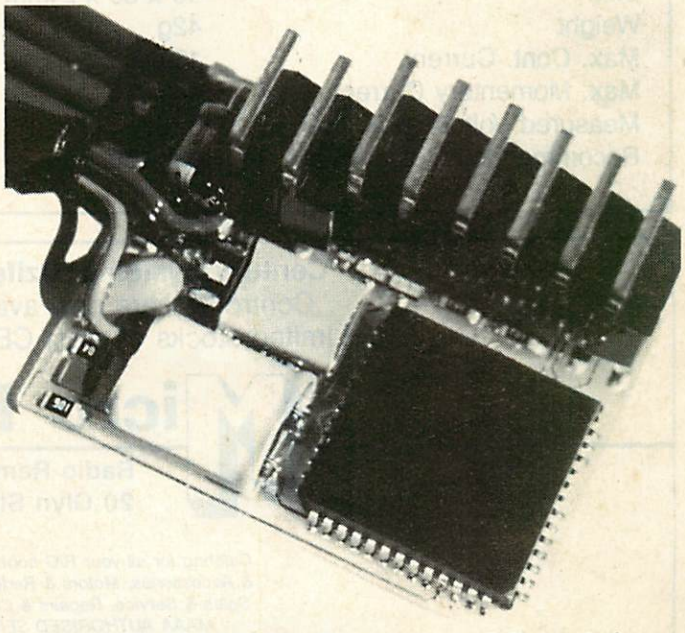


PHOTO SCOOP! The Purge case is fully sealed so this is the only time you get to see inside.

TECH TALK

It's nice to know what goes on inside the little sealed box. Those that understand these things may be interested in the following technical discourse, the rest of us Neanderthals can just be impressed. The Purge is constructed using mainly surface mount components. As the name suggests, these resistors, capacitors etc, are small and flat and sit directly on the printed circuit board instead of sticking up through holes in the board. This SM technology also improves reliability and mechanical strength as well as reducing size.

Inside the Purge DSP 150 are four major subsystems that combine to solve one of the most demanding of problems, that being to control the power to an electric motor in response to throttle position and in an environment hostile with magnetic fields, high temperature and shocks, ie a typical buggy race. The four subsystems are;

1. CMOS microprocessor, 8 bit, 8 mHz with on-board ROM, EEPROM and RAM.
2. Low drop-out regulator (BEC) for receiver and servo.
3. Charge pump high voltage regulator used in driving final stage.
4. High speed power FETs for final stage.

The real work is done in the processor as it executes the software algorithms. Pulses arrive from the receiver about 25 times per second, each one representing the desired motor speed at that instant. The DSP 150 measures the pulse to get a raw value, then processes this to extract a raw throttle position. This value, the true linear value, is still not the final value of speed however. The true linear value is then superimposed onto a transfer characteristic which is responsible for the deadbands and maximum speed/brake bands. This is necessary since transmitters use RC oscillators and other components which introduce noise. However, unlike conventional anologue controllers these deadbands can be kept very small - 4.6% in the Purge. More on this later.

Once the value has been superimposed on the transfer characteristic it then becomes the true desired motor speed. This is passed onto the Pulse Width Modulator algorithm where it is turned into an electronic signal whose duty cycle is varied depending on the true motor speed value. Yes, this is all true — no bull. You are not reading the April first edition!

Since the speed is digitally processed the controller remains efficient at intermediate speed settings. This is certainly noticeable in practice as the Purge's FETS run quite cool. As we all should know, as MOSFETS get warmer their internal resistance increases and down goes the motor speed and running time. We didn't do any tests, but we now have noticeably more battery left after a run with the Purge.

BUY OZ!

Compared with the imported opposition the Purge DSP 150 is more honestly rated. But don't let the 150 Amp rating fool you. When it comes to proving the performance of equipment you cannot strive any higher than the world champs. Rick Bartolozzi used a Purge to become one of the more successful local drivers at the recent Worlds and he is very impressed by this speedo and stands behind the Purge Project 100%. There have been teething problems but they are now sorted out. The latest version now sports a bright yellow case and improvements based on the world champs experience. Rick used a 13 turn motor in his Losi 2WD buggy with no problems but advises that a similar motor in a 4WD may be pushing the controller to its limit because of the higher current draw of 4WD drive trains. But fantastic for any level of 2WD and all Stock classes. He particularly likes the lack of power surges typical of a conventional controller with a freshly charged battery, and also the controllable low down power. This is praise indeed, from one of our most experienced and mature drivers.

Digital speed controllers are the wave of the future. The future is here now in the form of the Purge DSP 150 and it's not just a gimmick. Digital Signal Processing (DSP) equates to more performance and driveability and in the case of the Purge the satisfaction of supporting local industry.

Intac are not resting on their laurels. Currently under development is a much higher rated controller for international level competition. It will be physically smaller but electrically bigger, and won't come cheaply. Meanwhile there is little excuse not to consider the DSP 150 for those who appreciate the best in the range.

REVIEW AT A GLANCE

Name	Purge DSP 150
Reverse	No
Brake	Yes
Set-up Aids	N/A
Integral Switch	Yes
Adjustments	Auto — see text
Size	48 x 38 x 21mm
Weight	42g
Max. Cont. Current	150A
Max. Momentary Current	480A
Measured Volt Drop at 12A	0.18v
Recommended Retail Price	$264.50

11400

SUPER SUBMARINE

1/250 SCALE

NIKKO

- 3 channel super heterodyne digital proportional system
- Overall length: 465mm
- Dual lever type transmitter with trim adjustment
- Reliable steering forward and reverse, submerging in both forward and reverse and stopping performance
- Batteries: Submarine 6 x "C" size Ni-Cad (1.2v) and 4 x "AA" size alkaline (1.5v)
  Transmitter 6 x "AA" size alkaline (1.5v)

19110

SPEED BOAT "JET TORNADO"

NIKKO

1/10 SCALE

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- RS-540SH motor
- Removable crystal
- BEC system
- Frequencies: 27 MHz band, 6 frequencies
- Batteries: Boat 2 x Ni-Cad rechargeable battery pack (7.2v, 1200mAh)
  Transmitter 6 x "AA" size alkaline (1.5v)

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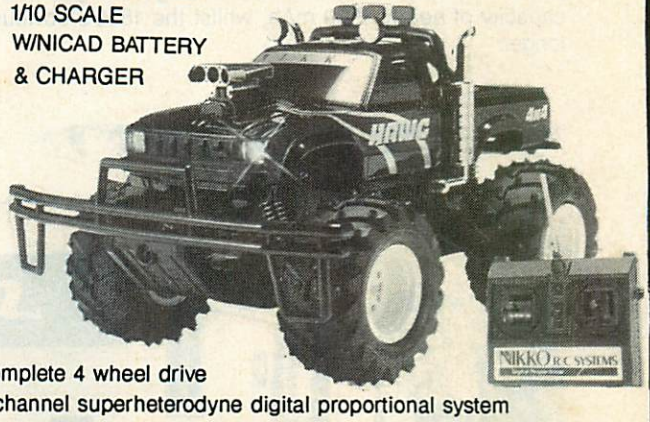

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- BEC System
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SAFT NICKEL CADMIUM BATTERIES

A new power source . . .

For several years there has only been one name associated with batteries to drive RC electric cars — Sanyo. The Sanyo Electric Company of Japan have kept pace with our fast moving sport and given us SC, SCF, SCR and now SCE type cells. But they are not the only manufacturers of Ni-Cads. General Electric Company, Gates and Saft are all into cells in a big way but have not paid RC cars much attention — until now.

Saft claim to be *the* world leader in nickel-cadmium batteries. They have the largest range and over 50% of the worlds aircraft market for Ni-Cads. Recently they have been developing fast charge and high discharge cells (useful in cordless tools) and these are the ones with applications in model cars. When a company so big in Ni-Cads (7000 employees worldwide), takes an interest in our humble hobby they usually do it right so it's worth checking out what they have on offer. . .

The offerings

Saft Batteries Australia have released three battery packs for our use. Each one uses different Saft cells and this should cover every application in our sport.

SUPER 1200 A general purpose pack with a nominal capacity of 1.2 Amp. hour and competing head on with the SC and SCF type cells. They offer top value for the performance.

POWER TQ A higher voltage (equals more speed) pack similar to SCR's but with the bonus of more capacity (running time). Rated at 1400 mAh they should be ideal for the Stock competition classes. These are the cells that won the 1988 European Champs in 1/10.

ENERGY 1800 With slightly more voltage than the 1200 and with more claimed capacity than SCE's these could be the ultimate Ni-Cad for Unlimited racing.

The enclosed graph, supplied by Saft, compares the three packs. It clearly shows the TQ's holding the highest voltage and a capacity of nearly 1500 mAh, whilst the 1800's obviously hold on longer.

The D&T non destructive quick tests.

We got hold of some non selected, unmatched cells and stuck them on the Hi-IQ (see review last issue).

The 1200's were all that Saft claim, ie good but nothing special. Capacity varied between about 1100 and 1300 mAh and the instantaneous voltage under a 30 amp load (a good measure of acceleration or punch) was around 1.25 per cell. If the price is right then give these a try. They should give a little more performance than the oppositions equivalent.

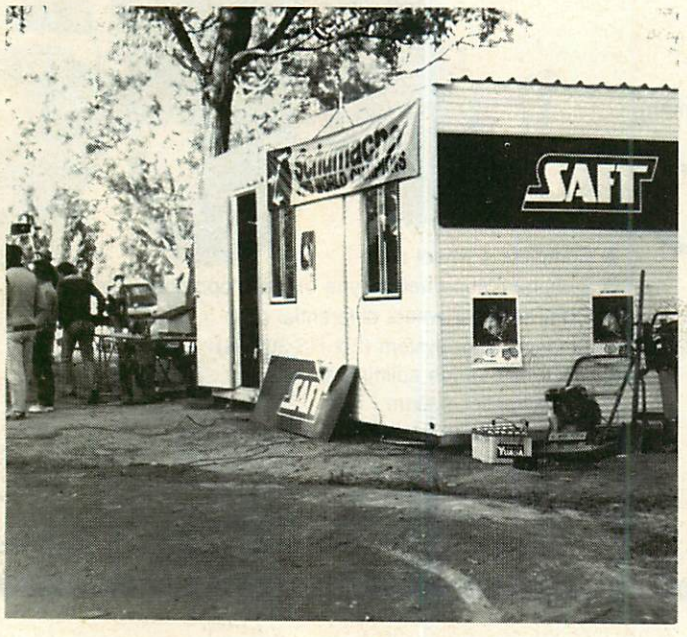
The same applies to the POWER TQ's. The 1400 rating appears a little conservative. As the graph shows, the actual capacity should be nearer to 1500mAh when the cells are at their peak. The 30 amp load voltage was around 1.30 per cell under test whilst the very first cycle produced a capacity of 1460mAh. Not bad.

The ENERGY 1800 cells tested initially at between 1670 and 1770 mAh with average punch voltage of about 1.28. Again, this is about what one would expect and is similar to Sanyo SCE's.

Secret ingredient

There is one important consideration when noting these test figures. All the cells were fresh and only had a few cycles. Sanyos get better after a few charges but Saft are different. They get a lot better after many charges. Just look at the second graph. This shows that the cells actually loose a little capacity up to about 20 cycles then improve over 20% up to a peak maintained from about 200 cycles. This graph is of POWER TQ cells (specially selected to show their full potential) but the configuration is the same for all three types. We didn't check these claims but have no reason to disbelieve Saft on this point. Saft cells are built with sintered technology, (sintering is a process where metal in powder form is moulded using high pressure and heat) which reacts favourably with the usual nickel cadmium construction to improve capacity with age. You could say they mature like a good wine.

