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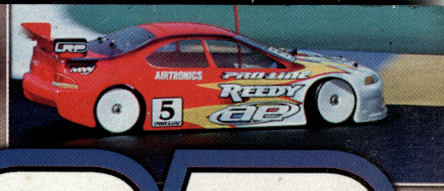

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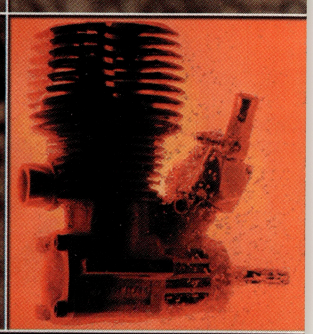

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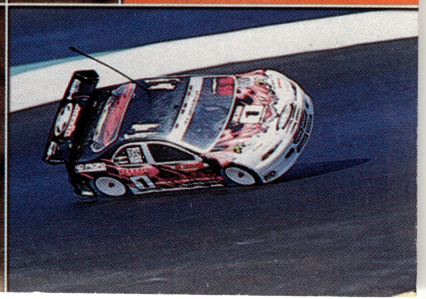

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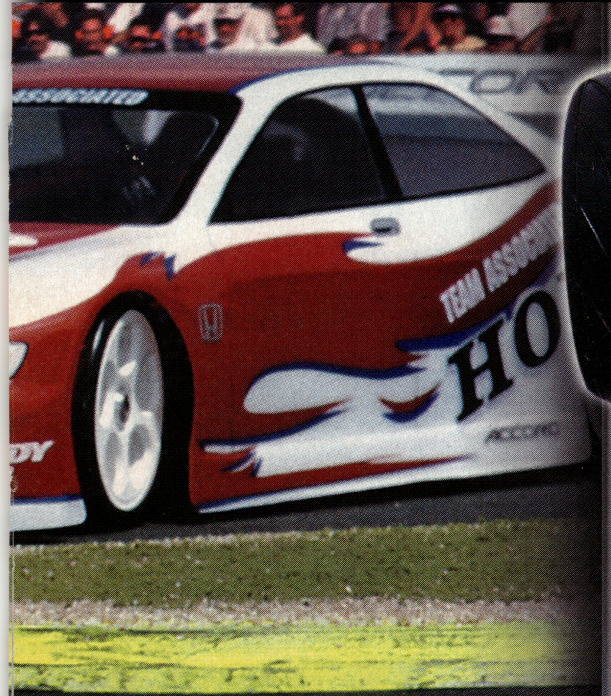

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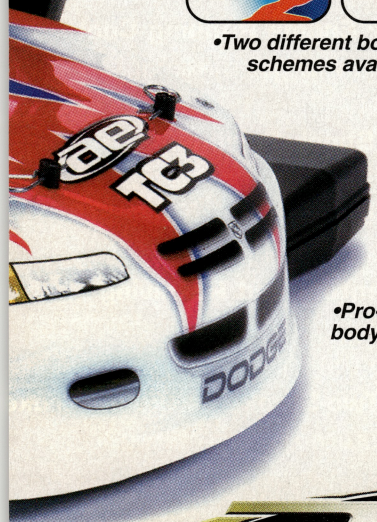

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R/C CAR
THE RADIO CONTROL CAR MAGAZINE
September 2001, VOLUME 4, NO. 9

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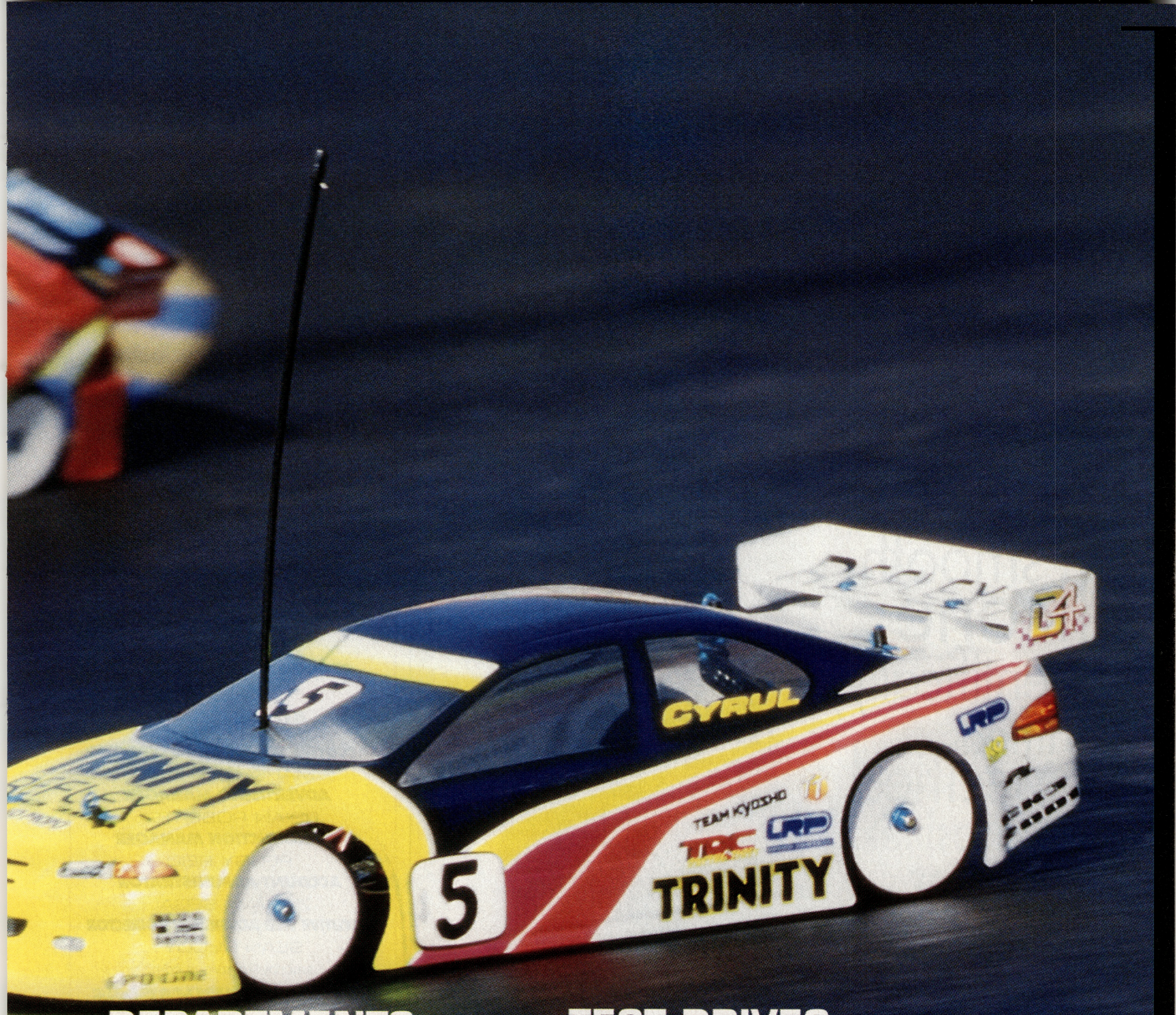
On the cover: GS Racing Storm, shot by John Howell with his Nikon F5, Tamiya's Mad Bull blasts through the dirt, and Atsushi Hara bicycles through a turn at the Reedy Race. Keep your engine cool photo by John Howell with his Nikon Coolpix 990. On this page: Trinity's Josh Cyrul and Kyosho's Takaya Ito battle at the Reedy Race. Photo by John Howell.



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EDITOR
FRANK MASI
ASSOCIATE EDITOR
JOHN "DOOGIE" HOWELL
CONTRIBUTING EDITOR
LITO REYES
ONLINE EDITORS
BRAD ROE
BradR@hi-torque.com
TOM HINZ
TomH@hi-torque.com
DESIGNER
TIM La PAGLIA
ASSISTANT DESIGNERS
NIKKI ANGEL'LA CALDER
ALMA MARTÍNEZ de DICSÖ
JACKIE CLEVELAND
BETH BOWMAN RIDGWAY

PHOTO ARTIST
PAT CARRIGAN
COPY EDITOR
JIM ALGAR
PRODUCTION COORDINATOR
KAY DEICKEN

ADVERTISING

EXECUTIVE ADVERTISING DIRECTOR
MARK THOMAS
ADVERTISING MANAGER
BRIAN ROBERTS
AD PRODUCTION MANAGER
PEGGY REID
ACCOUNT ADMINISTRATOR
ZAHAVA SEGAL
EXECUTIVE WEB ADVERTISING DIRECTOR
SEAN McCOY
smccoy@hi-torque.com

HI-TORQUE PUBLICATIONS

PRESIDENT & PUBLISHER
ROLAND HINZ
ASSOCIATE PUBLISHER
LILA HINZ
ASSISTANT TO PRESIDENT
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ADVERTISING & GENERAL OFFICES
25233 ANZA DR.
VALENCIA, CALIFORNIA 91355
(661) 295-1910
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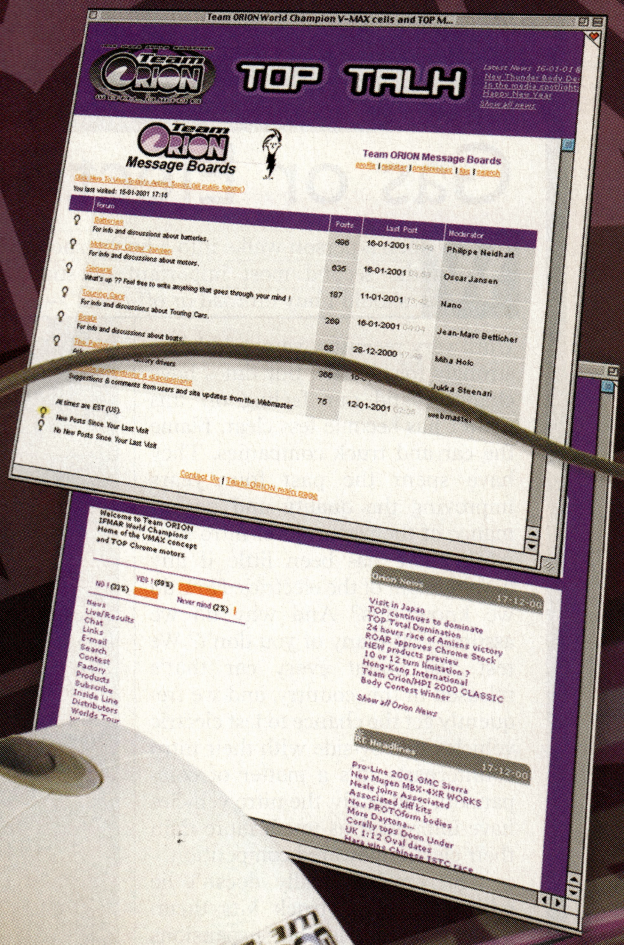



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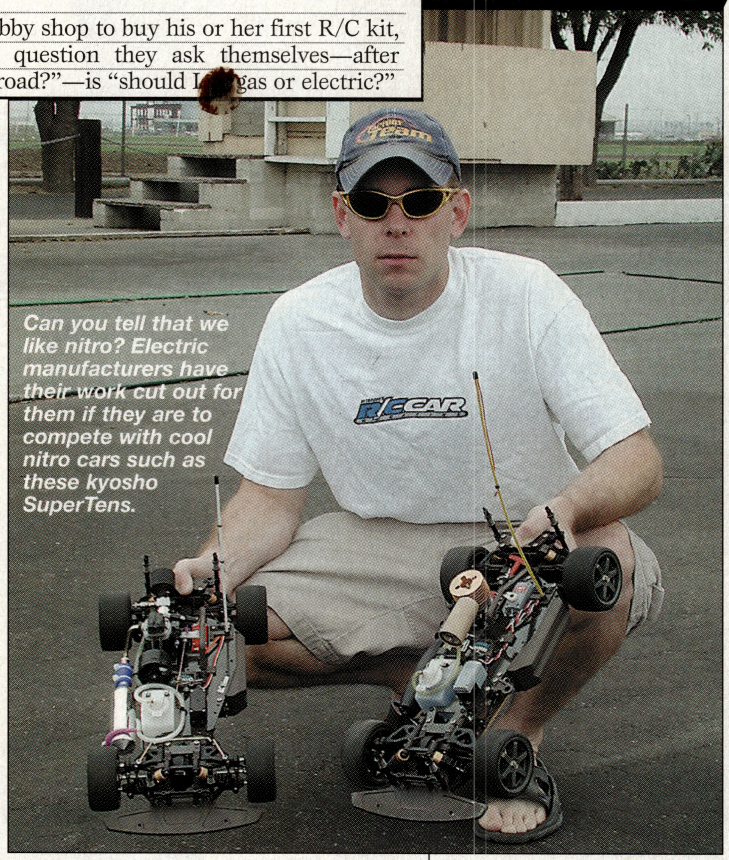
Gas or Electric, Part 2

BY FRANK MASI

When a person walks into a hobby shop to buy his or her first R/C kit, the second most important question they ask themselves—after "should I buy on-road or off-road?"—is "should I ... gas or electric?"



Can you tell that we like nitro? Electric manufacturers have their work cut out for them if they are to compete with cool nitro cars such as these kyosho SuperTens.

Until very recently, we would lobby strongly for electric. But times have changed, and our feeling on this matter has become less clear. Blame the car and truck companies. They have spent the past four years improving the quality and performance of their sport-level nitro kits, while there has been little if any development of the electrics. How do we know this? And why do we assume that many of you don't? We test just about every car that's released in this country, and we frequently get the chance to test electric vehicles side-by-side with their nitro counterparts. It's a matter of comparison, and lately, the nitro vehicles have impressed us much more than their electric-powered competition.

The problem really doesn't lie with the car or truck kits themselves; the chassis and suspensions of nitro and electric vehicles seem equally matched. It's the powerplants that cause most of the disparity. With the exception of the Traxxas E-Maxx, virtually every electric-powered RTR or sport-level kit we've tested has been woefully underpowered when compared with nitro kits of equal price and intent. Couple this with the limitations on run-time (a battery lasts for five or six minutes, where a nitro vehicle will run for as long as the radio batteries will last, which is at least an hour), and you end up with an electric vehicle that's slower and doesn't run as long.

But hasn't this always been the case? Essentially, it has, but until recently, sport-level nitro engines weren't that reliable, nor were they very easy to tune if you were a beginner (and sometimes even if you were an expert). This tended to offset the speed and run time differences, so we got in the habit of unilaterally recommending electrics for the first-time hobbyist. Now, virtually every sport engine we test runs well straight from the box with little fuss, and manufacturers have figured out that we all love speed, so they have bumped up engine displacement to feed our need.

