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Welcome

Hi! Thanks for reading our first edition of "Dirt & Track". We hope that you enjoy reading the magazine, as we enjoy bringing it to you.

Please let us know what you, the readers, want to see and read in future issues to enable us to bring you the best and most comprehensive topics and articles relating to our great sport.

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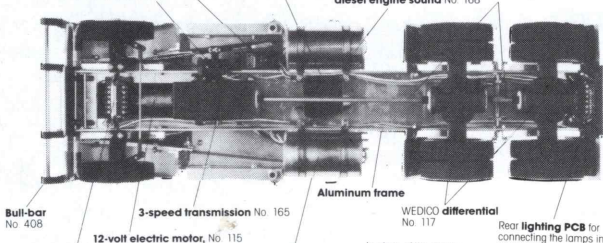
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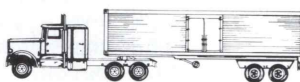
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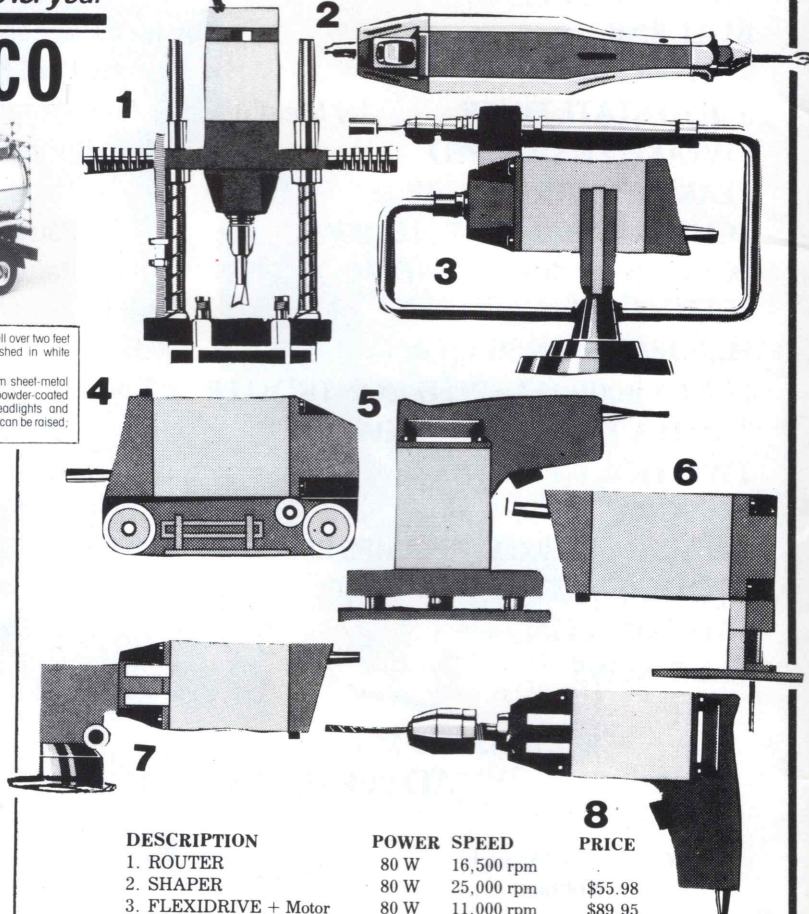
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STOCK MOTORS

by Todd Cameron

Technically, a stock motor is a motor having no more than 27 turns of 12 gauge (0.065 mm) wire on the armature, inside a fixed end-bell (i.e. non-adjustable timing) 540 size can with brass bushings in the can and end-bell. Due to the difficulties in policing stock motors in the past, new rules have been voted in which allow anything to be done to a stock motor, short of opening the actual can itself. As with Formula One, the technical laws are merely parameters within which amazing performance can be extracted.

Standard off-the-shelf stock motors, such as the Yokomo 05Rs used at the 1987 Buggy Nats, may be advanced up to 20 degrees and retarded up to 4 degrees in their standard form, by a combination of can and commutator advancement or retardation. **Can advancement** is simply the relationship of the two magnets inside the can (and stuck to the can, thus effectively being a part of it) to the three poles of the armature. **Commutator advancement** is the relationship of the armature to the magnets, depending on where the armature arrangement is situated on the motor shaft.

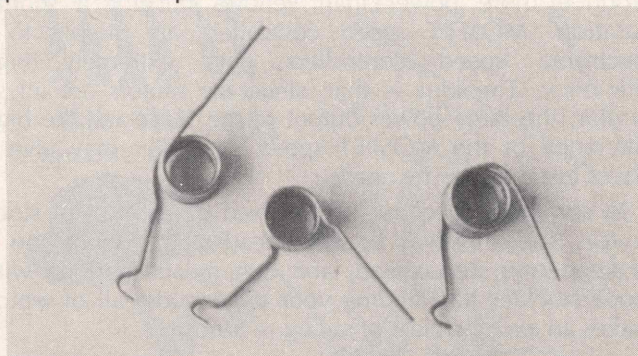
A new breed of stock motor can now be purchased with 23 degrees or more advancement (once again, with a combination of can and commutator advancement). These motors are currently available from Reedy ('green label' stock), Race Prep (stock) and Rev Tech (off-road stock). Needless to say, these motors produce extraordinary performance, and often require good NiCads and smooth driving to last six minutes. It is generally agreed that any significant further advancement decreases efficiency and would result in a 'touch and go' time situation. Due to the state of tune of these stock motors, by manufacturers' recommendation, they last approximately ten races (depending, of course, on how they are treated). Consequently, they make ideal 'finals motors'.

That may be all fine and dandy for club running, but the best Reedy or Race Prep motor is of no use at a State Title or National Title event where all stock entries are issued with one motor of similar specs (with the option of purchasing a second), usually Yokomo 05Rs. So the question is, "**How does one get such performance from an 05R?**" I'm glad you asked.

Firstly, some people prefer to replace the standard **brushes** with the new 'oiled' compound type brushes from Reedy and Rev Tech, which polish the commutator. These may then be **filed** (however, they can be purchased filed, and this is recommended) to reduce the

brush contact area. File away about 1/3 of the brush from its trailing edge. As I said, most brushes can be purchased already filed, so then it's simply a matter of soldering them on.

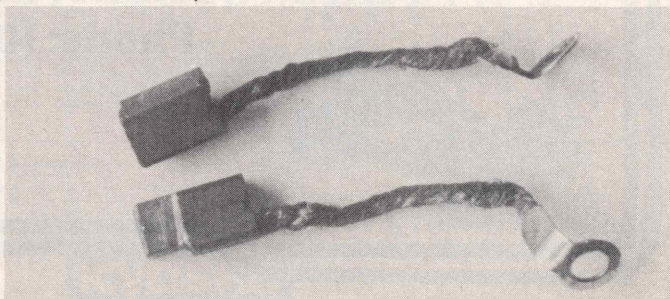
Something which is often overlooked is **spring tension**. The factory setting is, in most cases, not the most efficient. This can be adjusted to its optimum only by trial and error. Adjusting and listening to the motor whilst monitoring current draw is the only way, if one doesn't possess a variation of the ubiquitous dyno to speed matters up somewhat.



The spring in the centre comes straight out of a stock motor. Open it out like the one on the left for more torque, and close it in like the one on the right for less torque.

With just these simple mods, you may be satisfied with the performance of your motor, but for those still hungry for more power, there is still one avenue left: **twisting**, which is now legal. I left this until last because it is difficult to perform correctly, and subsequently, difficult to rectify if a mistake is made (which is an important consideration when only two motors per person are allowed at National and State Titles). Therefore, it is wise to use this step only as a last resort. Twisting, when it is performed without damaging the motor, is equivalent to rotating the end-bell clockwise (looking at the end-bell) on a modified motor; that is, it **increases the RPM**, with a subsequent increase in current draw.

To twist a motor the basic requirements are an old pinion, some pliers and a smallish Allen key or screw-driver type implement. The screw-driver is placed in one of the ventilation slots and in between two poles of the armature. This should be a snug fit so that the armature cannot move, but not so tight that it removes the enamel from the windings. The pinion is then fastened on to the motor shaft and, with the pliers, gently turned a few degrees anti-clockwise. This is performed until the desired RPM:current ratio is achieved. However, as I said, great care must be taken not to damage the motor. It would be a good idea to practise on a couple of old stockies first.



The top brush hasn't been filed. On the bottom brush, notice how part of it has been filed away to increase the performance of a stock motor.

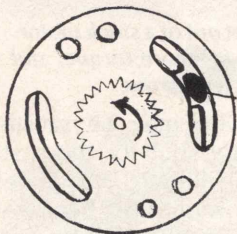


Two of the latest (advanced) stock motors in the offering from Rev Tech, both in slightly different states of tune.

Now that you know the main tricks of the trade, the secret is to know which mods are needed to produce the motor characteristics suited to your car (which will be different for 2WD and 4WD), and this only comes from **experience**. Stock motors can be 'over-tweaked' to the point where they become very inefficient; I have seen several stock motors pull over 3 Amps free-run, and only the very good 'hot' motors pull anywhere near that sort of current free-running.

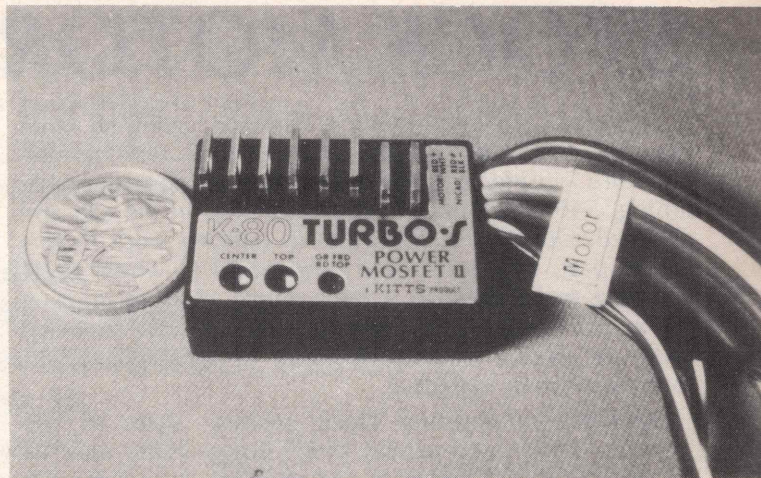
Before I conclude this article, it seems appropriate to mention **SCR cells** and **MOSFET speed controllers**, which are playing an increasingly important role in stock racing. SCR cells are a new development from Sanyo, and they are a sort of hybrid red and yellow cell which produce more power than yellows but for a shorter duration. MOSFET speed controllers are simply fully electronic speed controllers with extremely high efficiency. The idea is that, since the motors are all so similar, the large power output of the SCRs and the high efficiency of the MOSFET speed controller may give a driver just the edge he needs.

In summary, because of the fixed parameters of stock motors, the only way to stay ahead of the opposition is to keep **one step ahead**, and that means fiddling with those stockies and finding your own mods; all of which makes an exciting class of racing — **Stock**.



Insert screwdriver here

For "Twisting", rotate pinion anti-clockwise to advance timing.



A MOSFET speed controller and SCR battery pack, similar to the electrics used by 1987 4WD Stock National Champion, Michael Gettys.



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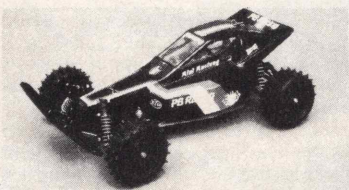
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SPA 240WS MOTOR REVIEW

by Paul Bird

The SPA 240WS is a new motor, brought out by Kyosho under the Option House label. It is the power plant recommended for Kyosho's off-road buggy, the Salute (see review this issue). Coupling the 240WS with the Salute, through a 12 tooth pinion, produces a buggy with a good turn of speed and very good throttle response.

The motor appears to be primarily for 4 minute and sprint races, and, as such, has a high rev rate. However, it is lacking a little on the torque necessary for getting around a sticky off-road track in the mud.

Being a modified class motor, the timing can be advanced or retarded to suit individual requirements, and, even advanced to six degrees, it is still possible to get a 5 minute race without the batteries dumping.

Naturally, the 240WS is ball raced, and, unlike some other modified motors, the end-bell is made of metal, reducing the chance of heat distortion.

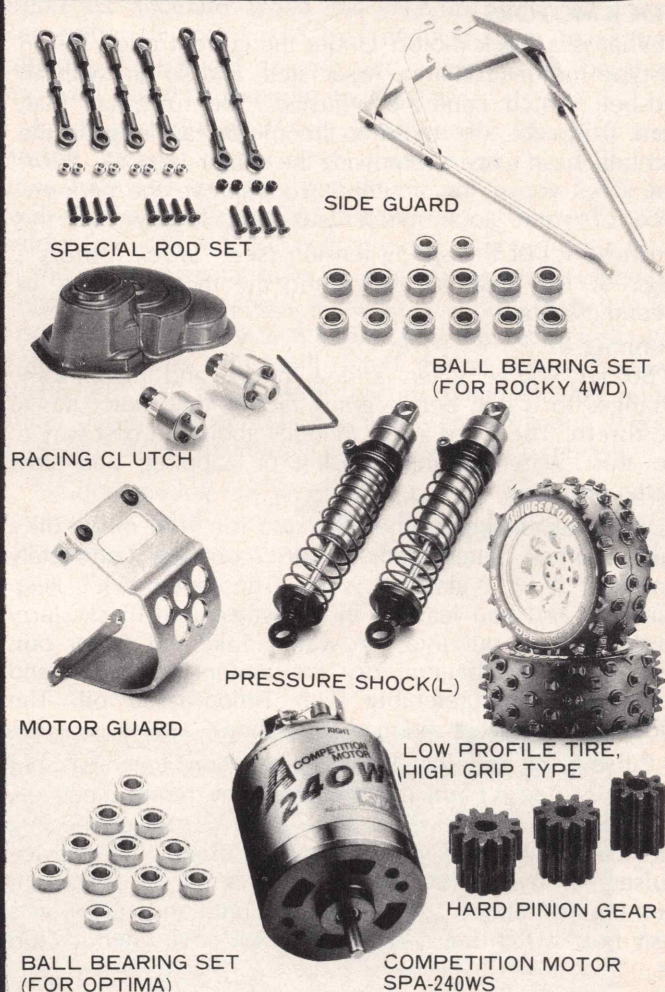
With a retail price of just under \$100, the SPA 240WS will allow the low budget competitor in modified class to be in with a chance.

Review motor was supplied by Kyosho Australia.



Option House's new SPA 240WS modified motor

Option House



LIST OF PARTS' ADAPTATION (WHICH REFER TO EACH MODEL)

Parts No.	Parts Name	OPTION HOUSE	4 ROCKY	MG K II	ULT I MA	COS MO	STURBO-NO	TOHAWAK	PIEGRUS
W-0101	MOTOR GUARD	●	●						
W-0102	SIDE GUARD	●	●						
W-0103	GOLD PLATE SET	●	●						
W-1001	HIGH CARBON PLATE 1.7	●	●	▲	▲			▲	
W-5001	PRESSURE SHOCK(S) (PAIR)	○	●			UM-26			
W-5002	PRESSURE SHOCK(L) (PAIR)	○	●			UM-26			
W-5009	HARD PINION GEAR 9T	○	●						
W-5010	HARD PINION GEAR 10T	○	●						
W-5011	HARD PINION GEAR 11T	○	●						
W-5005	SPECIAL ROD SET	●	●						
W-5001	UNIVERSAL SWING SHAFT	●	●						
W-5002	UNIVERSAL SWING SHAFT	●	●						
W-5040	RACING CLUTCH 10T	●	●						
W-5042	RACING CLUTCH 12T	●	●						
W-5044	RACING CLUTCH 14T	●	●						
W-5046	RACING CLUTCH 16T	●	●						
W-5048	RACING CLUTCH 18T	●	●						
W-5021	LOW PROFILE WHEEL (PAIR)	●	●						▽
W-5031	LOW PROFILE TIRE ALLROUND TYPE (PAIR WHEEL IS NOT INCLUDED)	●	●						
W-5032	LOW PROFILE TIRE HIGH GRIP TYPE (PAIR WHEEL IS NOT INCLUDED)	●	●						
W-1011	COMPETITION MOTOR SPA-240WS	●	●						
W-1012	COMPETITION MOTOR SPA-480WT	●	●						

● = Available (Not included)
○ = Included in Kit
▲ = Available under necessary processing
■ = Use them with Wheel of Low Profile Tire (OT-67, UM-17, RK-2 & W5021)
▽ = Use them with Wheel set (OT-3 & OT-62)
▽ = Use them with Front Wheel (PI-21)
UM-26 = Use recommended part with the No. indicated

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BIRD TORQUE

by Paul Bird

In this article I'm going to look at what are probably the two most important things in an RC buggy: the batteries and the motor. The motor first. There are quite a number around, especially in the Modified or Unlimited class, and, because these motors can easily be adjusted to improve their performance, I'm going to look at stock motors.

STOCK MOTORS

What is a stock motor? Under the current rules, it's an 05 type motor (Yokomo, Associated, and so on) with an end-bell which can't be adjusted. The rules say that, apart from actually twisting the motor, as long as the end-bell hasn't been removed, the motor is stock. Now, that gives you a lot of scope. To improve the performance of your stock motor you can, legally: file the brushes, adjust the spring tension (see "Stock Motors", page 5, for details), and run-in the motor by one of several methods.

Running-In

So far you've taken a new motor and made some changes to it but, before going racing, that motor has to be run in. There are a few theories about the best way to do this: water-dipping; pulsing or zapping; and slow battery running.

With **water-dipping** the idea is to run your motor on a fully charged battery and, while it's running, completely immerse it in a glass of water. The motor WILL keep running, and you leave it in the water until black slurry starts to float out into the water. Take the motor out, disconnect the battery, dry the motor thoroughly and re-lubricate it, preferably with Teflon-based oil. The motor is now run-in and ready for racing.

Pulsing, or zapping, looks a little more technical, but probably doesn't run the motor in any more effectively than water-dipping does. The idea is to connect a 'device' between a nicad and the motor. The device pulses, or cycles, the motor on and off. You leave it running for about 15 minutes, or until the motor gets very hot; switch off, and let the motor cool. Then it's run in.

Now, be careful when it comes to motor zapping. Commercially made zappers sell for \$60 and more. You can build the same device for between \$5 and \$25. All that a zapper is, is a 6 volt car blinker can; the \$25 version. If you buy a \$5 can, just carefully open it,



A 6 volt Volkswagen blinker can is all you need to run-in your stock motors by the motor-zapping method.

slightly bend out the thermo-couple wire, and put the can top back on. All this does is slow down the cycling rate a bit. If it pulses the motor too fast it will reduce performance rather than improve it.

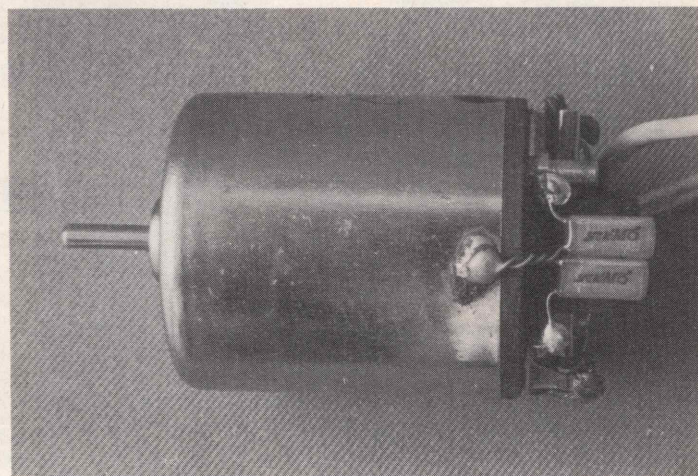
Finally, there's the **slow battery method**. This involves running the new motor for several hours on a 3 to 4 volt supply, remembering, of course, to keep the brass bushes well lubricated.

Of course, having made these changes, it's a good idea to be able to check just what effect they've had on your motor, and a good way to do this is with a **dynamometer**, or dyno. They are rather expensive to buy, but you can make a very simply dyno at home, which will allow you to compare your motor's performance before and after any changes. All you need is an old motor that still works, a piece of board to mount it on, some plastic tube to fit the shaft very tightly, and a multi-meter. Connect the old motor's wire to the multi-meter and set the meter to read DC volts, somewhere up to about 15 volts. Fit the shaft of the motor under test into the plastic on the dyno motor. Connect a fully charged nicad to the test motor and let it run. Make a note of the reading on the multi-meter. After you've made your changes; i.e. filed the brushes or done the springs etc., repeat the test and compare the readings. Hopefully the reading after the changes will be a little higher, indicating that you've gained a few more revs.

To be really particular, you should connect an ammeter across the motor and check what your changes have made to the current consumption. Ideally, I like a stock motor, running with absolutely no load, to draw no more than 2.1 Amps, preferably it should pull only 1.9 Amps. (Most stock motors, when new and untouched, will draw about 1.4 Amps.) Under load, as in racing, this current draw can exceed 5 Amps, which does rather shorten your racing time, or affects the gearing that you can use.

By the way, if you're having trouble with radio interference, I suggest fitting two .33uf capacitors to the motor; one from the positive connection to the can, and the other from the negative to the can.

That's about it really. Your stock motor has now been modified within the rules. Now you need to think about the go-juice; or how to charge your nicads and get the most out of them.



Notice how two capacitors have been fitted to this Yokomo 05 stock motor to reduce radio interference.

BATTERIES

If you're reasonably new to the sport, then you are probably still using the quick-charge leads which came with your car kit, or perhaps you've now got a clockwork timer type of charger. Both of these methods will, of course, charge your nicads, but not to 100% of capacity.

Firstly, it's important to understand something about how nicad batteries are made. Normally they comprise 6 cells joined together in series, to put out a nominal 7.2 volts. Put simply, each cell is made up of layers of chemicals which store a charge. If the cells are over-charged they get very hot, and if they get too hot a sealed vent opens, spraying hot and corrosive material in all directions. So, it's very important NOT to over-charge those nicads. The thing to remember with nicads is that as they charge they get warm, but when they start to over-charge they get hot, very, very quickly.

Charging

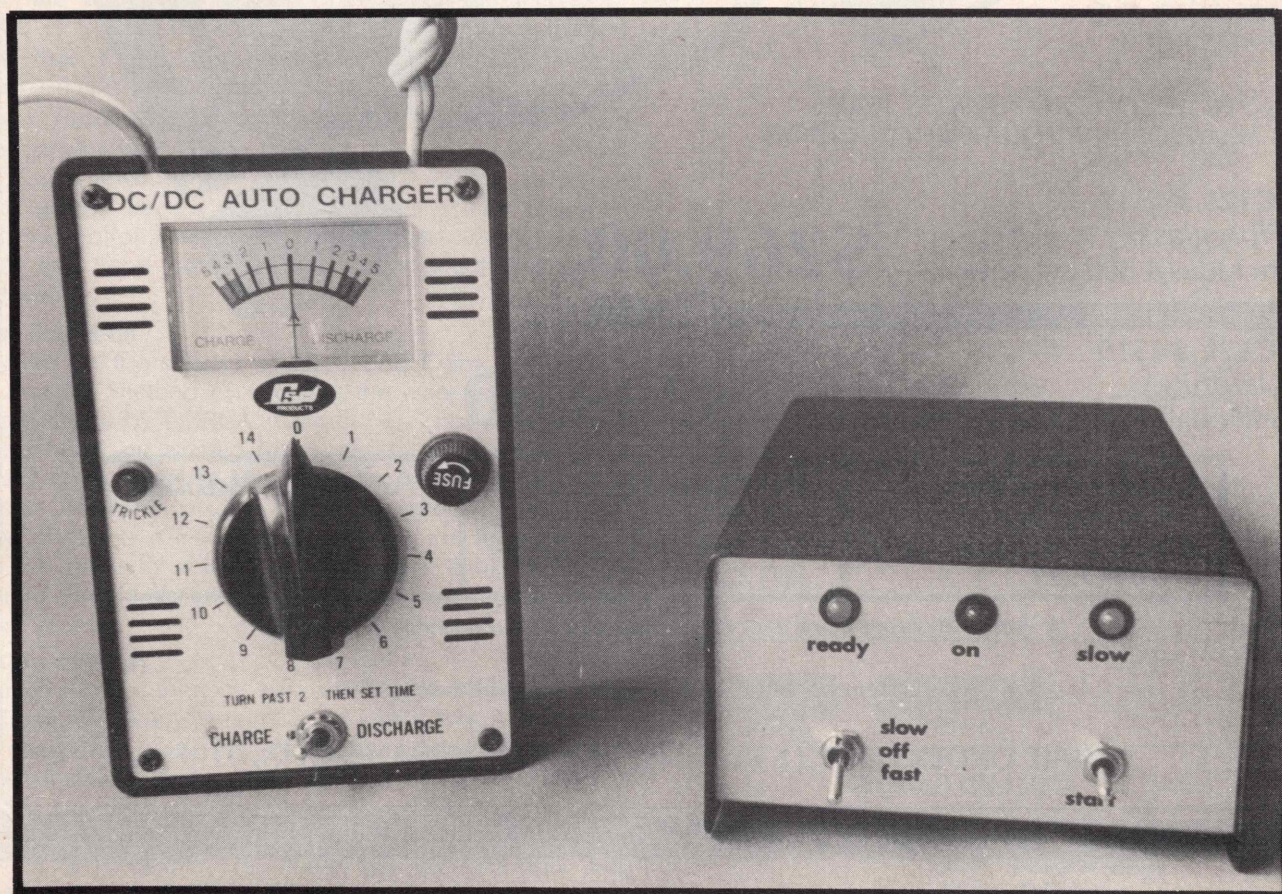
Quick-charge leads and clockwork chargers do work, provided that you are prepared to sit there and watch over the pack to make sure that you don't cook it. One way of making sure that you get the maximum charge possible is to connect a digital voltmeter across the battery and watch the voltage reading. When a nicad reaches its full charge, and starts to over-charge, the pack voltage starts to drop; so, when the voltage on the meter drops, unplug the nicad, because it is charged.