Saft also claim that this technology combined with excellent quality control means less variance between individual cells. There is less chance of getting super cells but also less chance of getting duds.



Saft were one of the sponsors at the recent world titles.

New Saft cells feature sintered technology.

If so, then this is good news. No need to pay top dollars for matched cells or go to the trouble and expense of matching them yourselves. Actually, the latest news is that cell matching is hardly worth the effort for most purposes since the cells in a pack quickly become unmatched after a few cycles and you have to tear them apart and re-match. After testing some old computer matched cells this appears to be true. Score another one for Saft.

What's the verdict?

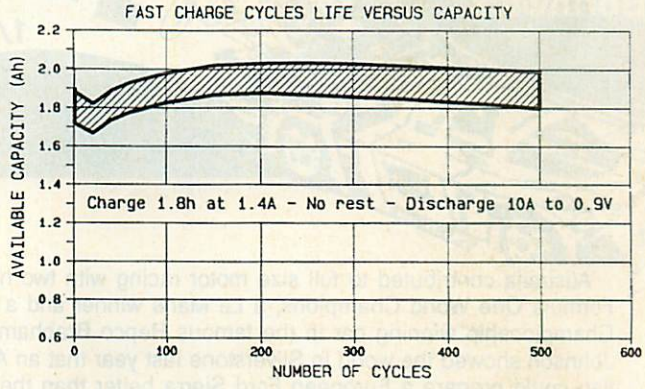
It doesn't take much figuring to realise that if our test figures mature an extra 20% with age then we have some terrific cells. The 1200's end up at over 1400, the 1400 become 1750 and the 1800's finish up over 2000 mAh. The instantaneous voltage tests gave results very similar to the equivalent Sanyos for the 1200 and 1800 cells but with a bonus for the TQ 1400's. Definately the go for competetive racing in the Stock classes.

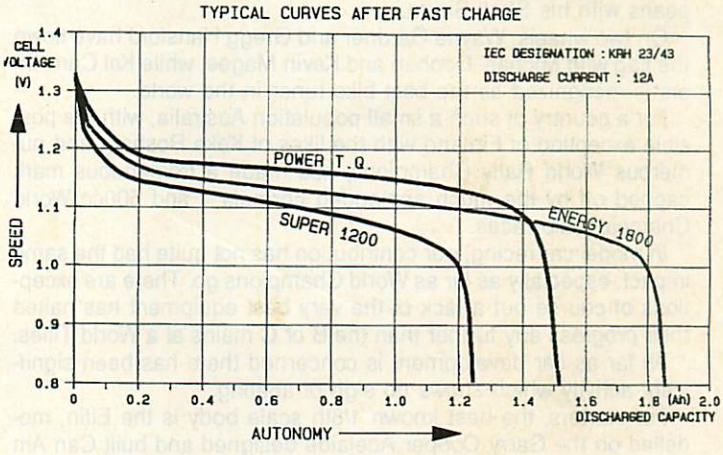
The folks at Saft Australia are quite approachable (many did just that at their World Champs tent) and seem genuinely concerned about doing their best for our sport. The same cannot be said of the Australian Sanyo mob who, in my experience do not want to know us.

Different charging and storing techniques could well be required for these sintered cells and, given co-operation between modellers and Saft, we may find even more performance from this product. Meanwhile I will be flogging my packs at every oppurtunity to see how they mature.

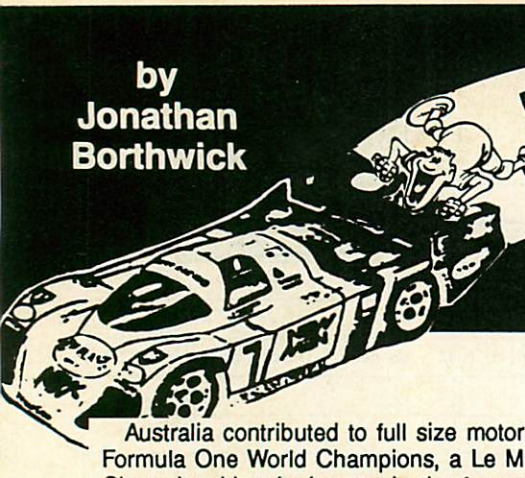
SAFT Racinbatt

" POWER T.Q. "





by Jonathan Borthwick



Tweaked & Dumped

1/12 SCALE ON-ROAD ELECTRIC RACING

Australia contributed to full size motor racing with two notable Formula One World Champions, a Le Mans winner and a World Championship winning car in the famous Repco Brabham. Dick Johnson showed the world in Silverstone last year that an Australian could prepare a European Ford Sierra better than the Europeans with his Shell Sierra.

On two wheels, Wayne Gardner and Gregg Hansford have flown the flag with Michael Doohan and Kevin Magee, while Kel Carruthers is recognized as the best bike tuner in the world.

For a country of such a small population Australia, with the possible exception of Finland with the likes of Keke Rosberg and numerous World Rally Champions, has made a tremendous mark capped off by the much applauded Formula 1 and 500cc World Championship races.

In model car racing, our contribution has not quite had the same impact, especially as far as World Champions go. There are exceptions of course but a lack of the very best equipment has halted their progress any further than the B or C mains at a World Titles.

As far as car development is concerned there has been significant activity which shows no sign of abating.

For starters, the best known 1/8th scale body is the Elfin, modelled on the Garry Cooper Adelaide designed and built Can Am car which proved quite effective in the late seventies.

Rex Williams in Brisbane produced a lexan 1/12th car in the early eighties which was as good as any other lexan chassis from England. That the car is still quite competitive on our very slippery tracks is a compliment to its designer and those racers Rex sponsored to keep his product at the front.

From Brisbane comes an exciting product which could well put Australia before the eyes of the world.

Intac Engineering's range of speed controls have already received a lot of exposure with a strong showing in 2WD at the recent World Titles in Sydney. With the advent of the mysteriously named 'Purge Project' comes a new all local programme supported by intensive back up, research and development which compares well with the best from overseas.

The man behind the 'Purge Project' is Noel Lovisa. I can only hope he never asks me to be part of his test team as the man's enthusiasm shows no abound with an exhaustive programme awaiting anyone who tests for him.

For many the brief has been simple. Go out and try and break it if you can. So far only little problems have been picked up and these have been fixed in production versions.

The first offering is the Purge DSP150 (see separate review this issue) which boasts an 8 bit microprocessor and 8 FETS. The system Intac have opted for offers EEPROM (Electrically Erasable Programmable Read Only Memory) which provides simple and accurate set up and no need for delicate trim pots. Merely turning on the set and going to full power and then brake programmes the system and you are ready. If this all sounds complex, the instructions, while not as good as Novak's (yet!), cover all contingencies.

Another bonus is that if the unit were to have problems, Intac are just a night away at worst using Priority Paid. When an early batch of their first unit had a small problem, Intac made an upgrade to every unit in existence at no cost and with minimum delay.

One of the advantages of having an active development programme is that enhancements are always being made. The off shoot of this is a D&T exclusive sneak preview on the new Purge force with more than twice the rating (360 amps) of the early unit. Prototype units have been tested by a number of drivers in anticipation of production well before Christmas.

The model I tested (and shown in photographs) is a preproduction unit with better FETS than the earlier DSP150 unit already on the market.

Size and weight are on par with the Novak NESC-I unit, although cost should be significantly less than what is already the best unit in 1/12 racing.

The fact that Intac have been testing prototypes of the new Purge in a Yokomo 4WD (without heat sinks even!) suggest this offering may have a more universal application than just 1/12.

The Purge allows a more proportional system than most others where full power must come in at 75% of full throttle to allow for any trim changes. The Purge can be cranked right up to about 95% of full power which equates to greater driveablity, a bonus on our slippery tracks.

On the bench, it is evident that set up is childs play and the smoothness of throttle response, even with a Reedy Pink Dot hooked up, is impressive.

Installation in an RC12L was a little tacky as my test prototype hadn't been lacquered on the circuit board, necessitating a small plastic bag to keep things well away from the graphite while Intac wait for cases. If the case on the DSP150 is any indication, racers should not be disappointed with the finished product.

On a very dusty track I was impressed with the control of the car and the predictable of response right down to a stand still. While some speed controls will start circling after your cells first dump, the Purge kept on crawling with full control until such time as their was no longer enough power to supply the radio.

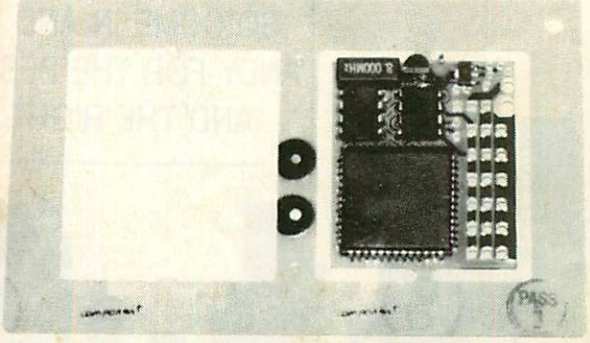
Also the unit stayed remarkably cool, despite sustained time at part throttle, a state which has seen many controllers meet their demise, especially where transistors and then a relay were employed.

Sadly household duties and the need to send 'my' prototype off to Sydney for Michael Geddes to use in 4WD class at the re-run NSW State Titles kept testing to a minimum but I intend to give the new Purge a comprehensive workout against my trusty (very!) old Novak NESC-I.

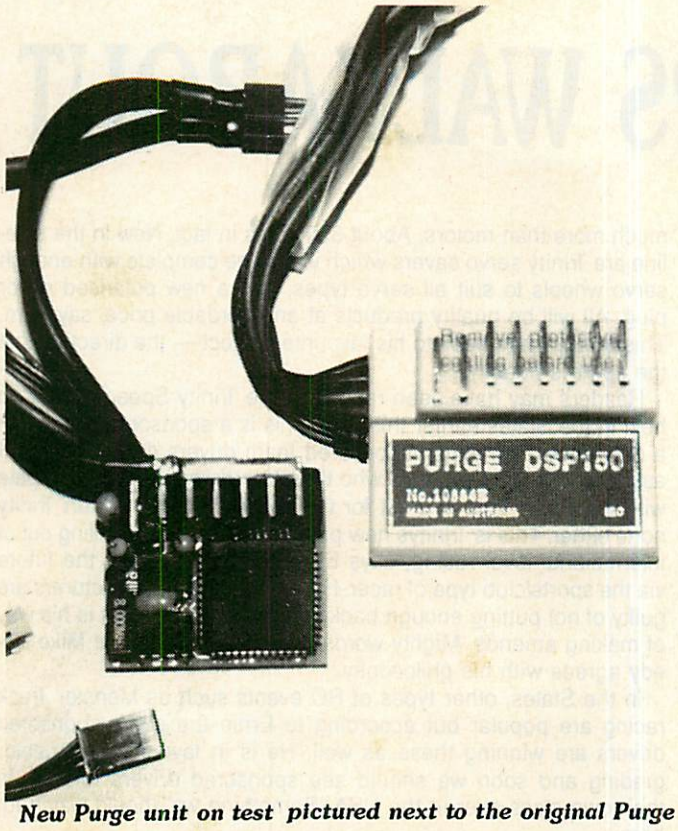
In the Purge Project, Intac have produced a great product suited to export which is where the main market lies. As with all successful manufacturers, Intac propose to keep improving their product and would appear to have a head start on the rest of the world.

The instructions, packaging, concept and execution are certainly world class and should create further interest in the activities of this small Brisbane based Company.