Does this mean that electric is doomed? No, but some changes are needed if manufacturers expect to draw more customers to their electric offerings. First, the sealed-endbell motors have to go. No matter how many windings are removed from the armatures, I have yet to see any sealed 540 motor that can hang with a good competition stock motor. Electric sport kits and RTRs need to be faster; manufacturer should work with motor suppliers to develop low-cost, rebuildable motors that can keep pace with a sport .12 or .15 nitro engine. And don't get me started on inefficient, power-robbing mechanical speed controls. I'll bet that there are several manufactures that wouldn't mind bringing a few older ESC designs out from mothballs. These ESCs could probably be included in sport kits and RTRs with a minimal price increase. The benefit would well be worth it.

These are just a few ideas, and I'm sure that the clever people who run many of today's top companies could easily think of viable solutions if they set their minds to it. Breakthroughs do happen. Just look at Traxxas' E-Maxx and its 14-volt power system, and—although unproven—Novak's upcoming brushless motor; if it works even nearly as well as Novak projects, it could surely give the electric category the shot in the arm it needs. Lately, so much attention has been lavished on nitro that we tend to forget that electric still has the largest slice of the pie. ◆

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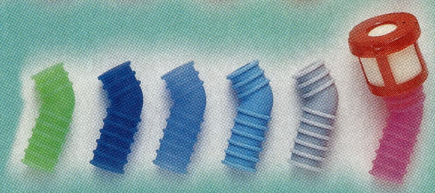

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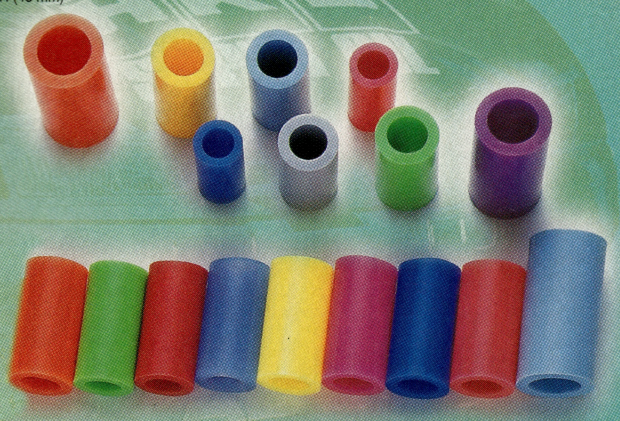

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UP FRONT



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UP FRONT

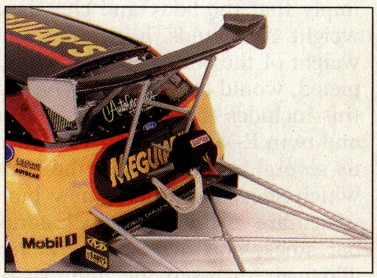
RC89



READERS' RIGS [PAGE 12]



NEWS [PAGE 14]



DETAIL SHOP [PAGE 20]

Welcome to *R/C Car's* Readers' Projects. We receive many impressive "home-built" reader projects each month, so we decided to showcase some of them in each issue. How about you? Got a lot of pride in your ride? Snap some pics and send 'em to us here at *R/C Car* Readers' Projects, 25233 Anza Drive, Valencia, CA 91355. Hi-res digital images can also be emailed to tomh@hi-torque.com. Who knows, maybe you'll see your car or truck in an upcoming issue! And if we use yours, you'll receive a free one-year subscription!

KEITH'S QUAD





Keith's Quad

Keith Maples from, Florida, sent us these photos of his semi-homemade R/C quad. Keith is an avid racer, but tells us that he needs a fun-type vehicle to run when the racing season ends. He started out with a Kyosho Quad Racer kit, but eventually trashed nearly everything on that kit with the exception of the body and rider figure. Keith then decided to rebuild the quad using a high-performance Team Losi Double-XT 'CR' as the foundation. Mounting the Kyosho quad body and rider proved simple; Keith used a Traxxas rear body mount, while the stock Losi front mount happened to be the right height. Keith fabricated the handlebars from hollow brass tubing that he filled with liquid steel for greater strength, and instead of paint, Keith dyed the rider figure using Rit fabric dye (no paint to chip). Keith's quad is equipped with several Team Kinwald blue aluminum parts, such as a rear motor plate, and is powered by a Lightspeed 13-turn triple motor and Integy Sanyo 2400 cells. A Tekin G-9 ESC, Futaba receiver and Hitec Ultra-Torque servo round out the electronics.

MAXX-VEE UPDATE





Maxx-Vee update

Remember Bruce Binkley's home-built E-Maxx Hummvee from the April '01 issue? Bruce wrote in after seeing his project in print, not only to update us on the Hummer, but to point out an error in our original article. Bruce corrects us by saying that he never meant to imply that the body and chassis would weight 25 pounds, but rather, that the weight of the entire vehicle, when completed, would be around 25pounds, and this includes the four 550-sized motors and twin E-Maxx gearboxes. Bruce sent us several new photos of the Hummer, which show the truck's new bumpers, which are made from 1-inch aluminum bar stock, and there are now vents to allow air to reach the motors—one in the dashboard and one in the rear of the body. Bruce also has added working tail-lights (four high-intensity LEDs) and stop lights made from 0.6 watt mini Halogen bulbs. And of course, to get an idea how large Bruce's Hummer is, those are Traxxas E-Maxx tires and suspensions mounted at each end.

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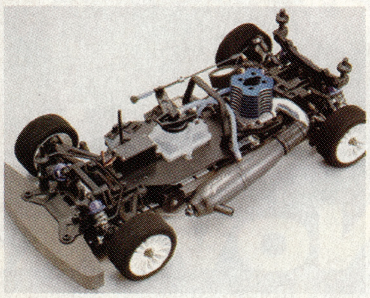
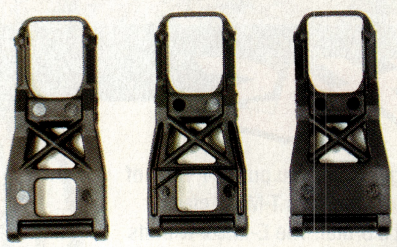


V-One R ROAR ISSUE

Kyosho's hot new V-One R nitro sedan has been tearing up the tracks in Europe and Asia, and now Kyosho is producing an upgraded kit specifically for use in ROAR sanctioned events. Although the V-One R is fully race-ready out of the box, this new version includes several accessory items that help the car take full advantage of the ROAR foam tire rule. Along with the standard V-One R items, the new kit includes mounted-and-trued foam tires in place of the standard semi-pneumatic rubber tires, and a set of front and rear stabilizer bars which allow the car to take advantage of the additional traction afforded by the foam tires. Other standard features include a 3mm-thick Duralumin chassis, threaded-alloy shocks, a two-speed transmission and fully adjustable pillow-ball racing suspension. Retail price is $499.99. Contact Kyosho at (217) 398-6300.

HPI PRO 3 UPDATES

In response to customer feedback, HPI has made two running changes to its RS4 Pro 3 touring sedan. First, the front and rear suspension arms have been beefed-up to improve resiliency during crashes. The photos show the original arms alongside the revised arms. The "revision 1" arms were HPI's quickest solution to customer reports of broken arms, while the "revision 2" arms are the final design that is now included in all new Pro 3 kits. Regardless of which type of arm you have, HPI still recommends that you boil the arms to increase their elasticity. Also shown are the updated Pro 3 diff out-drives, which feature revised collars that can be glued in place, yet still allow the driveshafts to be removed easily. The out-drives are molded from graphite composite for light weight and formidable rigidity.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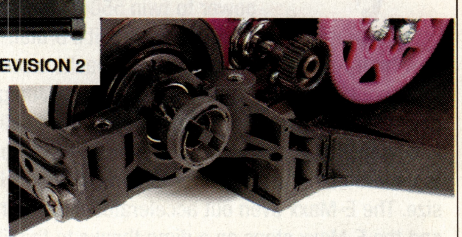



NEW OUTDRIVE RINGS



JB FOAMS FOR TOURING CARS

Team Orion announces its new line of JB foam inserts for touring car tires. These inserts have already made quite a showing in international competition. At the recent LRP 2001 Touring Car Masters, the top 10 drivers all used JB inserts (including Masami Hirosaka, World Champion Atsushi Hara and David Spashett). Because of their low weight (a set of four inserts weighs just two grams), the JB inserts provide quicker acceleration, higher top speed, longer run time, faster steering response and reduced unsprung weight. In addition, new production techniques mean that JB inserts offer greater consistency, so you'll no longer need to match inserts for hardness (and traction will also be more consistent). All JB foams are super-round cut, which means that less suspension movement is needed, making the car more stable and traction more consistent. Inserts are available in four degrees of hardness to fit 24 and 26mm tires from HPI, Pro-Line, Schumacher, Take-Off, Medial Pro, Yokomo and Sorex. The price is $9.99 per set of four. Contact Team Orion for more information at (714) 694-2812.

2001 Product Preview

XXtra Synthesized Receiver

Novak's new XXTRA Synthesized Receiver's biggest feature is simple:
NO EXTRA RECEIVER CRYSTALS TO CARRY! Of course, there's more to it than that:

- Small and lightweight synthesized FM receiver
- Convenient frequency selection switch (no crystals to change)
- Ultra narrow-band ceramic filter for 10 KHz channel spacing
- Available on all legal bands
- Compatible with all popular radio systems

Coming SPRING 2001



Cyclone C2 & TC2 Speed Controls

A new generation of Cyclones are on the horizon. These small, powerful ESCs are forecasted to continue thrashing the competition.

- 480A rated current/160A braking current
- Minimal on-resistance: 0.00049Ω
- Built-in combination 1-touch On/Off switch
- User-replaceable input harness
- 3 updated throttle profiles
- No motor limit
- Heavy-duty BEC

Coming SPRING 2001



Ionic AC/DC Charger

You asked for it, so here it is: Novak's new IONIC AC/DC Charger—just plug it in and you're ready to charge!

- 0.5, 1.0, 3.5A constant linear charge
- Universal 100-240V AC input voltage
- Dual mode: Ni-Cd, Ni-MH
- Fully output protected
- Built-in fan

Coming SPRING 2001

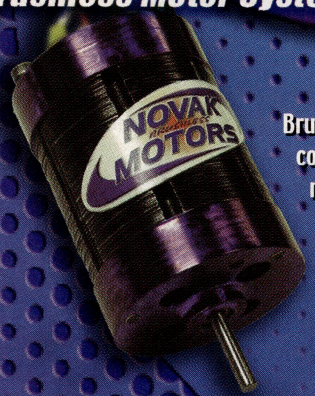


Brushless Motor System

Brushless Motors from Novak are coming soon! The R/C car hobby will never be the same—we're making it BETTER! Here is a preview of what you can expect from our new Brushless Motor System:

- Motor Dimensions: 2.04" x 1.410 (Std. car motor size)
- Higher efficiency than brushed motors
- More power output than brushed motor
- No brushes or commutator to wear out (think of the savings!)
- No motor rebuilding necessary
- ESC with both forward-only & reverse capabilities

Coming SUMMER 2001



NOVAK ELECTRONICS, INC
18910 Teller Avenue • Irvine, CA 92612
TEL: 949.833.8873 • FAX: 949.833.1631

For more details about our upcoming new products for 2001, visit our website at www.teamnovak.com

All product specifications and appearance are subject to change

NOVAK

If your FIRST truck was an RTR...



Team-Built™

•Available in pull-start or non-pull start versions

•Adjustable Caster, Camber and Toe-in

•High-quality sealed bearings in the wheels, outdrives, transmission, and clutch!

•Aluminum tuned pipe and exhaust header (not pictured)

•Pro-Line Stubbie "T" Rear tires

• New longer-wheelbase "Team" chassis

A Team-level 16-bearing, Pre-Painted ASSEMBLED Racing GT!

•Pro-Line Ribbed "Edge" Front tires

•White one-piece Pro-Line front and rear wheels

Due to ongoing R&D, equipment pictured may not reflect most current kit updates

Here's your chance to join the TEAM!





Team-Built
#7009 T3

"Team-Built" T3 Features:

- **Rubber-sealed ball bearings**
- **Pre-painted and trimmed Pro-Line Body**
- **Blue-anodized Aluminum Shock bodies**
- **Rugged steel "dogbone" rear axles**

...and many other features of our "Team" level kits!

Assembled, "rolling chassis" competition-level trucks!

When you're ready to move up from your RTR, Team Associated has the perfect truck for you! Our new "Team-Built" trucks are the easiest way to graduate to a full-race quality vehicle without any of the building or painting hassles. Just install your own radio gear and motor and you're ready to go racing. Welcome to the Team!

Priced LESS than our T3 and GT Team Kits!



Team-Built GT

#7050 Pull Start
#7051 Non-Pull Start



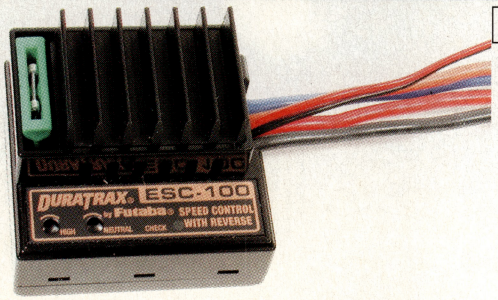
•Two different body color schemes available

"Team-Built" GT Features:

- **Pre-painted and trimmed Pro-Line Body**
- **Rubber-sealed ball bearings**
- **Blue-anodized Aluminum Shock bodies**
- **Rugged steel "dogbone" rear axles**

...and many other features of our "Team" level kits!

3585 Cadillac Ave., Costa Mesa, CA 92626
www.teamassociated.com or www.rc10.com

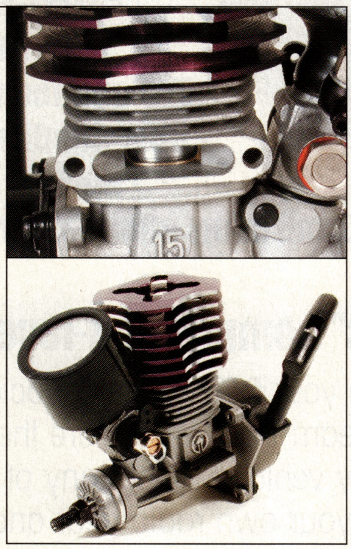


HERE'S YOUR FIRST ESC

Looking for a low-cost ESC to replace that inefficient mechanical speed control that came with your sport kit or RTR? DuraTrax's new ESC-100 is the ideal replacement. Featuring smooth throttle control in both forward and reverse, the ESC-100 is for use with 23 to 27-turn stock motors and up to 7-cell battery packs. Plus the ESC-100 has built-in protection against reverse polarity as well as a thermal shutdown mode to protect against overheating. Comes with JST (Tamiya-style) battery connectors and bullet-type motor connectors for easy plug-in installation (no soldering needed). Contact your DuraTrax dealer or call 1-800 682-8948.

TOWER OF POWER

Here's a low-cost, high-performance small-block .15 engine from Tower Hobbies that's a great replacement for your on- or off-road .12 or .15 engine. The .15 R/C ABC Car Engine features a one-piece webbed crankcase for reduced flex, an easy pull-start for added convenience and a cylinder head machined from solid bar-stock aluminum for improved cooling. The .15 R/C also has ABC piston/cylinder construction for longer life with greater power. A racing-style rotary carb offers both high and low speed needle adjustments. Comes with a large capacity foam air filter, extra head shims and an airplane-style muffler. No glow plug is included. Contact Tower Hobbies at (217) 398-3636 for more information.