A better, although more expensive, way of charging, is with either a peak-detection charger or a thermal cut-off charger. The prices for these start at about \$130 and go upwards quite rapidly, but they are usually very reliable and require a minimum of supervision, allowing you to do car repairs, marshal, or whatever.

A **Peak-Detection** charger charges the nicad at a constant current of about 4 Amps until the maximum voltage is reached. Then it switches off. A **Thermal Cut-Off** unit works on the fact that, as a nicad starts to over-charge, its internal temperature increases very quickly. A sensor is fitted to the pack, and when the temperature reaches about 10°C above the ambient temperature, the charger cuts out. Because we often race in rather hot conditions during summer here in Australia, I prefer the peak-detection charger for my nicads. I've found that some thermal cut-off chargers aren't as accurate when the mercury gets up a bit. Remember, if your nicad isn't charged to its maximum capacity, you might as well not bother racing, because you won't get the most from your buggy.

A lot has already been written about charging and storing nicads. Some racers like to totally discharge their packs on resistors and then fast charge them on race day. I advise against this as, taking a 6 cell pack below 6.6 volts, i.e. 1.1 volts per cell, can result in some of the cells reversing polarity, making the pack useless. I suggest that after about 6 races, use a volt-sucker to discharge the battery to 6.6 volts and then trickle charge it for 16 hours. This will avoid the so-called shadow effect, and will also ensure that the nicad charges on a linear basis, with all cells taking the charge evenly. Look after your nicads and they'll give you very good service.

Good racing to you; and if you have any tips, suggestions or ideas, then please drop me a line here at Dirt & Track and tell me about them.



Two battery chargers. The one on the left is the clockwork variety. It will fast charge for up to 15 minutes then revert to trickle charge. The unit on the right is a no frills peak detection charger.

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BULL BAR

by Jack Grenenger

WORLD CHAMPIONSHIPS — FINANCIAL ASSISTANCE

With the World Championships coming up in August, it is good to see a committee formed to raise money to assist those chosen from NSW to attend. I had previously mentioned to various members of my own clubs and ORRCA delegates, as far back as December, that ORRCA itself should do something, but, as usual, nothing happened. It fell to the mother of a racer to start the ball rolling. A committee was formed with Ian Kennedy (President of ORRCA, NSW), Barbara Bolton (Treasurer of Warringah RC Car Club) and myself as Trustees. The response from Sydney clubs has been tremendous, as it has been from individuals. Brian Sawtell, President of Ku-Ring-gai, donated \$200 and formed the \$200 Club. So far there are about 5 who have joined this Club: Airborne, Kraft Systems, Pit Stop, Dawn Trading and Toy Traders were some of the early contributors, and by the time this article hits to press hopefully there will be a lot more. As always it is the ladies who have done most of the work, including door knocks, lamington drives and a bingo night. St. Ives is putting on a race night, raffles are underway for a C.A.T. (donated), auction sales for dinners, 10 video rentals, radio sets, Novak speed control, Check Point motors (all donated), so in the short time that the fund has been in operation (at the time of writing, one week), things are really moving.

It was decided at the first meeting of the committee that it would be an on-going thing, not just for the World Titles, and that they would continue to raise money for any other contingency that may arise. For example, if the Inter-State Shield becomes a fact, the committee could perhaps provide money for accommodation of the drivers selected. So, anyone out there who feels that they could assist, please contact Barbara Bolton on (02) 451 7775.

One unfortunate aspect of the World Titles is that some of our best drivers are not able to attend because the Championships fall during school exams. However, those going, namely Colin Grenenger (Team Captain), Andrew Bolton, Michael Toms, Scott Kennedy, Guy Evans and Scott Salter, will no doubt acquit themselves very well.

Team Selection

While on the subject of the World Titles, it seems to me that the method of selecting the team for this event, as laid down by ORRCA Australia, was not a satisfactory one. There are some drivers who, on overall merit, should have been in the team but, because of a disastrous weekend at the Nationals, did not qualify. I know that the rules were laid down for selection and that we have to abide by them, but I think that more thought should be put into the manner of selection for future years.

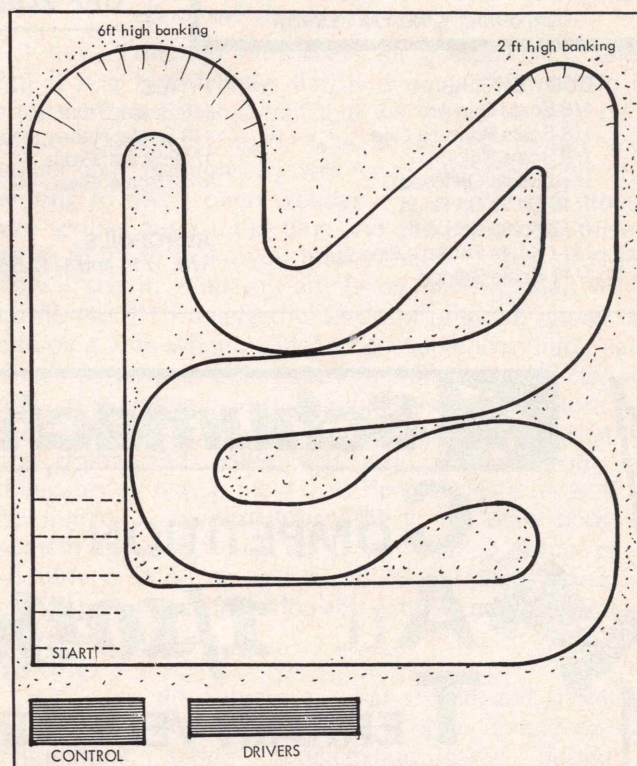
Communication

Also, some confusion has occurred somewhere along the way. We were originally told by ORRCA that there was only one class, i.e. 4WD Open. Now we find that there is also a 2WD Open and, as we were allotted 8 places, I would assume under the selection procedure that the 8 drivers would have the opportunity of racing one or two classes. They have, but we find now that, because there are about 4 drivers not running 2WD, it's open go for anyone to enter the 2WD Class, having

qualified for nothing. I don't know where the blame lies, but this sort of thing must not happen again. As the two classes are completely different, and we don't run 2WD Open here, it is not fair to ask 4WD specialists to drive 2WD. On the other hand, what sort of showing in a World Title will our 2WD Stock specialist have in 2WD Open! It is all very complex, and one of our biggest disadvantages is the size of our country and the lack of communication between States. I'm glad we haven't got 50 or more; States, that is. I think that the time is here for a yearly conference of all States; not just a get-together at a National Titles, when everyone is tired and on edge. Our sport warrants better than that.



Neil Blaney, from Wollongong, has his hands full being chief mechanic for his two boys and a friend.



WORLD CHAMPS

Track Details
Lap: 114.5 metres
Width: 3.84 metres straight
Straight: 21.37 metres
Surface: red speedway shale.

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O.R.R.C.A. AUSTRALIA

On the subject of control of our sport, I suggest that the present format for ORRCA Australia selection is unsatisfactory. To those of you who are unaware and perhaps not interested in how or who governs our sport, let me say that **it is time that you became interested.** The present system states that whichever State has the Nationals each year, that State takes on ORRCA Australia (i.e. the controlling body of RC Cars in Australia). This was done originally for expedience, and seemed to be the natural way to go at the time, but things are changing so fast in this sport that it is now a cumbersome and unviable system. As it stands we have a different President and Officers each year. What our sport needs is a leader to take charge and to make sure that we are kept up to date with happenings overseas, so that we can follow overseas trends where possible and suitable; to make sure that all States know what is going on in all other States; to organise a newsletter that goes out to all affiliated members; in fact, to organise our sport.

I don't wish to be critical of our present executive. the problem as I see it is that every 12 months the job is handed on to someone different from another State, who is, as often as not, an unwilling starter, but takes the job on because no-one else will do it. These positions (President, Secretary and Treasurer) should be for at least 3 years. Nominations should be called for and vote of all affiliated members from all States taken. You would be surprised what a difference it would make knowing that, once elected, you had 3 years, not 12 months, to do the job.



Judy Mason, wife of Mark Mason, was up to no good when we took this shot. That grin tells me she's happy with what she has done.



\$\$\$\$\$\$s Barbara Bolton put on a brave face as she reviewed, with apprehension, the blown nicad pack.

I have criticised off-roaders for complacency before; but it is a fact. I know that it is not just limited to our sport: it is a national trait that we would be well rid of. Make yourselves heard; take an interest in our sport; voice your opinions by writing to this magazine or by writing to me. I often wonder if it is worth the trouble. We scribes put a lot of time and effort into our articles. I write to try to make you think. I tell it as it is, or at least how I see it. After my article on the Nationals in Airborne No. 81 I received 2 letters of praise, 6 phone calls agreeing with what I said, and a couple that didn't agree. That's what it's all about. You should write to your magazine voicing your opinions and letting those who run the sport know when you are happy about what they are doing and when you are not. Get your club delegates to play a more vocal part at State level. If you belong to a country club, write to the State body. Do something; don't just let it go with a shrug of the shoulders. Stand up and be counted! Interstate rivalry is great, but interstate jealousies will do not good for our sport; just cripple it.

TRACKS

While on the subject of what should and should not be done, it is about time that a basic update on track regulations and/or specifications was posted by ORRCA. Forgive me if I'm wrong, but the phone calls and letters that I get asking for specifications on tracks make me believe that the original specifications, laid down in 1981 at the first Nationals held at St. Ives Showground, are still the only ones available. The winner of that event was driving our first Taipan (an RCH updated Rough Rider) and did 19½ laps in 8 minutes.

Yes, in those days it was eight minutes racing. Some time ago, as an experiment, we took a CAT over the same course, and did 23 laps in 5 minutes. That's how far technology has come, but our tracks, although somewhat smoother than in those days, have changed very little. On most tracks available to the racer today, good Stock 4WD are doing close to the number of laps of the Open, and, of course, 7 cells are a joke: 6 cell Open always turn in more laps, and in some cases I've seen a 4WD Stock do as well as its 7 cell counterpart.

The most impressive thing about 1/8 scale racing, apart from the smell and noise, is the sheer speed that they reach. It's breathtaking. We have never seen a 7 cell 1/10 scale buggy really going out here, simply because we don't have the tracks to suit them. We have very few tracks that compliment our good 6 cell Open Class cars either. It is negative thinking to cry that our track is an equaliser. Our sport is racing, and racing is all about going fast, and the faster the tracks are built the better for all: spectators and racers alike. Just cast your eyes about at any meeting where there is a large crowd of spectators. Which races grab the most interest? The fastest, of course. Tracks should be built to accommodate the quickest, wide enough for comfortable passing, with easy access for marshalling, and above all, with a clear run before the first bend, which should not be a hairpin, as is so often the case. Starts should be well spaced so as to allow cars to get off the grid before some clown from the rear wipes out half of them.

I have always said that it is the prerogative of a club to build and race any way it pleases, but it is time for the powers that be to insist that tracks being used for National, State and ORRCA events come up to a standard set and policed by ORRCA, not the narrow, 6 feet wide, postage stamp size tracks that are currently being used. Harsh words, but true. Clubs who want to be considered for hosting major events would have to update their tracks. If they didn't wish to comply they wouldn't have to, but they would not get to host major meetings. In short, since our beginning, buggies have improved out of sight, but our tracks are still three years behind the times. How do you think Brock & Co. would go using a Go-Kart track?

If ORRCA does bring in the new rule regarding buggy width (250 mm), they should police it. There has been quite a deal of protest and argument lately at scrutineering over the 241 mm or 9½ inch limit. As racers declare the buggy by lifting suspension and squeezing them, they fit into the box. Scrutineers, not wishing to create waves or make enemies, pass them. When they are sitting on the table, a tape run from outside rear wheel to outside shows that they are well over the prescribed 9½ inches. The box was brought in originally as an easy way to measure: the buggy was supposed to drop in easily. If this rule continues to be flaunted when 250 mm comes in, there will be buggies running around that are 255 mm or more.



14 Peter McLean was very serious about some last minute adjustments to his CAT when we sneaked up on him. Photo taken during round 2 of the ORRCA Shield.



John Juroczko and son Jason having problems.

CHAMPIONSHIP EVENTS

If clubs wish to hold Championships and advertise them as such, they must first apply to ORRCA for permission. Canberra Club recently advertised that they were holding the ACT Championships over the Queens birthday weekend. Last year this was an ORRCA sanctioned event and I wrote at length on the efficient way in which the meeting was run, and heaped praise on the club, its officials and members for a job well done. Alas, this year was a different story. I first rang the vice president and was informed that it was being run under ORRCA rules, only to find out, after Saturday's heats, that it was club rules, and some buggies were allowed to run which, by ORRCA rules, are illegal: over 9½ inches; in some cases, 10 inches wide. This was upsetting for those of us who travelled from Sydney on the Friday (2 nights in motels), and abided by the club's request not to take food or drink to the track (an agreement with the Rose Cottage Inn) only to find that the shop didn't open till mid-day. This was a long time to go without a hot drink in the cold that Canberra dishes out at that time of year. Also, because it was not an ORRCA sanctioned event, it has no bearing and/or place in the record books, and is not recognised by ORRCA, and so was not the ACT Championships. A \$15.00 entry fee is rather a lot for a club meeting! So clubs, be warned. If you want to stage a special event and advertise it as such, make sure that your officials take the appropriate steps by getting ORRCA's blessing, and run it the the ORRCA rules.



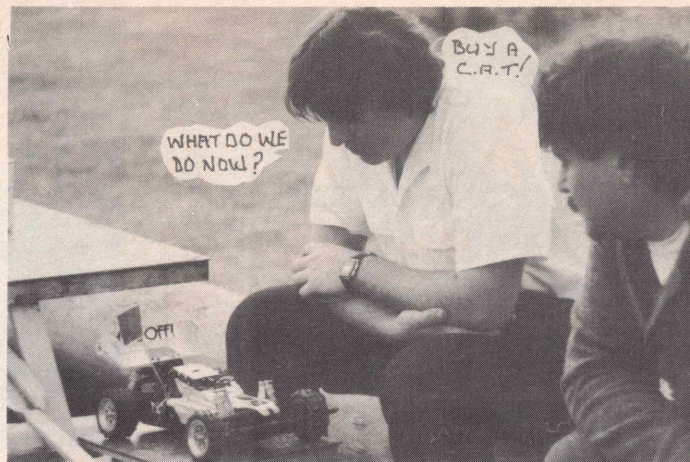
Col Grenenger locked his keys in his car. Jeremy Edwards obliged and had the car open in seconds!!!

CARPET

I hear that the Victorians have put it over us again! I'm told that the carpeted indoor off-road circuit at Ballarat in Victoria is magic, boom corners and all. Not having seen it I can only pass on the tales of praise that I keep getting about it from Melbourne, Bendigo and Warrnambool. It can be used for 1/12 circuit cars as well. Oh; poor Sydney. We poor New South Welshmen have no such luxury, although Rick Bartolozzi, with a partner, is starting a commercial venture for 1/12 scale carpet racing at St. Ives Showground in the David Pickering Pavilion. Opening night is July 19th. Of course, the carpet has to be put down and taken up each night, so it will be a lot of work for the two fellows involved, particularly as there is no storage, so it all has to be transported to and from the site every Friday night. Good luck to you Rick. We need it badly, and it should be a huge success.

BATTERIES

I mentioned in a recent issue of Airborne that 1.3, 1.4 and even 1.5 Ahr batteries are creeping into our races. At a recent local meeting in Sydney it was rumoured that they were, in fact, being run in several buggies. From what I have been able to learn from overseas sources, they will not make the buggy faster, as their discharge rate is limited, but they will give you longer runs. For my money I'll stick to the Technicad CS and/or computer matched Sanyos, but I think that it would be a step in the right direction if ORRCA came out with specifications on batteries. Actually, I think the rules say 1200 mAHr batteries. If that is the case then it is up to the clubs themselves to start spot checking the nicads being used. Rules were made to break, I've heard. There is nothing wrong with finding a way to get better results, but I am against flaunting of the rules.



Paul and Len Edwards, of Maitland, having a tough time, and debating what has to be done.

INTERSTATE SHIELD?

I have heard that the Victorian ORRCA Shield, held at Bright, was a huge success. My informants tell me that the track is a ripper, and everyone had a great day. This is encouraging for the Inter-State Shield that I suggested earlier this year. I'm told that the Victorians are as keen as mustard. My original idea was that the two winning clubs should compete, but it has been suggested that a Victorian team, selected from all clubs in that state, should compete against a NSW team, also selected from all that state's clubs. Each team should consist of say, 4 drivers in each of 7 Cell, Open, 2WD Stock, 4WD Stock and Junior (probably 4WD Stock). This would make a total of 40 drivers in 5 classes, with say 3 heats, a graded heat and 3 finals in each class, making 35 races in all. That would take about 6 hours, including a lunch break. The track could be open for practice on Saturday, with the event being run on the Sunday. I think that the idea has great possibilities; don't you?

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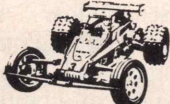
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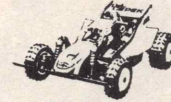
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KIT REVIEW

4WD OFF-ROAD RACER

SALUTE

by Paul Bird

Meet the latest 1/10 scale off-roader from the Kyosho stable, the **Salute**. This buggy is based on the race-proven Optima, with the refinements of the Turbo Optima, but it is designed especially with the International class, or 7 cell racing, in mind.

The features are very similar to those of the Turbo Optima: four wheel drive through a hardened steel chain, over-sized shocks, stabiliser bars, duplex servo savers, extra long and re-inforced wishbones, torque-limiter gear, protective under-pan, and all necessary bearings (16 of them); but all the important bits have been strengthened to cope with the extra power of an 8.4 volt nicad pack. However, it runs very happily with the standard 7.2 volt pack.

As is usual with Kyosho kits, virtually everything you need is supplied in the one box: Allen keys, grease, thread-lock, and so on. The instructions are comprehensive and easy to understand. Naturally, the kit does not include a radio, but for this review the car was built with a JR Alpina two channel system. A motor isn't supplied either; after all, what's the point of putting a stock motor in a kit for a very high performance buggy? Kyosho recommend the Le Mans 240 motor. For this test the Salute was equipped with an Option House SPA 240WS.

Assembly

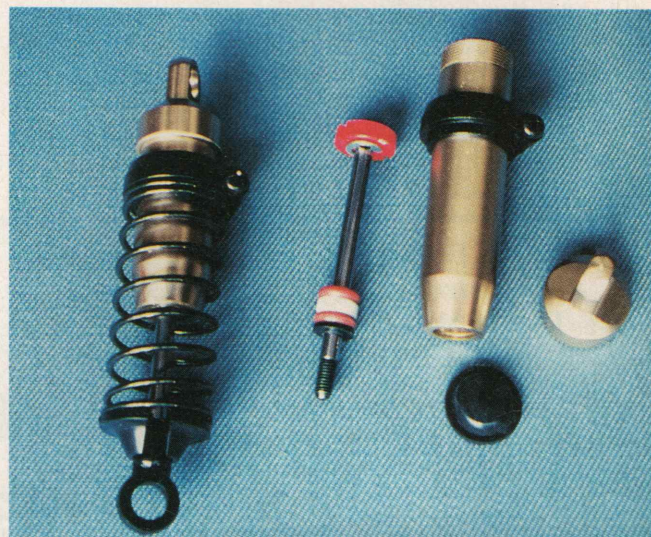
Now to the nitty-gritty. Firstly, and most importantly, read the instruction book from cover to cover to make sure that you're going to put everything in the right place. There are some tricky bits!

Before you start, it's a good idea to decide what sort of handling characteristics you want. The Salute can be set up for neutral handling, over-steer, or under-steer, depending on how you fit the front and rear differentials.



Showing sleek lines, the Salute is a great-looking vehicle. Photo taken during track testing.

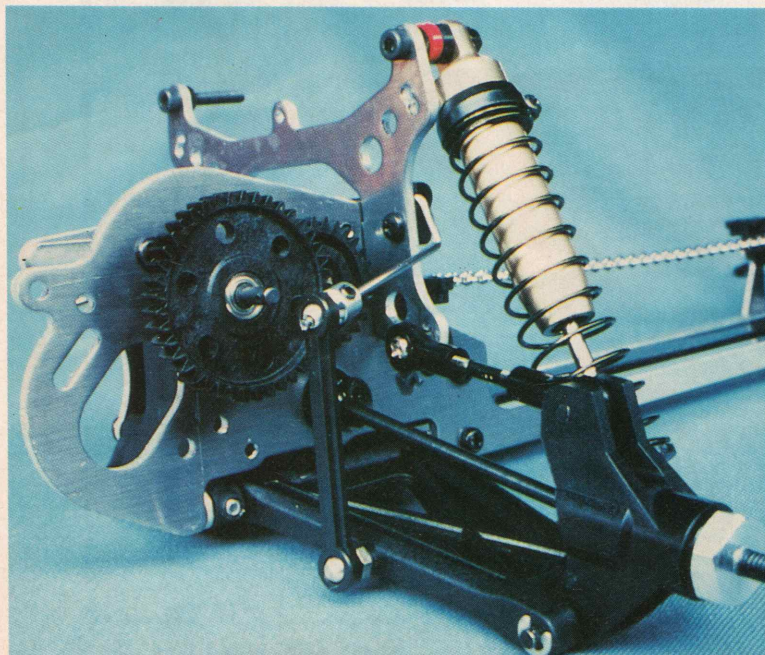
The standard assembly is with the drive chain running on an 18 tooth gear front and rear, to distribute power evenly to front and back wheels. However, if the chain drive is set up with an 18 tooth gear on the rear diff, and 19 at the front, more power will go to the back wheels, resulting in under-steer. Conversely, a 19 tooth gear at the rear and an 18 at the front will allow more power to the front wheels, giving over-steer. Of course, these gear settings can be changed after the car is built, to suit your driving, the track, and so on, but it's a bit fiddly to do track-side.



Oversize Option House shocks, as supplied in the kit.

Assembly is straightforward; just follow the directions and don't leave anything out. For example, when the instructions say to use thread-lock, don't ignore this, because these buggies take a lot of vibration on the track and things can come loose. When fitting the chain, follow the diagram which shows which way round it's supposed to go. This drawing isn't quite as clear as it might be. The chain must travel with the loop fold back ends pointing to the rear of the buggy so that, if part of the chain links lift, the open ends can't snag any part of the car while you're going forwards, flat chat.