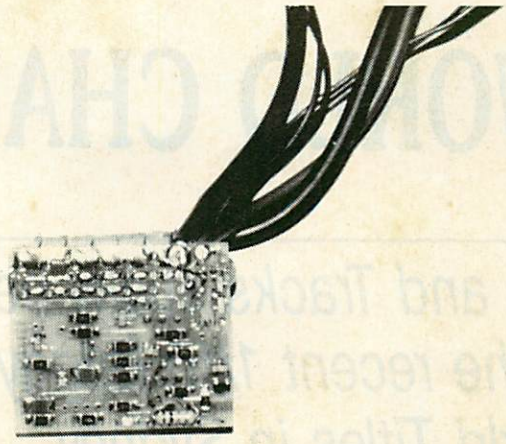
Now all they need is a box to stick it in!



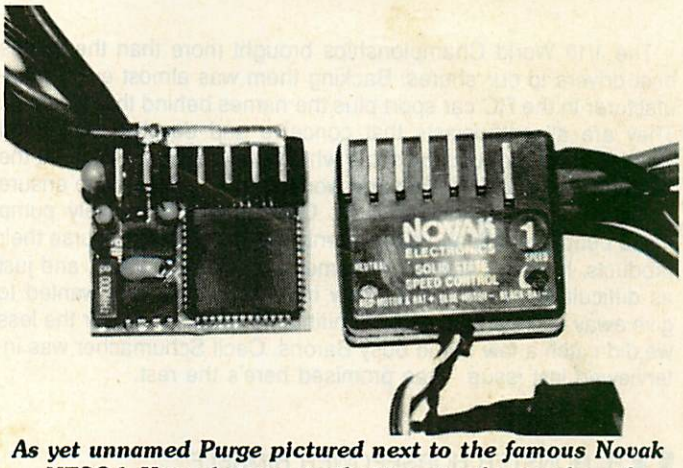
One of the new units awaiting installation of its FETS. Neat workmanship is evident with the latest technology.



New Purge unit on test pictured next to the original Purge



Underside of the new Purge speed control detailing neat assembly.



As yet unnamed Purge pictured next to the famous Novak NESC-I. Very obvious similarities are the number of FETS and size.

WORLD CHAMPS WALKABOUT

Dirt and Tracks sticky-beak at the recent 1/10 Buggy World Titles in Sydney.

The 1/10 World Championships brought more than the worlds best drivers to our shores. Backing them was almost every manufacturer in the RC car sport plus the names behind those names. They are all enthusiasts that conceive and develop their often world famous products by doing what we all like to do, race. At the Worlds they were all racing and working, their job being to ensure that their products worked also. Our job was to politely pump these people to talk about the event, the sport, and of course their products. It wasn't easy to tie some of these guys down, and just as difficult to extract useful new information. No one wanted to give away secrets that would benifit the opposition. Never the less we did catch a few of the busy Barons. Cecil Schumacher was interviewed last issue — as promised here's the rest.

MR. MONSTER HORSEPOWER HIMSELF, ERNIE PROVETTI

From the USA, the boss of Trinity motors thought our country was beautiful but wasn't so keen on the World Champs track. Too slippery and too small a straightaway was his comments. He would have liked to see the surface groomed after every round and the competitors split into A and B programmes, morning and afternoon respectively, to even up the conditions. On the positive side he thought the format and organisation was great.

You have to remember that this is a motor man talking. There was no horsepower race at the Worlds — everyone had plenty, and Ernie admitted that he couldn't show off his motors because he couldn't hook up any serious horsepower.

Steering him back to his products, we found that Trinity make much more than motors. About 350 items in fact. New in the pipeline are Trinity servo savers which will come complete with enough servo wheels to suit all servo types, and a new polarised motor plug. All will be quality products at an affordable price, says Ern. This brought him back to his favourite subject — the direction that the sport is heading.

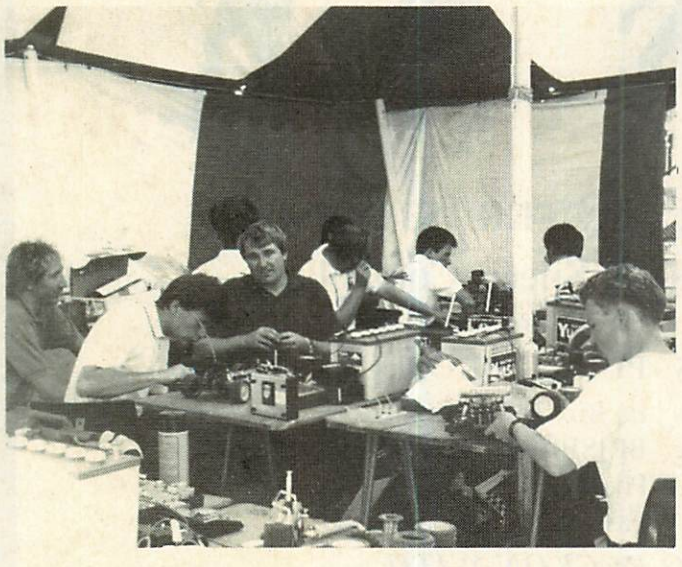
Readers may have seen reports of the Trinity Speedworks Cup held in the States earlier this year. This is a sponsored event with a difference. The expert/sponsored team drivers do not race, but assist all the other entrants who therefore do not have to compete with the Pro's. This is great for the sport and doesn't hurt Trinity none either. This is Trinitys new philosophy. They are pulling out of international level racing, says Ernie, and investing in the future via the sports/club type of racer. He says that all manufacturers are guilty of not putting enough back into the sport and this is his way of making amends. Mighty words. He doesn't think that Mike Reedy agrees with his philosophy.

In the States, other types of RC events such as Monster Truck racing are popular but according to Ernie the same sponsored drivers are winning these as well. He is in favour of competitor grading and soon we should see sponsored drivers running in their own class over in the USA. Something we should watch for here.

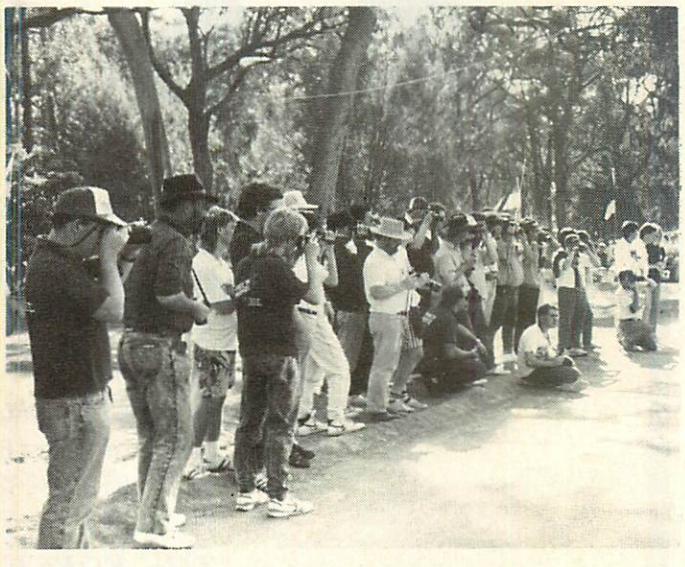
NO MORE SRM

One piece of sad news at the World Titles was the likely demise of the famous english supplier, SRM. This company had made a name worldwide thanks to its large range, good service and innovative products for the RC car market. Mick Langridge is the name synonymous with SRM and also the administration of the sport in Europe. Drives too — he qualified 116th for the English Team.

Readers may be surprised to learn, as I was, that Mick was the Manager of SRM and not the owner. The company may continue without him but I don't give them much of a chance. To most customers Mick was SRM. Meanwhile he's looking for a job. I couldn't persuade him to emigrate to the lucky country (whatever happened to it?!), as he is a dyed in the wool Thatcherite but I'm sure a man with his talents will not be unemployed for long.



Competitors were supplied with tent, tables and 12v batteries at W/C. Here's part of the English mob.



The World's press were at the W/C and there was no shortage of photographers.

ASSOCIATED'S ROGER CURTIS

This is the man behind the new Associated (USA) cars including the new world champion 2WD. We questioned him on this car first.

As expected the 2WD car is the result of ideas put into practice for the purpose of winning the Worlds. It is well in advance of any production car and may not work on other tracks. Roger explained some of the dilemmas facing manufacturers due to variations in track conditions worldwide. Back home they have high bite, big jumps and rough surfaces whilst in Europe it's generally smooth grass. He gave the Top Cat as an example of a sleek and light buggy for racing on the Continent whilst the original RC10 is still fine for the States. Australia's dusty and hard surfaces are different again. A new gearbox with adjustable slipping clutch was used at the WC and this is now available as an option. Not neccessary in the States, says Roger, but great here. The new and secret front end is not neccessarily an improvement — but it worked well at St. Ives (at this point I began looking for a tongue in his cheek, but his expression gave nothing away). In summary, they will try to put features in their cars that work everywhere with options being available to suit particular circumstances. They must have the right idea since business is very good, he said.

Unlike Ernie Provetti, Roger thought the WC track was fine. Slippery, but otherwise good layout, nice straight and very close to a true off-road track. The same went for all aspects of the event and he congratulated the organisers for doing a tough job very well. The fact that he had a winning car probably swayed his opinion but it just goes to show that even the Gurus don't agree on everything.

However, he did agree that track grooming between heats should be undertaken if only to lessen the advantage of those with unlimited quantities of the right tyres.

He has some strong opinions on track surfaces and racing format that might affect the future of the sport. Experience has taught him a rule for tyre selection, applicable to on or off road, which says that dusty and slippery tracks must have a fast wearing tyre. This tyre constantly replaces old rubber with new in order to gain traction. Thats why small spikes work, but it's tough on the non supported driver who has to pay for new tyres every race. Hence he is an advocate of high traction surfaces to make tyre selection less important and to make the event cheaper and fairer. Problem here is that mother nature doesn't always present us with any alternatives.

Combine a high bite track, says Roger, with 7 cells and 4 minute races and you have an event better for almost everyone. With this format, motors and batteries, as well as tyres, are not critical but skill and chassis tuning is. This is the way they do it and he reckons the result is more participation and more fun (what about more speed and more broken cars!). However, those in the mighty horsepower and matched battery business don't agree with him.

The original Associated was of course the RC 500 gas racing car. This is how they started and Roger, together with his boss Gene Husting, still hold a soft spot for 1/8th gas. The car is still popular but Roger reckons they lose a fortune every time they attend a race. The numbers just aren't around in gas but he said that numbers are growing again as the new electric crowd become curious. The complexities of i.c. engines suit the older guys who have realised they can't compete with the reactions of teenagers in electric racing. That's the last word from this apparently quiet talking nice guy who said he enjoyed Australia and would like to vacation here. Any time Rog. . .

MISCELLANEOUS MUSINGS

The brightly coloured tents that housed all the teams and individuals was a constant hive of activity. Thousands of things to see and fascinate and much to learn. We buzzed around and noted the following:

★ Jurgen Lautenbach, 4WD A finalist, was constantly fiddling with his LRP motors. What ever he does obviously works and he would have seriously challenged the establishment if all that power could have been harnessed. But he wouldn't divulge the wind on his motors.

★ Kyosho seemed to have a junior member of the team constantly trackside recording race progress. What they do with all the data is anyone's guess.

In similar vein, Masami Hirosakas team manager video'd much of the world champions races — no doubt to play back that evening to look for any improvements.

★ Hi-IQ's and Turbochargers were prominent in the pits (see reviews last issue) and so were Novak, Tekin and other popular chargers. These last two, together with KO, easily dominated the speed controller line-up, plus some Nosrams and not much else. The expected onslaught of new technology ESC's such as the Corally, didn't materialise.

★ Team Associated faxed the days results back to the States every day. This kept their distributors and customers well informed. Must have been all good news.

★ In Sweden you don't drive an RC car unless you have a licence. Their two friendly team members explained that licenc-

Above: Mr S.R.M. himself, Mick Langridge.