REEDY MAXXES OUT!



New from Reedy Modifieds are the BaddMaxx Modifieds designed specifically for the E-Maxx! These big .07 size motors come packaged with bullet-connector/solderless lug motor leads, so installation is very easy—there's no soldering necessary! The motors are available in "mild 19-turn" or "wild 15-turn" versions with precision machine-wound armatures, and are equipped with low-friction bushings to help keep costs down. Both versions retail for $39.99, and can be found at your local hobby shop. Contact Reedy Modifieds at (714) 850-9342.

R/C CAR MAGAZINE COLUMNIST CROSSES OVER TO FULL-SIZE CARS...

Well, not really, but *R/C Car* columnist Ian Aquino's stunning concours winning cars can be seen in the Summer issue of *Honda Tuning*, a spin-off of *Sport Compact Car Magazine*. Inside is a complete article about R/C cars—what types of kits are available, where you can find them, etc. In addition, we especially like the last paragraph in the article that states, "For more details on R/C models, visit your local hobby store and get ready to have some fun! Or, start by checking out www.rc-car.com (*R/C Car* magazine), the leading source for the radio controlled industry." Gotta like that...

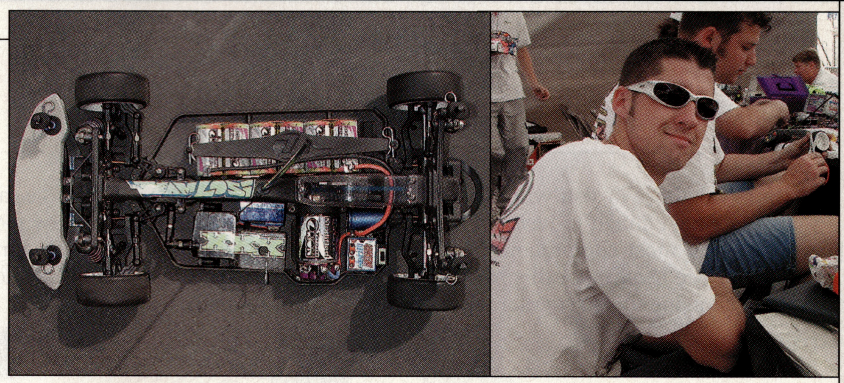






XXX-S UPDATE!

At the recent Reedy Touring Car Race of Champions, the new Team Losi XXX-S made an impressive debut. With relatively little time on the car (most team drivers finished building their cars a few days before the event), Brian Kinwald and teammate Jason Corl did very well with their new ride. Kinwald won the first day of Invitational competition, but wasn't quite so lucky the second day and finished the event fourth overall. Corl, on the other hand, had a little better luck—not only did he TQ the Open Modified A-main, he went on to win the first two out of the three A-mains, handing him the overall win. Very impressive considering the team hasn't really has time to dial-in setups yet. The car that was raced there was 80-percent completed—the only thing non-production were the body mount posts and the steering bellcranks. By the time you read this, the completed car should be sitting on hobby shop shelves! For more info, contact Team Losi at (909) 465-9728.



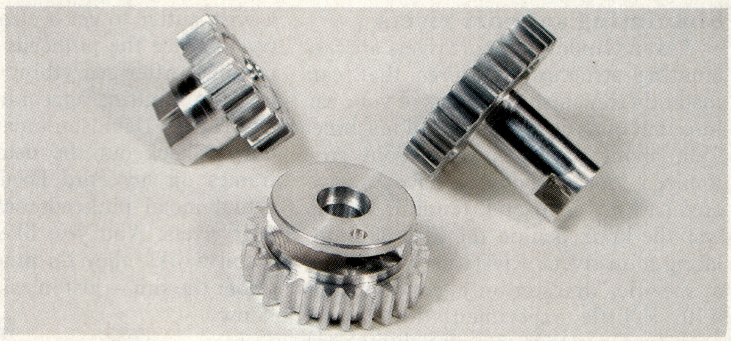
WICKED WHEELS!

In our 6/01 issue, we incorrectly identified Neumark Design's wheels in our T/E-Maxx Wheel and Tire Buyer's Guide. So, to make up for our mistake, we'd like to show you the correct wheels with the correct info! The Neumark wheels are made from 6061 T6 aluminum, come in six different styles (more are on the way), and are available in seven different colors. For more information, contact Neumark Design & Mfg. at 13562 Northwest Industrial Dr., Bridgeton, MO 63044 • (314) 298-3999.



JS PRODUCTS T-MAXX ALUMINUM TRANNY GEARS

Here's something new for you T-Maxx owners who are running a big block .21 engine.. JS Products is producing a line of Aluminum transmission gears designed to shut the door on tranny failure. Shown here are the forward and reverse primary gears along with the forward output gear assembly, which will go for about $140 for the set of three. Replacement press-fit pins for the output gear clutches are included in the kit. All of the gears are made from 7075-T7 material. The T7 hardening process makes the alloy more chip-resistant than T6 alloy, so they should hold up well to the power of a .21 mill. Also in the works are steel spur gears in a variety of sizes and a full seven-piece tranny gear kit. For more info, contact JS Products at 378 Buckboard Circle, Simi Valley, CA 93065 • (805) 306-0014 (dealer inquiries welcome).



MICRO UPDATE!

In case you missed it, HPI Racing is working on a Micro RS4 kit—one of the coolest minis we've ever seen! We just received word that the kit should be hitting hobby shop shelves by the time this magazine hits the newsstand (sometime in August). If you never heard about the car, here is the scoop—the Micro RS4 will cost approximately one-half the cost of the Pro 3, and will include a body, motor, tires, three kinds of wheels, and full ball bearings (You will need a transmitter, receiver, electronic speed control, servo and 4 AA or AAA batteries to run the Micro RS4). For more info, contact HPI Racing at (949) 753-1099.



Detailing to the Extreme

By Ian Aquino

For those of you who have been following this column, you may be familiar with the custom drag racer that I was fortunate enough to have on the pages of this magazine in the past few months. I have to be honest by saying that it is one of the most comprehensive works I have accomplished, and it was done with the idea of taking detailing to the extreme, hence the heading of this particular installment in our "Detail Shop" section. Prepare to take a journey throughout the course which made this particular piece of art unique in so many ways.

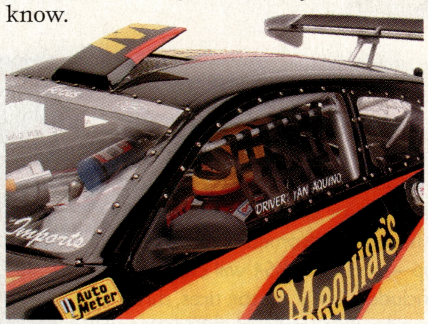


In past issues, I have dealt with detailing tips any R/C enthusiast can easily do to get the perfect concourse look. From here, we move forward to the concluding steps in finishing your one-of-a-kind masterpiece. Fine-tuning the foundation of your theme and improving your original ideas will certainly help in accomplishing your goal of having a good, realistic-looking body. The following suggestions will help guide you in turning your project into a maxed-out detailed sedan.

Simulating support rivets

Lexan window support rivets are fascinating structural features that can instantly transform the looks of your car into that of a serious race-bred machine. Talk about having a tricked-out customized looking body! I have to give credit to my girlfriend, Jennifer, as she was the brain behind the idea of simulating mini-rivets. Rivets may seem like a specific, dragster-only concept, but with a little experimentation, you'll soon find out that this straightforward technique works great with any genre of cars; yes, even clean-looking street cruisers.

How do you achieve this common feature found on numerous race cars? Simple: use ordinary household cushion pinheads as rivets. Application is as easy as driving the sharp point of the pin through the lexan body. With just the right amount of force, you shouldn't have any problems. Just try to be careful not to press too hard, as the plastic body might not be the only thing you'll be putting a hole into. As for the pin extrusions inside the body, trim them off with a wire cutter to get a clean look. Also, try to space the pinheads as equally as possible. After everything has been laid out, the resulting appearance may leave any Harley Davidson fanatic filled with envy. Check out the detailed window frames on my Ford Focus. Those are actual metal pinheads simulating support rivets. And yes, like any chrome metal works, they do produce sparkles under the sun— just in case you want to know.



To simulate rivets, Ian used ordinary household cushion pinheads, and cut the ends off (the part that was sticking through the Lexan body) with a pair of wire cutters for a clean look.



Customized ground effects

Ever wonder how real racing cars manage to stick to the ground at unimaginably high speeds? The answer may seem obvious: body aerodynamics! Well, not quite. Sleek shells do help most of the time, but ground effects and rear air dams are more responsible for the high grip race cars require to put every inch of horsepower to the floor. But forget physics and the effects of down force; we are here to build the ultimate concourse machine! You have to admit, these mammoth-size air dams look extremely tricked out! And just imagine equipping your project with one of these babies; your car will look fast even at a standstill.

Undercarriage details do not mean much unless you desire your car to look its best from top to bottom. This may not be everyone's priority, but subtle views of such complex-looking details are the most effective form of flaunting if you want to grab all the attention you can get. But, this isn't your goal, right? Hmmm.

You will need a little ingenuity in creating a form-fitting rear air dam outlet similar to the ones seen in actual touring cars, Formula 1 cars and drag racers. For this project, I used several folded Lexan pieces to form the basic structure of the air dam. After that I laid graphite decals over the assembly to simulate the tough material. If you take a closer look, mesh grills outlining the exits of the replicated ground effects greatly compliment the lower back of the car.

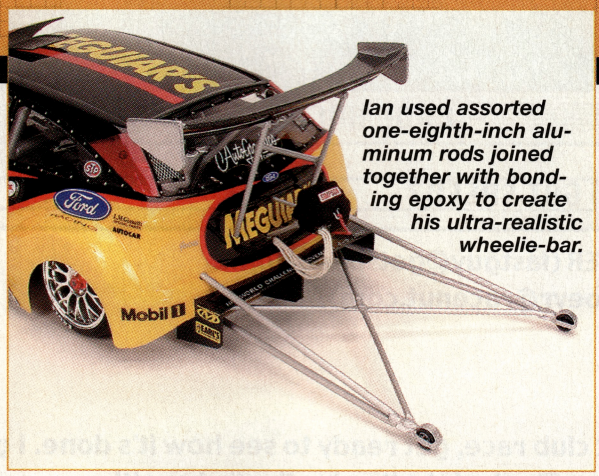
This is yet another attraction in the multitude of details applied to this car.



You can make front ground effects by using scrap pieces of Lexan and then can finish them by covering them with graphite decals.

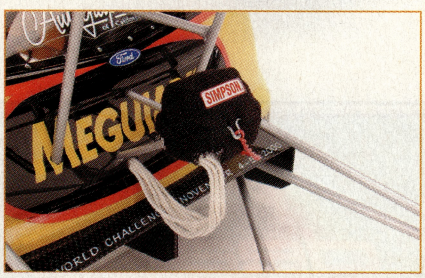
Fabricating wheelie bars and drag parachutes

This portion may be only for drag-vehicle *aficionados*, unless you want your vehicle to look as if it came out of a "Mad Max" movie. Among these dragster-inspired devices are safety mechanisms such as wheelie-bar frames and drag parachutes. If you are going all-out in your detailing conquest and just happen to have a dragster-type car in progress, these features might just buy you a trip to the winners circle. You may even get the urge to make these things work and dash the strip while popping a wheelie and finally parachuting to a halt. Sounds crazy, but we're sure it could be accomplished with a little more time and effort on your part. But if you want these bits and pieces just for show, follow these steps and get ready to produce a hot looking ride just like the real thing.



Ian used assorted one-eighth-inch aluminum rods joined together with bonding epoxy to create his ultra-realistic wheelie-bar.

First, you will need several hobby-type aluminum tubes for building the bar frames. One-eighth-inch diameter aluminum rods joined together with bonding epoxy were used to recreate the dragster wheelie-bar and parachute mounts you see on my car. Actual rail designs may vary as different bodies require various styles of bar attachments. Providing you have two (or maybe three) protrusions at the back to facilitate the small rail wheels, you are on the right track. After completing the frame, I then took the wheels off of a Hot Wheels brand toy car and had them act as the miniature rail tires seen on real dragsters. As for the non-working parachute: a piece of cloth, few inches of thread and a slight know-how in knitting was all it took to give the car a professional ultra-detailed finish.



For the drag parachute, Ian threaded together some spare pieces of cloth and custom-made the Simpson logo.

Working gas cap

Still hungry for more concours-quality tips? A logical accessory you may want to add to your sedan is a screwed-on removable gas filler cap. Yes, you read it here first—a gas cap! After all, every gasoline-powered automobile has one, right? If you want to be realistic, creating a simulated gas cap is yet another route to take and thus another step in redefining the term "attention to detail."

You will need a decent scale size screw and nut system for this effect to work. A 1/4-inch diameter setup should



be the perfect stand-in for a removable gas cap. Carefully drill a hole where you want to place the gas cap while being sure to consider the diameter of the screw you are working with. Use Shoe-Goo to attach the nut under the body, with the nut outlining the drilled hole. As you may have already guessed, this will be the virtual opening of your gas tank. Now, attach the screw "cap" in the nut as you would with its real life counterpart. You may need to cut the screw body and grind the head to make it look more like a gas cap. You may also want to consider painting the assembly as this will also add realism in most cases. Always remember, subtle details like the ones sampled here are valuable assets in transforming your project car into a one-of-a-kind show piece. ❑

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Hard Drive

Race Secret

COOL RACER, FRIDAY, GOT SPEED?

GOT SPEED?

From: COOL RACER (fastguy@gotspeed.com)
To: JOE RACER (joeyr@racenut.com)

YO JOEY,

Bro, at the next club race, get ready to see how it's done. I got the new "SPEED SERIES" body from DEANS. That's right they're finally here!!!

Here's the view I'll be seeing during the race. You'll see it in the pits. Sorry dude, I didn't get a shot of your view, you know THE BACK OF MY TRUCK!

Gotta charge bro – Gotta make room on the shelf for this weekend's trophy.