I do have one criticism of the Salute instruction book. The instructions specify which screws etc. to use by metric size, in terms of diameter and length, but it's hard to tell the difference between a 2.6 mm screw and a 3 mm screw, or one that's 6 mm long as against an 8 mm one, unless you have a vernier. It's very important to put the right length and size screw in the each place because, in some cases, damage can be done if you

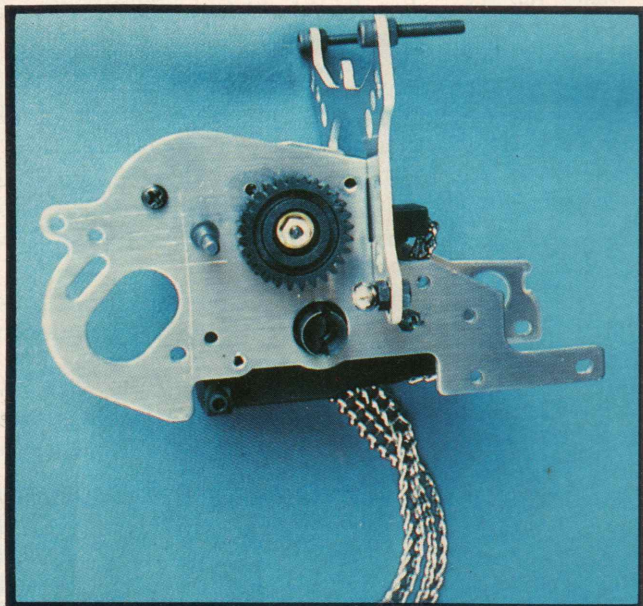


Rear suspension and gear assembly.

make a mistake. In the Optima instruction book, all screws etc are identified with a life size drawing on the side of each page. All parts are identified in this way too. You just put the screw over the drawing and, if it fits exactly, you have the right one. I would have liked to have this system in the Salute instruction book too.

Still on the subject of screws, when tightening them, be firm, but don't over-tighten. Even with the alloy bits, it's easy to strip a thread if you're not careful. That's even more important when it comes to the plastic components.

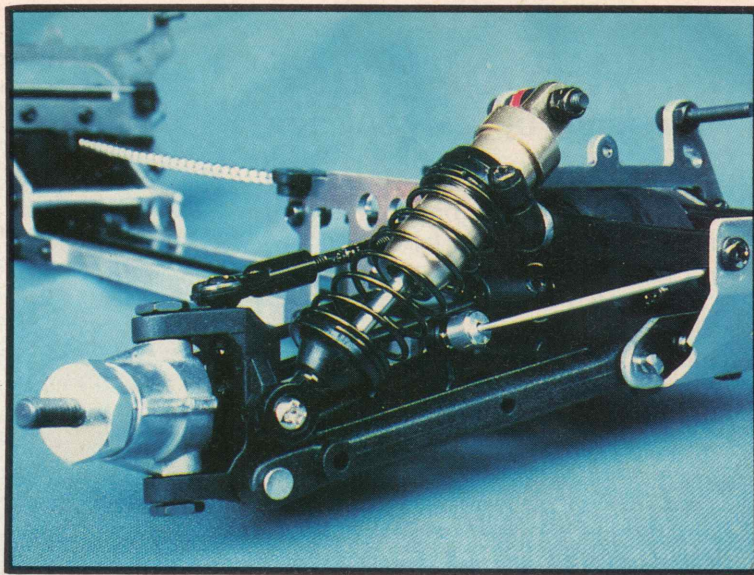
I was impressed with the changes made to the suspension wishbones in the Salute. They've been strengthened, but also, Kyosho have added some extra holes so that you can vary the shock mountings and thus the suspension travel. The front wishbones have one extra mounting point, while the back have three! Depending on whether the shocks are mounted on the knuckles or along the wishbone, the maximum width can be changed. This is an important change, as some Kyosho buggies have had trouble passing scrutineering on the maximum width of 241 millimetres. This should see an end to that problem, and give a lot more flexibility when it comes to setting up the suspension to suit a particular track.



Slipper clutch and rear diff assembly with rear shock mounts and gear bar assembly.

The shocks are the Option House units which are available as an extra for the Optima. They are big and quite effective. The kit comes with the choice of three different pistons, depending on whether you want to set them up hard, medium or soft. That's probably a matter for personal taste. By the way, there are some spare clips for the shock seals, which is good to see, because these clips can easily be lost when assembling the shocker.

You'll notice that some measurements are given in the instructions for the upper front and rear suspension rod lengths, as well as the tie rods. It is important, not so much to follow the given measurements, but to make sure that each pair of rods is the same length; i.e. that the tie rods are the same length, the front upper rods the same, and so on. If they aren't you'll find that the suspension won't be even. The upper rods can be shortened for more negative camber, and lengthened to give positive camber.



Front wishbone and suspension assembly.

On the Track

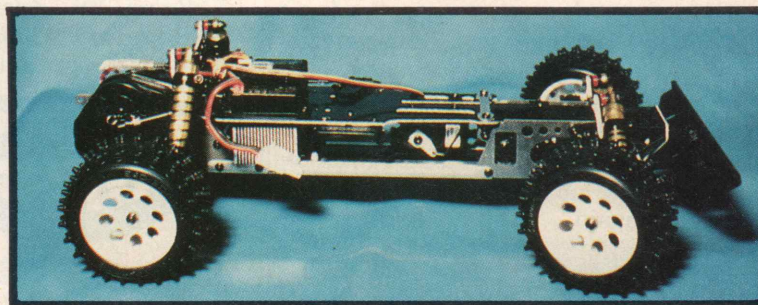
For this review the buggy was built exactly to the instructions, then put on a track and raced in Modified Class. The Salute is a good, rugged and reliable buggy, but you will need to spend some time setting it up for the track you want to race on. Straight out of the box I found it to be a little twitchy and a little unpredictable on a mildly rough track with a very slippery surface. However, I still managed a second in the Modified B Final.

Conclusion

Allowing for the lack of proper setting up, this was a good result. I would recommend the Salute for both the experienced and novice driver alike. However, as a kit, it is probably a little advanced for a beginner.

The Salute is a continuation of the high standard that Kyosho set with the Optima and continued with the Optima Turbo. The Salute has the potential to be a real race winner.

Thanks to Kyosho Australia for supplying the car for review.



This is how it all comes together, with radio gear and speed controller installed.

REVIEW AT A GLANCE

Quality of Instructions:	★★★★
Ease of Construction:	★★★★★
Quality of Materials:	★★★★★
Motor Supplied?:	No
Chassis Type:	Ladder
Suspension Type:	Independent Arm
Shocks Type:	Oil-Filled Inside Spring
Sway Bars?:	Yes
Ball Races Supplied?:	Yes
Motor Accessibility:	★★★★
Battery Accessibility:	★★★★★
Speed Controller Supplied?:	Yes; Mechanical Resistive Plate
Steering Servo Saver:	★★★
Body Shell:	Lexan; You cut out and paint
Balance of Car:	★★★★
Handling on Track (as tested):	★★★★
Ease of Setting Up:	★★★

A Fool-Proof SOLID STATE TIMER for Batteries

Designed by Andy Solanov

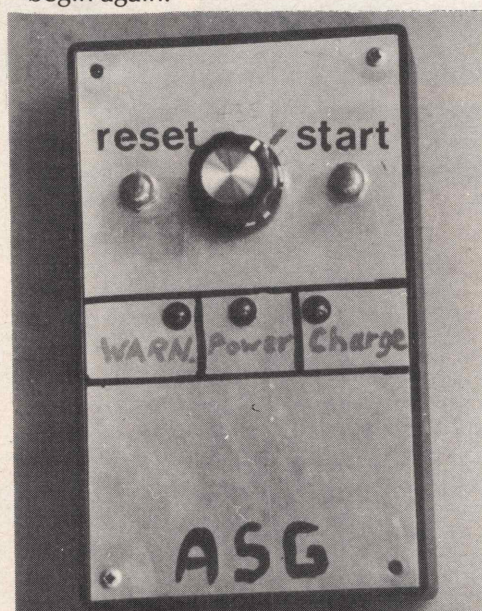
Described by Mel Gillott

The humble quick-charge lead has its place, but it takes only one cooked nicad to discover the false economy. A kid's span of attention doesn't often stretch to a 15 minute charge. A clockwork timer for about \$35 solves the problem, or you can pay even more for electronic timers with more features. Alternatively you could have the satisfaction of building this electronic automatic cut-off timer yourself, for about \$20. It is simple, and would make an ideal first electronic project.

What it does.

The circuitry is based on a 555 timer chip, available for a measly 70¢ from Dick Smith. The circuit operates a relay. In practice the input leads are connected to the usual 12 volt auto battery. Crocodile clips direct to the battery terminals are advisable; using a cigarette lighter socket can lead to burnt upholstery if anything goes wrong. Connect output to the nicad to be charged.

Set the timer knob to the desired charge time, usually 15 minutes. Press the push button to start. When the time has elapsed the circuitry operates the relay and cuts off power, hence ending the charging process. If it is desired to peak the nicad (for racing), then turn the knob back to, say 2 minutes, and repeat the exercise until the nicad starts to get warm. Alternatively, a voltmeter (digital or large scale analogue) can be connected to the charger output and charging can be continued until peak voltage is reached. Pressing the re-set button at any time will terminate the charging; ready to begin again.



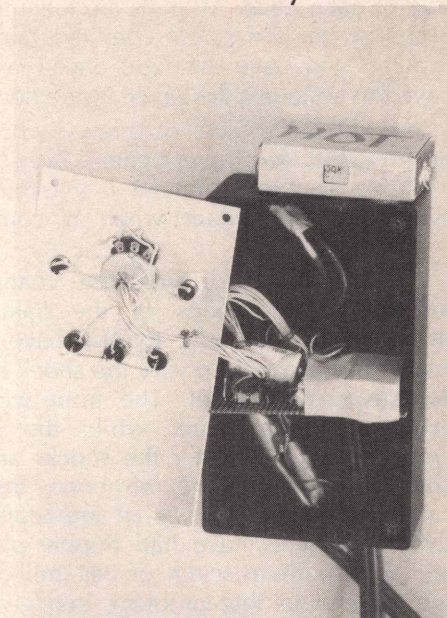
Easy to build timer at minimal cost. Should stop cooked nicads. MG pic.

In addition, the circuitry incorporates various safety features. Three LEDs illuminate to show the present status of the system. The green stays on whenever input is connected; the red whenever charging is in progress, i.e. the timer is counting down; and another red LED will flash if the input is connected reverse polarity, so no damage will result. Assuming that the usual (polarised) Tamiya connections are made to the output, then this unit will indeed be fool-proof.

Construction

From the photographs and bread-board layout, this ought to be self-explanatory. The actual position of components along the copper strips is not critical, as long as they all fit in and the circuit is maintained. It is recommended that the 555 IC be fitted into a socket to make replacement easier, since this is the part that usually blows if a mistake is made during construction. Pay particular attention to:

- * Size of breadboard (or Dick Smith Stripboard). Cut to suit Zippy box.
- * Position of breaks in copper - cut with sharp knife.
- * Polarity of some diodes.
- * Don't forget the jumper wires.
- * Watch orientation of IC.
- * Solder joints. Quick and shiny; not slow or dry.
- * Wiring of relay. Connect from board to Normally Open (NO) terminal. Some relays are not clearly



Inside the solid state timer with charge resistor mounted on top of box. Note breadboard with large capacitor shown and relay taped on. MG pic.

marked. Get advice at the time of purchase. Tape wires to body of relay to take load off the fragile pins.

The large (1000uF) capacitor and the relay should be physically supported in the box to prevent movement.

When all is complete, have a beer or kick the cat (not C.A.T.!), depending on whether it works or not. It should, if built properly. You will hear the relay click when the charge button is pressed and click out when

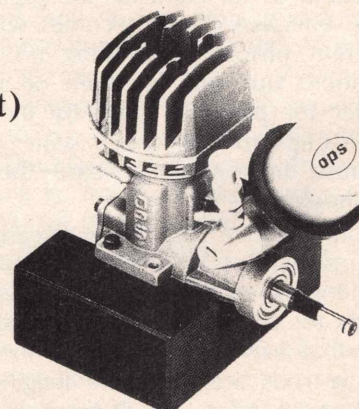


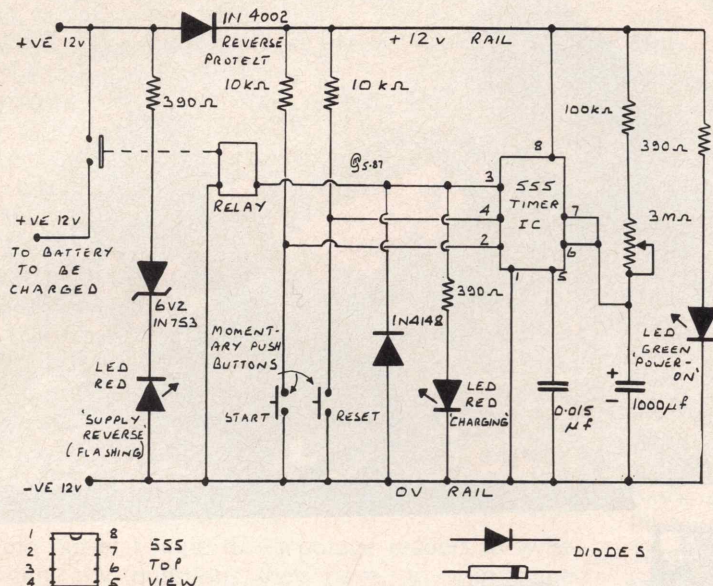
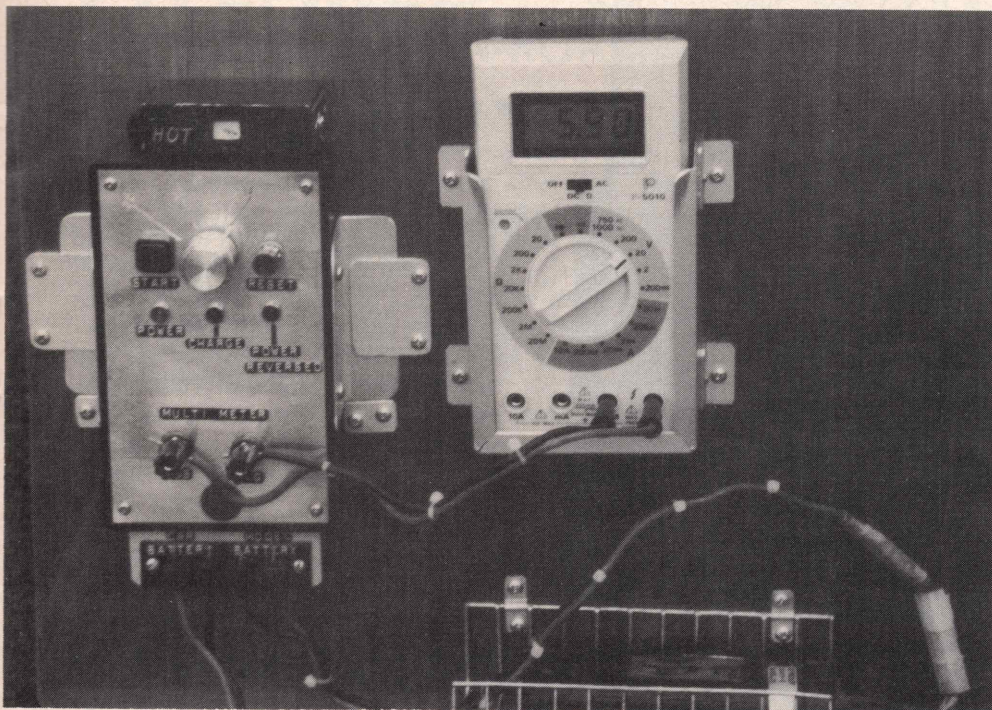
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Timer for charging nicads

Timer breadboard layout

FROM COMPONENT SIDE

Hi-Charger!

Conclusion

And now it's working, you had better go and console the cat.

PARTS LIST

LC

Relay

Resistors

Capacitors

Diodes

IN 753

+ LED Mounting

Zippy Box

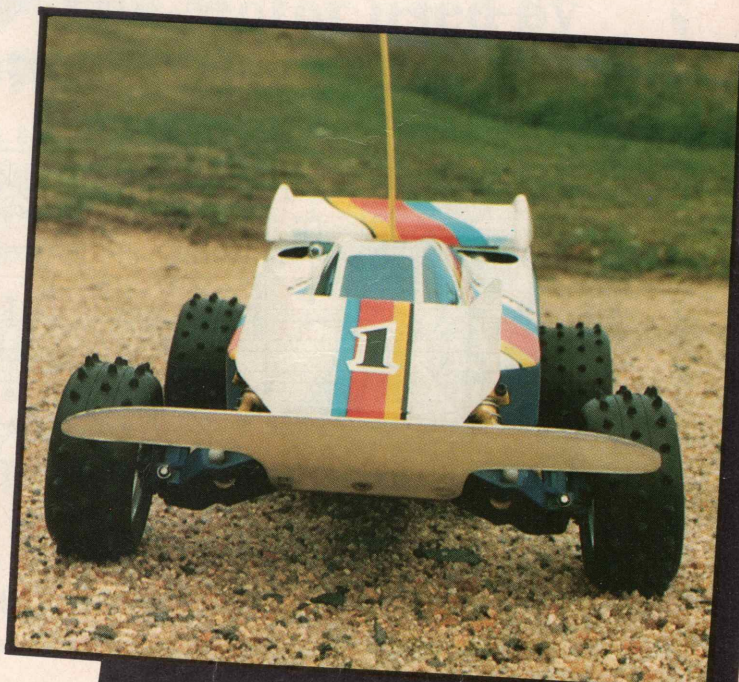
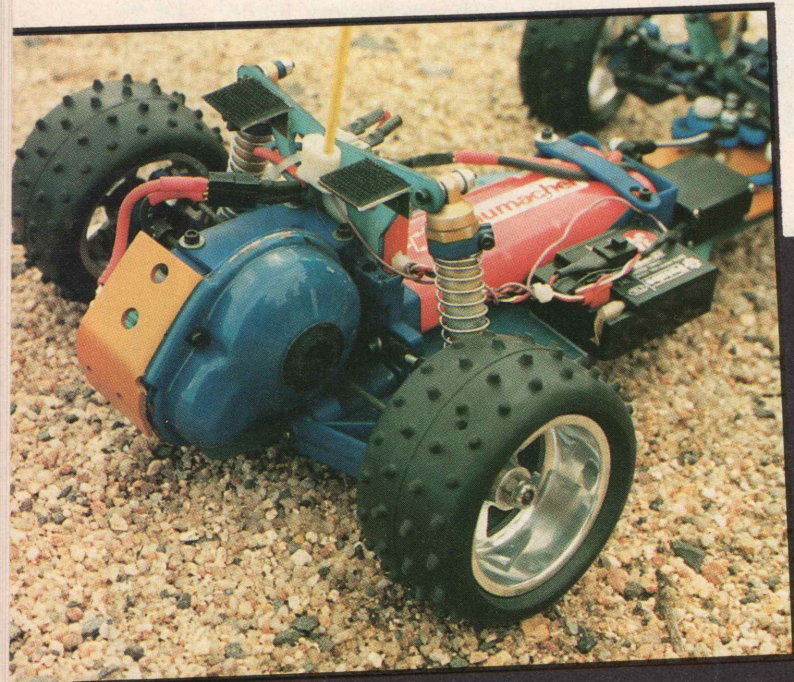
(Also charger parts required; i.e. 0.5 5W Power Resistor (Tandy) for \$0.99

"EXTRAS"

When you have your standard "off the shelf" RC10 really moving, and you're wondering what to do with all those dollars that are burning a hole in your pocket, Peter Orchard of Melbourne has an RC10 with all the good gear, just to get you thinking.

- * Body shell is a Parma 'Eagle' with Parma front wing and lexan front bumper.
- * R.P.M. aluminium rims.
- * Schumacher fibreglass chassis which is a 1/2 inch (12mm) shorter wheel base, suited to indoor racing.
- * Novak FET speed controller.
- * Parma heavy duty ball joints.
- * Reedy Red Dot 'Enforcer' motor.
- * Frewer gear cover with removable plug, enabling easy clutch adjustment.
- * Futaba S32H servo.
- * Schumacher soft tyres.
- * Deans connectors used throughout.
- * All nylon parts are dyed to give a great colour scheme.

Photos: J. Rogers



"TWEAKED" & "DUMPED"

1/12 SCALE ON-ROAD ELECTRIC RACING

by Jonathan Borthwick

1/12 electric on-road is perhaps the most precise form of radio control car racing. At the recent World Titles, 3 of a second separated the top two drivers after eight minutes of racing and nine heats. Jonathan Borthwick is one of the best-known racers in Australia, with three National Titles, back-to-back, the only driver ever to achieve this in any form of radio controlled car racing in this country. He represented Australia at the World Titles in 1982 and 1986 and has written his PitStop column in Airborne Magazine since 1981; our longest serving car columnist. When the idea of a car-only magazine was mentioned, he was enthusiastic about the prospect of being able to go back to basics and, hopefully, introduce a new crop of racers to 1/12 racing.

Often times a racer forgets that he or she has a lot of experience (or thinks they have), and the tendency is to gloss over seemingly obvious issues and concepts. I believe that there are three types of people who will read this column. Firstly, the people who have never raced a model car in any shape or form, and may intend never to do so. It will be one of my challenges to win those readers over to the great sporting virtues of radio controlled racing generally, and 1/12 electric specifically. Secondly, there are a lot of people who, through 1/10 off-road cars, will have a lot of questions and preconceptions about on-road racing. These people form the nucleus of future growth in our sport as more and more off-road clubs become over-crowded. Some of them may even have 1/12 cars and have already dabbled a bit. Many top off-roaders have started in on-road racing and have found it to be a great way to train for off-road racing. People who have tried my cars and then run their off-roaders always comment on how much better they drive, and how much easier off-road is. Don't let the difficulty factor put you off yet, however! Finally, there are my peers from around the country who know as much as I do and who will be out to see if I goof up. I hope to be able to draw on their expertise in certain areas, to enrich the value of this column.

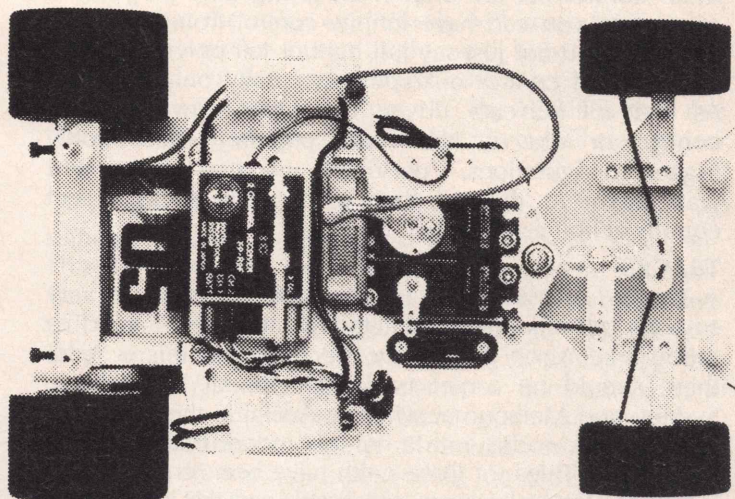
From the outset I hope to encourage readers to write to me with any questions they have, to gain some impression of what people want. If there is a question that relates to a certain car type that I am not particularly familiar with, I will forward that to one of my aforementioned respected peers for their comments.

HISTORY

To gain some insight into 1/12 scale cars, it is necessary to delve back into the dim past; the halcyon days of the 1960s. This was the era of table-top race cars, better known as **slot cars**. They were as big as 1/10 off-road cars are now, and responsible for satisfying, in part, boy racers all over the world. **1/8 petrol cars** were a quantum leap as far as realism was concerned, however, their size, noise, expense and speed posed problems.