Right: Jamie Booth, number one driver for England & Schumacher.

ing is a four grade affair with newcomers getting a D grade licence and generally racing with C graders. Likewise the A and B licence holders race together except in large events when individual classes are run. Could be the competitor grading format that Ernie Provetti is looking for.

Charging and discharging methods change as frequently as the weather. We learned a new one at the World Titles. One US team were discharging each cell individually with a 1.2 Ohm resistor (see picture). They asserted that this gave a useful performance gain as did topping-up each cell individually after charging the pack.

BRAT PACK

There weren't too many unusual cars at the WC, so I was drawn to the new Nikko car from Japan. Yep, this is the same Nikko that makes the cheap plastic kits you find in Coles and other supermarkets. But the Brat 4WD was obviously no cheap toy. Designed and tooled for top competition it has belt drive, three gear type differentials and a novel pair of chassis braces that could be used to adjust tweak. They make their own range of motors and tyres, so they are getting into RC cars in a big way. The car shows some Tamiya influence, especially in the suspension area, but looks to have most of the goodies required for competitive racing. On the track it looked like it needed some work in the area of the shocks, but was very fast. At this point in time it is not known whether we will be able to buy them here.

SCHUMACHERS OPERATIONS MANAGER, TIM WALDEN

The big boss, Cecil Schumacher, was interviewed last issue but his right hand man Tim Walden is outspoken enough to devote more space to the word according to the house of Schumacher.

Coming here as 4WD world champions they were obviously disappointed not to retain a title. Both cars went well, said Tim, but lacked traction via the right tyre on the slippery track. If you didn't have the tyre then you weren't in the race. Never the less he paid tribute to their number one team driver, Jamie Booth, for placing so highly. I think Team Schumacher greatly regret not having come here for the invitational back in June (Jack Grenenger, their Aussie connection tried real hard to get them here) but they have had a very busy northern summer which has included many successes. Seven out of ten places at the European Champs were Schumacher cars and they have completely dominated Europe this season according to Tim. Similarly the new Pro-Cat is now becoming the winning 4WD on the NSW racing scene.

An ex electronics engineer by trade, Mr Walden still likes to dabble in electronics and the Schumacher micro-processor controlled ESC is his latest toy. We haven't seen much of this speedo here but it is digital and programmable. With the new Aussie Purge in mind (see review elsewhere this issue), I asked Tim about the dead band and he said it could be set as low as 12%. Not as low as the Purge but drivers like to see this and shouldn't have to change their driving style to suit equipment. Casting our minds back to the introduction of the CAT I thought this last comment amusing since we had greatly to change our driving style to suit the new car.

Schumacher have come a long way since Cecils garage. After their third move they now have two side by side factories with one of them currently serving as a warehouse. This has now solved their spare parts supply which was a problem earlier this year. Tim reckoned that retailers were the problem since they didn't want to stock any spares but expected immediate delivery when required. This situation is not surprising when the fickle public could leave a shop holding thousands of dollars worth because a buggy has gone out of fashion.

Unlike their English competitors, PB, Schumacher have no plans to develop and market a 1/10 on-road car. But like Roger Curtis and his ideas on racing format, this last question struck a chord which immediately put Tim on his soapbox. He wasn't in favour of the rules which restrict development of this type of car. The crude pan chassis and solid rear axle were just a development of the horse and cart, he said. This was the European ruling but ROAR in the States allow independent rear suspension making things a mess for the bigger manufacturers, but easy for the smaller boys who have little trouble putting together a simple kit. He cited the example of a buggy kit which is far more sophisticated (eg. with gearbox and four coil over shocks, as well as independent rear end) compared to a typical circuit car but both cost about the same price. According to Tim this is seriously holding back Pro-10 racing (as the Europeans call it).

If suspension cars were permitted then it would be a whole new scenario. Buggy parts and developments of existing buggies could be used, more adjustments would be available, the cars would be easier to drive and there would be more interest, claims Tim. Kids could race on-road at the weekends and then jack-up the suspension for driving around the street during the week. For those who want to try this, I believe that smooth racing sponge tyres with hubs are now available for the CAT and Topcat.

The same argument applied to the 1950's style bodies popular in on-road racing, said Tim. The die-hards like 'em because of their aerodynamics but they hold back the sport because they look so old fashioned. Todays kids just don't relate.

This spirited discussion was taking place over a snack in the world champs outdoor cafe but it was interrupted by the announcement that it was Eustace Moores birthday. By the time the applause had subsided the moment was lost and Tim Walden had to return to less stimulating things — like watching Jamie Booth drive.

AFTER THE BALL

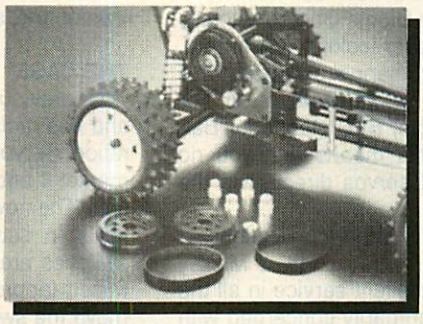
It is obvious that many of the worlds big names in the sport have much to say about its future direction. They may not agree on that direction but they all have the same goal. They also have influence, and this should ensure that things change for the better of all! Surprisingly, all those interviewed seemed more keen to discuss these politics than push their own products. This may dissapoint readers hungry for trade secrets but at least it shows that the manufacturers care.

Hyperdrive kits and accessories

Racing Systems

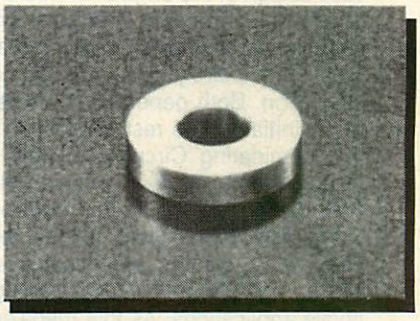
RC-10 EXTENDED MOTOR PLATE KIT #HY 1007

Consists of motor plate, modified transmission case, rear-motor dust cover, & mid-motor dust cover, plus assorted belts. (Belts 78 & 81).



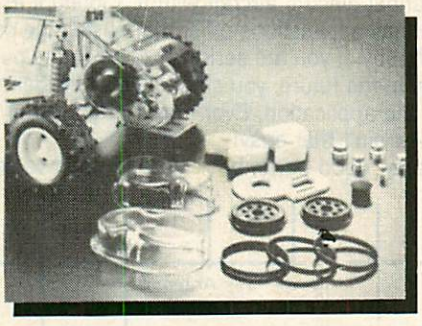
KYOSHO MID OPTIMA KIT #HY 1009

Consists of 4 motor pulleys (11-14 teeth), 2 differential pulleys (62 & 64 teeth), 2 belts (70 & 72), plus a differential pulley adapter. Reverse wind stock or modified only.



KYOSHO MID OPTIMA ADAPTER #AC 0301

Adapts Hyperdrive as well as 32, 48 and 64 pitch gears to the Kyosho Mid-Optima.

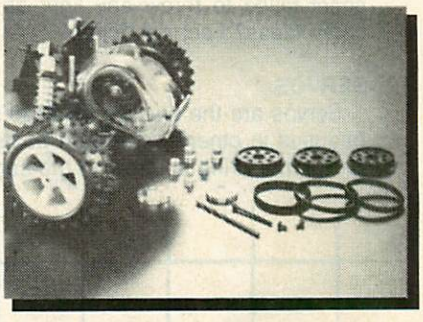


RC-10 PRO KIT #HY 1008

Consists of motor plate, modified transmission case, rear-motor dust cover, mid-motor dust cover, 5 motor pulleys (12, 14, 16, 18 & 20), 2 differential pulleys (60 & 66), 3 belts (75, 78 & 81). The kit allows wider motor adjustment broadening the ratio range.

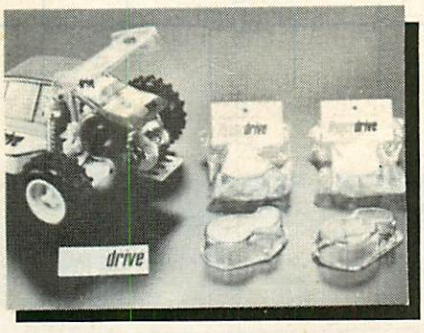
KYOSHO ULTIMA KIT #HY 1012

(Also fits rear motor Kyosho Optima & Javelin). Consists of 2 special aluminum pulleys (DP 40, DP 50), 6 motor pulleys (11-16), 4 belts (64, 65, 70 & 72).



JRX-2 KIT #HY 1010

Consists of 5 motor pulleys (10-14), 3 differential pulleys (56-60), 3 belts (67, 69 & 72), plus a differential pulley adapter. Drill Bit — Drill Jig-Screws

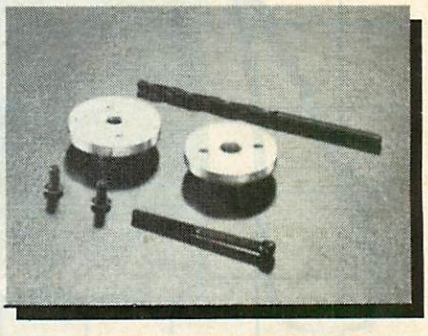


HYPERDRIVE DUST COVERS #EP0104, EP 0105

Replacement dust covers for the Hyperdrive RC-10 Extended Motor Plate Kits. EP 0104 is for Rear Motor and EP 0105 is for Mid Motor applications.

DIFFERENTIAL PULLEYS FOR KYOSHO ULTIMA #DP 2040, DP 2050

Consists of 2 special aluminum pulleys (DP 40, DP 50). Adapts Hyperdrive to the Kyosho Ultima.



JRX-2 ADAPTER KIT #HY 1011

Consists of differential pulley adapter, Drill Jig, Drill Bit, Screws: 4-40 x 1½ Socket Head, 4-40 x ¼ Button Head. Adapts Hyperdrive as well as 32, 48 and 64 pitch gears to the JRX-2.

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FUTABA'S NEW BIONIC GOLD

by Laurie St John

Only a relatively short time ago, users of 2 channel radios were introduced to Futaba's Bionic Gold, 2 channel stick radio. The case design of the original Bionic Gold was almost identical to that of previous 2 channel stick sets. The new Bionic Gold is a totally re-designed case and I might add a far better looking one at that. BEC is not entirely new, although not all 2 channel sets boast this innovation. Both generations of the Bionic Gold however do. For the uninitiated (the rest of you can skip this) BEC stands for Battery Eliminating Circuitry. Simply put, this means that you no longer have to fit your receiver (Rx) and servos directly via the BEC component inside the receiver.

The new 'Bionic Gold' is ideal for all 2 channel applications — cars, boats, gliders and electric aircraft. This is not a Mickey Mouse 'Toy Shop' special and will give excellent service in all the above applications. As this magazine is primarily concerned with RC cars, I didn't think you would want to hear how I fitted it to my electric aircraft so I went to the not so unpleasant task of fitting the Rx and servos (as mentioned briefly last issue) in a Panda Stocker. The 'Stocker' is fitted with a speed controller compatible with BEC, which made setting up a breeze. The Rx although housing extra BEC circuitry is smaller (55 x 37 x 19mm) than the older generation receivers. One interesting thing printed on the case of the receiver was BEC and ASP. A thorough check of the instruction sheet failed to throw any light as to its meaning. Anybody got some ideas? Fact not fiction!

SERVOS

Servos are the smooth FP-S148's, I have several of these little beauties in other aircraft and boats and have nothing but praise for them. Wiring is direct to the servo amp, motor and potentiometer for less shock and vibration damage. The torque of 3kg cm is heaps for any car or monster truck application and with a speed of .22 seconds per 60° is fast enough for all but the most fastidious of 1/12 scale drivers.