Later,
Cool Racer



deans

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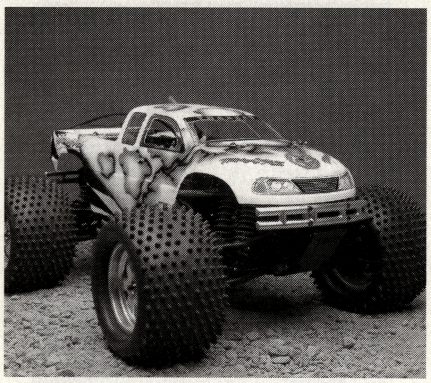
Trash



Shift eliminator

In the March '01 issue in the feature "Maximum Maxxes," there was an article on Steve Slayden's ROAR-Winning T-Maxx. In the article you mentioned that Steve had used a prototype of a forward-only output gear that disables the truck's reverse and makes it direct drive. My question is does it get rid of the four-wheel drive, and if it takes out the two-speed how can it give it quicker acceleration and higher top speeds without the two speeds? Thank you,

Joseph Brown
via *rc-car.com*

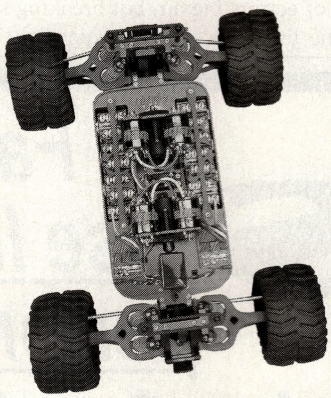
Traxxas' Forward-Only Output Gear eliminates the various clutches and linkages that allow the T-Maxx to be shifted into forward or reverse. It does not, however, affect the two-speed automatic-shift mechanism. By eliminating the weight of the forward/reverse transmission parts, the rotating mass of the gearbox is reduced, and acceleration is improved because there's less weight for the engine to spin. As reverse is illegal for sanctioned racing, there's no need to carry all that weight.

Burned by brushes

I own a tamiya TL-01 and TA03F. For the '01, I installed a 12-turn triple Team Orion motor and for the '03F, an 11-turn double Team Atlas motor. I noticed that the motor brushes on the 11-turn motor are consumed much faster than on the 12-turn. Is it possible that I may have a problem with my setup? Or is it that motors with fewer turns do consume brushes faster? I installed a 19T pinion on the '03F with the 11-turn. Is this okay? Thanks!

Edwin
via *rc-car.com*

Assuming that you are in the ballpark with gearing, i.e., the motors run for at least five minutes, provide decent acceleration and don't melt, the problem lies in the differences between the brushes' material and the tension of the brush springs. Some brushes are softer and will wear more quickly, and if your motor has stiff springs, these will increase wear. Also, the condition of the motor's commutator (the copper surface against which the brushes rub) can affect wear. For example, if the comm is severely worn, burned or pitted, the more abrasive surface will wear the brushes more quickly.



The ultimate Ultimate

I got your July *R/C Car* issue and I'm glad to see that Jason Jaeckel's amazing four-motored E-Maxx was featured. I've been following Jason's project for a while. The last sentence in the second body paragraph, though, caught my attention: "Unless you have unlimited financial resources, and access to a CNC milling machine, don't even bother trying to top this work of art."

I'd like to take this on as a challenge, as I've assembled 50 percent of my own second E-Maxx project, the "Valkyrie," aiming to be hands-down the single toughest 1/10th scale R/C ever created, and the unchallenged, fastest E-Maxx on the planet. Your readers can follow its development at *www.UltimateTraxxas.com* (updated regularly). I'm doing a CAD design of a completely new E-Maxx chassis that is not evolutionary like all of the custom chassis made to date—it is revolutionary. The finish of the entire vehicle will be polished aluminum/chrome, including parts you never expected to be so.

Bamidele O. Shangobunmi
via *rc-car.com*

XXX-S Rated

I own a Team Losi Street Weapon IWC, and after reading the "first look" on the new XXX-S in your July '01 issue, I have to wonder why Losi has abandoned the SW? I love mine and I have beaten many other brands of sedans. My question is this: do you think the new car will be that much better than the old one? Should I consider selling mine to buy an XXX-S? Thanks.

Jack Pollard
via *rc-car.com*

We've never said that the Street Weapon wasn't competitive, but then again, when it was first introduced, Losi never said it intended the car to be for racing (at the time, there really was no serious sedan racing). Losi is to be commended for developing the SW into a serious race machine (it did win the first ever IFMAR provisional sedan class), but tweaking a car to be competitive isn't the same as designing an all-out racer from scratch—and that's what Losi has done with the XXX-S. Although we've not tested one yet, the "near production" XXX-S did very well at its first race, the Reedy Race of Champions, (see coverage in this issue) with Brian Kinwald running very near the top, and Jason Corl won the Open Modified class with his XXX-S after building his car a few days prior to the event.

Looking for Skinny

Help! I am looking for more information on Brian Skinner's water-cooled T-Maxx conversion ("Readers' Projects", July '01). I have an O.S. .15CV in an HPI F1.

Joel Lucas
via rc-car.com

Joel, there are several resources you can use to create your own water-cooled engine conversion. For the coolant tank and miscellaneous hardware that was used on Skinny's project, you can contact Hobby

House in Reseda, California at (818) 609-1968. The Perry Pump is available through Conley Precision Engines in Illinois. You can reach them by phoning (630) 858-3160. As we stated in the July issue, Atomik R/C may release a full water-cooling kit. Call Atomik at (805) 499-7003 for additional information.

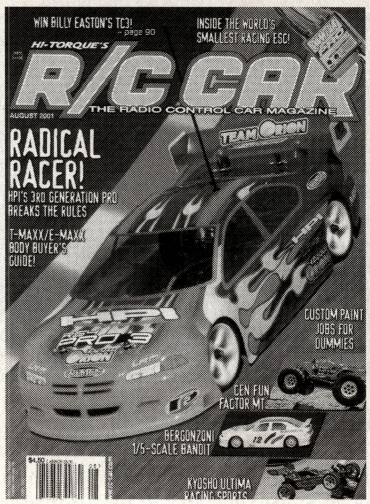
You guys made a mistake in the July issue. On page 13, the rear tires on Brian Skinner's water-cooled T-Maxx are mounted backwards, with the tread going in the wrong direction. I always thought that directional paddle tires such as these had to all run in the same direction.

Mark Preston
via rc-car.com

One-eighth-scale off-road racers have known for years that changing the direction of a paddle-style, or directional tread changes the way the tire works. Skinny reversed his truck's rear tires because he feels it provides more responsive steering. It may look funny, but it if works, who are we to criticize?

Freestyle anything but free?

I just got my July issue and loved the freestyle article. My question is, how many parts did you guys break? I've run my Team Associated RC10T3 on skateboard ramps and I have broken several parts, including rear arm mounts and front spindle carriers. I totally dig the idea of getting big air, but breaking stuff all the time gets kind of expensive. Too



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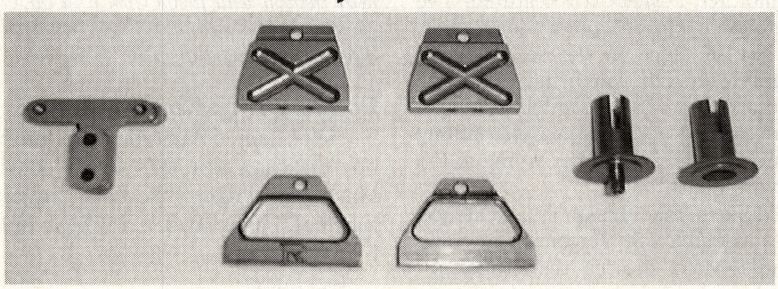

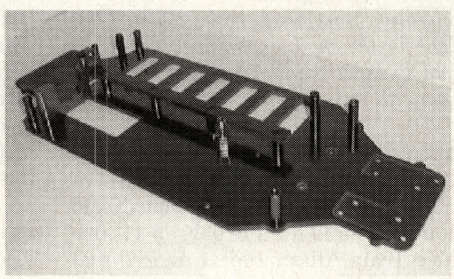

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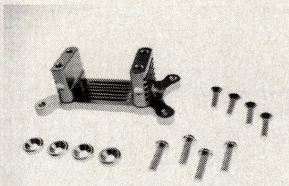

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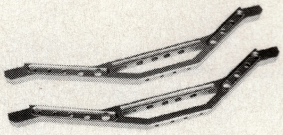
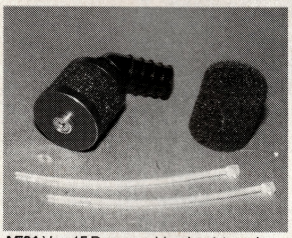
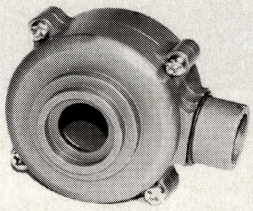


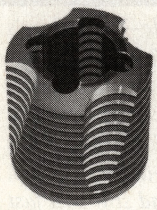
TMX1014 This will help you to improve your stock chassis. These replace your orginals perfectly. $50.00



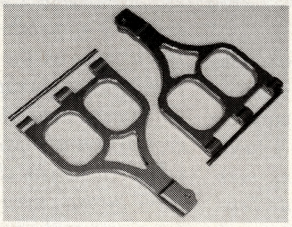
AF01 Has 45 Degree rubber boot, two zip ties and an outer foom pre filter. $15.00



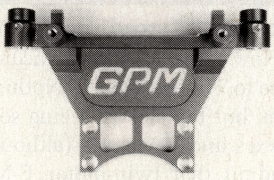
TMX1011 These are the first step to building a bullet proof drive train. You will need 2 sets for each truck. $65.00



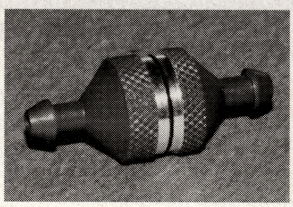
TMX1815 With 30% more cooling area and a large opening for easy maintenance. This is a must for longer engine life. Fits Pro 15 engine. $40.00



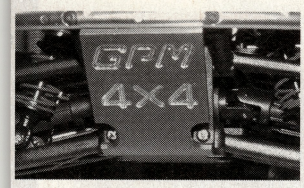
TMX1054 Set of 2 upper control arms. These are by far stronger than the original plastic arms. Includes pins and clips. $40.00



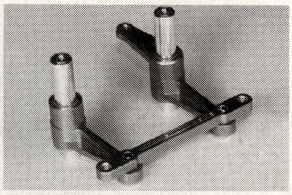
TMX1028 You will need 2 for each truck. These are direct replacements for the stock shock tower. Replaces original perfectly. $40.00



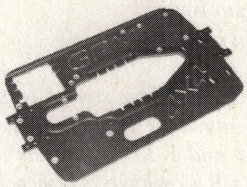
OF01 Filter comes apart to allow cleaning and is sealed with an o-ring. Fits standard size fuel tubing, common on all cars. $8.00



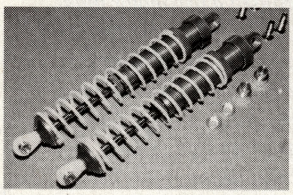
TMX1331F Don't be a poser, get one of these 3mm thick skid plates and be with the "in" crowd. $25.00



TMX1048 Tighten your steering slop with this. Comes with everything you see in the picture, as well as all necessary screws. $40.00

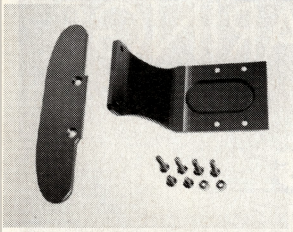


TMX1016 This 3.5mm thick main chassis features thick 4.5mm Ribs don't risk loosing power to a thinner chassis! It is a must for a more power engine hop-up. $75.00

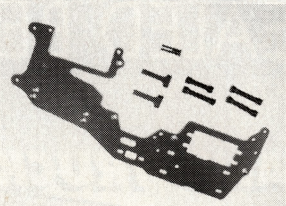


DP100 Threaded shock bodies are perfect for fine tuning your ride hieght. These are 4.125 inches long. $45.00

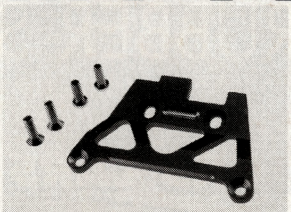
HPI NITRO MT PARTS



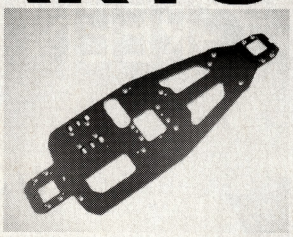
NMT4003 Is your bumper large enough? Install this bumper and matching skid plate for improved protection. $40.00



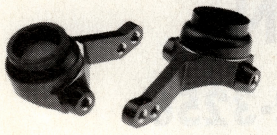
NMT4014 Customize your Nitro MT with an alloy radio plate. Includes posts and screws need to mount. $40.00



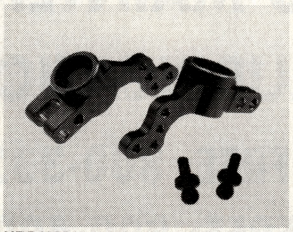
NMT4015 Keep your truck on the track and running strong with an alloy front top plate. $25.00



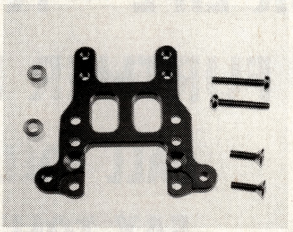
NMT4016 Set your truck apart from the crowd with a 3mm thick chassis machined from 6061 T6 Aluminum $55.00



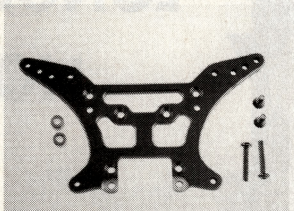
NRS4021 Includes all parts needed to install. Improve strength and looks with a pair of alloy front knuckles. $25.00



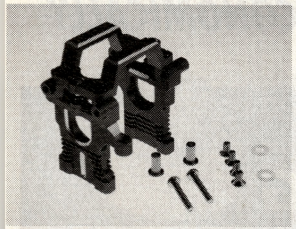
NRS4022 Keep the rear wheels pointed where they should! These hubs will remove the flex found in your stock plastic parts. $25.00



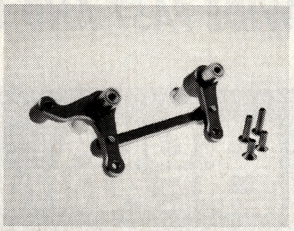
NMT4028 Improve both looks and durability with one of these front shock towers. $20.00



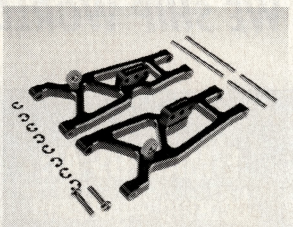
NMT4030 Did you break your shock tower, again? Replace it with this aluminum one! $25.00



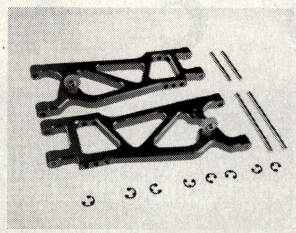
NMT4038 Alloy center gear mount replaces original perfectly. Keep your gear mesh in line with a rigid aluminum replacement. $45.00



NMT4048 Tighten your steering and improve straight line tracking with a ball bearing steering assembly. $40.00



NMT4055 Replace your fragile stock front control arms with a pair of sturdy aluminum ones. $35.00



NMT4056 Replace your fragile stock rear control arms with a pair of sturdy aluminum ones. $35.00

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bad nobody makes a purpose-built jump machine that can take the abuse of mondo-air!