Enter the **1/12 electric race car**. Essentially the ultimate slot car, the first offerings were, by today's standards, quite laughable. However, the response was fantastic: within a short time there were more electric cars than petrol cars at any US Nationals event.

As an aside, there was one somewhat tragic, earlier form of 1/12 scale racing called Class A and B Gas. Using



The car that really started it all, from a serious racing point of view: the Associated RC12e.

the very successful Cox .049 petrol motors mated to 1/12 chassis, the formula never really got off the ground, with numerous engine flame-outs and a lot of frustration. They offered a good power to weight ratio, however, handling was non-existent, and the class soon caved in to the highly successful electric racers.

The first really successful electric car was Associated's RC12e. It offered good handling and strength with light weight, and forced manufacturers such as MRP, JoMac and Bolink to come out with better chassis, which they all did.

Now, before we get too deeply involved, I should clarify things a bit. I am a fully sponsored Team Associated racer. I have been since 1981 and my experiences have been almost exclusively with their products. That is not to say that I cannot recognise the good points in other products, as some people have hinted in the past, but merely that I am well qualified where RC12e/i/l Associated cars are concerned. I have reviewed, in my Pitstop column over the years, cars from Delta, Parma, Tamiya and AYK, as well as numerous related products. I believe that I have been fair and impartial in my reviews, and have a policy of sending a manufacturer or importer a copy of the review before publishing. In some cases, where there has been a major problem with a product in the prototype stage, changes have been made, to the benefit of the product and the consumer.

Anyway, enough of the introductions and ancient history lesson. What is a 1/12 on-road racing car?

THE 1/12 ON ROAD RACING CAR

Quite simply, it is a low-slung, purpose-built race car, weighing no less than 880 gms (31 oz.), powered by no more than six sub-C 1.2 volt 1.2 AmpHr nicad batteries driving an electric motor. Most cars have a differential, either geared or balled (more on that later), and featuring amazing road-holding through grippy foam tyres. Suspension varies from very simple, utilising the flex of the chassis, to very complex, featuring dampers and springs. Top speed with ball bearings and modified motor is about 60 kph, so body design and rear wing replacement become critical. The most popular style is for Sports/GT/Can Am bodies, fully enclosed and virtually wedge-shaped for maximum performance.

The cars are, as their name implies, 1/12 the size of a real race car. This gives a length of about 35 cm, a width of 18 cm, and a height of about 11 cm. Two channels of a radio control set are employed, giving fully proportional (that is, you can have infinite control from neutral to full lock, and not just say full right or left only) control of steering and control of throttle (generally only forward). As with all RC cars, drivers use either a two joy-stick control or one of the more popular wheel-throttle trigger configurations. I personally use a wheel, but as I was taught to fly and then drive using sticks, I feel equally at home with either.

TRACKS

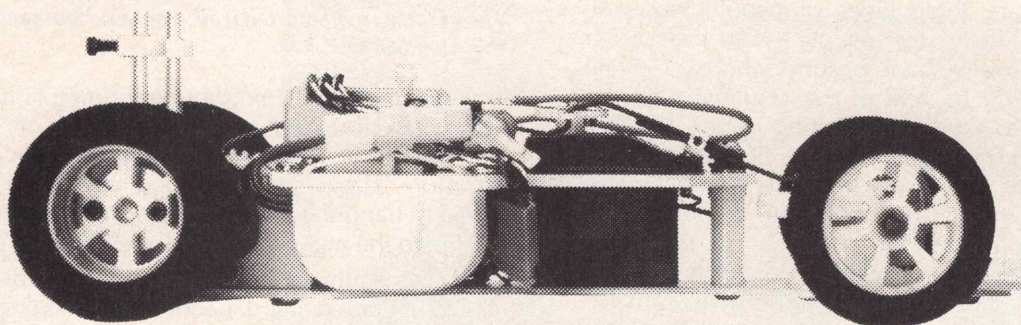
Tracks in Australia are mostly outdoor circuits on very smooth hot-mix bitumen, although there is a trend to indoor racing on carpet. By the time that this is read, there should be carpet tracks operational in Brisbane, Sydney and Melbourne, while in Adelaide they have the best of both worlds with a hot-mix indoor track. The last two World Titles (of three held) have been on carpet, as it has proven to be more consistent, and the indoor sites

offer protection from the gamble of the weather. Most cars will perform well on either surface with only a few changes in set-up, although many new cars have been designed purely for carpet, particularly in Europe where the weather dictates that all racing be indoors.

THE NATIONAL SCENE

1/12 racing has been around for about 9 years, with the first Nationals being held in Sydney in 1980. They have been held each year since then, always in an eastern state. There have been the odd runaway victories at these events, but generally the spirit of competition has been keen and the actual racing has been very close.

The most successful cars have come from Associated in the USA, with wins in every outdoor Nationals since their inception, making eight on the trot. AYK have been the traditional opposition, with some classic encounters. However, they have now taken a back seat to Schumacher and Mugen's challenge to Associated's domination.



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With the exception of Tasmania and the Northern Territory, every state has had representation at a National level. South Australia is the latest to put in their challenge. Over the years the balance of power has shifted between the three eastern states. In 1980 NSW dominated, but this quickly changed to Queensland for 1981, 82 and 83, with a slight waning in 1984, although a Queenslander did win. In 1985 the Victorians came to the fore and there was a slight resurgence from NSW. 1986 was much the same, with the Queenslanders making a comeback, while 1987 was another mixed bag, with NSW again taking the trophy; so it has gone a full circle.

WHY SHOULD ANYONE WANT TO RACE 1/12?

Quite simply, I believe that it is the closest form of model racing, where the driver still holds the advantage over car preparation. It compares with 1/8 gas cars as 500 cc Grand Prix bikes compare with Formula One cars. In a Formula One car, it is very easy to make the car wide in an effort to stop the driver behind from getting past. Bikes are a lot smaller, so the task is far greater, forcing the driver in front to concentrate on riding fast and keeping in front, rather than keeping someone else behind. The result is the same, but the means differ, and racing is the beneficiary. 1/12 scale cars are similar to bikes in that they race on relatively wide tracks, but are physically a lot smaller than the 1/8 petrol cars, so passing is easier. The onus is then on the driver to travel the least distance around the track in order to maintain his position in front of another driver or drivers. The result is some of the best racing you will ever see, particularly at a National event. I have a video of the 1986 Nationals on the Gold Coast, where we ran 10 cars in each of the three finals. There is scrapping all the way through the field, most of it very tidy and clean, with the odd biff as frustration mounts at not being able to get past. Drivers have to get past as quickly and cleanly as possible, otherwise they themselves will be engulfed by the fellow behind.

Unfortunately, in our sport, and this applies to all three forms of racing, but most particularly to off-road, there are some who seldom try to get past through sheer driving skill, preferring instead to drive over the car in front. This forces a hasty re-assessment of the full size motor racing adage when cornering, of 'slow in; fast out'. In any form of model racing you want to get into the corner as fast as possible and worry about getting out when you come to it, lest you be bumped back down the field. Driving strategy is another factor that I will be discussing later on. I personally believe it to be a major factor in any success that I have had.

THE COST?

The cost of racing 1/12 is another misconception about our sport. The initial outlay is not insignificant, however, once underway, maintenance costs are low when compared to 1/10 or 1/8 racing. Tyres are the only real expense here, and every now and then a new body will be needed.

It is only when you leave the local club scene and chase the National Title that costs escalate, when new batteries, tyres, spare bodies, and even a spare car are purchased. Even then a racer will usually have an abundance of spares left over to continue his club racing so, averaged out over 12 months, the cost is much the same as for the pure club racer, except for the cost of the actual travelling.

What is gained from travelling interstate and overseas is the experience. It is one thing being top of the tree at your club or even at the Australian Nationals. It is another to finish 70th out of 120 at the World Titles! You can bet that the racer who travels will come back to his club and improve out of sight, and hopefully he will impart some of this knowledge to the other racers in the club and not keep it to himself. The result is that the standard of racing overall benefits, giving all concerned more satisfaction.

On the debit side, this continuing improvement of standards makes it difficult for the newcomer to get in. This is something clubs should always keep in mind. This column will be aimed mainly at the newcomer, and will examine what car to purchase, how to set it up, and other matters. I will concern myself with helping the interested 1/12 racer put together a competitive race package with a minimum of outlay. One problem that I will have is that the costs of all radio control spares and cars vary dramatically, depending on where they are purchased. For this reason I will not be able to use dollar value as a guide. However, a carefully itemised list should do the trick.

GETTING STARTED (FINALLY)

OK. Enough of the boring historical stuff. Next issue I will look at the available cars, and make a few recommendations as to what makes a good club car and, for the more ambitious, which cars are capable of winning our Nationals. A few surprises there, I think.

Meanwhile, I would ask anyone interested in getting into 1/12 to read as much as they can. If you can get your hands on some old copies of Airborne Magazine (available from the Manager of this magazine) and read my Pitstop column, or any other articles that will be a help. The English RC car magazines are readily available through newsagents (distributed by Gordon & Gotch). These are Radio Race Car and RC Model Cars, both of which feature a good deal of well-written material on 1/12. One thing to keep in mind, however, is that their racing is on carpet, so what works well there will not always work here.

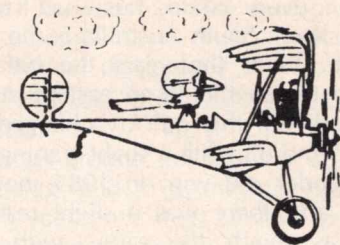
The same applies to the American magazines, which are a little harder to get. One warning though. Beware of car articles in US aircraft magazines, as they are usually written by aircraft modellers who have no real grasp of what an RC car is supposed to do from our point of view. These guys may know a ton about aircraft, but their perception of the use of cars is about zip! The two exceptions to this are Dan Rutherford who used to write in Model Builder, and Gene Husting who wrote in Radio Control Modeller. Both these gentlemen now write in the US magazine RC Model Cars, if you can get your hands on it. Another source is anything written on 1/8 gas cars. The power source differs, certainly, but driving techniques and chassis set-up are shared.

Finally, go along to your local hobby shop and see what 1/12 kits he has in stock. Chances are that he will have 14 million off-road kits and no 1/12, but see what he can get in and make a list of full names and price. Next issue we will go through most of the available cars and look at their good and bad points. See you then.

Send your letters to:

Jonathan Borthwick, 39 Copeland St., Milton, Qld., 4064.

ABC MODELS Ato Z MODELS

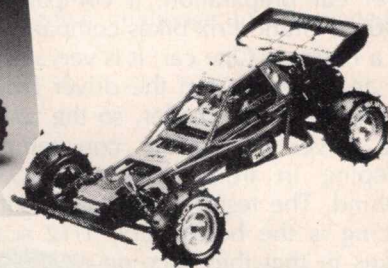


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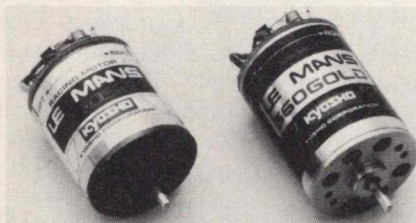


BUGGIES & CARS



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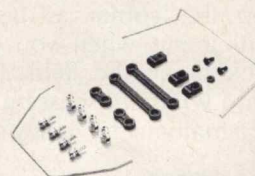
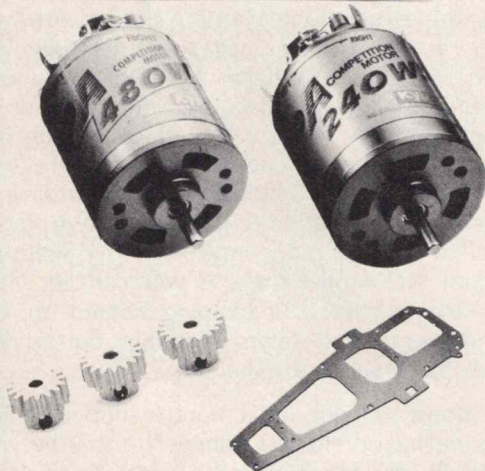
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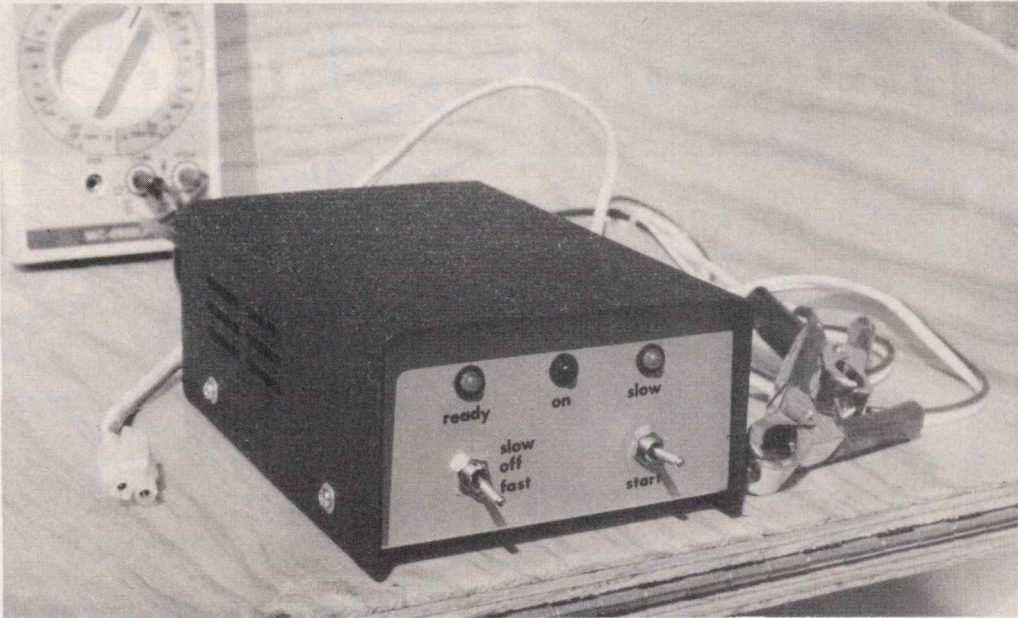
PEAK DETECTION

ALL THE THRILLS, WITHOUT THE FRILLS

Let me take you back into your not too dim and distant past, to the day you were given (or bought) your first 1/10 scale electric buggy. Clutching your package deal under your arm you rushed home to assemble it the best you could, then read, just as hurriedly, through the battery charging instructions. More than likely you used a \$12.00 charge lead clipped to a 12 volt supply, and kept an eye on your watch. If you were very lucky you had been given a \$45.00 charge lead attached to a 15 minute timer. It did not take long, however, to realise that charging your brand new nicad for exactly 15 minutes (as per the instruction book) didn't always give you 5 minutes of racing. So off you went in search of some answers. You may have read articles on charging nicads, advising you to totally flatten your battery using a volt sucker. You may also have read articles by manufacturers such as Sony Technical Department advising you **not** to totally flatten your batteries! The visit you took to the local hobby shop was equally confusing. Red cells, yellow cells, computer matched, selected, peak power chargers, constant current chargers, and so on. All you really gained from it was the knowledge that the biggest and best looking charger, with dials and digits, costing \$350.00, would do the trick. (Or so the hobby shop owner told you!)

So now we are back to the present. All of those bad experiences are over and forgotten forgotten maybe, but the confusion still exists. Well, now I feel that someone has at last come up with a simple, safe and relatively cheap solution to the nicad charging problem. When I first saw the No Frills charger and was asked to report on its performance, I have to admit that I was a little sceptical. The endless visits to hobby shops had led me to believe that the big names with dials and digital read-outs in flashy colours were the only chargers that would work.

The No Frills charger, as you can see from the photograph, is pretty basic. It is supplied as a charger only: crocodile clips, connecting wire and battery connections must be purchased separately, which isn't such a bad idea really. At least you are not stuck with parts that don't match your system. The only other 'optional extra' you may want to add is a digital multi-meter.



In order to dispel the doubting Thomas in me, I set about arranging a series of experiments, as follows:

1. I asked my wife (who knows **nothing** about charging batteries) to read the instructions and then charge a battery.

Result — a fully charged nicad without a worry;

Conclusion — the instructions are simple and concise.

2. In order to check that this peak power charger switches off when the nicad is actually fully charged, I used a digital multi-meter. Wired directly into the out terminals on the charger, it became a semi-permanent fixture. Then, after connecting the whole system to a 12 volt supply, I selected 6 nicads in various states of discharge, and fast charged them. By constantly watching the multi-meter I was able to tell the voltage in the nicad at rest, the speed at which it charged, and finally the voltage at which the charger switched itself off. In each case the voltage reached its peak, the nicad started to warm up, the voltage dropped by approximately 0.3 volts, then the charger switched off.

Result & Conclusion — the No Frills charger does successfully fast charge by peak detection. More importantly, it can do it constantly for 2 hours without over-heating.

3. The supplied instructions warn against fast charging a nicad that has a voltage of less than 6.6 volts. Not wishing to get into an argument, and bearing in mind the current (no pun intended) confusion as to whether the use of a volt sucker is beneficial, I slow charged nicads as per instructions. The slow charge facility was

just as simple to use as the fast charge, and so charged another 6 nicads for between 8 and 16 hours. As expected, the longer the battery was left on slow charge the fuller it became. Its maximum, however, came in at about 16 hours, and slow charging for longer than that is not beneficial, and yet not harmful. Once again, not wishing to get into an argument, I personally believe that after fast charging a nicad a few times, it can be revived by using a volt sucker then slow charging.

Result & Conclusion — A useful facility for safely charging your nicads at a slow rate (115mA). Most manufacturers of nicads recommend a slow charge now and again to even out the individual cells. Even the 16 hours on trickle charge works out conveniently. Start charging before your breakfast then disconnect before you go to bed!

Summing Up

Certainly some of the big name chargers do have other facilities and so could justify a slightly higher price. At \$130.00 I couldn't fault the No Frills charger, except to give one warning. The 12 volt supply **must** be a minimum of 12 volts. I did have a problem at one race meeting where other drivers borrowed my 12 volt car battery to charge their nicads, and its voltage dropped to about 11.5 volts. The No Frills charger could not accurately peak my nicads in that situation.

The charger is available from:
Paul Bird, P.O. Box 976, Ringwood, Vic., 3134 (see advertisement elsewhere in this issue).

Mail Order Shuttle

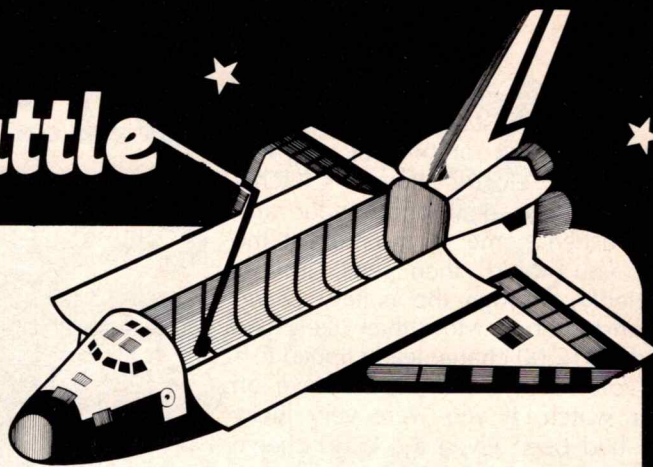
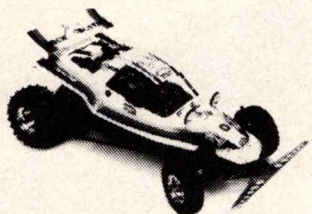
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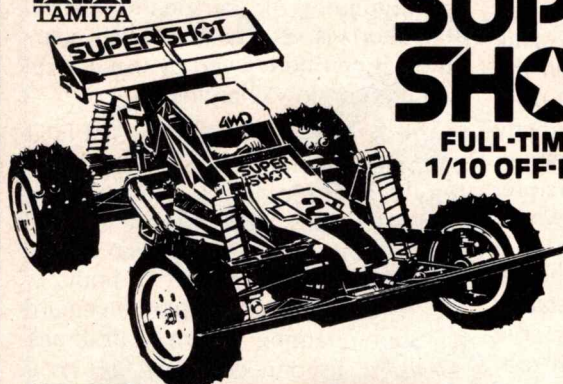
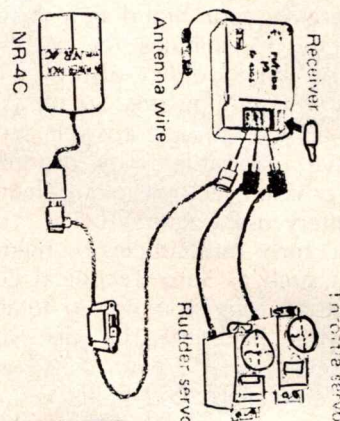
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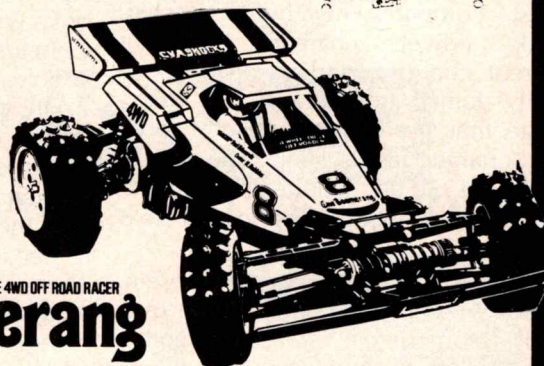


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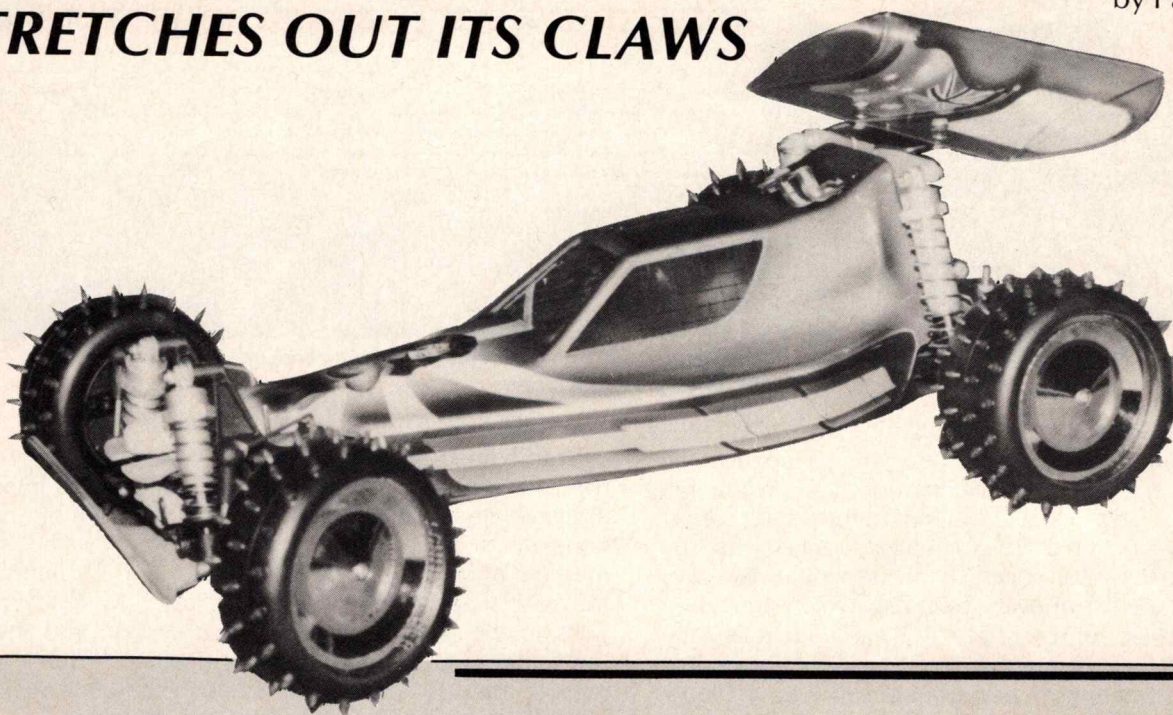
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THE Schumacher CAT

by Paul H. Bird

STRETCHES OUT ITS CLAWS



The Schumacher CAT is probably the only true thoroughbred electric off-road buggy, and it certainly has an enviable list of wins to its credit. It is hard to believe that such a buggy could be improved on, but its creator, Cecil Schumacher, has done just that, with the new CAT XL. Why the need for improvement? Well, the only real criticism of the CAT in its original form was its apparent difficulty in handling tracks that were rough and getting rougher. But the CAT XL should change all that, with its extended wheel-base which makes it about half an inch (12 mm) longer than its predecessor.