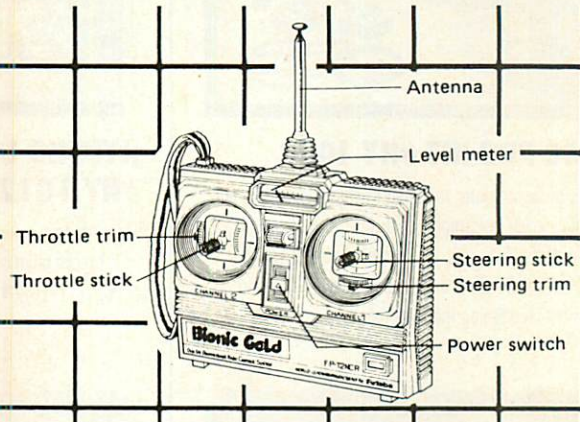
THE CASE

As previously mentioned the case has been totally re-designed and has racing specification short aluminium sticks for easy operation. Servo reversing, once only found on the more expensive up market 4 and 5 channel sets, is now common place in 2 channel sets. The new Bionic Gold is no exception. This allows greater flexibility in setting up your car, boat and aircraft. The reversing switches are located on the base of the set and are only slightly raised (approx .5mm) so it would be quite difficult to accidentally move the switches. A range check proved Futaba's claim that the set is good for 500 metres on the ground. Try that with your 'Toy Shop' special. The centre mounted battery level metre is large and easy to read and the crystal, located on the front bottom left panel, is easily accessible and quick to change. The ease is comfortable to hold and has a good non slip moulding.

CONCLUSION

After using the Bionic Gold stick radio in the Panda Stocker, then flying a 2 channel electric aircraft with it, I found it to be an excellent radio that has applications other than just in the car and buggy side of the hobby. If you are seriously considering purchasing boats or aircraft in the future, you should also consider a radio that is suitable for the application. Ever tried flying a plane with a pistol grip radio — it ain't that easy!

All up, good quality, good parts, back up and good value.



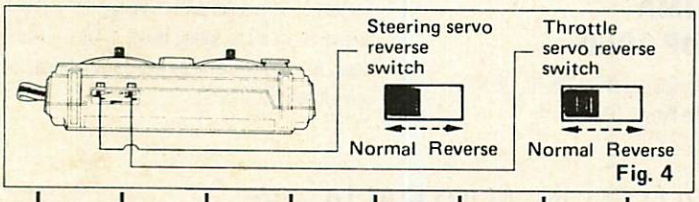


Fig. 4

AROUND THE CLUBS

THE 1989 AUSTRALIAN CHAMPIONSHIPS FOR 1/8 SCALE GT CARS

by Stuart Grant

The 11th Australian Championships were held on a new purpose built circuit in Perth. The airline dispute did its best to upset competitors plans with some drivers who were planning to attend unable to obtain a flight. Even so the majority of top name drivers managed to find their way even if they arrived slightly later than they would have liked.

The new WA track proved very popular with the interstate drivers, being very fast and flowing with some sweeping corners that allowed the true potential of these cars to be seen. In fact the three Australian drivers who recently attended the World Champs in Holland were at a distinct advantage as the setup required on the cars was identical to that used in Holland.

Tony Warren was running his recently acquired Blitz car and although the car was quick his laptimes were rather erratic. Stewart Grants car looked particularly smooth as did the local drivers. Defending champ Steven Burgess was struggling all week for more speed from his car although he looked assured of a top four spot. The PB team although weakened by the absence of Andrew Reade looked to be struggling with handling on this occasion, particularly down the straight where the PB seemed to have great difficulty steering a straight line when being passed by faster cars. The team from Thailand consisting Chira Retanarat, Preecha Pongrai, Vissut Ampaivorn and their two travelling mechanics Eddie and On were running some very interesting cars that had Associated front ends on a Serpent Chassis.

QUALIFYING

Qualifying consisted of six ten minute heats giving drivers ample opportunity to gain a good time although it must be said that the attitude of some of the drivers in the qualifying heats left a lot to be desired compared to the major races held in the Eastern States or in other parts of the world. After all, qualifying is about the driver against the clock. You are not racing other cars in your heat and therefore if a faster car comes up behind, it is an easy task to move slightly off line, let them through and then follow. Invariably if you do not do this there is a collision and both parties lose a lot of time. At all major races referees watch for this and if the slower car does not move over they receive a caution. If the faster car loses time and then hits the slower car no action will be taken, but with good refeering and sensible drivers this situation does not often arise.

Unfortunately at this meeting the refereeing was only done in the correct fashion during the semi finals and final, and subsequently many drivers lost good qualifying times due to stupid and totally unnecessary collisions.

At the end of qualifying after a great battle for the all important fourth position between David Braund and Devin Soltoggio the order was 1 S Grant 38 613, 2 S Burgess 37 615, 3 T Warren 36 600, 4 D Braund 36 603, 5 D Soltoggio 36 607, 6 P Pongrai 36 608, 7 L Robinson 36 614, 8 W Bilston 35 609, 9 V Ampaivorn 35 609, 10 R Soltoggio 35 612.

FINALS

The six drivers to progress forward from the ¼ finals after two eventful races were Aaron Soltoggio (the only 2WD car entered), Mark Giovannini, Phil Hartley, Paul Wyllie, Shane Piles and Eric Gaudieri.

RESULTS

	SPONSOR	NAME	CAR	ENGINE	LAPS
1	Serpent Model Cars Aust	S Grant	Serpent	Paris Rex	111
2	David Braund	D Braund	Serpent	S-Power	107
3	Maxima Racing team	P Pongrai	Asspent	Paris Rex	105
4	Custom Model Cars	S Burgess	Serpent	Paris Mon	105
5	PB Model Cars WA	R Soltoggio	PB	Rex	100
6	Maxima Racing Team	V Amperat	Asspent	Rex	99
7	Tony Warren	T Warren	Blitz	Rex	96
8	PB Model Cars WA	J Perkins	PB	Rex	88
9	Newman Builders	L Robinson	Serpent	Paris Rex	82
10	PB Model Cars WA	D Soltoggio	PB	O'Donnell	17

The even semi final started off with Preecha Pongrai taking the lead and then driving very sensibly to assure himself of a spot in the final. Ray Soltoggio finished second with Simon Wedd third. Unfortunately Simon's time was too slow and he just missed the final. Nevertheless a good effort by a promising driver. The odd semi was much the same as the even excepted at a quicker pace. Devin Soltoggio led all the way with Les Robinson settling for second. Vissut Ampaivorn originally finished third but received a lap penalty for a pit lane infringement which moved Jens Perkins up to third. Either way both drivers had more laps than the even semi drivers, so both progressed to the final.

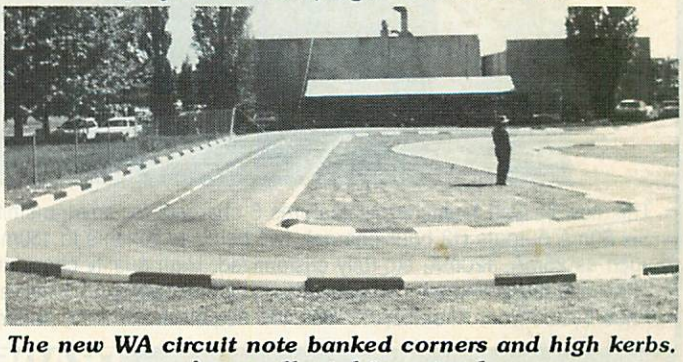
FINAL

At the start of the final Grant immediately jumped to the lead only to clip a curb and let Burgess through. Grant repassed Burgess on the second corner and began to pull away from the great battle for second between Burgess, Warren, Pongrai, Braund and Devin Soltoggio. Devin Soltoggio's PB was the first to go with muffler problems. Tony Warren also struck muffler problems at this stage after a collision with Steve Burgess. Les Robinson broke a rear drive shaft and lost about five minutes. David Braund from WA was doing an excellent job, running clear second from Preecha with Burgess suffering from an extremely rich engine not far behind fourth. Ray Soltoggio was having a quiet race in midfield waiting for the more fancied drivers to drop out. At the end of the thirty minutes Stewart Grant ran out a convincing winner from David Braund and Preecha Pongai a very happy third.

CONCLUSION

A good meeting on an enjoyable drivers track. From the Australian Associations point of view it was disappointing to see no 2WD class due to a lack of entries. Perhaps it would be better if the Australian Association dropped this class at a National level and introduced a cheaper class for 4WD cars as in reality 4WD cars are not really any more expensive to run than 2WD and the 4WD cars are much easier to drive. Special congratulations to David Braund who drove very well for his first meeting against the interstate drivers. It is to be hoped that Braund along with some of the other young drivers from WA can attend a selection of the other sanctioned meetings around Australia, as I am sure the experience gained will help them and their club immensely.

Line-up of drivers at 1/8 gas Australian Titles.



The new WA circuit note banked corners and high kerbs. An excellent drivers track.

ACT 1989 TITLES

by Gary Davey

Canberra Off Road Model Car Club Inc hosted their Titles for 1989 over the October long weekend. With just under 100 drivers, the event was an outstanding success and hopefully enjoyed by all.

A major feature, from the local viewpoint, was the increased percentage of local entrants compared to previous years and the excellent results achieved against visiting competitors. For the record, any local knowledge was negated by the late inclusion of many, many fiendish jumps.

The Canberra Club has recently moved from Rose Cottage to The National Velodrome in Narrabundah, an inner suburb on the southside of Canberra. Following the decision to relocate last year the Club was beset with the incredibly bad weather so familiar to us all earlier this year. The plan for a quick track build turned into a nine month saga of frustrating delays. All the workers did their best and everyone from the kids pushing wheelbarrows to Pat Searls Bobcat Service and the fretting organizers can be proud of a set-up which is darn good now and will be a proud and fitting venue for the Australian Titles in 1991.

Following the World Titles the ACT Championships were not expected to attract an enormous sign-on. However the roll up was good and more importantly, the event was well-run (computer failure aside) and enjoyed by a wide spread cross section of our fraternity.

The program consisted of two Upgraded Heats and one Graded Heat on the Saturday followed by two Graded heats on the Sunday plus Finals. A Finals were run as best two of three. All other Graded finals were sudden death.

FOUR WHEEL DRIVE OPEN

A classy field with several World Championship drivers taking on some who couldn't gain enough points to make the grade — for reasons other than lack of ability! Throw in some who voluntarily restrict their involvement and the formula for tough, close racing is complete.

Finals time (when the bull stops) has Greg Brooks on Pole with Scott Kennedy alongside him. Darren Campbell and Dallas Gardener are hot to trot in the second row, while Andrew Nelson and Jason Arnold are in positions five and six. The back of the grid has locals Adam Davey and Daniel Gillogly putting up for the host club. Had they thought it out, would the track eat 'em up?

First run sees the truth with Jason Arnold and Adam Davey blasting from the back of the pack. Up the long straight over the monster jump and suddenly several drivers show their true colours. Arnold leads Davey and Kennedy with the rest left in the dust. Last corner and Davey's Dog dies — Arnold takes the win from Kennedy and Nelson.

Second Final sees Davey leading Campbell from Arnold and Nelson. Once again the driving is superb with the drivers pumped right up. Scott Kennedy's chances fall away with an untimely prang and the boys are away. A tiny gap and the Campbell Pro Cat slides into the lead. Pro Cat from Dogfighter with Jason Arnolds's Mid in third, just clear of Dallas Gardiner.

Third final and we've reached the wire with nerves on edge. The start sees Arnold, Campbell and Davey run away with it. Arnold finds that glorious extras and we see him post 13 laps, as the battle between Davey and Campbell gets real serious. End of the war sees Jason Arnold fly the Kyosho flag high, Darren Campbell claims second with his Schumacher Pro Cat and Adam Davey comes third with the Holeshot Hobbies Dogfighter.