Raul Pimesto
via rc-car.com

Believe it or not, the cars and trucks we used for that article fared very well. It was the motor magnets that proved to be the weakest link. Several bad landings on the rear motor plates caused a few motor magnets to crack in half! Things actually became more ugly after the photos were snapped; one of the BMX Plus editors broke poor Jimmy's truck nearly in half! As long as you use your head and don't bust any moves that are totally insane, most hobby-grade R/C kits are capable of withstanding quite a bit of skatepark freestyle abuse. We had a blast.

Are we Maxxed out?

How come you guys dedicate so much space to Traxxas trucks? Nothing against them, but I'm sick of seeing so many T-Maxxes and E-Maxxes (although I have to admit that twin-motor E-Maxx was pretty cool). How about some more articles on smaller segments such as dirt oval and paved oval? I'm sure some of your readers would enjoy them.

Sean Bixler
via rc-car.com

Sean, there are several reasons why we do so much on Traxxas trucks: 1) the T-Maxx and E-Maxx are the world's best-selling R/C vehicles so, there are a lot of them out there. 2) There are more after-market hop-ups available for these trucks than for any other vehicle—and there's much more on the way. This means that there are lots of people who are interested in hopping up their Maxx trucks. 3) Have you ever driven a T-Maxx or E-Maxx? What other vehicle can climb 45-degree inclines, wade through deep mud and still post fast lap times at the track? We do try to make R/C Car as diverse as possible, but we also must try to appeal to as many people as we can.

E-mail your letters direct to the editors! You can get ahold of Frank Masi at evaone@pacbell.net or Doogie at doog2@earthlink.net. If you're going the old fashioned route, send along your letters to R/C Car at 25233 Anza Dr., Valencia, CA 91355. Check us out on the web at www.rc-car.com.

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.12 CV-R w/10A Slide Valve Carb
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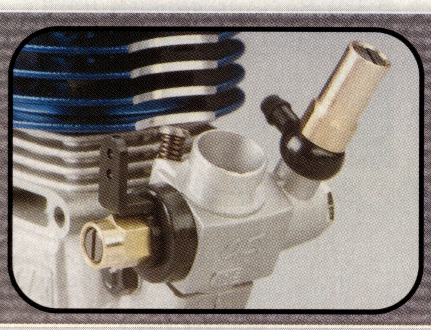
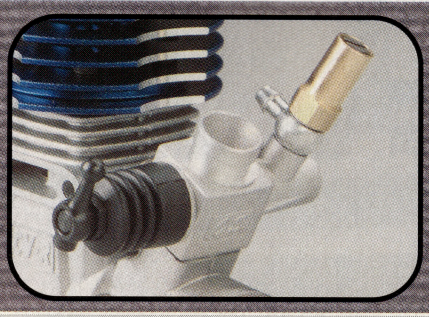


The 10E-R rotary carb delivers super hole-shot performance, especially for off-road vehicles.



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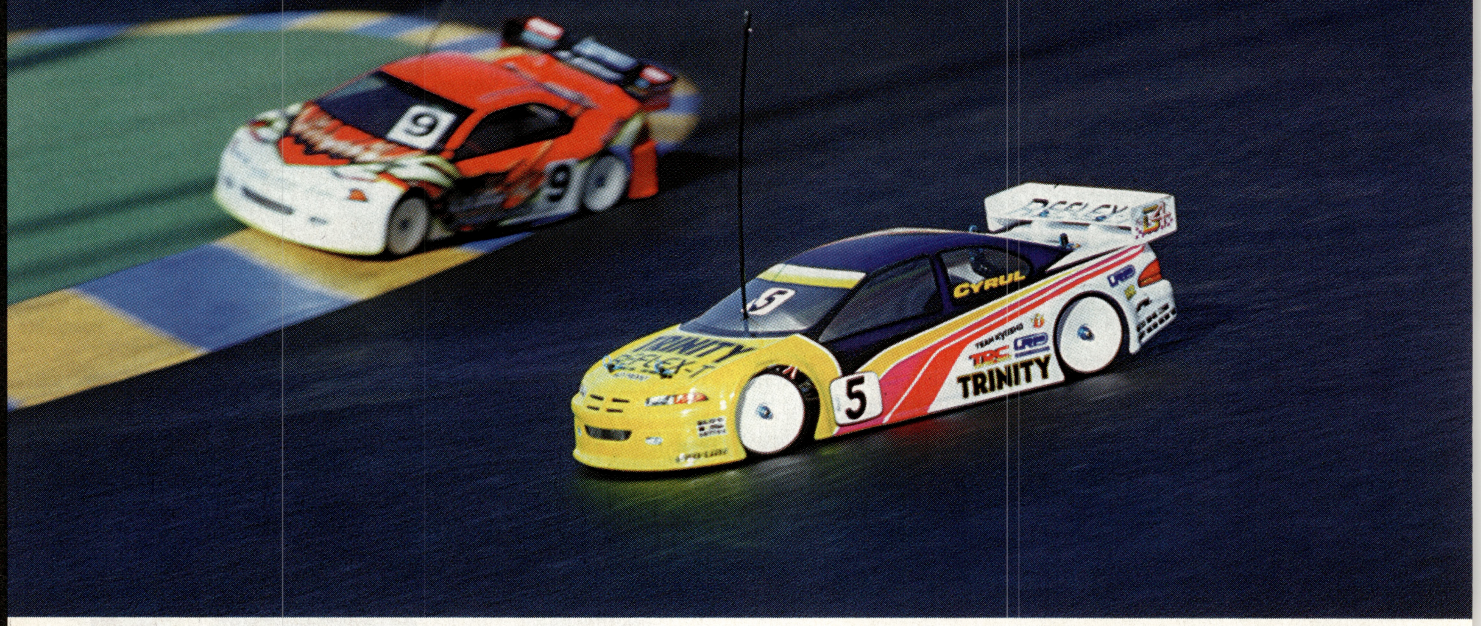
[RACE REPORT]

2001 Reedy Touring

Racing action as close as it ever gets!

Story and photos by John Howell



Held over Memorial Day weekend, this year's Reedy Race was one of the most amazing races I've been to in recent times. Everyone in attendance was treated to some of the closest racing action ever seen at a big event such as this one. By far, the Invitational Class featured the most spectacular racing action of the weekend. Usually at a big race there are a few guys who clearly outpace the rest of the field, but at this event there were at least a dozen or more guys that could have walked away with the win—it was that close! The Invitational Class consisted of 34 top touring car racers collected from around the world—participants came from as far as Japan, Finland, Great Britain, Germany, and Switzerland! Most impressive though, in terms of international participation, came in the form of racer Surikarn Chaidajsuriya who traveled from Thailand to take part in the event in the Open Modified class.

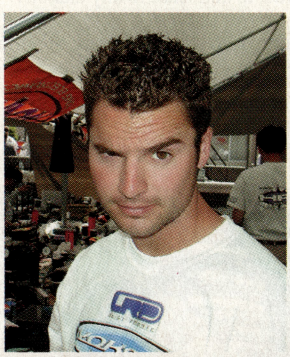
I was also very interested to see how the race would be since this was the first year to incorporate the new 10-turn motor limit, as well as the inclusion of using a spec tire in all classes. The 10-turn limit was put into effect in an effort to control the battery/motor war, whereas the spec tires helped cap the ever-escalating tire war. Both plans worked out well, but the only problem with the spec tires situation was that any type of insert could be used—with the hottest ones being scarcely available. Look for a minor revision next year to include not only a spec tire, but a spec insert as well. Overall, both the motor limit and spec tires worked out great, and didn't detract in any way from the intense racing action.



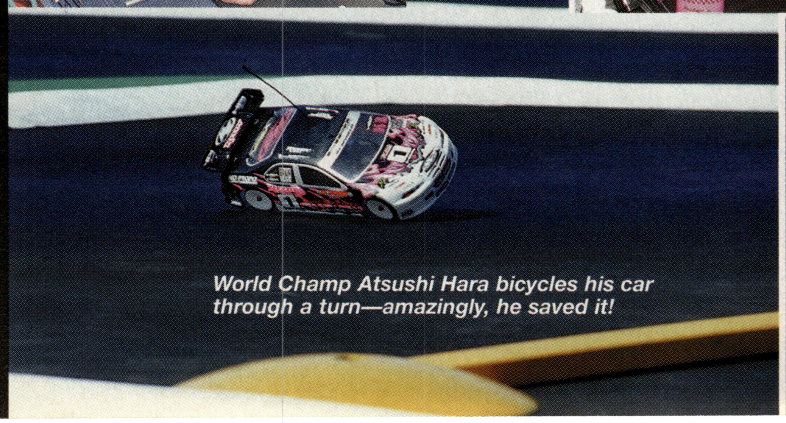
Team Associated's Mark Pavidis was the man to beat. His Reedy-powered TC3 was completely hooked-up all weekend.



Current world champion Atsushi Hara has been tearing up tracks throughout the world with his new HPI Pro 3. At the Reedy Race he finished a very respectable second overall.



Can you smell what Chris Tossolini is cookin'? How about a third place overall finish!

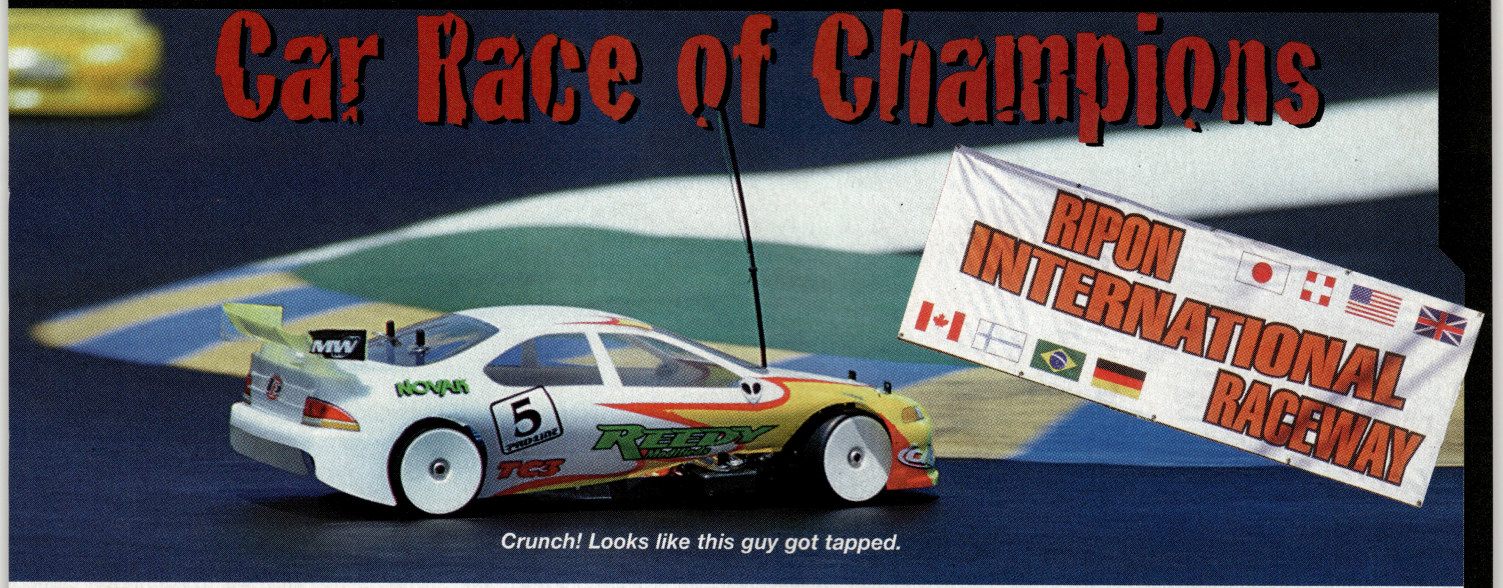


World Champ Atsushi Hara bicycles his car through a turn—amazingly, he saved it!

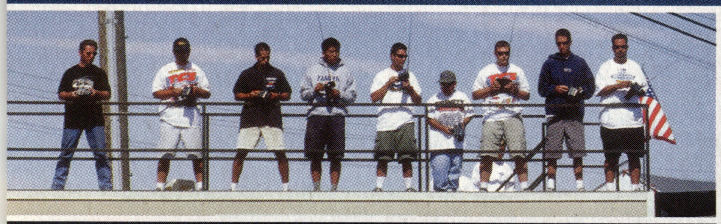


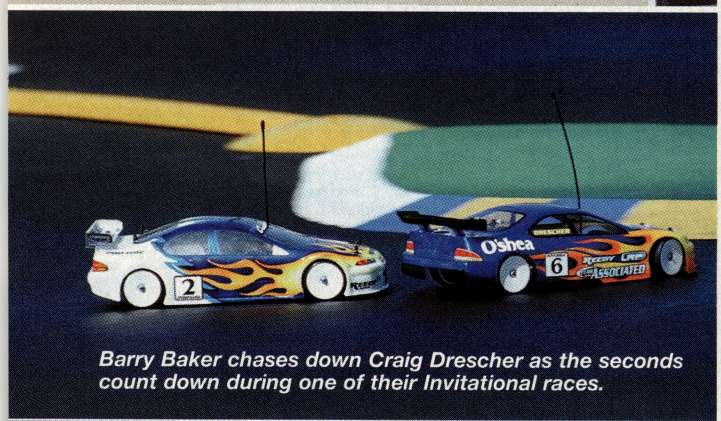
Brian Kinwald was on fire with his new Losi XXX-S. Brian won the first day's Invitational contest, but ended up taking fourth overall for the weekend.