WARNING:

Before I go any further, I must warn you that the CAT XL is NOT a kit for the beginner. It is a piece of precise engineering and thus needs precision construction skills. This buggy is a very sophisticated piece of equipment and will require a lot of patience, and a lot of hours, to build. I've been putting buggies together for some years, and the CAT XL still took me at least 30 hours of concentrated, hard work.

FEATURES

This buggy has so many features that it's hard to list them all. Perhaps the most important is that it's virtually completely adjustable, so it can be set up for any track surface.

It is four wheel drive and you can adjust the amount of power that you want going to the front wheels; adjust toe-in and toe-out on **all four wheels**; castor and camber are also adjustable. All the adjustments are reasonably easy to make. Most of them can be accomplished with a bare minimum of dismantling and could certainly be done at the track, between races.

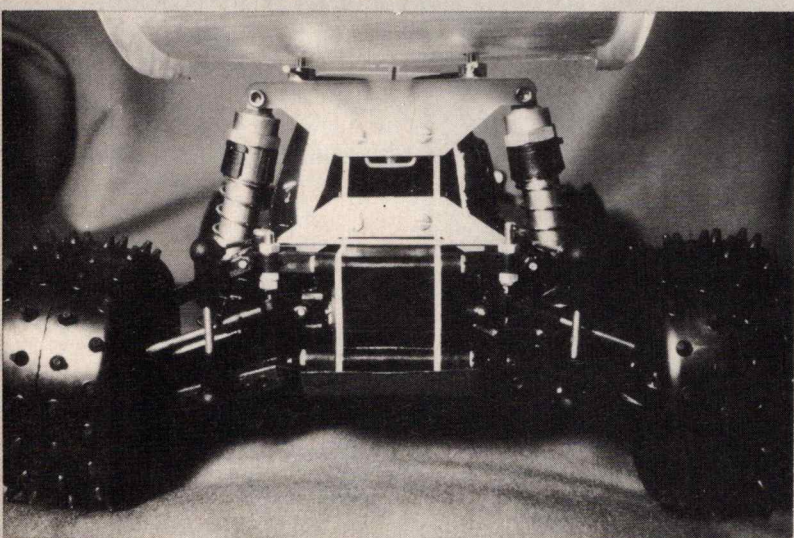
The CAT XL comes with all ball races supplied, and they are big, no-fooling races. What's more, they fit into place exactly, without any slop in the housings.

The suspension is brilliantly designed, with large, heavy duty shocks. Ball joints connect the wheel hubs to the upper and lower suspension arms, and the wheels are a single piece, combining with the enormous hubs to keep dust and dirt out of the wheel bearings.

The drive system is a series of toothed belts which are re-inforced with Kevlar, the same stuff that bullet-proof vests are made from.

The body shell is made from Lexan, and comes in two parts: a lower tray and an upper body. The tray screws to the fibreglass chassis plate, and the top is held on with Velcro, making an integrated unit which helps keep dirt out of the works. The motor is mounted inside the shell, so is less prone to collecting dirt and mud.

The front end is designed in a way that should minimise collision damage. If you do have the misfortune to hit something hard with a front wheel, the whole suspension arm assembly springs back out of the way. Both arms are on pivots, and are held together by a very strong rubber band!



The rear suspension assembly: sway bars and rear track rods are standard equipment.

UP-DATES

One of the good things about the Schumacher CAT XL is that it is backed by an intensive development program, so that the latest technology is always available. You don't have to buy a new buggy each time some innovation is released. Instead, it's all available in the form of 'Up-dates'.

The XL conversion is an update of the original CAT, and is available separately for existing CAT owners. Also available is part number T638, which replaces part of the steering pivots. The kit uses threaded bolts, but T638 replaces these with brass bushes and results in improved steering response. Other items available include a ball-diff for the front, and one-way front drive shafts for use in conjunction with the front diff. These will be incorporated in the test car and reviewed at a later date. For those of you with big radio gear, a wider body shell is available so that the gear can be fitted inside the car more easily.

Development of the CAT never seems to stand still, and, with the Up-date system, you can always be assured of having access to the latest racing development while keeping the same basic buggy.

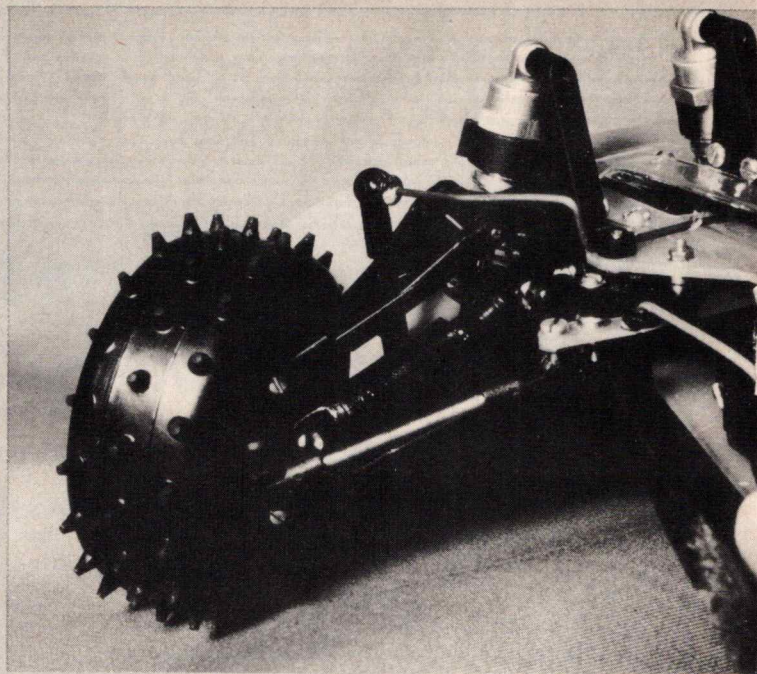
SETTING UP

Inside the back cover of the instruction book is a chart which you should find helpful when setting the car up for its first run. I suggest that you use this chart as a starting point, and then slowly make changes to suit your own driving and track. The test car was set up according to the chart and gave me my best ever lap score at my home club! Pretty impressive for a new buggy straight out of the box.

The CAT XL does not come with a motor. I used a 19 turn **Schumacher Yokomo modified motor**, which I found to be quite quick, with a good torque level as well. A 15 tooth pinion was coupled to the 58 tooth spur gear, and gave good acceleration out of the corners, as well as a good top speed.

SUMMARY

It would be difficult to do better than a CAT XL! If you're serious about buggy racing then you should consider one of these. Yes, I admit to being enthusiastic about this car, and for good reasons, which have nothing to do with the fact that I was born in England, where the CAT comes from. It's a good, precision, fun kit to assemble, and, on the track, is very easy and



Though a little dark, this photo shows the front suspension and drive.

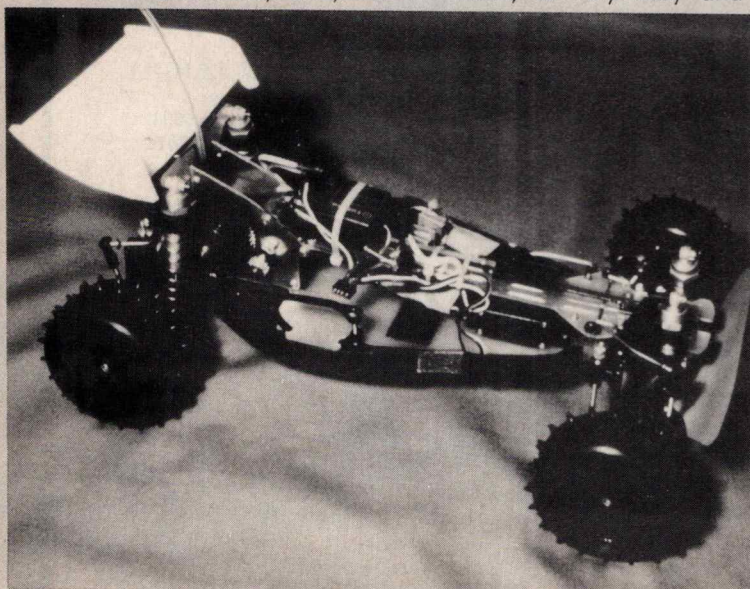
forgiving to drive. The CAT XL is predictable in its handling, copes with rough terrain very well, and in my opinion, is **the** car for the serious, experienced competitor. However, it may not suit the novice because there are a great many variables that can be changed on the CAT, and, if you're not experienced, it might be difficult to set the buggy up for its optimum performance.

THANKS

The test car, motor and some update parts were supplied by Greg Collings of Performance Hobby Supplies in Melbourne. Greg imports the CAT, and is one of the driving forces behind its dominance of tracks here. Thanks Greg, for making available the best buggy I've ever driven!

REVIEW AT A GLANCE

Quality of Instructions:	★★★★★
Ease of Construction:	★★★★★
Quality of Materials:	★★★★★
Motor Supplied?:	No
Chassis Type:	Fibre Glass Plate
Suspension Type:	Independent Arm
Shocks Type:	Coil spring over oil-filled damper
Sway Bars?:	Yes
Ball Races Supplied?:	Yes
Motor Accessibility:	★★★★★
Battery Accessibility:	★★★★★
Speed Controller Supplied?:	No
Steering Servo Saver:	★★★★★
Body Shell:	Lexan; You cut out and paint
Balance of Car:	★★★★★
Handling on track (as tested):	★★★★★
Ease of Setting Up:	★★★★★



Fitting everything in can be a tight squeeze if your radio gear is on the big side.

JR ALPINA RADIO

by Paul Bird

The two channel JR Beat 2 Alpina wheel radio is ideal for car and buggy racing. The unit is well balanced, with all the important controls easily accessible. The hand-piece features steering and throttle end point adjustments, servo reverse, adjustable wheel tension and adjustable throw length. A charging jack has also been provided to cater for drivers who like to use nicads in their transmitters.

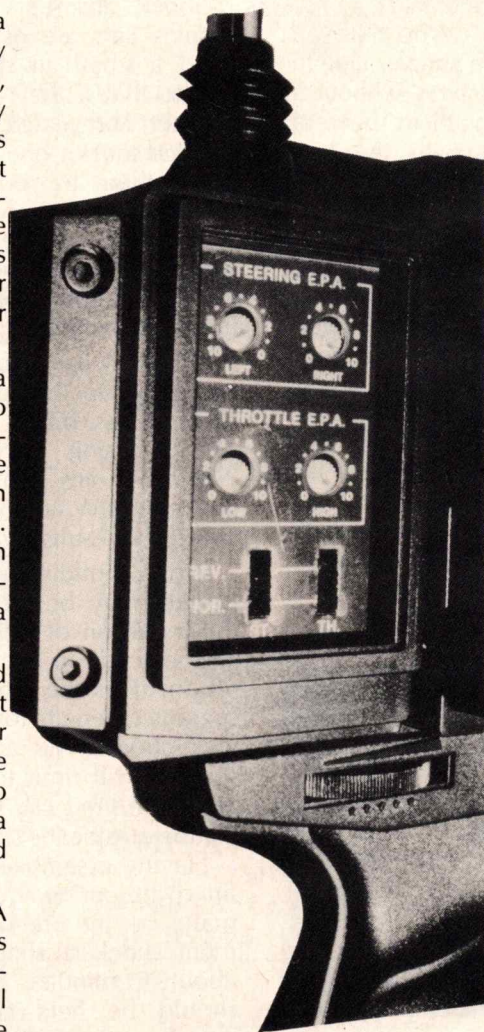
The Alpina radio set has quite a small receiver, which should fit into most cars and buggies quite comfortably. The servos are of standard size and seem to have more than enough torque to cope with car applications. The instructions which come with the radio outfit are very comprehensive and, with them, setting up is a breeze.

The wheel itself has a hard, ridged surface but, being made of plastic, it can become quite slippery if your fingers start to sweat during a tense finals race. I would have preferred to have had the wheel surface made of a soft rubber or similar material, and more heavily ridged.

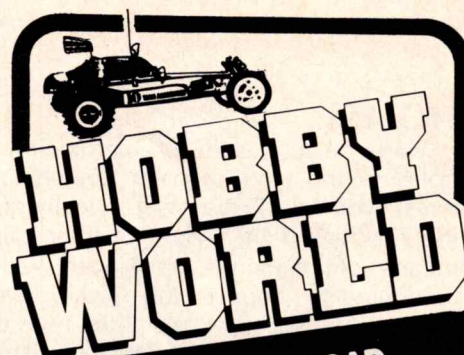
Another criticism is that the EPA adjusters and servo reverse switches are not covered. They do sit in a recessed compartment, but could still be inadvertently altered without the user noticing until it is too late.

These comments aside, the Alpina radio is exceptionally good value for money at about \$229. It has all the features that you really need, at what could be considered a budget price.

Thanks to JR Remote Control Aust. for supplying the radio for review.



Adjustment controls for throttle and steering EPA (End Point Adjustment), servo reversing and throw adjustment thumb-wheel on top of the pistol grip.



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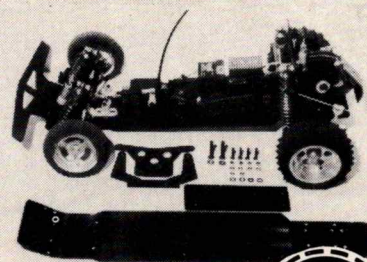
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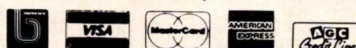
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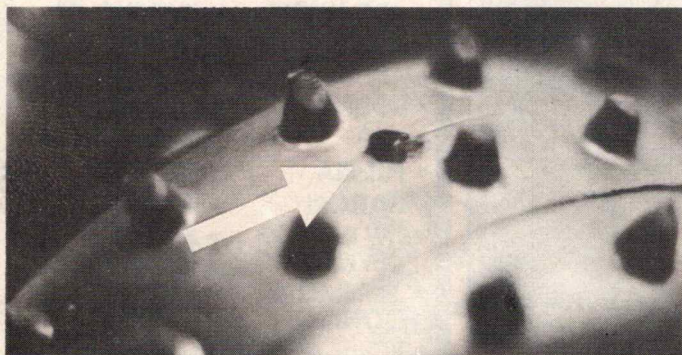
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SETTING UP

by John Bowring

HOLES?

Many newcomers to off-road racing are amazed to see holes in the tyres of other competitors. 'Why holes in tyres?' you ask. The answer is really quite simple. Due to the relatively light weight of these cars, tyres without a means of relieving air trapped within them have a tendency to bounce too much, even with the best suspension set up. Hence the need to reduce bounce by releasing air from the balloon-like tyres. The size of the holes is most important. Some of the holes are far too big and some are in the wrong place. What is the right place? Well, in most cases the best place is in the wheel in the flat section between the locating flanges; 2 holes at 180° separation of about 1 to 1.5 mm diameter should be sufficient. If it is not possible to drill holes in the wheels, holes in the side walls of the tyre are the next best thing. These should be the same size and spacing as suggested for the wheel. Don't use a hot soldering iron to melt a hole in the tread face. Too big a hole will let small stones and dirt into the tyre, which will add to the overall weight and cause an imbalance. This will result will be a slower car with poorer handling.



Tyre showing a small (1 to 1.5 mm diameter) hole to allow air to escape, hence reducing unwanted bounce and the resulting loss of speed and control.

SHOCKS

Shock absorbers fitted to the most competitive of today's cars are of the displacement type; that is, they need a small air space to allow for full function. This means that if they are over-filled with oil the full stroke will be prevented. If using after-market shockers to replace the kit ones, read all the instructions first before fitting them to your car. Most manufacturers supply a detailed instruction sheet describing exactly how the shocker should be assembled. These cannot be read too often, as it is the small errors that cause the shockers to malfunction. The shockers should also be tested for freedom of movement (stroke) before the oil is added.

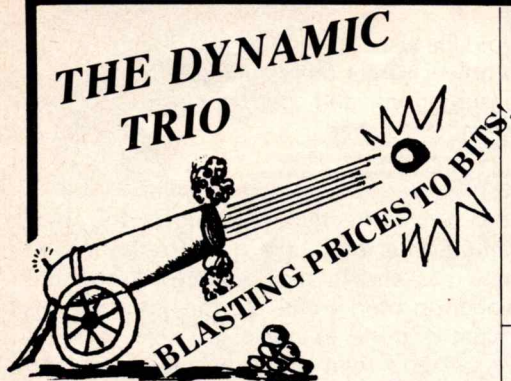
What oil can you use? Almost all lubricating oils can be used, including fork oil formulated for trail and motor cross bikes. However, for the beginner I would suggest using a multi-grade engine oil: 10W/40 or 20W/50 of any brand you like. There are also some twin packs of 30W and 50W oil; red/green; which I have used with good results, available through hobby shops.

When building up shockers, the amount of travel (stroke) may be more than needed. To limit the stroke the inclusion of a good quality fuel tube, cut to length, and placed on the piston rod under the head of the piston, does the job. Some kit manufacturers give you a suggested length for such addition. Again, read the kit instructions. The addition of the fuel tube inside the shocker will limit the down stroke if it is necessary. An up stroke limit can be achieved by putting another piece of tube outside the shocker, again on the piston rod.

Having assembled your shocker, filled it with oil, and fitted the spring, it is now ready to be tested against its mate; i.e. the one on the other side of the car. Displacement shockers should be allowed to stand vertical for about 5 minutes before testing. To test, the shocker should be held vertically and compressed with the thumb and forefinger. The action should be smooth, right to the full stroke and back. Its mate should feel the same. If the shocker feels tight at the top of its stroke, remove 1 or 2 drops of oil and check again. If the



NEW INDOOR BUGGY TRACK. Melbourne buggie drivers, not wanting to brave the winter elements, can now race in indoor comfort at suburban Nunawading. The new indoor circuit is at the Nunawading Skate Ranch, 2 Moncrief Road, Nunawading, and is open every Monday night, with registration starting at 7.30 pm. At the moment the track surface is a combination of carpet and polished, painted concrete, making for some very interesting driving! Track borders are of sand-filled fire hose, so there's very little chance of damaging your buggie if you go out of control. Power is available for battery charging, and there's a kiosk if you get thirsty or hungry. This new club has been going for only a short while, so it's no surprise that plenty of improvements are planned, including carpeting the entire track surface, and probably the addition of a jump or two. Meetings at the Skate Ranch are well organised, with race control and timing being done by audio tape, which keeps the proceedings moving. Admission is \$5 for a driver with a pit crew member; spectators pay \$2; and it's well worth a visit. For more details, contact Don Clark on (03) 874 2145 AH.



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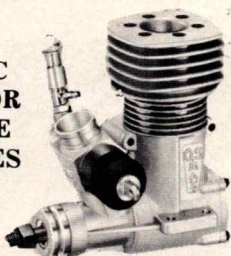


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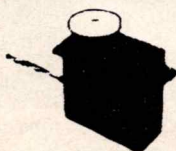
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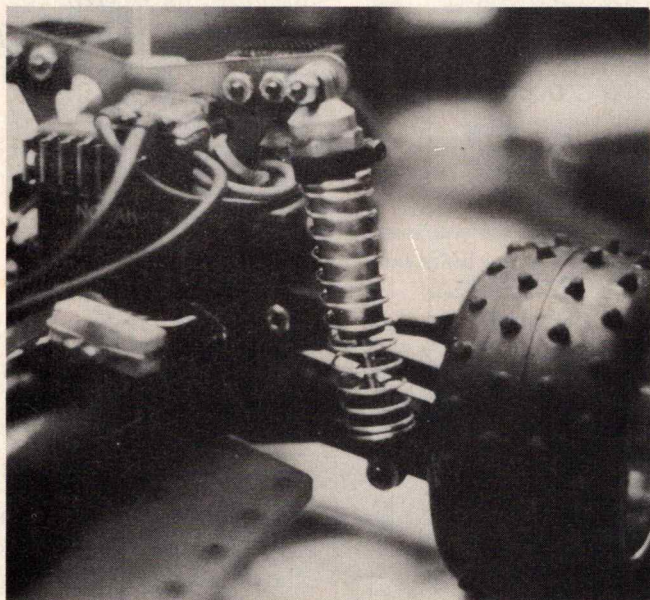
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Still looking good despite the years, this Pit Stop Taipan belongs to Paul Edwards of Newcastle. Gillott photo.

shocker makes a squishing noise, add 1 or 2 drops of oil until the noise stops, but stop before the shocker becomes tight at the top of the stroke. When both shockers feel the same, fit them to the car. (The front shockers need not feel the same as the rear ones, but the two front ones must feel the same as each other, and the two rear ones the same as each other.)



Coil-over springs allow tension adjustment by moving a locking ring either up or down the shocks to increase or decrease travel, dampening effect and vehicle's height.

TYRES

Tyres available today come in a wide variety of tread patterns, rubber compounds (hard and soft), and standard profile or low profile. Getting to know which is the right tyre can be difficult. One short cut is to copy what everyone else is using. The trap for beginners is that, as track conditions change, so may you need to change to a different type of tyre. You must learn to read the track surface and fit the tyre that suits best that day. Don't be alarmed and think that this will lead to a large number of different tyres. In fact, about 3 types should cover all needs at most tracks. Where possible, low

profile tyres should be used. These have a lower weight and require less power to get them rolling, which means less battery consumption, and perhaps using a high ratio and still lasting the distance.

HANDLING

Setting the car up correctly to achieve the best handling is something that may take quite some time to master. Experience has shown that what works on full size cars also works on model cars, so for basic information, read up what is done to make full size cars run straight (not dive left and right under acceleration), and what promotes over and under steer. This will be of benefit to those with no basic knowledge about these things.

Some important points to remember are:

- * With a limited power supply (battery), anything that causes **friction will reduce the running time.**
- * **An over-steering car** can be made to get around a **tight circuit** more easily than one that under-steers.
- * When setting up a 4 wheel drive car, the **front wheels should have toe out** (about 1 mm maximum) and the **rear wheels should have toe in** (again about 1 mm).

These can be taken as starting points; adjustments can be made later to suit either the driver or the particular track. Remember to make only one alteration at a time.

* Wheel camber is not as important, but again, practice has indicated that a small amount of negative camber (tops of the wheels looking in) for best results.

* With regard to 4WD cars fitted with an integrator (to allow 4WD split to be adjusted) it is best to start with about 25% front drive; 100% 4WD will consume more battery than, say 50%, but not in proportion, so it is a trade off between handling and running time.

* For cars with belt drive, belt tension is very important. They should be set just before the point of slipping (jumping a tooth). Again, tight belts use more power.

* The main differential in some cars can be set for slip or no slip as required. In the beginning some slip can be accepted. However, as skill level rises, no slip will become standard.

The **ride height** of the car can be one of the more important features of setting up your car. In practice the lower the car can be run the better it should handle. The ride height should be one of the last adjustments made when setting your car up for a particular track.