Ross Kramer IQ'd from Greg Brooks for the front of the grid. Mark Phelan has his Losi in third alongside Andrew Nelson with Rick Nelson and Ian Bush in the next row. Back of the grid sees Darren Campbell and Franz Pichler fronting for the Bankstown Club.

First Final is a massacre with the back of the grid boys taking advantage of many, many prangs on the front monster jump. This particular jump is criticized for it's steep ascent and closeness to a high-speed corner. The 2WD high-speed monsters are finding mass air and luck is a big factor coming into the unforgiving sweeper. Darren Campbell wins this one from Canberra's pride, Ian Bush using a Top Cat. Ross Kramer takes his neat RC10G into third from Greg Brooks' Losi.

Second Final sees Andrew Nelson haul it in a big way from Ross Kramer and Darren Campbell with Ian Bush slipping into fourth.

Third Final and the scene is set for a memorable run with four drivers in very tight on the score board. Darren Campbell starts hard, finishes harder and asks for no quarter — this dude hauls. Andrew Nelson takes second from Ross Kramer and Greg Brooks comes good. The computer spits out the points and we see Campbell take it out from Nelson and Kramer with Ian Bush in fourth.

FOUR WHEEL DRIVE STOCK

This Class is huge with Finals down to E. Many drivers were seen sleeping between Heats and one fella missed a Graded Heat because he forgot to get ready! Three drivers managed 15 laps and the rest did 14's. You have to go down to the C Final to get below 13 laps and even these guys were rippin'.

The A Finalists are a real good mix with Dallas Gardener on Pole (Lazer ZX), Troy Burgess (Optima Mid) alongside, youngster Michael Santalab (PB Mini-Mustang) and Mark Mason (Dogfighter) in the sec-

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TRADE NOTES

ond row plus Denis Hawkings (Holeshot Hobbies Dogfighter) and David Catchpole in the third row. Positions seven and eight are occupied by Simon Trotter and Scott Blair using CAT's.

After six minutes of cut and thrust we see David Catchpole has ground through the pack to take a great win from Dallas Gardener and Troy Burgess. Much thinking is called for if these guys are going to be caught.

Second Final and current Australian Stock Champion, Mark Mason blasts into form with a fantastic win — eight seconds ahead of the Gardiner Lazer and a lap clear up on third placed Catchpole. Burgess breaks his Mid in this one giving Santalab a chance with a fourth just clear of Hawkins in a good duel.

Third Final sees Mason and Catchpole fight to the line. Little separates these two through the entire race; well clear of the others by nearly a lap! Back with the pack and Gardener is just holding out a slashing, desperate Burgess. Thirty seconds to go and the Mason/Catchpole duel is on to the line. Mason holds well to take out the race and the Championship from a very skilled David Catchpole. Third in this Final goes to Dallas Gardener and this clinches him third overall.

TWO WHEEL DRIVE STOCK

This Class is rapidly becoming popular again as drivers rediscover the fun and lower cost of 2WD Stock racing. The Canberra Track's slippery surface is demanding and requires full application of grey matter (ya gotta think!) and a few drivers have problems sorting out where the grip is good and when to slow up a wee dram or so.

The start for the A Finals sees Mark Phelan (Performance Hobby Supplies Losi JRX2) TQ from Allan Huggett (Holeshot Hobbies JRX2 with Illawarra boys Matthew Brown (Ultima) and Matthew Roberts (RC10G) in third and fourth. Back one sees Barry Leech (JRX2) followed by Keith Barton (JRX2) and Rick Holland (Top Cat).

We see Phelan run well away with the first Final. Mark has them by the throat with victory by over a lap. Back in the dust, Matthew Roberts and Barry Leech complete their private fight ahead of surprise package Ian Buckham.

Second Final sees the scrap of the day with Buckham pushing Phelan to the line with Brown and Huggett in very close proximity. This race was the closest of the entire weekend and had the crowd worked right up. Phelan hangs on from Buckham, while Brown just pips Huggett over the moon-walks in front of the scoring shed.

Coming to the last Final and Phelan has the Championship in the bag. He's racing for a clean sweep and is not to be disappointed. Ian Buckham is the only driver who can pace the flying Losi. Side by side the JRX2's play duelling banjos with experience coming through in the end — Mark wins the whole thing well. Keith Barton takes third in this Final after a b...' of a time to salvage honour for the nice fold from Albury/Wodonga.Phelan first, Buckham second with Brown third.

CONCOURS

A very pretty group of buggies was divided into two classes: Show and Race. After Judy Mason and Julie Burgess had cast their eyes over the glittering entrants the winners were announced. Show Class went to Simon Trotter's 'Dennis the Menace' Cat painted by Mr Airbrush in England. Race Class went to Mark Wallin's Optima Mid, painted by Adam Davey.

SUMMARY

A good race meeting, well run by Barry Leech, Bob Gillogly and Heather McPherson with the capable Illawarra Transponders. Credit to others behind the scenes and we'll see you all next year as the Canberra Club ready's for the 1991 Australian Championship.

RESULTS

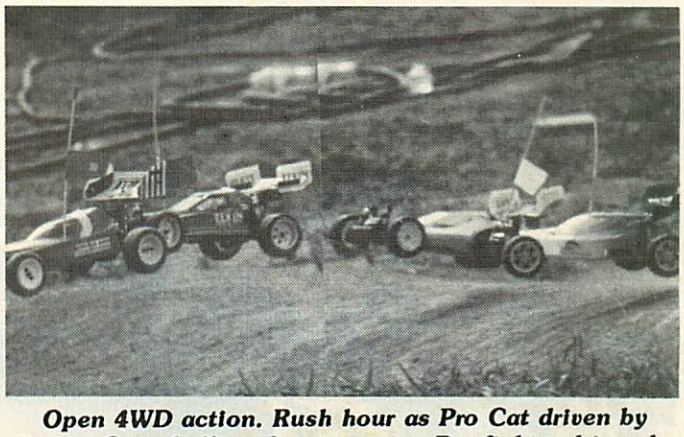
4WD OPEN A: 1 Jason Arnold (6), 2 Darren Campbell (3), 3 Adam Davey (8), 4 Andrew Nelson (5), 5 Scott Kennedy (2), 6 Dallas Gardiner (4), 7 Greg Brooks (TQ), 8 Daniel Gillogly (7).

2WD OPEN A: 1 Darren Campbell (7), 2 Andrew Nelson (4), 3 Ross Kramer (TQ), 4 Ian Bush (6), 5 Greg Brooks (2), 6 Rick Nelson (5), 7 Franz Pichler (8), 8 Mark Phelan (3).

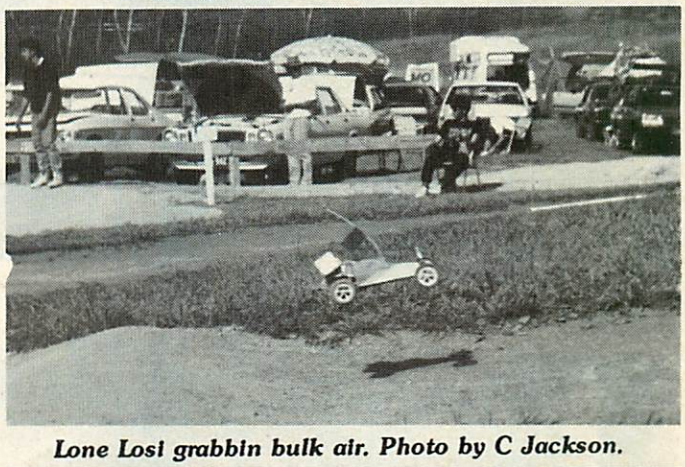
4WD STOCK A: 1 Mark Mason (4), 2 David Catchpole (6), 3 Dallas Gardener (TQ), 4 Troy Burgess (2), 5 Denis Hawkins (5), 6 Michael Santalab (3), 7 Simon Trotter (7), 8 Spot Blair (8).

2WD STOCK A: 1 Mark Phelan (TQ), 2 Ian Buckham (6), 3 Matthew Brown (3), 4 Matthew Roberts (4), 5 Allan Huggett (2), 6 Rick Holland (8), 7 Barry Leech (5), 8 Keith Barton (7).

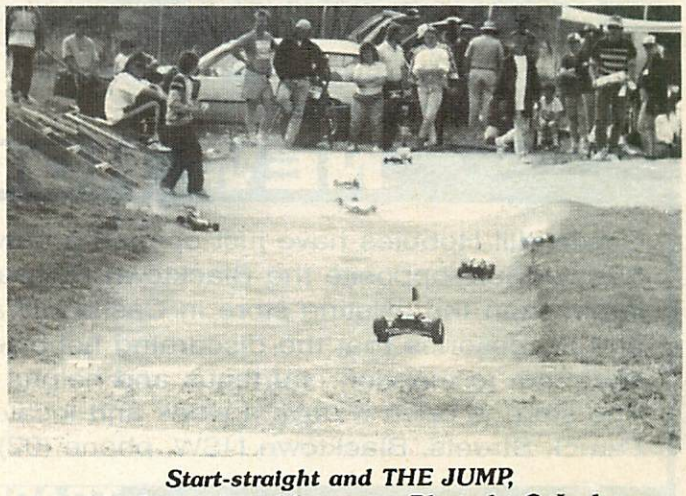
Overview of Canberra Track, National Velodrome, Narrabundah. This is the site for the 1991 Nationals. Photo by C Jackson.



Open 4WD action. Rush hour as Pro Cat driven by Darren Campbell works at passing Dogfighter driven by Adam Davey — not assisted by Kyosho's ably driven by Greg Brooks and Dallas Gardener. Photo by I Buckham, Cropping and montage by Canon Laser.



Lone Losi grabbin bulk air. Photo by C Jackson.



Start-straight and THE JUMP, loved by few — hated by many. Photo by C Jackson.

NSW ORRCA SHIELD & CUP

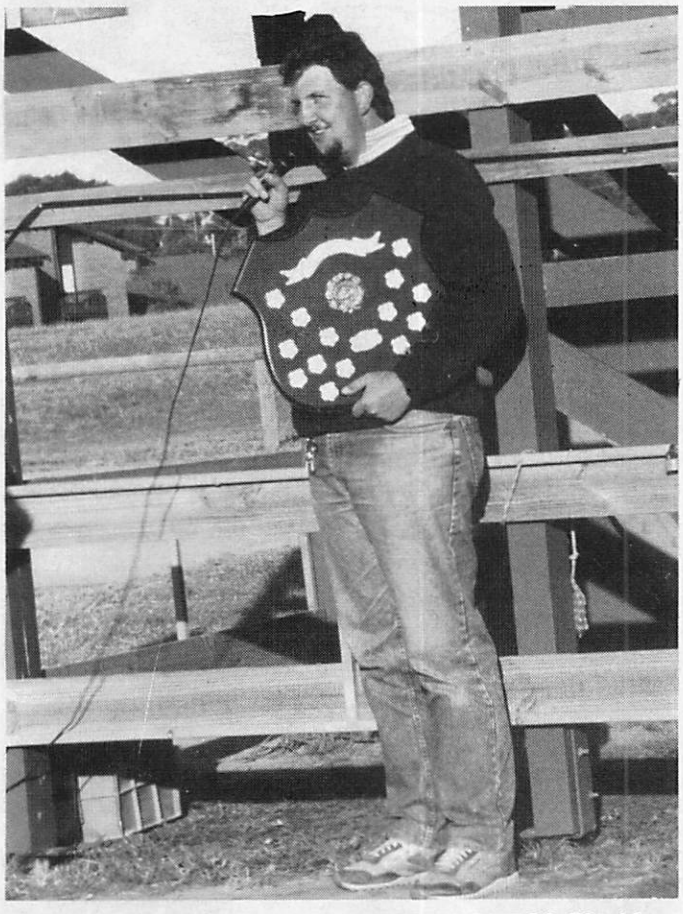
by Glen Spain

Once again Sydney (Ryde) Radio Control Car Club has taken out the NSW Interclub Shield by a small margin over St Ives with Illawarra coming in third. Illawarra lead the point score after Round 1 but was pushed back over rounds 2 and 3 by the 'Big Guns'.