Car Race of Champions



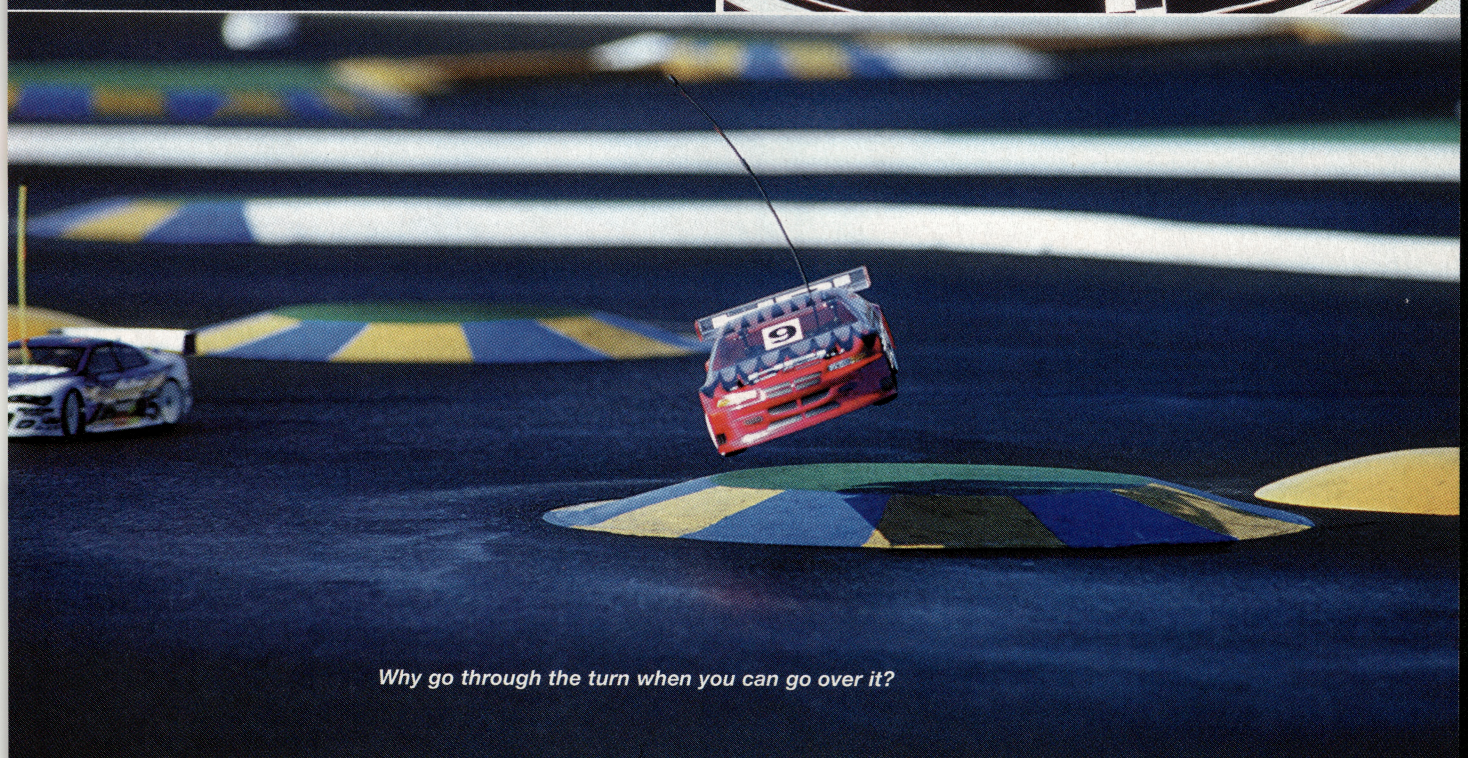
Crunch! Looks like this guy got tapped.





Barry Baker chases down Craig Drescher as the seconds count down during one of their Invitational races.





Why go through the turn when you can go over it?



Brian Kinwald, in his first race with the Losi XXX-S, won the first day of Invitational with the new car. The second day of competition didn't go as well for him, and he finished the event fourth overall.

Open Modified A-mains

A1

Top qualifier Jason Corl, who had built his brand-new Losi XXX-S only days before the race, jumped off the line and led Jeff Wittman and Terry Martin for the early going. Not long into the race, Corl and Wittman jumped away from the pack and Dave Loftin managed to move up past Martin for third place as did Thailand's Surikarn Chaidajsuriya, who then took over the fourth spot. Chaidajsuriya was trying to make up ground on the leaders and was aggressively hounding third place Loftin—you could hear the crowd letting out a few "boos" as he made a few questionable moves on Loftin. Up front, no one was close to Corl—he had completely checked out with more than a straightaway lead with Wittman in second. Chaidajsuriya kept working on Loftin and eventually passed him for third and he set his sights on second place Wittman. As the race started winding down, Chaidajsuriya and Wittman battling for the third place spot had brought their battle to the back bumper of second place Wittman. Chaidajsuriya made an ultra-aggressive pass on Wittman for second, and as Wittman tried to get a pass back, he hit a corner marker and got airborne which dropped him back in the pack a bit. Chaidajsuriya, Loftin, and Adam Drake went by into second, third, and fourth respectively. At the end, Corl cruised in for an easy win, followed by Chaidajsuriya, Loftin, Drake, and Wittman in fifth.

A2

Once again, Jason Corl jumped out to an early lead and right behind him all sorts of carnage broke loose. Second place through tenth were held up in a pileup and by the time they had sorted themselves out, Corl had more than a straightaway lead! Jared Tebo had worked his way through the pileup and managed to take over second place, and he was followed by Tony Phalen and Jeff Wittman. Surikarn Chaidajsuriya started working his way up towards the front and started putting pressure on Phalen, who had just been passed by Wittman for fourth . With his pass over Phalen, Wittman started to work on Tebo and managed to get pretty close which allowed him to make a few passing attempts. Eventually, one stuck and he got past Tebo for second place. Not content with sitting in third, Tebo managed to get back past Wittman and then Wittman tried a crazy pass back and missed the target and "lawn-darted" off line when he hit a corner marker, which dropped him back in the pack a bit. Phalen, sitting in third now, had car troubles when he hit the wall and took out a wheel which allowed Chaidajsuriya to get past for third place. As the buzzer went off signaling the end of the race, Corl cruised in for his second easy win of the day and with his two first place finishes, secured the overall win.





The "Fabulous One," Barry Baker wasn't able to get on the pace that he had at previous events where he won the overall—this year he finished eight overall.



Hara's driving stance looks a little odd, but he finished second overall, so we can't really make fun of him.

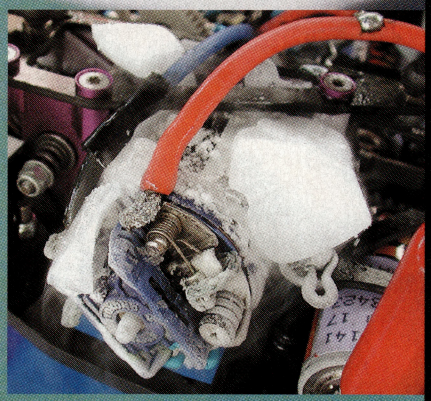


So what do you do with a few dozen control tires once they're all worn out? Duh...you make a tire tree.



Invitational top three; Atsushi Hara (second place), Mark Pavidis (first place), and Chris Tossolini (third place).

While cruising through the pits, you couldn't help but notice Larry Bates' dry ice trick he was using on the motor in his Schumacher Axis 2. Does it help keep the motor cool? Well, last year at this race Larry made the G-main, and this year he made the B...so where can I get my hands on some dry ice.



Chris Tossolini was tough to beat all weekend, but had some bad luck in a race or two..still, third place overall is something most of the racers there would have been more than happy about.





A3

The third and final A-main in the modified class can best be described as being a total "hack-fest" which drew many repeated warnings from the race officials for un-sportsman-like behavior. Throughout the race, there was all sorts of carnage going on—lots of double-jumping corner markers, ultra-strapped driving, and take-outs galore—not what you'd expect in an A-main event! With his previous two wins under his belt, Jason Corl sat out the third and final A-main. Off the start, Jeff Wittman jumped out to an early lead over Adam Drake and Surikarn Chaidajsuriya. Drake managed to get by Wittman early and then Chaidajsuriya made a bold move on Wittman and tried to shove his car out of the way. Wittman retaliated by giving Chaidajsuriya a little "return the favor" tap, which set the two off on a little back and forth payback session which drew a lot of heat from the officials and the crowd alike, and both were told to "clean it up". Chaidajsuriya took out Wittman again, and soon after Wittman spun out, which then took out Tony Phalen. As you looked around the track at the crowd, many were seen just shaking their heads in disgust at the driving display—guess everyone got a little spoiled with how clean the rest of the racing action was all weekend. Up front, Chaidajsuriya had managed to get past Drake, and was starting to build up a pretty decent lead over him, with Wittman sitting in third place. As time started winding down, Drake started to slowly reel in Chaidajsuriya. With seconds running out, Drake made a clean pass on the last lap over Chaidajsuriya, who then retaliated by hitting Drake's car. Drake was unfazed and managed to hold him off and he took the win by half a second (both drivers were the only ones to go 17 laps). Wittman took the third spot, while David Loftin took fourth, followed by Jared Tebo in fifth.

[RACE REPORT]

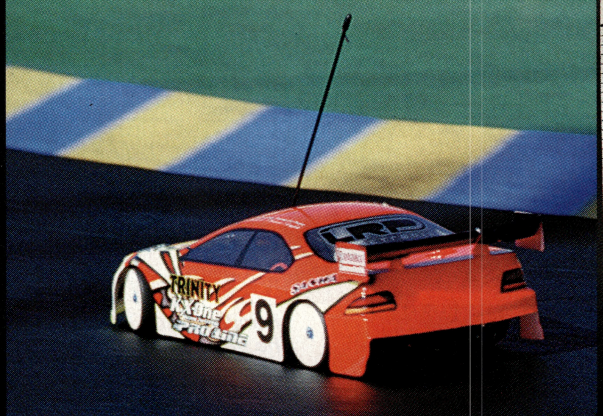
Open Stock A-mains

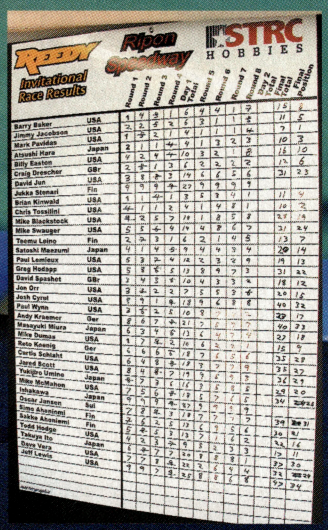
A1

When the tone went off to start the first of the three A-mains, top qualifier Pat McCarson jumped out to a great start but was quickly followed by Charlie Suangka, Marc Garvey, Brad Geck, and Steve Perez. On the second lap, though, a bobble from Suangka allowed Garvey past along with Geck and Perez to pass him. Unfortunately for Tyree Phillips, he got collected in a crash and it completely smashed in his Lexan body, which made it difficult to navigate around the track quickly. With only a minute into the race, McCarson and Garvey began to distance themselves from the rest of the pack, leaving third place back to battle for the remaining spots. McCarson and Garvey battled for most of the race and at one point Garvey tried an aggressive pass, the two tangled, and McCarson got the better of it and stretched out a decent lead. The closest battle on the track at this point with only a minute left to go was between Geck in third and Suangka in fourth—both were very close. A few laps later, Suangka tapped Geck on the side, which pushed in his body and Suangka went by into third as Geck struggled with his crippled car. Geck had to pull over and Ripon Speedway owner Dan Tanis quickly popped out the body for him, but the damage was done—he had dropped to sixth at this point. As the seconds wound down, Korgae Scales and Jay Neil took advantage of Geck's misfortune to pass him and finish fourth and fifth respectively, while Suangka took the third spot. Up front, there was no way Garvey was going to catch McCarson and he had to settle for second place—McCarson easily cruised in for the first win! All top three racers completed the race with 20 laps with a winning time of 5:05.48 for McCarson.

A2

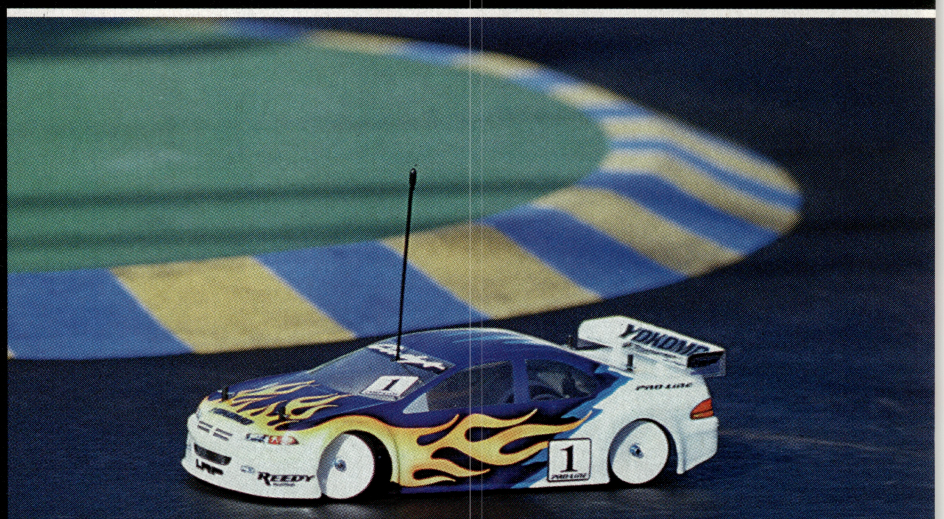
Pat McCarson again jumped out to an early lead, followed by Jay Neil, Charlie Suangka, and Marc Garvey. Before the lap was completed, Garvey and Jeff Maurer get tangled up, and Maurer's body was completely hammered in—their cars were actually intertwined for a second or two before the marshall got to them. Up front, McCarson had a big lead, with Suangka in second and Tyree Phillips in third. At the end of the straight, Suangka and Phillips collided with Suangka taking the better of the crash as he took over second place from Phillips. Garvey, who had the unfortunate incident on the first lap, began working his way through traffic and slowly set about working towards the front. Phillips made a clean pass on Suangka and made it stick.



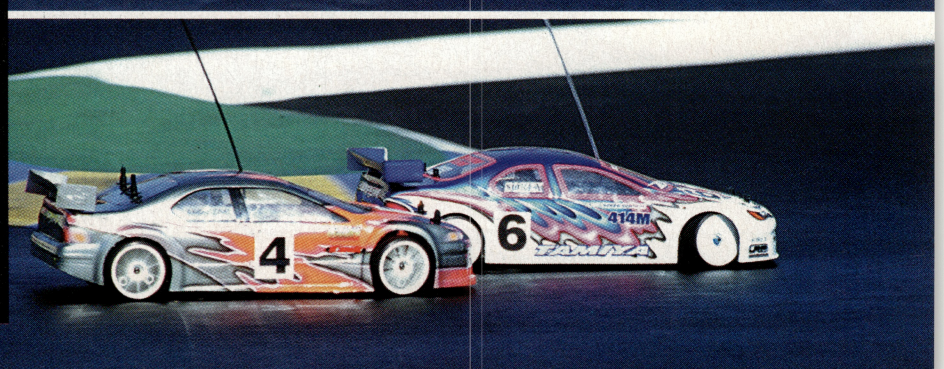


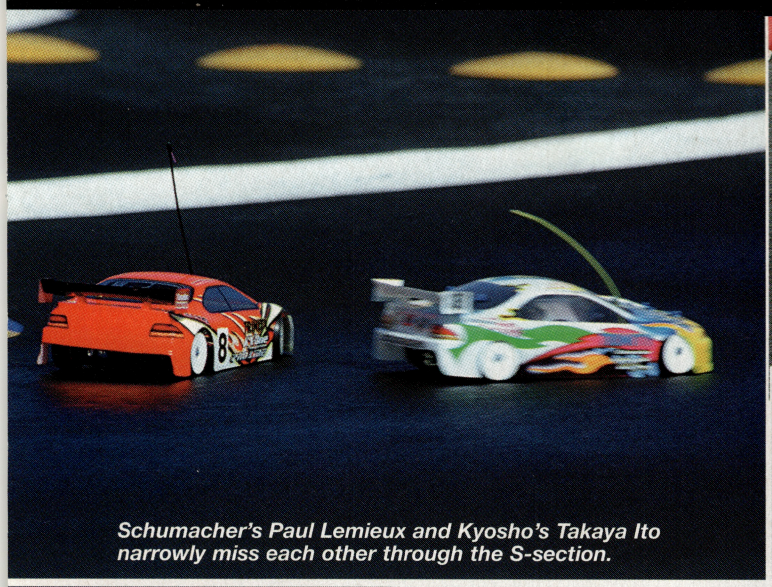


The electrifying Barry Baker grabbed the mic during a few of the Open Stock and Mod mains to add to the commentary—Barry is one of the best announcers in the business.