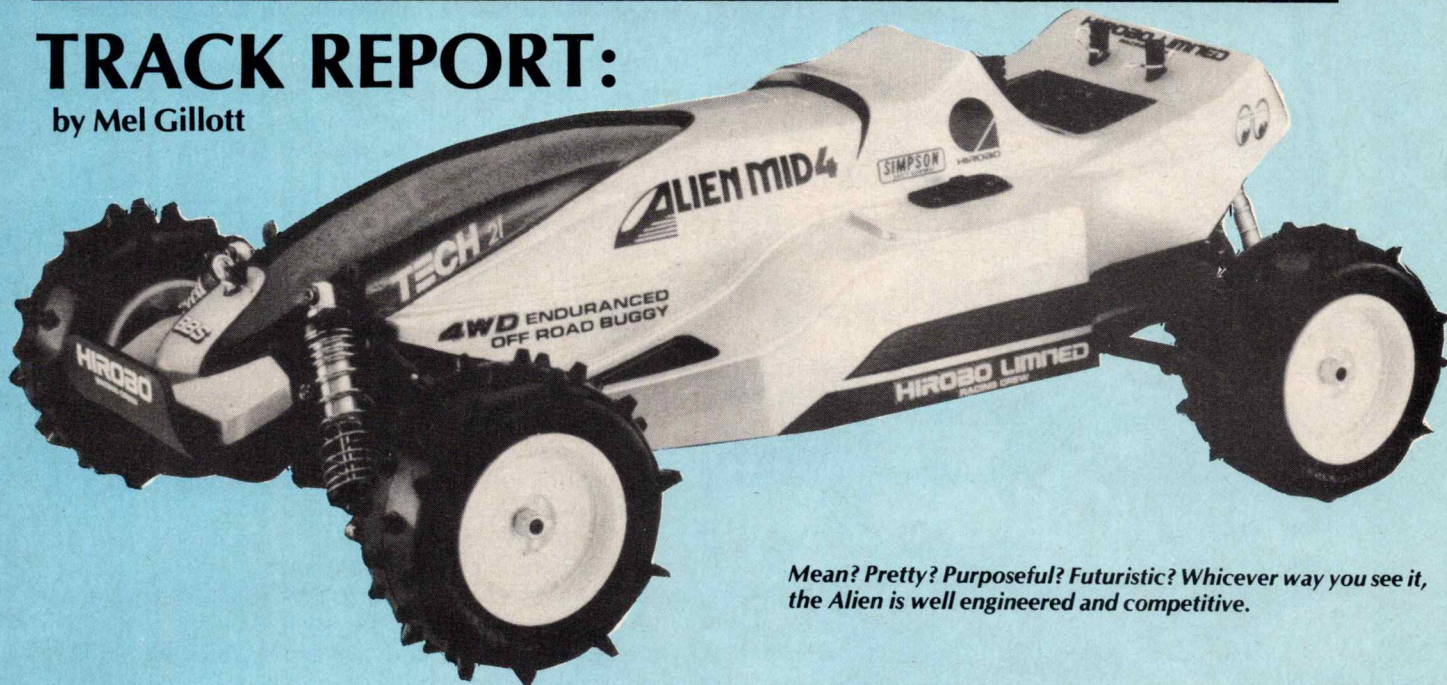
Bob Inglis of Bankstown with his Zerda. Has Supershot rims all round, MRC tyres, Option House shocks and inboard USR stock motor. Made the A Final. MG pic.

ALIEN MID4

1/10 MIDSHIP 4WD RACING BUGGY

TRACK REPORT:

by Mel Gillott



Mean? Pretty? Purposeful? Futuristic? Whichever way you see it, the Alien is well engineered and competitive.

At last you can buy a buggy that doesn't resemble a traction engine, or look like a Stevenson's Rocket. The new **Alien** belongs right up there with the Millennium Falcon, USS Enterprise, and, of course, ET. But there's much more to the Alien than a futuristic face, as we shall soon see.

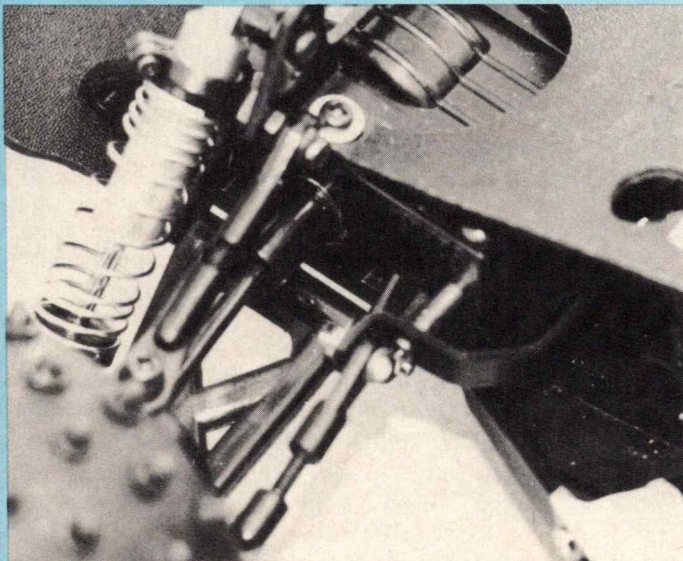
The Story So Far

First we have time to warp back a couple of years to the Hirobo Zerda. The Zerda was most things that a competitive off-roader should be: belt drive, fully ball-raced, a shock on every wheel, lower wishbones with upper adjustable tie-rods all round, two geared differentials and overall light weight. Soon the serious car racer discovered that the good basic design of the Zerda was capable of winning any race by adding some simple mods. These included uprated shocks and larger wheels and tyres. They also found that the short primary

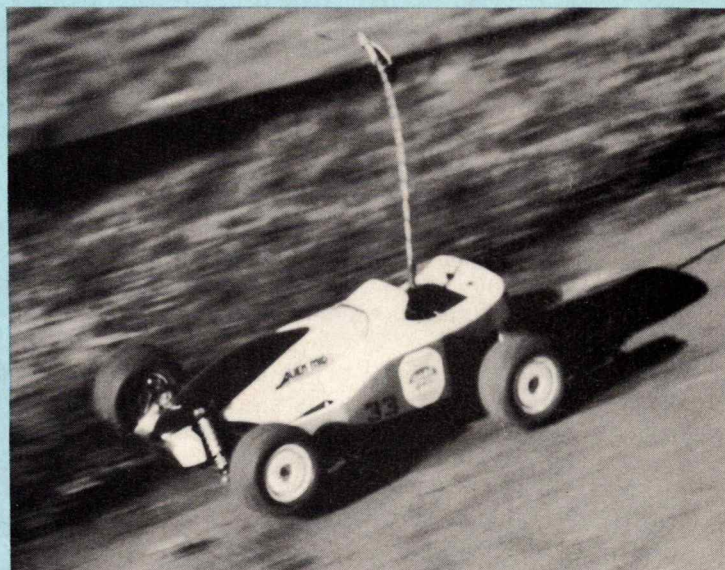
drive belt could be scrapped by moving the motor in-board and adding an extra gear. The ready-built Zerda was competitive straight out of the box, but with these mods it was a winner. It's still available, and a good buy. Someone Up There must have been paying attention and decided to incorporate most of these mods as standard. Now the Alien beams down.

Dissection of an Alien

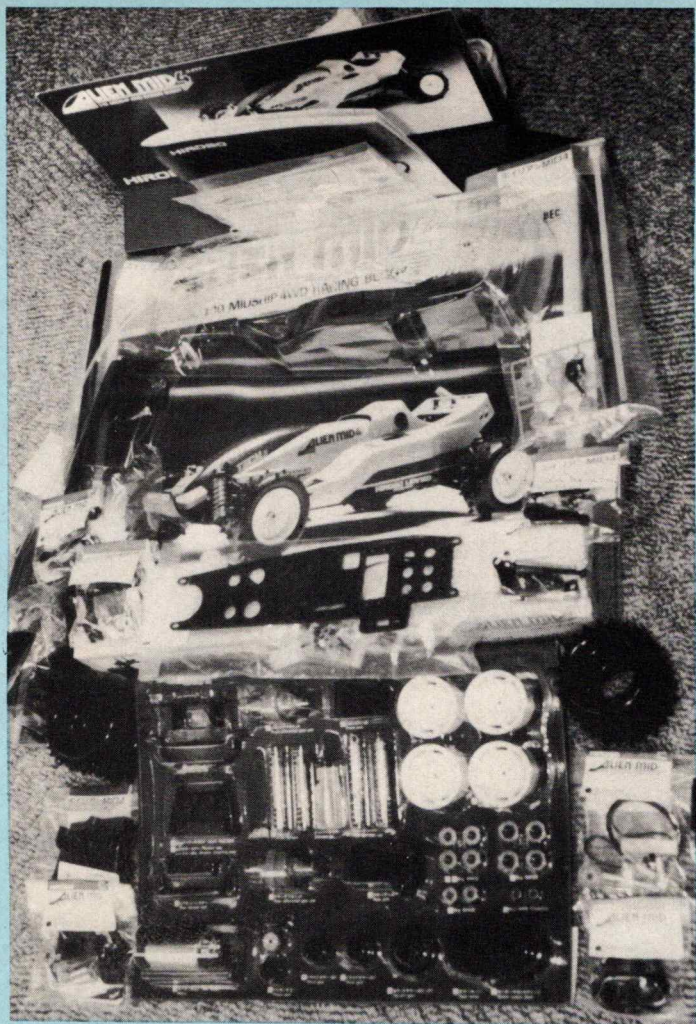
This new Hirobo incorporates all the good features of its predecessor, the Zerda. Add to that shock absorbers that work well and don't leak, inboard motor plus ball-raced, geared drive to diff, smart lightweight wheels, and soft, low-profile tyres, and you have a race-ready machine straight out of the box. There's more. Other features include:



Innovative steering linkage on Alien. Positive location via sliding rod in front gearbox. Servo connects to U shaped rod. Note adjustable wheel camber and switch position.



No folks! Despite bend in aerial, it's not going backwards. New Hirobo Alien is fast and sure-footed.



You can appreciate why good buggy kits are not like cheap toys. Alien packaging is not only attractive, but makes assembly easy.

- * An innovative steering shaft supported in oilite bushes that gives positive steering and a good look.
- * A quality speed controller with brake. Works well and should last.
- * Substantial tinted plastic dust covers for gears, speed controller and its servo. They fit so well that they actually work.
- * Even lighter weight at 1.64 kg (3lb 10 oz).
- * Further improved secondary drive, via toothed belt, to front wheels.
- * Even stronger, lower wishbones, and many other more subtle changes.

Construction of an ALIEN

This is easy. The instructions are very good, with clear diagrams and a logical sequence. The Japlish, as we have come to expect, is rather quaint and often humorous (like 'brister' for 'blister'), but understandable. All parts fit well, and no part of the assembly could be described as difficult for a person with average intelligence and dexterity. Even I could do it!

On the understanding that nothing man makes is perfect, I did find some minor faults. Add these as hints for prospective builders, and we come up with the following list:

- * If the differential assembly is a bit notchy, then pull it apart and remove any burrs from the metal gears.
- * Servo saver on the Alien is new, and a smart idea. It uses a steel spring in compression. My spring was slightly short, but was soon fixed by pushing a screwdriver into a few coils to lengthen it.
- * Steering stay M2 bolts were supplied too long.
- * Assembly and installation of speed controller would

be time consuming for a novice, so would benefit from step-by-step instructions.

* Drive belt (front to rear diffs) is tensioned by simply moving front and/or rear axle mounts. Should be as loose as possible without slipping, but this is not covered in the instructions.

* No BEC (Battery Eliminator) is supplied to feed the receiver off the main battery. You'll need to buy one (up to \$20, depending on type) and, while you're at it, get a male plug to replace the female one at the speed controller input. (The Alien does include a neat temperature fuse for protection of the circuit.)

Taming the Beast

Setting up a model car is an acquired art. I don't pretend to know everything, but my previous experience with the Zerda and others helps. For reliability and racing I recommend the following, many of which are applicable to other buggies:

* Add washers under the heads of lower shocks and steering rod screws to prevent ball links from popping off in a shunt.

* Screwing a machine screw into plastic is not sound engineering practice. It occurs on a number of buggies, including a few on the Alien, and a stripped thread usually results. Either use superglue in the hole first or, better still, replace with self-tappers.

* Move the radio switch to upturn on the front part of the chassis. This way the switch won't spoil the sexy lines of the Alien's body, and the switch is less likely to be turned off by an enthusiastic marshal. It happens!

* Don't oil the steering shaft, ball races, or any other parts of your buggy exposed to dirt.

* Like the Zerda, the Alien has only one ball race to support each axle. This means that the wheels will develop a wobble as the bearing wears. You can slow down the process a little by superglueing the bearing to the shaft. Don't get superglue in the bearing though!

* Mount the receiver horizontally for easy access to the crystal. If the Rx is too wide, then pack it under the upper deck post rather than put it vertically.

* Tape over all holes in the upper deck to keep dust out of the speed controller cover.

* Burn 2 mm holes in each tyre (or in the rims) so that the tyre will not remain squashed.

* The Alien might look pretty with its narrow bumper, but it's certainly not practical. The front wishbone pins will get bent after 2 minutes of racing, and it's not legal at many tracks. Either fit a plastic extension or the excellent RPM lexan bumper (about \$15).

* Fit the middle size pinion (3 are supplied); set the shocker springs full length; run-in the motor, and let's go racing.

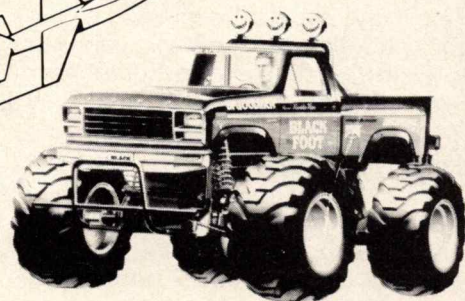
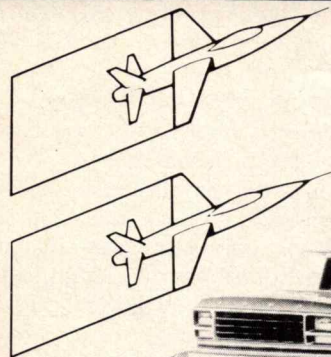
Can Aliens be Domesticated?

The first couple of race days were hardly fair to this Extra Terrestrial. It was plagued by interference and other problems that were no fault of the car. Even Aliens haven't solved teething troubles! Once domesticated it flew. With inboard motor modification, the Zerda had a fairly friction-free drive train, but the Alien will outroll it. I also tested it against a Schumacher CAT and couldn't pick the difference. This makes it fast. It will take large pinions, especially if the 540 is replaced with an 05 stock motor. I'm using a 17 tooth, even on our tight track.

In AIRBORNE No 77, Michael Jersey described the Zerda as having almost limitless cornering power. He enthused over the Zerda's suspension, and put it at the top of the list when it came to ease of driving. The Alien



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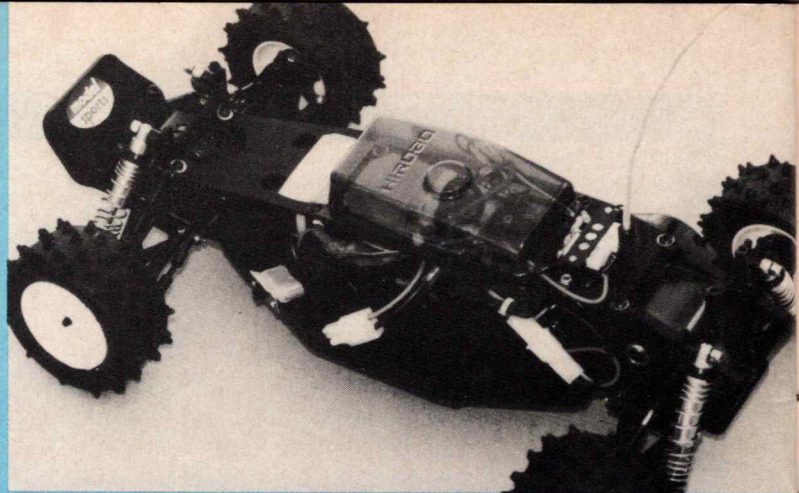
is even better. Handling is almost neutral, with maybe a hint of over-steer when the tyres are new. With all the adjustments available, it can be altered to suit your driving style. I suggest starting with a little negative camber (top leaning in) on all wheels and some toe-in (front pointing in) on the front wheels. Use the damper oil supplied and set rear springs about 8 mm harder. Make adjustments a little at a time to suit your track and style, but the standard settings aren't far out. With the speed controller supplied, braking is always available from reverse, and an option from forwards. Again, set to suit yourself. Unlike the Zerda, the Alien doesn't slip the belt under braking or acceleration.

**Summary; or,
Will this Alien be Accepted into the Community?**

All the kids think that the Alien body is choice, and grown-ups learn to like it, like Star Wars. It looks quick, even when standing still. On the move it is low and slippery. Good for getting out of trouble. No wonder there's a queue for Alien bodies to fit to other makes. Under the skin it's almost as advanced as our pre-conceived ideas of ETs. More down to earth, some would say that Hirobo have missed the boat (space-ship?) by not updating those annoying wheel axles. But as it is, the Alien is competitive, both in price and performance, straight out of the box.

The enthusiast can play around with larger shocks, bigger wheels with different tyres, a rear wing and, of course, twin ball-raced axles. But with only minor mods, as noted in this report, the Alien is quick, sure-footed, reliable and durable. An ideal first four wheel drive buggy, or basis, with limited outlay, for an all-out racer. And race wins are already coming in to prove it.

Test kit supplied by Southern Model Supplies.



See, undressed the Alien is still attractive. Electrics easily accessible under plastic cover, but seal the holes in the top plate to keep out dust.

REVIEW AT A GLANCE

Quality of Instructions:	★★★★
Ease of Construction:	★★★★
Quality of Materials:	★★★★
Motor Supplied?:	540 Stock
Chassis Type:	Rigid Plastic Multi-Level Tray
Shocks Type:	Oil-Filled Coil Over Spring
Sway Bars?:	No
Ball Races Supplied?:	Yes
Motor Accessibility:	★★★★
Battery Accessibility:	★★★★★
Speed Controller Supplied?:	Yes
Wiper Type:	Resistance Plate; quite good
Steering Servo Saver:	★★★
Body Shell:	Lexan; You cut out and paint
Balance of Car:	★★★★
Handling on Track (as tested):	★★★
Ease of Setting Up:	★★★



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JR NEA 800B MOSFET SPEED CONTROLLER

If awards were given for the smartest looking electronic speed controller (ESC), then this new JR would take some beating. Its heat sink is cleverly designed to fit within the box shape of the controller, not hang off like a Xmas tree decoration. And they've given the heat sink a distinctive appearance that complements the product, not detracts from it. The whole package is complete with mounting lugs, and will fit in place of a JR 505 servo if required. However, the JR 800B is more than just a pretty face.

On paper the specifications are very impressive. The ESC will handle up to 10.8 volts, 60 Amps continuous or a massive 240 Amps momentarily. Full forward resistance is negligible at 0.018 ohms. This all adds up to a bullet-proof circuit that lets all the power get to the motor.

Inside the little black box it's easy to see where the performance comes from. JR must be after the world record for packing the most Field Affect Transistors in an ESC! There are 8 of them, each one 27 mm long, and together they take up about 70% of the total ESC volume. The other 30% includes a battery eliminator circuit



NEA-800B FET speed controller, showing controls for setting up.

(BEC) to feed the receiver, and a green and red lamp for setting up the adjustments for neutral and fast forward positions. There are no (potentially troublesome) relays. Reverse is included (at about 50% max power), and electronic braking is available if required by adjusting neutral towards reverse.

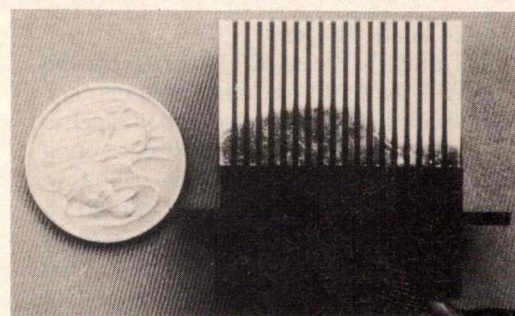
In use this speed controller lives up to all expectations. With the mounting lugs cut off, this 45 x 40 x 20 mm controller (weight is 55 grams) lives nicely on the lower tray of a Schumacher CAT, so it should fit other cars without much problem. Wiring up is easy and, once connected, the power comes on smoothly and proportionately. There's no sudden jump to full throttle. I've run this ESC now for several weeks in Open Class (7.2 volts, unlimited motors) with no problems whatsoever. It handles the super power of

Reviewed by Mel Gillott

Kyosho's new Option House SPA 240 WS motor and, after a 5 minute race, is warm but not hot, despite the rather poor cooling in a CAT. Told you that the heat sink was more than just a pretty face!

But I have saved the best until last. The JR 800B comes at a price that puts other MOSFET controllers to shame. That's what I call progress. It is not as small as some, otherwise the ESC sacrifices nothing to its more expensive competitors. The unit is available without the heatsink, but one would be foolish not to use it. Anyway, it looks nowhere near as sexy without it.

Product supplied for review by JR Remote Control Australia Ltd..



Side view of the NEA-800B with a 20 cent coin to show comparative size.

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by Stingray



1/24 Scale 'Rockets'

Tamiya's latest RC offering is the new 1/24 scale on road Tamtech cars. At half the size of the usual electric 1/12 scale road cars, these cars open up a whole new area of racing to many people unable to get to a normal outdoor track. Their size is very deceiving, as the speed they reach is comparable to the speed of many 1/10 stock motored cars, such as the Hornet.

The first Tamtech cars to arrive in Australia are the Porsche 962 (very similar to the famous 956), and the Lancia LC2, but by August other cars, such as the Ford Mustang Group C, Ferrari Testarossa sedan, another Porsche, and a Celica, will be released. All these bodies are interchangeable on the Tamtech chassis.

FEATURES

Mechanics

The Tamtechs have a very sturdy, polycarbonate, monocoque type chassis with coil spring independent front suspension and a coil spring with link arm rear suspension. This suspension works well to soak up the irregularities in the track surface.



Don't let their size fool you: these 1/24 scalers can really get up and go.

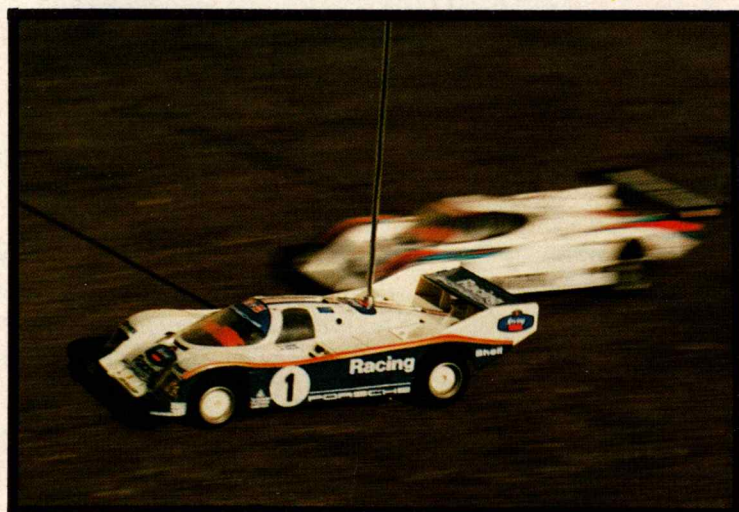
A geared differential with four pinions (8, 10, 12 and 14 tooth) is supplied to gear the car to the area you are running on. Running time per battery charge is between 8 and 15 minutes, depending on the pinion used, and with the fast 14 tooth pinion, the Tamtech really moves out.

Power Source

The 7.2 volt, 270 mAh Ni-Cad battery supplies power to a potent little Mabuchi Fk 180 SH mini-black motor through a fully proportional, forward and reverse, electronic speed controller.



Tamiya's Porsche 959, 4WD 1/12 scale Rally Car. Probably the fastest car ever, out of the box! Photo from Ray Wood.

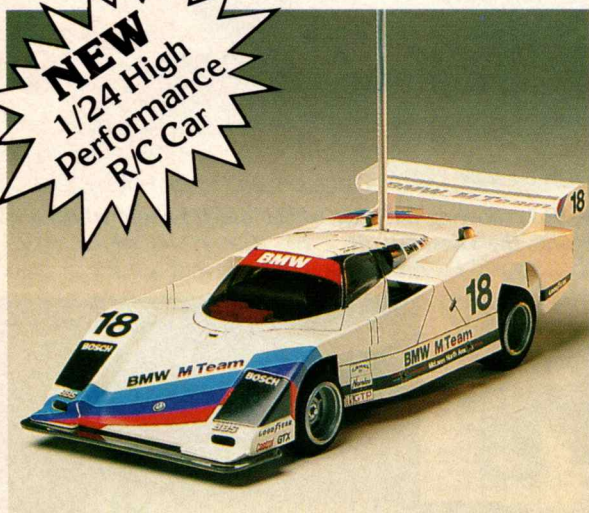


Making a fast over-taking move. Rothmans Racing is about to be blown away by a 'fast Martini'.