However, Ryde didn't have it all their own way with Bankstown winning in the Interclub Cup followed by Castle Hill and Ryde Third.

1989 has been a busy year for NSW and the Interclub Shield and Cup events were not given as much importance as they should have. 1990 should see a much stronger interest return to these events. With more emphasis on 'Club Spirit' and 'Teamwork'.

CLUB	ROUND 1		ROUND 2		ROUND 3		FINAL	
	PTS	PLC	PTS	PLC	PTS	PLC	PTS	PLC
BORMAC	597	4	610	4	607	3	1814	4
CANBERRA	595	5	593	5	479	6	1667	5
C. COAST	445	6	521	6	546	5	1512	6
ILLAWARRA	640	1	617	3	560	4	1817	3
RYDE	637	2	639	1	617	1	1893	1
ST IVES	635	3	629	2	608	2	1872	2
WESTLAKES	104	7	471	7	228	7	803	7
LAKE MCQUARIE					191	8	191	8



Guy Evans receives prestigous NSW ORRCA Shield on behalf of Ryde club.

NSW STATE CHAMPIONSHIPS STOCK CLASSES

by the Smithwell Family

The NSW State Titles (Stock Classes) were held at Castle Hill track on 14th and 15th October 1989 with a total of 118 drivers competing. The host club Castle Hill Radio Controlled Off Road Car Club had spent months preparing the track which is in a peaceful bushland setting in the Fred Caterson Reserve, Castle Hill. Looking colourful with advertising banners and bunting, the weather was sunny and hot making for a very pleasant weekend's racing. The Castle Hill Club is small but enthusiastic.

Breakfast was served at the canteen run by mothers and wives of the club members, at 7am. Due to the 'gallantry' of three Castle Hill members, who camped over night at the track, we were able to set the track and equipment up on Friday evening, so allowing for a prompt and speedy 8.30am start on Saturday and Sunday.

Lap scoring was by computer and transponders supplied by the Illawarra Club. This was powered by a large very quiet generator, all of which ran flawlessly.

The atmosphere was busy but friendly and enjoyable. Large raffles were run on both days and for these we must thank our major sponsors who were Wings'N'Things, Bolt-on Hobbies, ABC Hobbies, Pit Stop and Dans Hobbies who provided awards for the fairest driver for each day. They were awarded to Ralph Gibson and Brendon Santalab.

Scrutineering was carried out by Castle Hill Club and apart from a couple of cases of underweight and a few cases of unidentified battery cells, most cars conformed to the regs.

Thanks also to Barbara Bolton, Glen Spain and Mark Mason for presenting the prizes and awards at the end of a great weekend's racing.

RESULTS

2WD JUNIOR STOCK, 1 Matthew Brown, 2 Daniel Watt, 3 Michael Hoad, 4 Jason Hunter, 5 Ryan Marshall, 6 Damien Foord, 7 Scott Pettet, 8 Peter Couper.

4WD JUNIOR STOCK, 1 Nathan Moore, 2 Jason Juroczko, 3 Christopher Scalley, 4 Michael Santalab, 5 Leesa Smithwell, 6 Daniel Watt, 7 David Crowther, 8 Cameron Sautelle.

2WD STOCK, 1 Andrew Nelson, 2 Greg Brooks, 3 Ric Bartolozzi, 4 Mathew Roberts, 5 Scott Salter, 6 Rick Nelson, 7 Peter McLean, 8 Ross Kramer.

4WD STOCK, 1 Darrin Campbell, 2 Greg Brooks, 3 Judy Mason, 4 Andrew Bolton, 5 Dallas Gardiner, 6 Andrew Nelson, 7 Troy Burgess, 8 Mark Mason.

Bateau Bay, Central Coast NSW and venue of final ORRCA Shield round.

DALLAS IS NEW NSW CHAMPION

Not many would have heard of Dallas Gardiner outside of the NSW race circuit but he beat most of the established names to become the new NSW ORRCA 4WD international class champ. On a bumpy Ryde track. Dallas overcame the track, the flies, a shower of rain and even Ralphs tuition. On side he had the new Kyosho Lazer, Dart matched SCE's and a Dart 14 triple wind with ceramic magnets and modular (slot car type) endbell.

Held on the third of December after the rain washed out the original date, the NSW Unlimited class titles featured some strong competition amongst the 53 competitors that included Vic title holder Reece Birtles and a good crowd from Coffs Harbour. Some regular Stock class drivers were also testing the water in this rocket class. After five heats all racers were graded into seven finals with the first eight vying for top honours.

Nicole Smithwell looks set to follow in Judy Masons footsteps with a third in the D final which was won by Darren Dowd from Bob Young. The C final was distinguished by Ben Panic wacking the pole of a large trackside flag and breaking it clean in two. Didn't do his car much good either. This was won by Jason Arnold from Adrian Harlors near standard Yokomo. In the B a very clean and close start saw Andrew Miller (Pro-Cat) the early leader, but this didn't last and the race became an exciting tussle between Mark Anderson (Lazer) and Colin Grenenger with another LRP powered Pro-Cat. Mark was first to the wire.

The first of three A finals gave a win to the 1989 Stock class winner and Pit Stop driver, Darrin Campbell. At the start it was TQ Michael Geddes (Performance Hobbies Dogfighter) the early leader followed by Gardiner and Bartolozzi but with Gardiner nibbling at Geddes all the way. A big spill at the front let Campbell through and he never looked back. In the second 'A' Geddes again had the early lead but lost it to Dallas who then displayed magnificant controlled driving to miss all the holes and pull away for a good win. Finally, in the third A Grade final Geddes took a big spill to move from first to last and despite threats from Greg Brooks and Rick Bartolozzi (who wasn't helped by a front wheel falling off) Dallas Gardiner again held out for a second win and championship status. The ensuing applause proved the popularity of this win.

None of the leading cars seemed to have an advantage in the rough conditions. They all handled similarly including the new PB ACE that made its debut in the C final. Some cars sported the German LRP motors and the Masons were trying a monoshock on the Lazer front end.

After the intense pressure of the recent world titles this event seemed low key and more fun. Good for the sport. There were delays in re-grading that slowed things down but otherwise a trouble free and successful event. Thanks to Julie and Carol on the computer and all the Ryde members and helpers for a classic competition.

RESULTS 1/10 NSW TITLES 1 Dallas Gardiner, 2 Darrin Campbell, 3 Michael Geddes, 4 Greg Brooks, 5 Rick Bartolozzi, 6 Reece Birtles, 7 Judy Mason, 8 Andrew Bolton.

BORMAC/ST IVES CHALLENGE CUP

Throwing ideas around on the telephone one day, Barbara Bolton of the St Ives Club in Sydney and Dave Smith (BORMAC) were lamenting the fact their clubs race days coincided and as a result each clubs members were unable to race at the others meetings. A few more phone calls down the track and the solution was found — there would be a special race meeting between the two clubs. Some more phone calls and discussion between the administrators of the clubs and the format was determined, a special interclub type challenge race between the two clubs would be held on Saturday November 25, 1989. To take advantage of the St Ives lights the race meeting would be a day/night meeting starting 4pm.

The concept of the BORMAC/St Ives Challenge Cup, as the race is now known, quickly gained acceptance. All classes would be raced (ie 2WD Production, Junior Stock, Senior Stock and Open) and rather than restrict the entries to pre-nominated drivers like the ORRCA Interclub series, the Challenge Cup would be open to every member of both clubs. As things turned out, 86 drivers signed up to race for points for their club. Points were awarded to the top four placegetters in each class from each club irrespective of their finals finishing position. 1st placing received 9 points, 2nd 7 points, 3rd 6 points and so on down to 8th 1 point. The club gaining the most points would win the Challenge and would hold the beautiful silver perpetual Challenge Cup until the next meeting 12 months hence. What a top night of racing we had as a result of this concept!

BORMAC won this inaugural Challenge Cup 138 points to 101 but it could have been a lot closer had St Ives had the ammunition in the 2WD classes. Rick Seymonsbergen started the ball rolling for BORMAC in 2WD Production with a great win from team mates Dave Maloney, Mark Jackson and Brad Moffat. Scott McLean grabbed 4 points for St Ives. Tony Glanville was the lone St Ives driver in 2WD Stock but it didn't stop him turning in a good drive to win for St Ives against some tough BORMAC competition. Then in 2WD Open Andrew Nelson gave BORMAC another victory and by the end of the 2WD section BORMAC had raced away to a big lead — 67 points to 28. Then came the St Ives revival.

Kevin Toole (BORMAC) won the 4WD Production final but it wasn't enough to stop St Ives winning this class 22 points to 11 — Jordan Pollock, Adrian Chappel, Mark Chappel and Amer Rached putting in good efforts for St. Ives. BORMAC struck back in Junior Stock when its ace drivers Matthew Pichler and Jason Juroczko ran away with the final, team mate Shane Whitaker taking third from a valiant Tim Warren-Smith (St Ives). BORMAC scored 26 points to 11 by St Ives.

4WD Senior Stock saw fortunes swing St Ives way although BORMAC's Brett Sainsbury led from start to finish. Interest though focused on the battle for the minor placings, Ron Nelson, Jerry Hopkins and Malcolm Pollock putting on a top display of tight power driving. At times these three were just a hairs breath apart and their hard fought driving had the sideline spectators roaring encouragement throughout the race. Ron eventually took second with Malcolm third and Jerry fourth to help St Ives to a 21 point to 16 victory.

The final races were the 4WD Open fianls, three in all with Jason Wakefield taking the C Final and Greg Brooks the B Final. All interest though was in the A Final and it was Dallas Gardiner who led from start to finish to give St Ives maximum points. Dallas got an early break and never looked likely to be put under pressure fro the lead. Andrew Bolton took second placing from Darrin Campbell and Jason Arnold. St Ives won the 4WD Open by the closest margin possible, 19 points to 18. Overall the 4WD section was won by St Ives, 73 points to 71 but that big early lead BORMAC had built up in 2WD gave them the Challenge Cup for 1989. Everybody is now looking forward to the 1990 edition of the Cup to be held at BORMAC the last Saturday night in November.

PERTH RADIO ELECTRIC CAR CLUB (1/12) 1989 WINTER CUP 3RD OCTOBER 1989

The 1989 Winter Cup meeting was the first trophy meeting held by the PRECC on their new carpet track. With a fairly tight twisty track laid out the racing was very competitive and close all night. Two heats were run to determine starters for the A and B finals.

Simon Wedd top qualified with his best ever performance and look like being a real threat to the top guns in future race meetings. Unfortunately for Simon the breaks in the A final did not go his way but nevertheless he finished a very creditable second and less than half a lap behind the winner. Kim Anning broke through for a long overdue win in a major event to take out the A final with the ever consistent Graham Reddin taking third place.

The event itself was closely contested between the three placegetters until about the four minute mark when Kim Anning managed to move out to about a one lap lead which he held on to until the finish.
RESULTS A FINAL: 1 Kim Anning (Schumacher), 2 Simon Wedd (Assoc 12L), 3 Graham Reddin (Assoc 12L), 4 Chris Schmidt (Assoc 12L).

Eight closely matched competitors lined up for the start of the B final which fulfilled expectations to be the race of the night as far as close racing was concerned. Two relatively new drivers qualified for the B Final and look like moving on to A grade racing very soon, in Graham Renn and Paul Saffrey. Both these drivers put on good exhibitions in the final with Graham finishing a very well driven fourth. The race itself started with the usual high number of bingles but fortunately no retirements through damage.