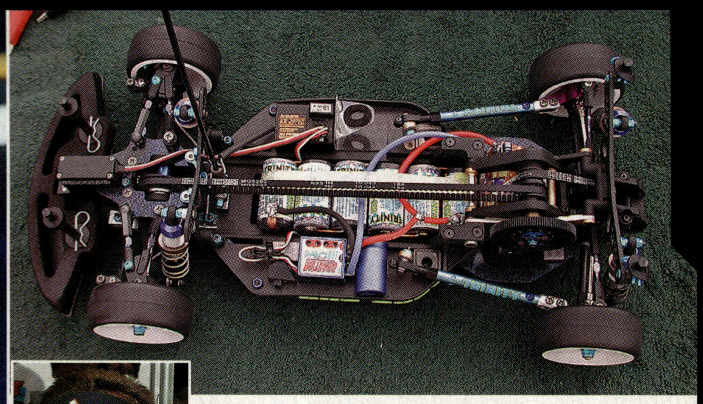


Yokomo's Barry Baker rounds the turn at the end of the straightaway.



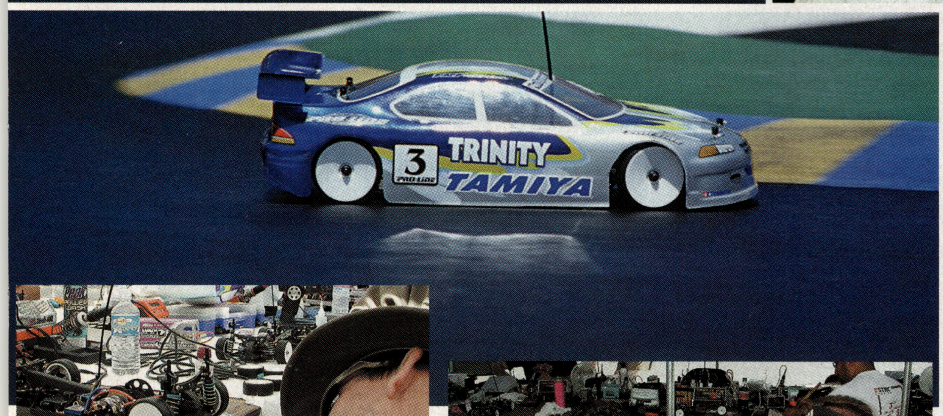


Schumacher's Paul Lemieux and Kyosho's Takaya Ito narrowly miss each other through the S-section.





Trinity's Josh Cyrul campaigned with a prototype Trinity Reflex-T touring car. There's no official word on if this car will ever see production, but we'll keep you updated.



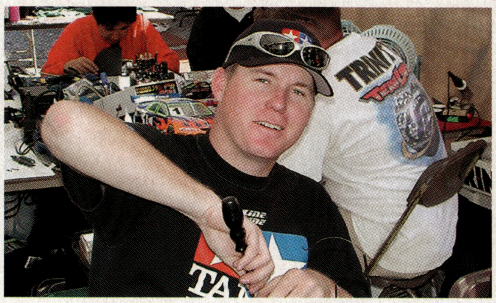
Gil Losi, Jr. made sure his team drivers' cars weren't tweaked before they headed out on the track.



Trinity's David Spashett and Josh Cyrul.



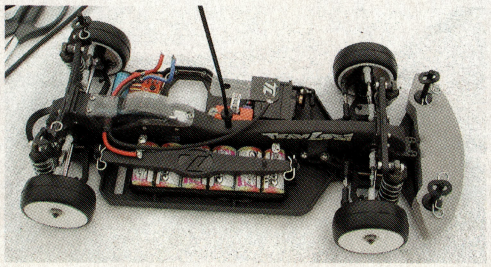
The pits were bustling with activity all weekend.



Tamiya's Jimmy Jacobson.



The Lone Gunman. Team Kyosho only had one driver at the race—Takaya Ito.



Losi's new XXX-S surprised many people with how competitive it was in its first outing.

Garvey kept working his way forward and was sitting in fourth spot when Suangka and Phillips tangled again which allowed Garvey to get past both easily. Up front, McCarson was way out front and put it on cruise control. Garvey tried charging to the front, but it was too much distance to make up. McCarson took an easy win, followed by Garvey in second, Neil in third, and Phillips and Suangka took fourth and fifth respectively. With two wins already under his belt and the overall race win clinched, McCarson could sit out the third and final race.

A3

With McCarson out of the race due to winning the overall, Marc Garvey jumped out to an early lead over the pack. Garvey had finished second in both previous mains and was looking for his first win of the day. Garvey was followed by Brad Geck, Jeff Maurer and Alex Siemantel. Garvey began stretching out a solid lead while many battles raged back and forth behind him—as it was announced over the PA, "doors are bangin' everywhere". The battle for second position was between Siemantel, Jay Neil, and Charlie Suangka. Throughout the race, Garvey built up a decent lead, while Neil, Siemantel, and Suangka battled back and forth for second place. It looked as if Garvey was completely checking out—to the point that many stopped looking at him on the track and turned their attention to the other battles on the track. But then bad luck struck Garvey—right around the 12-lap mark, Garvey's car seemed like it was losing power. Unbelievably, Garvey's batteries started to dump, and Neil and Siemantel worked past him. Within a lap, the rest of the field managed to work their way past Garvey's crippled car. With time running out, Neil and Siemantel battled fiercely until the end, passing each other back and forth, but it was Neil edging out the win by less than half a second (both were the only two to turn 20 laps). Suangka finished third overall, followed by Geck and Maurer. Unfortunately for Garvey, he retired on lap 17, but with his two second place finishes in the other two mains, he had secured a solid third place overall podium finish.



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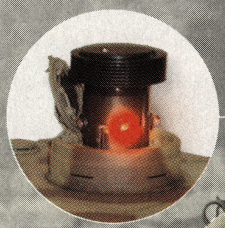

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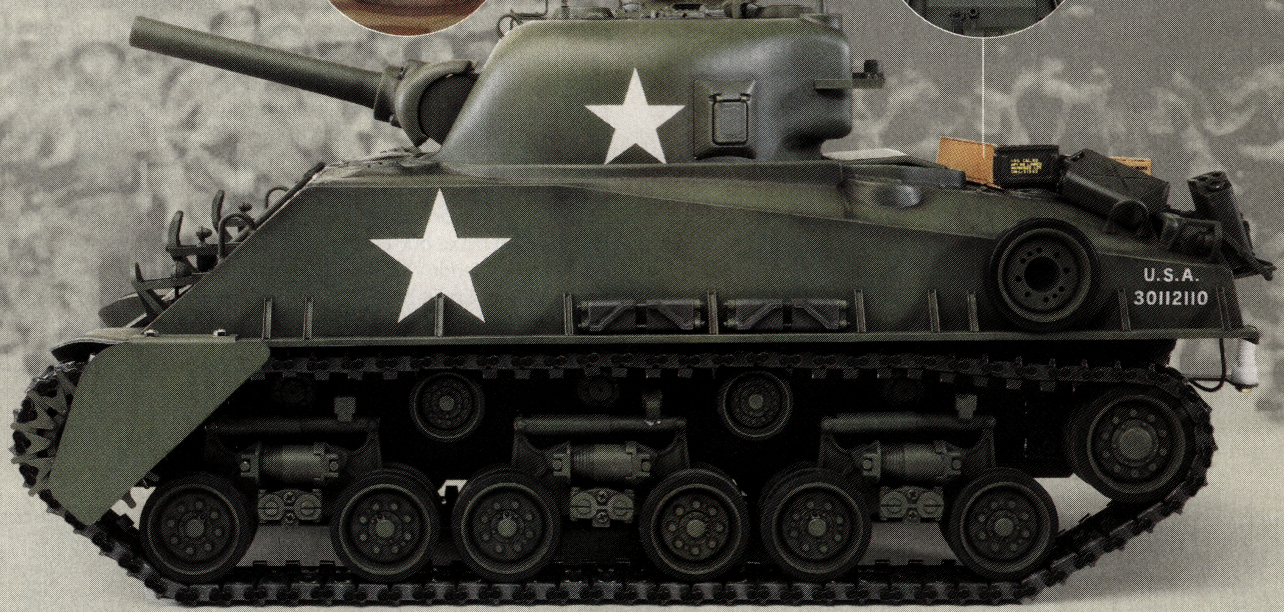

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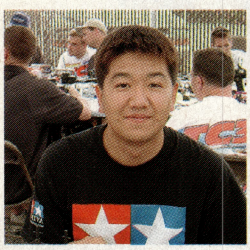
The Reedy Race Heads South

Hello, my name is Fred Medel and I am the Tamiya America TRF manager. I would like to proudly announce that we are the host site of the 2002 Reedy Race Race of Sedan Championships at our Aliso Viejo Test Facility next year. Mike Reedy has agreed to bring his prestigious event (after a wishful brainstorming session between he and I at a Hooters restaurant in Milwaukee) to our facility in an effort to bring the manufacturers together in helping promote the sport of R/C racing to an audience that has not been exposed to our industry yet. Our collective goal is to make this event the biggest of the 2002 year and we invite all manufacturers to join us in reaching out to an audience that may not be aware of our exciting sport.

We also want this to be an even bigger international event so that all drivers and all manufacturers from around the world can be proud to be part of. It's Mike's dream that this event be not about which manufacturer can beat who, but rather what driver can outdrive the other, no matter what they drive. Driving precision, door-to-door racing and getting the newcomer and hobbyist to mingle with the pros will be a focus. As manufacturers we will be showing the outside world what our fun sport has to offer. Due to our location in Southern California we feel we can bring the major manufacturers together to showcase their drivers and products at this event. Luckily, most of the major manufacturers are based in Southern California, and that will make our efforts a bit easier. I am further fortunate that I have many friends who work for other companies that I can ask for help and support in making this event spectacular. We (the industry and many manufacturers) have a full year of planning ahead of us and we can't wait to see what happens.

INTERNATIONAL CREW



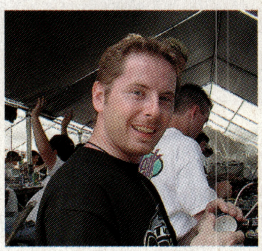
Tamiya Japan's Masayuki Murai.



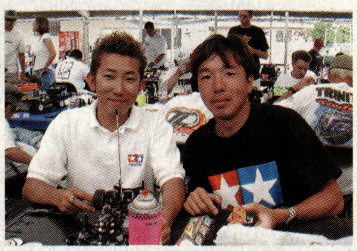
Schumacher's Teemu Leino—Finland.



Associated's Craig Drescher—Great Britain.



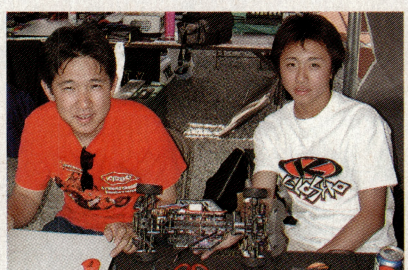
Team Orion's Oscar Jansen—Switzerland.



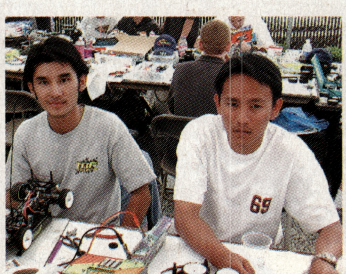
Tamiya Japan's Satoshi Mazumi (left) and Takanori Aoki.



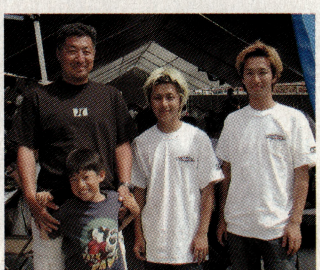
Team Canada (from left to right); Adam Ohoshi, Tyler Levy, Greg Yigit, Korgae Scales, and Frank Bortolazzo.



Team Kyosho's Hiroyoshi Ishikawa (left) and team driver Takaya Ito, Japan.



Surikarn Chaidajsuriya (left), and his mechanic Anon Phisuithichinawong—Thailand.



HPI's Tatsuro Watanabe with his son Taku came out to the race to cheer on his Japanese drivers Atsushi Hara and Yukijiro Umino.

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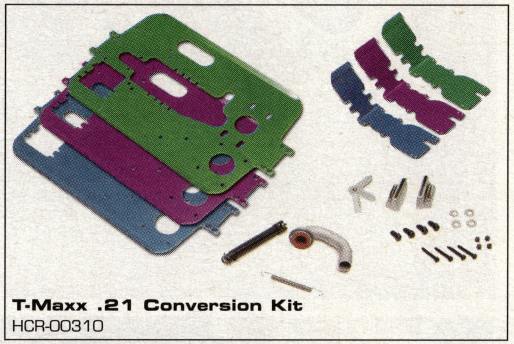

T-Maxx .21 Conversion Kit
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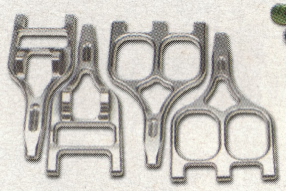
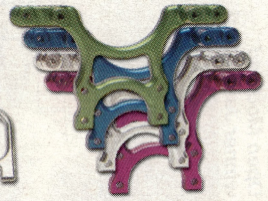
E-Maxx T-6 Aluminum Chassis
HCR-00330

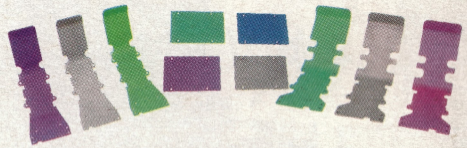




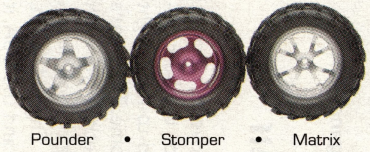
T-Maxx/E-Maxx Billet Aluminum Suspension Arms
HCR-00304



T-Maxx/E-Maxx Billet Aluminum Shock Towers
HCR-00312



T-Maxx/E-Maxx Titanium Skid Plates
Front: HCR-00308
Center: HCR-00307
Rear: HCR-00309



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T-Maxx/E-Maxx Billet Aluminum Wheels with 5/16" offset
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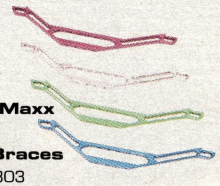
Stomper - HCR-003112
Pounder - HCR-003113



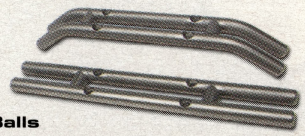
T-Maxx/E-Maxx Aluminum Chassis Braces
(pair)HCR-00303



T-Maxx Hyper-Laminate Brake Disc and Titanium Calipers
HCR-00301(brake disk)
HCR-00302 (calipers)



T-Maxx/E-Maxx Titanium Pillow Balls
HCR-01504



T-Maxx/E-Maxx Billet Titanium Bumpers
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Rear - HCR-00305

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The man, the myth, the legend—Mike Reedy.