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MUSTANG
PROBE GTP



LANCIA
LC2



PORSCHE
961



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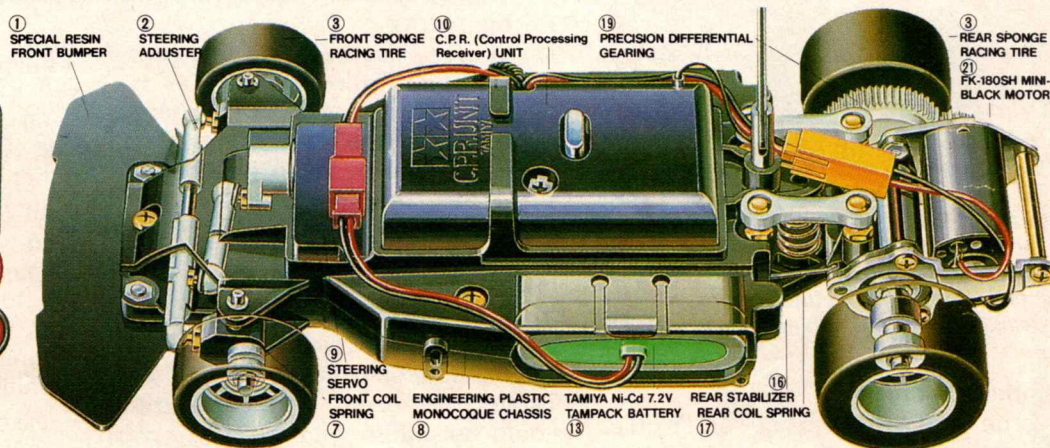


PORSCHE
962C

TamPack

TAMIYA NI-Cd
22V-270mAh
BATTERY

* Charger varies according to country.



TAMIYA — way out in front!

MELTON T.O.R.R.C.C. TWO HOUR ENDURANCE RACE

by Les Bone

In August 1986, a one hour endurance race was held for 1/10 off road buggies. It was held on a temporary dirt track in conjunction with a local motor show, and organised by a club which was only six months old. Despite all of this it was a huge success, so the club committee decided to get a little more adventurous this time and try a two hour event. Finding willing teams of four drivers was certainly the easiest part to organise. So, to all of those who missed out sorry!!

The day of the race dawned. Melbourne weather, typically unpredictable, didn't look the best at all. It was cold and overcast with persistent drizzle, which made us wonder about a cancellation. However, the drizzle turned out to be a blessing in disguise. The dust on our dirt track would normally have been spread over miles during the 2,009 laps, but the convenient drizzle kept the track just lightly damp perfect. The teams from Melton, two Optimas, a Javelin and a Hotshot, had prepared themselves and their cars, and all were confident that they could win. The visiting teams, however, were



not to be outdone. A Bulldog from the Ballarat club, an RC10 and an Ultima from Keilor and a Supershot from Templestowe, all approached the race professionally.

Scrutineering and the drivers' meeting went quite smoothly, with the only rules strictly adhered being that drivers must change with each battery change (to prevent the best driver staying on longer), and that there would be no abuse from the drivers' stand.

The start was typical of a mad panic eight car grid, and chaos reigned for the first few laps until the faster cars got themselves sorted out. The first car in for a battery change, at only four minutes, was an Optima with its Technitune motor turned up full, but a six second change had it back on the track without losing much ground. The Ultima team, however, were running a different race. This 2WD car is very light and, by combining this with a Le Mans 600E motor, they were able to get eleven minutes

parma

1/10 SCALE LEXAN BODIES

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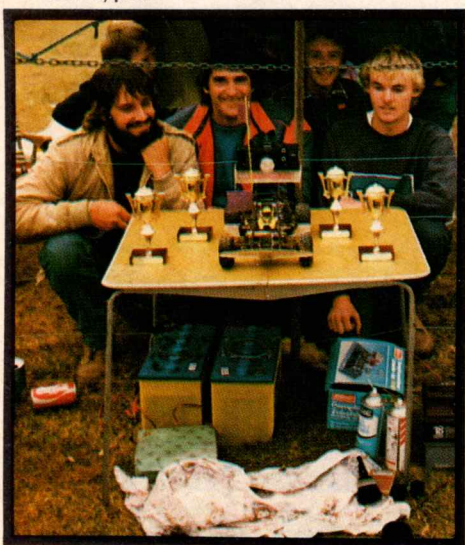
on our tight track. It was the old tortoise and the hare story all over again.

Laps were called out at half hourly intervals, and after one hour there were only ten laps between the first four places (average 150 laps); the 2WD cars were certainly showing the way, with fewer battery changes and stops for running repairs. The star of the day, however, was the Bulldog, with bushes (not bearings) deliberately left in so as not to be bothered by dust, and, with no breakdowns at all, just kept slugging on. Those people who attended the Australian Nationals in February will remember that, when the track became very rough, the CATs and Mustangs just couldn't handle it; the Bulldogs, well.....! After two hours, 2,009 laps and 170 km travelled, our track looked a bit the worse for wear. (N.B. I'm not biased. I drive a CAT.)

Judging by the very positive comments we at Melton received, a good day was had by all. Cups were presented to 1st, 2nd and 3rd placed teams, while all other drivers were given commemorative medallions.

A few important tips to remember when organising an event such as this:

- * Try to get a good cross section of car types.



Winning team at the Melton Two Hour Enduro. Left to right: Craig Dicker (Animal), Peter Collier, Tim Sanford and Dean Fisk.



Melton track, situated in Yuille Street, Melton. For more information on the Melton T.O.R.R.C.C. Phone the secretary on (03) 743 1153.

- * Encourage spectators: it's good for everyone.
- * Keep spectators and drivers away from lap counters. It is difficult enough concentrating for 6 minutes with 6 cars in a normal event. Two hours of it is an horrendous task.
- * Use a minimum of 3 lap scorers.
- * Strictly enforce pit area rules. (Tempers do get frayed in the heat of a race if cars race through the pits.)

The information sheet below is an idea that I picked up from the 1987 Nationals. It is very interesting to check the type of equipment that each team used. In hindsight, what would have been even more interesting, is an information sheet of the equipment used by the end of a two hour endurance race. For example, the Bulldog team was the only team **not** to change its motor; the Ultima had its tyres changed and the Optima had just about everything changed.

The main thing, of course, is to enjoy the racing. Remember that an event like this does take a lot of work and finance. In our case we are indebted to the Uniting Church for the loan of their land, and to the Hobby Yard (Melton) for its sponsorship.



Two Hour Enduro lap counters: one person called the cars, one operated the mechanical lap counter and one operated a manual back-up system. After 2009 laps there was no discrepancy found between the scores. Wow! some concentration! Left to right they are: Brenda Bone, Jason Burgess and Kate Goodison.

NUMBER OF LAPS RECORDED AFTER

Team Colour	Car	½ Hr.	1 Hr.	1½ Hrs.	2 Hrs.
No. 7 Purple	Bulldog	83	153	233	326.9
No. 3 White	Javelin	66	137	216	307.0
No. 2 Green	RC 10	83	143	211	288.7
No. 6 Black	Ultima	83	147	215	285.0
no. 5 Yellow	Hotshot	71	100	159	223.4
No. 1 Red	Optima	72	127	148	207.5
No. 8 Silver	Optima	53	82	127	185.5
No. 4 Blue	Supershot	69	109	119	185.2

Team Colour	Car	Speed Controller
No. 1 Red	Optima	Hi Tech Challenger
No. 2 Green	RC 10	Futaba FET
No. 3 White	Javelin	CX2R
No. 4 Blue	Supershot	RM7 480 (KO)
No. 5 Yellow	Hotshot	MK 600
no. 6 Black	Ultima	MK 600
No. 7 Purple	Bulldog	Mosfet
No. 8 Silver	Optima	Hi Tech

Tyres
Rocky
Schumacher (R); Proline (F)
Schumacher
Supershot Spikes
Hotshot Spikes
Hotshot Spikes
Schumacher
Optima Block

Motor
Technitune
Parma Enduro
Kyosho 480G
M & Y Stock
M & Y Stock
Le Mans 600 E
Yokomo 05H (Turbo)
Kyosho 480G

Radio Equipment
Futaba
Futaba Magnum Senior
Hi Tech
K.O.
Futaba Magnum Jnr Techniplus
Futaba
JR Alpina
Hi Tech

The above table is what each entry STARTED with. Unfortunately, a comparative table was not done AFTER the race, to compare the stamina of the various motors, speed controllers, tyres and so on. Might have made some interesting discoveries.

STINGRAY

by Ray Wood

Hi! I'm Ray Wood. Welcome to my little section of this new magazine in which I will try to pass on some of the information that you need to get full enjoyment out of your RC vehicle. My own little world revolves around electric RC cars, with 2½ years of on-road, and over 4 years of off-road racing behind me, with the emphasis, at present, on 1/10 buggies, both on dirt and on ice; yes, ice! Racing at ice skating rinks is a Monday night activity at two venues in Sydney at the moment. More on that later.

In coming months I'm hoping to get some competition racing the new Tamiya Porsche 959 1/12 rally car. It looks as though a club and a special class will be started in Sydney soon to cater for those who have one of these speedy little beasts. 1/12 road racers know how many thousands of car parks there are in a major city, and how the number that are flat and clean enough to run a 1/12 circuit car on can be counted on the fingers of one hand. All the dirty, dusty, sandy, bitumen car parks around are now perfect terrain for the 4WD 959. Built straight out of the box, and armed with optional slide tyres, this car and this sort of racing surface are the closest thing we can get to the sort of four wheel power drifts that full size rally cars accomplish in the heat of battle. This car is a heap of fun, and I'll keep you up to date on the development of the new club.

THE RACING CLIMATE

1/10 buggies are obviously the biggest aspect of RC car racing at present around the world, and the climatic differences experienced by the major racing countries reflects in the type of racing they do.

Look at **America**. California is the mecca of RC car freaks. They race everything radio controlled, from 1/4 scale IC powered sprint cars to 1/10 scale 10 cell dragsters (that's a mind-blowing concept in itself; think about it!). Getting back to 1/10 buggies. They run two competition classes, basically: Stock Class, which is 2WD, 'Stock' motor, 7 cells, 4 minute races; and Open Class, which is 4WD (or 2WD if you like), Modified motor, 7 cells and again, 4 minute races. Their tracks are usually large, wide and open areas with undulating but fairly smooth surfaces. Traction is generally fairly high, although, of course, it varies from track to track. Under these conditions, the cars really fly.

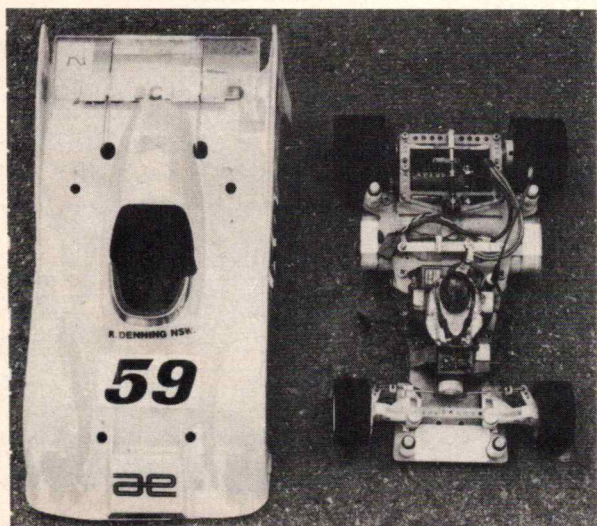


Yours truly caught out trying to screw my Boomerang back together. Photo by R. Wood.

Over in **England**, however, it's a different kettle of fish. In a country where land for tracks is harder to come by, the tracks are smaller, tighter and, due to the climate, usually damp and grassy, with heaps of traction. So they race 380 Class, 540 Stock, and 6 Cell Open, over 5 or 6 minutes. Of course, 7 cells is not much use to these racers, but with the emergence of production 7 cell cars and batteries now on the market, things might change soon even in England!

In **Japan**, the original home of RC cars, land is worth an amazing amount, and the number of tracks is small. However, the class of the facilities, and the well laid out plans, make for some rather fast tracks, considering the areas. They have been running 6 cells, but in 1986 both Tamiya and Kyosho came out with 7 cell cars: the Big Wig and Optima Turbo, respectively. With both these big companies, and Associated in America, promoting 7 cells, Japan will no doubt be making the change to 7 cell racing. The number of people who race in Japan is staggering, and it's fairly normal to have 130 entrants at a club meeting.

Back home in **Australia**, NSW has 7 cell racing in its second year, and it's slowly catching on. As it is accepted and the tracks get bigger (which is slowly happening), the class will show its potential. We all love speed, and the first question that most of us asked the man in the shop where we bought our first RC car was "How fast do they go?" Well, let me tell you, if you have a few motors that don't quite scream any more, but you can't afford \$80 to \$180 for a new competition motor, then add an extra cell to your 6 cell pack and see what a \$15 investment can do for that dead motor. One extra cell makes a big difference to available horse power, and your manual speed controller will handle 7 cells, as will all Mosfets and most electronic relay type speed controllers, but not all! Please, if you're not sure, check with someone who knows first.



Current Australian 1/12 Champ, Rodney Denning's Associated RC12i. Rodney and many others are looking forward to carpet racing at St. Ives. No, we're not racing carpets, silly!. Ray Wood photo.

Traction is high without using tyre additives (which are banned anyway), and tyre wear is relatively low. Ric also tells me that, as well as regular 1/12 cars, they will also run Tamtech 1/24 cars and 1/10 Road Wizard F1s as the numbers turn up. So, as long as you've got an electric road car, even a Tamiya Porsche 959, turn up on Friday nights and join in the fun.

So, with the new carpet venue and the regular meetings at Merrylands Plaza and Zaner Raceway at Rouse Hill, Sydney now has three good venues for the buggy racers who might want to hone up their skills in the tight, fast racing of circuit cars.

For further information on the indoor racing at St. Ives ring Ric Bartolozzi on (02) 452 4578 A.H.

THE TAMIYA CHALLENGE

The biggest RC promotion ever undertaken in this country is just a couple of months away. The **Tamiya Challenge**, as it will be called, will be run in conjunction with ORRCA-OZ, with race meetings in over 70 cities and towns all over Australia between September '87 and March '88. Briefly, there are three classes:

1) Open Class — Open to anyone. 2 or 4 wheel drive Tamiya cars may be entered. Cars must be Tamiya-based, but can have limited modifications (shocks, diffs etc.).

Restricted, or Stock 2WD Class — Open only to those who have never won a club sponsored race before. Only totally Tamiya Stock motored cars can enter.

Fun, or Stunt Class — open to any totally Tamiya fun car; e.g. Monster Beetle, Wild Willy, Pajero etc. Again, open only to non-club racers.

Prizes will be given to heat winners and, after the finals, which will be held in Sydney, the winners of each class will receive a trip for two to Japan to compete against the Japanese on their tracks. **Entry forms** will soon be available from the Tamiya stockist in your area. This promotion will undoubtedly bring a stack of new members to all our clubs around the country.

FIRST IN AUSTRALIA!

Unique indoor race track at Birkenhead.

A totally new approach to radio controlled buggy racing has been introduced at the Birkenhead Shopping Centre, Sydney, by the Australian distributors of Tamiya radio controlled vehicles. An indoor dirt track, with ramps and jumps, and featuring a track-side grandstand, has been installed in Unit 8 Cary Street, opposite the Lego display. Budding champions can select the Tamiya car of their choice from a range of 10 different models, and for just \$2.00, can race the car for 5 minutes around the circuit. Distance of each lap is approximately 100 metres.

Drivers do not require any previous driving experience, and the Tamiya people are on hand to answer questions on driving techniques and on the maintenance of radio controlled cars.

The track is the first of its kind to be established in Australia, and right from the opening day has been drawing huge crowds.

PLEASE NOTE:

Not recommended for children under the age of 10 years

1/8 SCALE WORLD CHAMPIONSHIPS

from Marion Grant

The World Champs organisation was very good, and provided time for practice, during which most drivers found that the track was much tighter than the advertised track layout, and car handling was a problem. The weather was good, not too hot, but the track surface changed with the temperature changes during the day, and this altered the handling of the cars.

This caused problems for Australia's sole representative, as none of his hybrid cars could manage the tight corners. So Stewart bought a Serpent kit on the afternoon before the heats began, finished assembling it in the early hours of the next morning, and ran it in the heats that day. His Nova Rossi was not running consistently, so he used an OPS engine, taken to California as a back-up, since no engines were available locally.

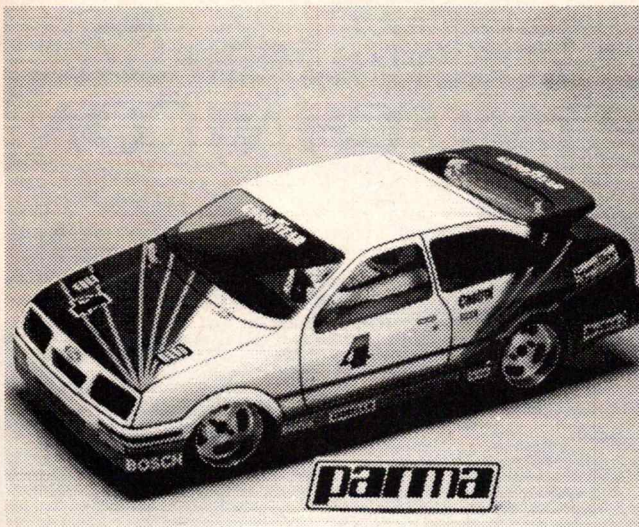
In spite of a few flips, Stewart qualified 17th, then came 5th in a semi-final, finishing 14th overall. He managed better than the driver from the local hobby shop. His efforts were acknowledged at the trophy presentation by the MC who described Stewart's work, and gained a round of applause. Of course, Stewart had help and encouragement from his dad, John, who was elected President of FEMCA at the administrative meeting.

The racing was dominated by the Americans, who had specially built cars and engines, giving them a considerable power advantage. There was a lot of collision damage, as shown by the lap scores. Attendance was good, with 120 drivers, representing 21 countries, but the European dominance was completely taken over by the Americans.

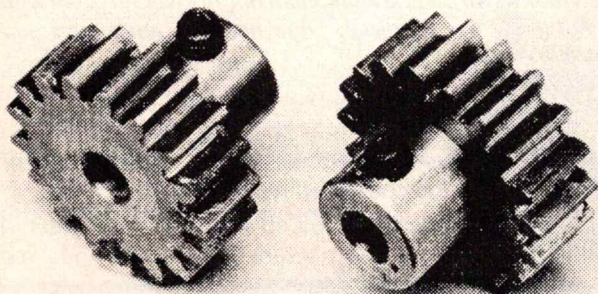
RESULTS:

1. Repete Fusco	USA	Associated	195
2. Kevin Mercadante	USA	Serpent	188
3. Tony Neissinger	USA	Associated	181
4. Gil Losi Jnr.	USA	Serpent	174
5. Curtis Husting	USA	Associated	174
6. Rody Roem	Holland	Serpent	153
7. Ralph Burch Jnr.	USA	Associated	143
8. Barry Grossenbacher	USA	Associated	116
9. Ron Rosetti	USA	Serpent	102
10. Butch Kloeber	USA	Associated	61
11. Herman Matticoli	Argentina	Serpent	
12. Albert Grob	Switzerland	Serpent	
13. Jurgen Baehr	W. Germany	Serpent	
14. Stewart Grant	Australia	Serpent	
15. Roger Sahli	Switzerland	SG	
16. Gary Culver	England	Serpent	
17. Domenica Calcci	Italy	Serpent	
18. Mario Margarucci	Italy	Serpent	
19. Gary Kyes	USA	Serpent	
20. Jacob Buehler	Switzerland	Serpent	

PRODUCT NEWS



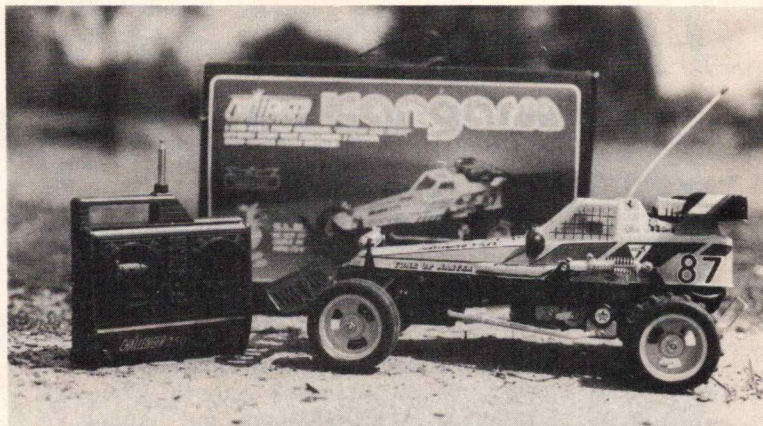
Parma's newest sedan body, a 1/10 Ford Sierra/Merkur XR4 Ti, is now available in clear lexan. Very popular on the European rally racing circuit, it is also making its mark on the American Trans-Am circuit. This body will fit all popular 1/10 cars with the use of a Parma body mount kit. Distributed by Seebern Hobbies, P.O. Box 491, Spit Junction, NSW, 2088.



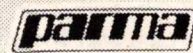
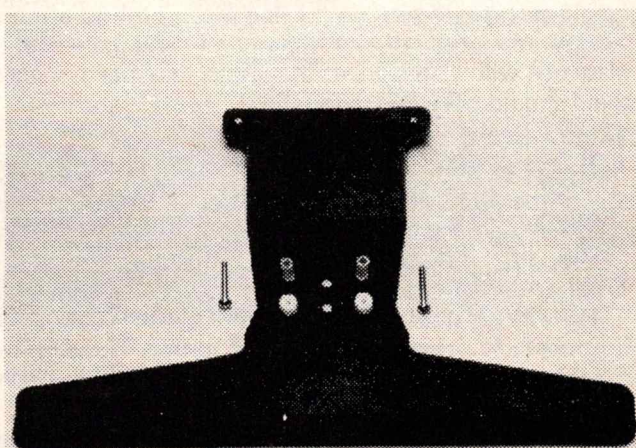
Parma has added to its fine line of machined steel pinions with these 17 tooth (6000-J), and 18 tooth (6000-K), gears. They will be very popular with stock motored racers. Phone Seebern Hobbies on (02) 94 7401 for more details.



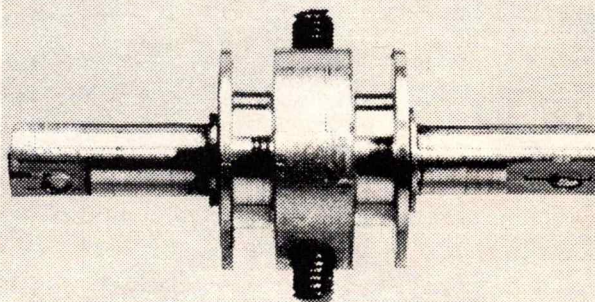
Australian International 7 Cell 4WD Buggy Champion, Mike Farnan, with father, Tony, pictured amongst the Mugen Bulldog buggy stock at Model Engines in Richmond, Melbourne.



The Hi-Tec Challenger Kangaroo Buggy comes fully assembled, with radio installed, and includes solid state electronic speed controller with built-in battery eliminator (BEC). This Korean company has captured a large slice of the world radio controlled market over the last few years, according to Australian agents, Mike and Tony Farnan of Model Engines.



Parma's latest accessory for the Tamiya Big Wig and Boomerang is a strong Kydex replacement bumper. Also, with slight modification, it can be used on the Tamiya Hot Shot and Super Shot. Distributed in Australia by Seebern Hobbies, (02) 94 7401.



This positive lock differential fits the Optima, Turbo Optima, Javelin and Salute. It replaces the original bevel gears, eliminating a breakage point, and uses one-way clutch roller bearings to give more positive steering response. Parma is Distributed in Australia by Seebern Hobbies, P.O. Box 491, Spit Junction, NSW, 2088.