Once the chaos became a little more organised and the drivers settled into the race Rex Wedd found himself leading and stayed there until the finish. Karl Hashfield worked his way through the field to grab second place from Neil Anning.
RESULTS B FINAL: 1 Rex Wedd (Assoc 12L), 2 Karl Hashfield (Assoc 12i), 3 Neil Anning (Assoc 12i), 4 Graham Renn (Schumacher).

In conclusion it was a very successful race meeting and great to see a few new faces in amongst the winners circle. The club has race meetings every Tuesday at the Para-Quad Association Recreation Hall in Shenton Park. Since starting racing on carpet about a month ago the numbers have increased and the nights have become very enjoyable with super keen racing the norm.

VICTORIAN 1/10 OFF-ROAD TITLES

by Les Bone

Importance is Relative: It was difficult after the prestige and hype of the World Titles to settle back down to normal club racing. So difficult in fact that even when it came around to competing at the Victorian Championships it took a while to get the whole event into perspective.

To participate in and to (hopefully) win a State Title is quite an achievement. For although the quality of the driving is in most cases lower than at World level, the committment and dedication required is exactly the same. This comittment of course extends to the organization, lap scoring and other non drivers. It is with this in mind that I reflect upon the 1989 Victorian Titles.

A good measure of a successful event is the number of drivers who hang around at the end to watch trophy presentation and how many are in a happy mood. Using this as a gauge the Victorian Titles was a huge success, the smiling faces through the rain proved it. There was, however, some hiccups and maybe we could all learn from them.

1. An event of this size should allow as many heats as possible given that non local drivers have driven long distances to compete. On Saturday we were only able to fit in nine heats. This was, I believe, mainly due to there being nineteen races per heat giving a three hour turn around. Dual or cross entries had been allowed in all classes, therefore, anyone lucky enough to own and run 4WD and 2WD raced six times and stopped others having at least one more heat.

   I would suggest either stop all cross entry or delete Mabuchi class from State Titles.

2. On Sunday a similar problem arose which added weight to the argument of deletion of a class. At State Title level all 'A' finalists are allowed three final races which means that had to be a total of 30 races. Now it's a well known fact that generally those who own 2 cars are usually better drivers. This face could lead to the situation where a driver who enters 4WD and 2WD Mabuchi and qualifies in 'A' finals would have driven (this meeting) fourteen times, whereas others had only four heats and one final.

3. The Concourse, always well attended has reached the point where some fantastic creations are being presented. However, although some body shells have a technically perfect paint job others are more pleasing artistically. This makes judging the event very difficult. I'd like to request that someone draws up a set of rules covering such subjects as paint work, general condition of complete car, exhibitor painted/professionally painted? Concourse body shell to be used during races, individuality, theme related to the sport, etc.

Okay, so that's the controversial section over with, now let's get on with the race report.

Total number of entries was 148 which, considering that very few interstate drivers attended, was very good. The six classes divided into nineteen races. Five on 4WD Stock, two in 4WD Mabuchi and three in each of the other classes. It was good to see the general standard of driving is starting to level out and in most cases the first five places were only divided by a few seconds. The Templestowe track is a tough track to win at. The combination of short sharp spurts for most of the track conflicts horribly with a very long straight making gear and motor selection critical. Add all of that to some suspension bending jumps and concrete corners that flip a 'too close' car and one can see that to win a Victorian Title driving skills were a necessity.

Some of the more noteable names during the event were: Dean Fisk (4WD Stock). He's been around for years and stuck at using not the best of gear but recently his name has started to appear regularly in 'A' finals. Michael Chard (4WD Mod), always tried hard but had never been consistent enough to be noticed, really shone at this event giving the regular winners a good battle. David Crowe, fresh from becoming last year's 2WD Stock driver came very close to becoming this years 2WD Mod Champ. But I suppose the names most people would remember at this event would be Reece Birtles for his double win in 2WD Mod and 4WD Mod (first time ever in Victoria) and the Ferriggi brothers. These two junior drivers who race regularly at Keilor took home trophies almost as tall as themselves by becoming Victorian Champions in 2WD Stock (Stephen) and 2WD Mabuchi (David).

As you can see from the race results generally the more notable drivers did win but only by fractions of a second. It is quite obvious that with competition that tough, lap scoring without a computer would just not be accurate enough.

I look forward to the next Victorian Championships, not only for the racing and the fun but to see how the next organizers can beat the 'tonnage' of trophies as supplied by the Hosts Templestowe.

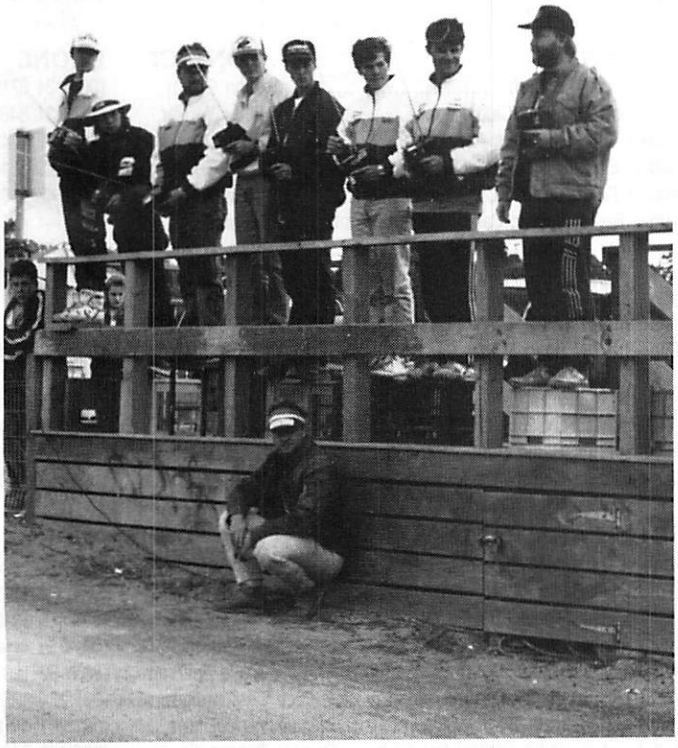
Chris Young, the man who pulled the whole thing together, did a good job of thanking everyone, even to the extent of awarding the lady helpers a bottle of champagne. So I'd kill to join with the best of the drivers and say thank you Chris, for a demanding job well done.

RESULTS VICTORIAN TITLES, OCTOBER 7/8, 1989

	2WD MAB	2WD STOCK	2WD MOD	4WD MAB	4WD STOCK	4WD MOD
1	D. Ferriggi	S. Ferriggi	R. Birtles	S. Timms	L. Harbour	R. Birtles
2	G. Gebert	C. Marshall	D. Crowe	G. Wright	R. Lewis	G. Collings
3	G. Henderson	M. Roberts	V. Riches	A. Bradbury	D. Fisk	M. Chard
4	F. Lawrence	B. Coleman	G. Collings	D. Holbrook	S. McCourt	N. Millard
5	A. Dunes	G. Lewis	B. Willoughby	A. Williams	E. Foong	B. Willoughby
6	B. Kimball	G. Grinter	N. Millard	P. Hooker	L. Sola	C. Kermond
7	D. Barker	G. McPherson	C. Young	J. Vergunst	A. Hall	D. Beilby
8	D. Armstrong	B. Shephard	C. Gebert	M. Willoughby	B. Peatling	C. Young
9	M. Bodnar	J. Garside	M. Chard	R. Brooks	B. Unsworth	J. Clarke
10	D. Holbrook	J. Ainslie	L. Bone	A. McDonald	M. Polistena	P. Bartollo
11	P. Baldacchino	T. Warne	A. Bishop	I. Warner	D. Walker	J. Watts
12	J. Brooker	J. Dennis	J. Williams	M. Straughan	W. Rehberg	C. Gebert
13	S. Wilson	J. Watson	A. Stubbs		G. Dettmann	B. Day
14	S. McKay	K. O'Neal	M. Parma		S. Giles	R. Bishop
15	J. Phipps	M. Crane	D. Watson		D. Moran	G. Soerono
16	T. Svaghi	A. Defina	I. McPherson		C. Monagan	E. Holinger

Big crowds and demanding track set the scene for Vic Titles at Templestowe Reserve.

Good age spread in Concours winners at Vic champs. Left to right, Andrew Cook (3rd), Michael Dettman (1st), Greg Collings (3rd).



First 8 finalists line-up for 4WD unlimited at Vic Champs. Left to Right: Michael Chard, Neal Millard, Greg Collings, Reece Birtles, Clifton Young, Craig Kermond, Brett Willoughby, Dennis Beilby.

NSW ORRCA SHIELD
FINAL ROUND CENTRAL COAST

by Justin Golding

Unbelievable as it may seem the wet stuff was falling in abundance the night before the Shield to undo all the track maintenance done only the day before and to bring out the holes and bumps for which, by now, I'm sure Central Coast is renowned. All was not bad though and the sun did fight through the clouds and racing was delayed no more than an hour. As for the track it soon became hard, slippery and bumpy which presented the drivers with a challenge in the true spirit of off road racing.

The newly rebuilt jump in the straight of the track certainly made its presence known. In fact for the open drivers it was the beginning of some rather spectacular tumbles, twirls and somersaults down the length of the straight. This did draw quite an audience, so perhaps it was worth it. Despite being a Kyosho person it has to be said that for all round stability nothing could touch the CAT on the day.

Special congratulations go to Ralph Gibson who as he yelled from the stand at the time, led in his final for a lap which was something that he said he wanted everyone to know, so there you go Ralph, its in print.

RESULTS

2WD STOCK A FINAL: 1 Scott Macgee, 2 Michael Fretlin, 3 Phillip Fretlin. B FINAL: 1 Alan Miles, 2 Martin Twine, 3 M. Svatos.
2WD MODIFIED A FINAL: 1 Guy Evans, 2 I. Bush, 3 Rick Nelson. B FINAL: 1 Franz Pichler, 2 Barry Leech, 3 Damien Foord.
4WD JUNIOR STOCK A FINAL: 1 Chris Scalley, 2 Jason Juroczko, 3 Daniel Watt. B FINAL: 1 Alexis Ramsay, 2 Shane Goldsbrough, 3 Brent Adams.
4WD SENIOR STOCK A FINAL: 1 Troy Burgess, 2 Adrian Harlor, 3 Franko Cellini. B FINAL: 1 Dallas Gardiner, 2 Andrew Gillot, 3 Alex Richardson.

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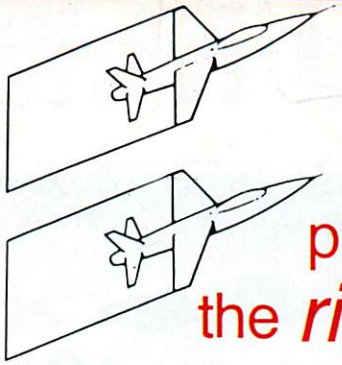

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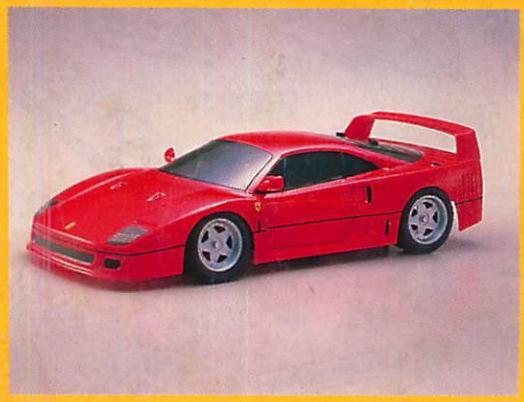

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