TRUCKING ON

1/8 SCALE VOLVO PANTECHNICON

with John Grant's

This article was originally published in a serialised form in Airborne Magazine last year. We thought that this article deserved to be seen in Dirt & Track to give all our RC car readers some idea of what can be achieved with an idea, time, dedication and lots of imagination.

This truck building project was originally commenced to provide a vehicle to carry our 1/8 scale RC Concours d'Elegance cars when showing them for judging at National Championships. At first it was going to be just a basic truck, i.e. chassis and cab, with not a lot of detail, and powered by an electric motor, but as I progressed with the bare chassis, I thought that, as it was 1/8 scale stand off, to display 1/8 scale RC Concourse cars, it should be powered by a gas engine. Then, as it progressed, like all these projects, I started to add more detail and fiddly bits, until I had given birth to a monster which devoured all my spare time and patience (and also my wife's; patience, that is). It has been suggested that I should put a bed in the shed!

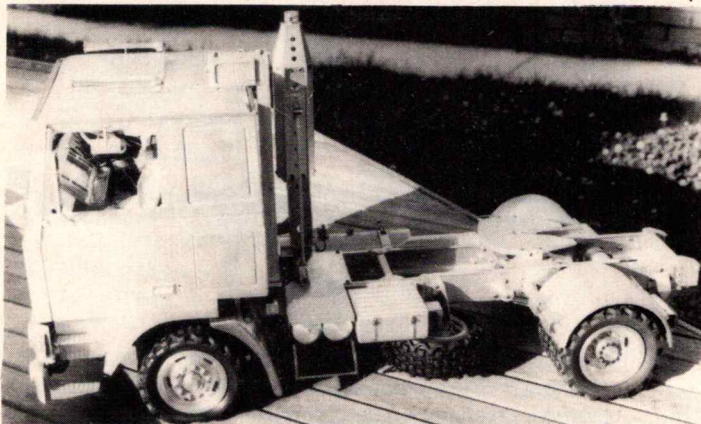
Tools

The tools used to build the truck-trailer were: milling machine, lathe, drill press, band saw, pan brake, folder, guillotine, linisher, grinder, plus all the usual, such as electric drill, files, dremel, pop riveter, and so on.

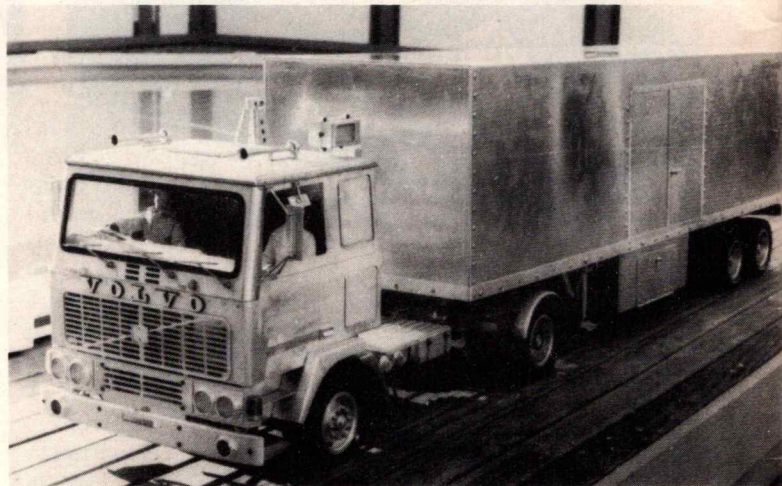
Truck Detail

The chassis is 2200 mm x 50 mm x 3 mm folded aluminium then riveted together. Spring hangers were machined from alloy square and round bar, and springs were made from VW front torsion bar small leaf. The front axle beam was machined out of 400 mm x 40 mm square alloy bar, and the rear axle housing was machined from 60 mm round bar. The diff centre was from a 1/8 PB Gepard off-road car, and the wheels were machined out of 80 mm round bar. The tyres are PB Gepard off-road tyres. At the time of starting to build this vehicle there were no other suitable tyres available. A plastic kit of a 1/8 scale Volvo truck has since come on to the market with suitable tyres in it, but unfortunately it was much too late for them to be used on this vehicle.

The power plant is a water-cooled OS 40 4-stroke engine with PB 2-speed forward and reverse gearbox and centrifugal clutch. The water pump was machined from alloy bar, and the fan was made from alloy plate. The radiator is a cut down heater radiator from an early model Holden. The radiator tanks and fan surround were from 25 thou. brass sheet, and the radiator cap



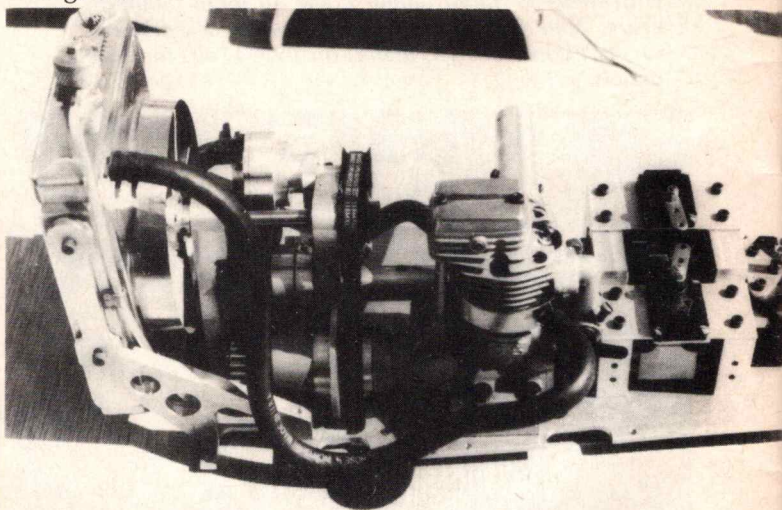
Prime mover complete. Realism is amazing: the tyres even flex.



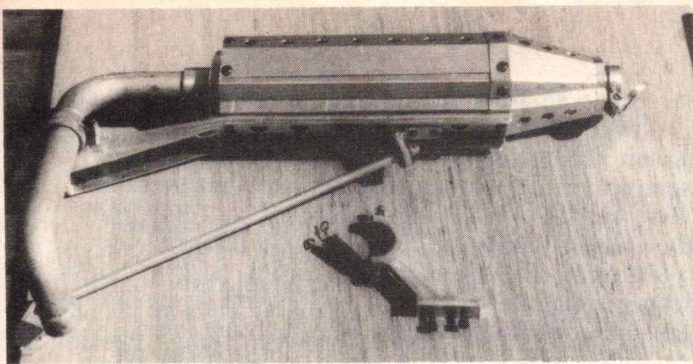
THE TRUCK! All natural aluminium finish. Rivets in panel work do not look out of place. Nine hundred hours plus sub-contractors' time.

with valve was from brass bar. The hand brake is a 2 inch disc brake on the output shaft of the gearbox. The power plant assembly is mounted on 3 mm alloy plate which is held in the chassis with six bolts.

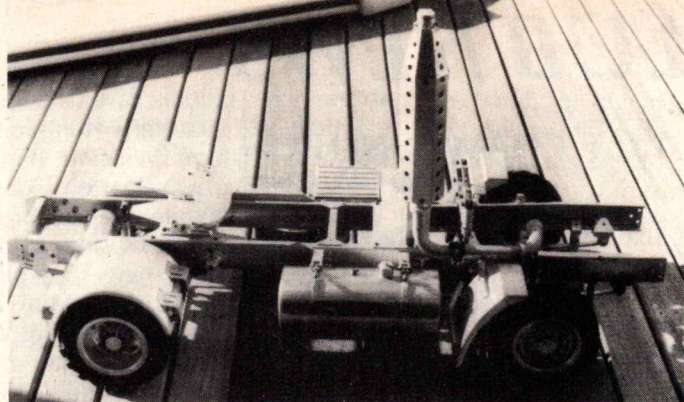
The front bumper was folded out of 3 mm sheet. The headlight bodies were machined from 40 mm round bar, and the headlight glasses were machined from the centre of full-size trailer lenses. Tail lights and front park and blinker lights were machined out of trailer lenses and superglued together. The light bulbs were from HO trains; 12 volt. The fuel tank was machined from 180 mm x 80 mm diameter tube with the ends machined from 80 mm diameter bar with O rings fitted and held in place by a central threaded bar. Brake air tanks were machined from 40 mm diameter tube with the ends machined from 40 mm diameter bar and pressed together.



Power pod for Volvo: radiator, forward and reverse gear box, brake, water pump (top), 2 speed automatic transmission and engine.



Flame-proof muffler with flapper valve on exhaust pipe. Mounting bracket, milled from solid, diagonal brace, also attached to chassis. Volvo thoroughness evident.

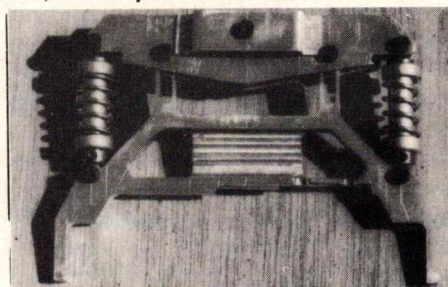


Chassis of prime mover. Cab sits to the right of the exhaust stack. No racing car this; but a super work horse.

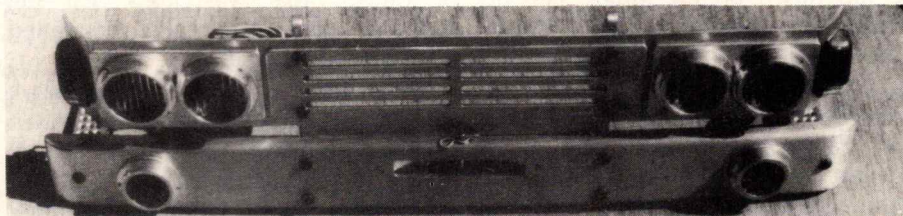
Muffler was machined from 50 mm diameter tube with ends out of 50 mm diameter bar and pressed together, connected to engine with 15 mm diameter alloy tube. Air cleaner top machined from 40 mm square alloy bar in two pieces and bolted together (fitted from Fram paper air cleaner element). Air cleaner pipe machined from two pieces of 30 mm x 20 mm bar and pressed together. Air cleaner pipe to engine machined from 40 mm square bar. Concertina rubber for attaching air cleaner tube on cab to tube on chassis is modified PBR brake master cylinder dust rubber. Shock absorbers on truck and cab mounting are machined alloy bar with brass ends. Cab mounting (sprung) machined from 6 mm plate plate and 2 mm

sheet. Muffler protector (heat) folded from 1.6 mm sheet. Cab is folded and beaten out of 2 mm alloy sheet. Perspex used for door windows and windscreens. Front mudguards folded from 2 mm alloy sheet. Rear guard beaten out of 130 mm diameter pipe.

This article is so extensive that it will be continued next issue.



Suspension of rear cabin, with locking device. Shock absorbers for the cab: Volvo luxury engineering.



Front bumper with headlights (high and low beam), fog lights and parking lights. Spring clip, centre, probably not scale!

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CLUB NEWS

A.C.T. CHAMPIONSHIPS

from G.W. Davey

Sixty drivers braved the cool Canberra temperatures for what was a well organised and most enjoyable two days of buggy racing. Although a little disappointed by the low numbers in some classes, everyone enjoyed themselves immensely. Many visitors were impressed by the track. One prominent Victorian said that the track was difficult to master, and up there with the best in the country. Mind you, this guy blasted the crowd with an awesome display of controlled power driving.

Two Wheel Drive Stock - Junior

Although way down in numbers, these guys had a ball. Michael Woodbury set a new junior 2WD track record of 20.50 laps, which is only one lap down on the junior 4x4 lap record! Steve Hewett, Gavin Wheatley and Gordon Wing also drove well.

Two Wheel Drive Stock - Senior

Another small class, and another new track record, with Ian Bush pushing his RC10 to 20.4 laps in a tussle with Richard Wheatley.

Four Wheel Drive Stock - Junior

No records set here, apart from the closest battle ever seen on Rose Cottage Raceway. In the A Finals Troy Lysaght was on Pole from the Watts brothers and newcomer Adam Davey slotting into the second row on the starting grid. Back on the third row sat Adam Benniston and Scott Blair, with current Aussie Junior Champ, David Spinney, and Anthony Gardner filling the last two spots. With the stage set by six CATs, an Optima and a Mini Mustang, the following three finals were a real treat to watch. When the dust and nerves had settled, Troy ran away with first, despite a sixth in one run. Justin Watts took second from a hard-charging Adam Benniston, and Nathan Watts held out the sole PB, raced by Adam Davey, for fourth.

In the B Final there was a very close battle between Chris Hore and Dennis Hawkins. The second place to Dennis was well deserved, as he had been plagued all weekend by problems with his Boomerang, including a fried CX2 FET and a steering hassle. An indication of the depth of talent in this class was the 0.6 of a lap between third and fifth places.

Four Wheel Drive Stock - Senior

Michael Geddes set a new record with 22.6 laps. Boy, can this guy make the pussy fly! In a tough class, the A

Finals saw Geddes on Pole with Tony Haseler alongside, Wayne Murphy and Winston Bartolo on the second row, Darren Johnson and Andrew White in positions five and six, with the final slots going to Bob Benniston and new boy Ian Buckham. Five CATs, one Mini Mustang, one Bulldog and one Big Wig. Setting Michael aside, with his clean back to back runs, second to fourth were separated by extremely short bits of flying dirt. Tony Haseler gave the home club its best result with a well-deserved second in his hi-spec PB. The battle royal between third, fourth and fifth qualifiers was like watching some video nasty: no beg pardons and definitely no prisoners. Winston Bartolo came in just ahead of Wayne Murphy and youngster Darren Johnson using a CAT for only the third time! Another creditable effort was put in by Ian Buckham with a lightweight Big Wig. Like a number of others, this was Ian's first big meeting, and he really benefitted from the experience.

The B Final was all Canberra. Mark Phelan was on pole with Allan Huggett alongside, and Don Morgan (ex-Canberra and great guy) in third, with Shane Davis, Peter van der Kley and Justin Kearney right there too. With Justin's CAT failing early, the race came down to three Boomerangs, one Big Wig and a Mini Mustang. Mark Phelan ran in a blinder which would have put him up there in the A Finals, followed by another Boomerang derivative driven by Allan Huggett. Don Moran took third with his PB from Shane Davis' Big Wig and Peter van der Kley's Boomerang.

Unlimited

This class was totally dominated by Greg Collings with a new track record of 19.35; an amazing 1.3 laps over the old record. It was worth the time just to see this dude drive. Not only a great driver, but helpful, diplomatic and plain nice to know. The others were CATs too, with the exception of local hard worker and all-round Mr. Fixit, Barry Leech. Barry finished eighth in the A Final and you could say 'So what'. That is until you're told that the guy missed the first final by rushing off to attend his daughter's First Communion, returned one race down and then had his Mini Mustang break in the final race. Truly the hard luck story of the meeting.

While Greg was setting the track on fire he was being pushed along by Peter Philibossian who was never more than a wheel back. Third went to Michael Toms, and Col Grenenger was fourth, while Andrew Jackson,

Frank Phelan and Jeremy Jackson did their best to lower the surface of the Rose Cottage Raceway.

Thanks

No meeting can operate without workers, and the 1987 ACT Champs had terrific people who put in 101% all weekend. Particular mention to Sandra Hewett, Julie Phelan and Doug Blair for a terrific lap counting and co-ordination effort. Others helped, of course, and the club is grateful. Many thanks also to the visiting drivers and their families. See you all next year.

RESULTS:

			Best Laps
JUNIOR 2WD STOCK			
1. M. Woodbury	RC10		*20.50
2. S. Hewett	RC10		19.20
3. G. Wheatley	Taipan		16.10
4. G. Wing	Fox		17.65

SENIOR 2WD STOCK			
1. I. Bush	RC10		*20.40
2. R. Wheatley	Taipan		20.05
3. J. Schweitzer	RC10		19.05
4. B. Grantham	RC10		16.73
5. B. Godwin	RC10		17.05
6. A. Carling	Optima 2WD		15.41
7. C. Dorl	Fox		14.70

JUNIOR 4WD STOCK

A Finals			
1. T. Lysaght	CAT		21.40
2. J. Watts	CAT		20.98
3. A. Benniston	CAT		20.70
4. N. Watts	CAT		20.90
5. A. Davey	Mini Mustang		20.65
6. D. Spinney	CAT		20.55
7. S. Blair	CAT		20.40
8. A. Gardner	Optima		20.05

B Final			
1. C. Hore	Big Wig		18.30
2. D. Hawkins	Boomerang		18.60
3. A. Bull	Optima		18.75
4. D. Gillogly	Optima		18.45
5. B. Purtell	Optima		16.50

SENIOR 4WD STOCK

A Finals			
1. M. Geddes	CAT		*22.60
2. T. Haseler	Mini Mustang		21.65
3. W. Bartolo	CAT		21.10
4. W. Murphy	Bulldog		21.20
5. D. Johnson	CAT		21.50
6. B. Benniston	CAT		20.55
7. A. White	CAT		20.70
8. I. Buckham	Big Wig		19.45

B Final			
1. M. Phelan	Boomerang		20.30
2. A. Huggett	Boomerang		19.85
3. D. Moran	Mini Mustang		19.35
4. S. Davis	Big Wig		19.35
5. P. van der Kley	Boomerang		18.98
6. J. Kearney	CAT		16.60

UNLIMITED

A Finals			
1. G. Collings	CAT		*19.35
2. R. Philibossian	CAT		19.15
3. M. Toms	CAT		18.98
4. C. Grenenger	CAT		18.30
5. A. Jackson	CAT		18.28
6. F. Phelan	CAT		18.25
7. J. Mills	CAT		17.50
8. B. Leech	Mini Mustang		17.95

B Final			
1. S. Salter	CAT		17.85
2. G. Evans	CAT		17.85

* Denotes Class Lap Record

O.R.R.C.A. 'B' GRADE

In NSW we have introduced a B Grade ORRCA series called the ORRCA Cup. This event was started this year in an endeavour to get more racers to meet other racers from other clubs in the same competitive atmosphere that we have in the ORRCA Shield. There have been two rounds run to date, and as it is impossible to be present at two meetings on the same day, Bob Roxborough offered to help out with the following report. Thanks Bob!

The second round of the ORRCA NSW Cup was held at the Hornsby MOB's new track at Asquith. I was really looking forward to this round as it would be different in two ways. Firstly, it was a new track, on which very few people had had a run before, and secondly, the track surface was a bowling green, unlike the clay-based surface that most clubs have adopted. Any fears that the racing would end up like a 1/10 scale road car meeting were quickly dispelled as the corners started breaking up after the first round. The racing was, in the main, excellent, with many clubs fielding relatively strong teams.

Having competed in several Shield rounds, I was pleasantly surprised at the atmosphere which prevailed at the event, which brought back memories of the old days when the main criterion was to have fun; where you were placed at the end of the day was of secondary importance. The event was well run, with few, if any, hitches, and the facilities available were the envy of all who were there.

As mentioned before, the racing was close and hard, with the two leading clubs battling it out to the end. At the end of the day Ku-Ring-Gai and Warringah were 15 points ahead of Ryde, with several other clubs not far

behind. It should be noted that 15 points on the new scale is probably less than 1/2 a point on the old system, so the event is still wide open. My congratulations go to all the competitors and to the Hornsby MOB for making it such an enjoyable event. I look forward to the next Cup round at the Castle Hill Club track.

O.R.R.C.A. SHIELD N.S.W. — 2nd Round

A glorious autumn day greeted those stalwarts who, rising in the wee small hours (some of our country colleagues were up and about at 3 a.m.), found that the frost was brittle underfoot and you could blow rings of steam. The track at Ryde was a credit, once again, to the now famous curator of the '86 Nationals track, Dave Jackson, and by 7.30 the contestants had all arrived, ready to do battle. With the points very close after the first round at Dapto, it promised to be one heck of a day's racing.

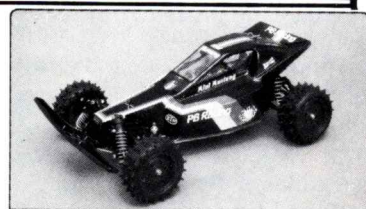
I spoke to representatives of the three leading clubs. Bankstown was quietly confident, feeling that they would do well in **2WD Stock**, as Keith Harding from that club has been the one to beat in that class lately, here in Sydney, while they were also expecting Ian Rollers to acquit himself well. Ryde thought that they really wouldn't be able to match Bankstown or St. Ives, as Tony Bovard has been in a horror stretch at the last couple of meetings and, while young Michael Bigley had been showing a lot of promise at club events, they thought he wouldn't be able to match the experience of the other clubs' drivers. St. Ives entered only one 2WD Stock driver, Michael Toms, and figured that, by the way he had been pushing that RC10 around lately, they were set for 11 points in that class.

Well, as you know, nothing is certain in racing. From the outset young Michael Bigley from Ryde, driving with



NEWS and VIEWS

Rob Reade



Stocktaking time has been and gone, and do I have some bargains for you! All of the items that I am about to list are available from your local PB/Nova Rossi dealer, but if your local hobby shop doesn't carry any of our lines, please get them to contact us.

Firstly, for **1/8 scale circuit racers**, I have plenty of **tyres** at cheap, cheap prices. These are PB 19/202S fronts, Frewer Black fronts, and in rears there are Arrows Reds and Yellows, Bajoma 110s, and Frewer Greens and Blues.

Cheap **1/8 scale bodies** — I have a selection in Sports GT, Saloon and F1 in both Lexan and ABS, from PB, Frewer and Parma. Your local PB dealer has details, or contact us direct.

Need a new **3.5 engine** for your car? Why not treat yourself to one from the superb NOVA ROSSI engine range. Now you can have your cake and eat it too! Prices are super low on Black Head Competition and Red Head Super Competition models, only while current stocks last, and remember, they are rated at 1.7 & 1.9 hp, and 29,000 & 29,800 revs. Your local dealer has details now of the 'jewels' from this very special Italian engine manufacturer, or please contact us direct.

For **1/8 scale off roaders**, I still have a few PB21 Mustang Xi2s left. This is the original high performance out-and-out competition 4WD buggy from PB, and set new standards when first released. At \$399, this is real bargain buying for this top quality kit, and again, it is a matter of being able to have your cake and eat it too!

For all you **1/10 buggy racers**, I have some good news as well. Looking for, or require, a **competition battery pack** at the right price? Well, look no further, as PB has just released one. Sanyo Yellow SCRs are used, and it is nicely packaged in a heat shrink pack and already wired with a Tamiya type connector. This type of battery normally maintains a slightly higher voltage during discharge (or use), and therefore is favoured by most top racers for more go or for use with high power motors. Check with your local PB dealer for pricing: it is very competitive for this type of battery.

As usual, I've saved the best for last. If you are a **Mini Mustang** owner, potential owner, or fan, there is some tremendous news for you. With the 1/10 scale buggy World Champs in the UK in August (which will have been run and won by the time you read this; and here's hoping that an Aussie can do a Pat Cash and get

up there), PB have been hard at work to **further improve** the efficiency, handling and reliability of the **Mini Mustang**. With no major redesign, but by modifying or using different types of some parts, PB have been able to obtain a dramatic increase in efficiency. What about delivering the same power to the wheels, but with **26.2% less input**? This figure has been confirmed by independent testing on a rolling road test bed. Some other absolutely outstanding figures were also noted at the same test. Suffice to say that Mini Mustang, in the configuration tested, had incredible top speed. These improvements, together with a long wheel base handling option, will be marketed as optional go-faster 'goodies', and should be available about September or October. Now, if you want to use that 'hot' motor for extra speed and acceleration but couldn't do so because you couldn't run the time, now you will be able to do so.

Eldest son Andrew and I are off to the 1/10 buggy World Champs in the UK. We leave on 28th July and hope to return with lots of news for next time.

Happy racing to you all.

P.S. Stocks of the new NOVA X5E 1/8 scale race car and the new Mustang X3 1/8 scale off roader have just arrived.

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