The Man Himself Speaks

Maybe I am selfish, but I love this format. The chance to see thirty of the best drivers in the world go head-to-head eight times in two days is awesome. This year's event was the most competitive yet with only a few points separating the top fifteen drivers! With drivers from England, Japan, Thailand, Germany, Finland, and the USA, it was a well represented international event. Thanks, guys—you put on a fantastic show and we all enjoyed watching it.

This year we tried a ten-turn limit. It must have gone over well, because I asked as many racers as I could and did not get one negative comment from a racer.

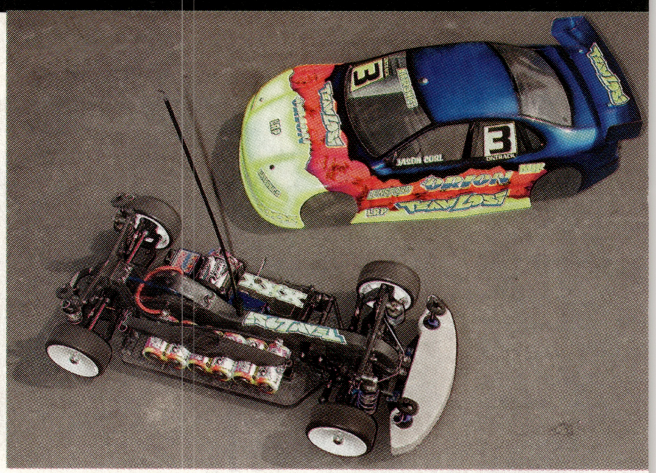
The one comment that was expressed by almost everyone was finding a way to do contolled inserts as we do with the tires. Since this race seems to be a test bed to try different ideas and formats, I will try and set next year to be a controlled tire and insert race. Let me know what you think.

Probably the most important announcement concerning the race was that next year the event is going to be held at Tamiya USA's track. This facility, located in Southern California, is in a park-like setting and is fantastic! The plans call for spectator bleachers, international promotion, and a new revised track. Tamiya and other R/C companies will be joining forces to promote this event and hopefully it will not only be a very competitive event but will be used to promote R/C car racing.

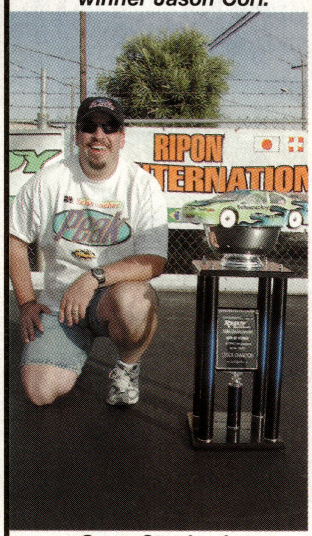
Thanks to the sponsors; without the help of Novak, Pro-Line, Yokomo, Associated, and *R/C Car* Magazine, this race would not be possible. Their continued support is appreciated.—Mike Reedy



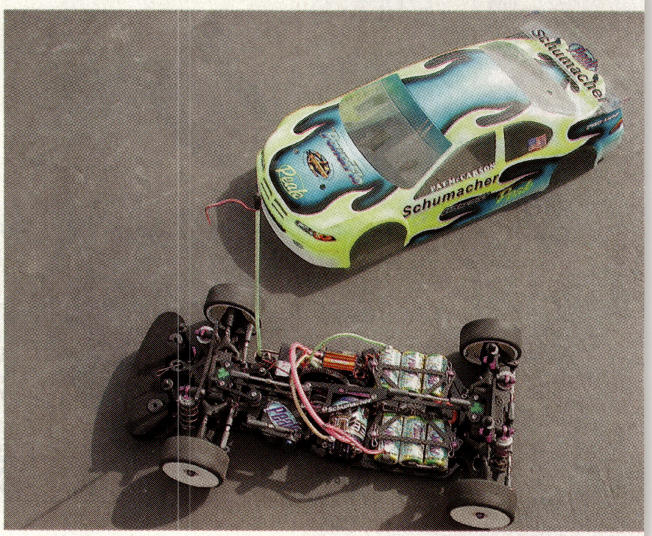
Open Modified winner Jason Corl.



Jason Corl's Open Modified winning Team Losi XXX-S.



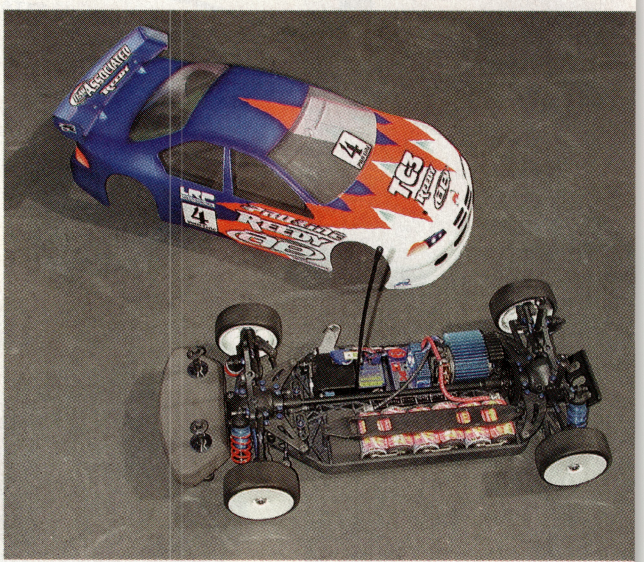
Open Stock winner Pat McCarson.



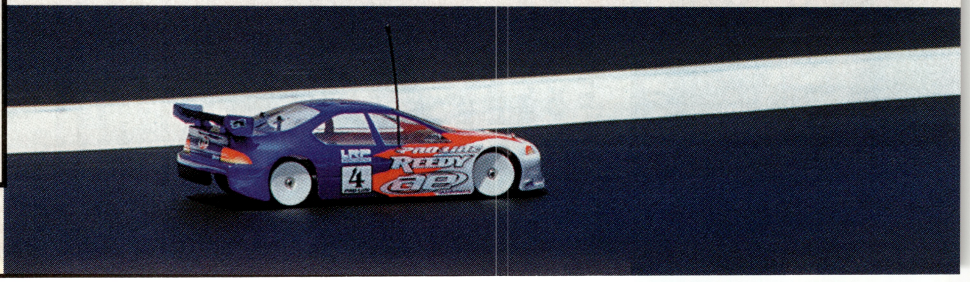
Pat McCarson's Open Stock winning Schumacher Axis 2.



Invitational Class winner Mark Pavidis.



Mark Pavidis' Invitational class winning Team Associated TC3.



Winner's Chart

Open Stock

Fin	Qual	Driver	Chassis	Motor	Battery	ESC	Servo	Gearing	Tires/Insert	Body	Radio/Rec.
1	1	Pat McCarson	Schumacher	Handout	Peak	Keyence	Futaba 9402	87/27	Handout	Andy's Stratus	Air./Tekin
2	2	Jay Neil	Yokomo	Handout	Panasonic	Novak	Air. 155	78/27	Handout	Yokomo Stratus	Airtronics
3	4	Marc Garvey	Associated	Handout	Trinity	Novak	Air. 452	100/37	Handout	Losi Stratus	Airtronics
4	3	Charlie Suangka	Yokomo	Handout	Reedy	Novak	Futaba	78/27	Handout	Andy's Stratus	Air./Novak
5	10	Korgae Scales	Yokomo	Handout	Nuclear Power	Novak	Air. 357	78/29	Handout	Protoform	Airtronics
6	5	Brad Geck	Associated	Handout	Reedy	LRP	Air. 257	72/27	Handout	Protoform	Airtronics
7	8	Alex Siemantel	Yokomo	Handout	Pro-Match	LRP	Airtronics	78/25	Handout	Yokomo Stratus	Airtronics
8	6	Jeff Maurer	Schumacher	Handout	World Class	LRP	Airtronics	111/33	Handout	Andy's Honda	Airtronics
9	7	Tyree Phillips	Losi	Handout	Reedy	Novak	JR	n/a	Handout	Stratus	JR/Novak
10	9	Steve Perez	Associated	Handout	SMC	Novak	Hitec 525MG	70/27	Handout	Protoform Stratus	JR

Open Modified

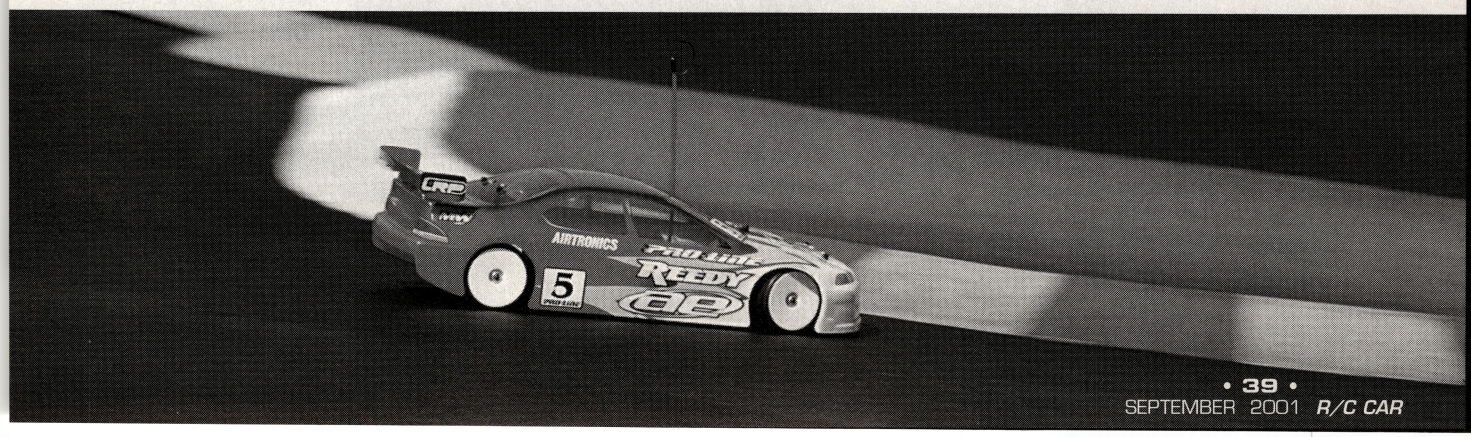
Fin	Qual	Driver	Chassis	Motor	Battery	ESC	Servo	Gearing	Tires/Insert	Body	Radio/Rec.
1	1	Jason Corl	Losi	Orion	Orion	LRP	Air. 94755	120/28	Pro-Line H13/Echo	Protoform Vauxhall	Air./LRP
2	2	Surikarn Chaidajsuriya	Tamiya	Reedy	Trinity	LRP	Futaba	124/35	Pro-Line H13/Echo	Protoform	Futaba
3	6	Adam Drake	Losi	Trinity	Trinity	Novak	Air. 94257	120/28	Pro-Line H13/Echo	Pro-Line Vectra	Air./Novak
4	4	Dave Loftin	Losi	Trinity	Trinity	Novak	Air. 357	88/21	Pro-Line H13	Pro-Line Stratus	Air./Novak
5	3	Jeff Wittman	Schumacher	Banzai	Nuclear Power	LRP	Futaba	- - -	Pro-Line H13	Protoform Stratus	Airtronics
6	8	Jared Tebo	Associated	Reedy	Reedy	LRP	Air. 452	72/23	Pro-Line H13	Protoform Stratus	Airtronics
7	5	Terry Martin	Yokomo	Fantom	Yokomo	GM	Airtronics	81/24	Pro-Line H13	Yokomo	Airtronics
8	9	Andrew Gray	Associated	Fantom	SMC	Keyence	Air. 357	72/24	Pro-Line H13	Protoform Stratus	Airtronics
9	10	Dominic Favorito	Schumacher	Fantom	SMC	LRP	Futaba 9402	116/30	Pro-Line H13	Protoform Stratus	Air./LRP
10	7	Tony Phalen	Associated	Reedy	Reedy	LRP	Air. 357	72/23	Pro-Line H13	Protoform Stratus	Air./LRP

Invitational Top 10

Fin	Driver	Country	Chassis	Motor	Battery	ESC	Servo	Gearing	Tires/Insert	Body	Radio/Rec.
1	Mark Pavidis	USA	Associated TC3	Reedy (10x1)	Reedy	LRP Quantum	Airtronics	100/33	Pro-Line H13	Protoform Stratus	Air./LRP
2	Atsushi Hara	Japan	HPI Pro 3	Reedy (10x1)	Reedy	Nosram	KO Propo	112/33	Pro-Line H13	H/B Stratus	KO Propo/LRP
3	Chris Tossolini	USA	Yokomo MR4TC	Reedy (10x1)	Reedy	LRP Quantum	Airtronics	81/24	Pro-Line H13	Andy's Stratus	Air./LRP
4	Brian Kinwald	USA	Team Losi XXX-S	Trinity (10x1)	Trinity	Novak TC2	Airtronics	125/32	Pro-Line H13	Protoform Vauxhall	Airtronics
5	Jim Jacobson	USA	Tamiya 414M	Trinity (10x1)	Trinity	Keyence	Airtronics	124/36	Pro-Line H13	Protoform Stratus	Airtronics
6	Craig Drescher	Britain	Associated TC3	Reedy (10x1)	Reedy	LRP Quantum	KO Propo	100/32	Pro-Line H13	Protoform Stratus	KO Propo/LRP
7	Teemu Leino	Finland	Schumacher Axis 2	Orion (10x1)	Orion	LRP Quantum	Airtronics	86/21	Pro-Line H13	Andy's Stratus	Air./LRP
8	Barry Baker	USA	Yokomo MR4TC	Reedy (10x1)	Reedy	LRP Quantum	Airtronics	81/23	Pro-Line H13	Andy's Stratus	Air./LRP
9	Mike Dumas	USA	Associated TC3	Reedy (10x1)	Reedy	Novak TC2	Hitec	100/32	Pro-Line H13	Protoform Stratus	Hitec/Novak
10	Billy Easton	USA	Associated TC3	Reedy (10x1)	Reedy	LRP Quantum	Airtronics	100/33	Pro-Line H13	Protoform Stratus	Air./LRP



Open Stock A-Main winners. *Open Modified A-Main winners.* *Invitational Class top ten.*

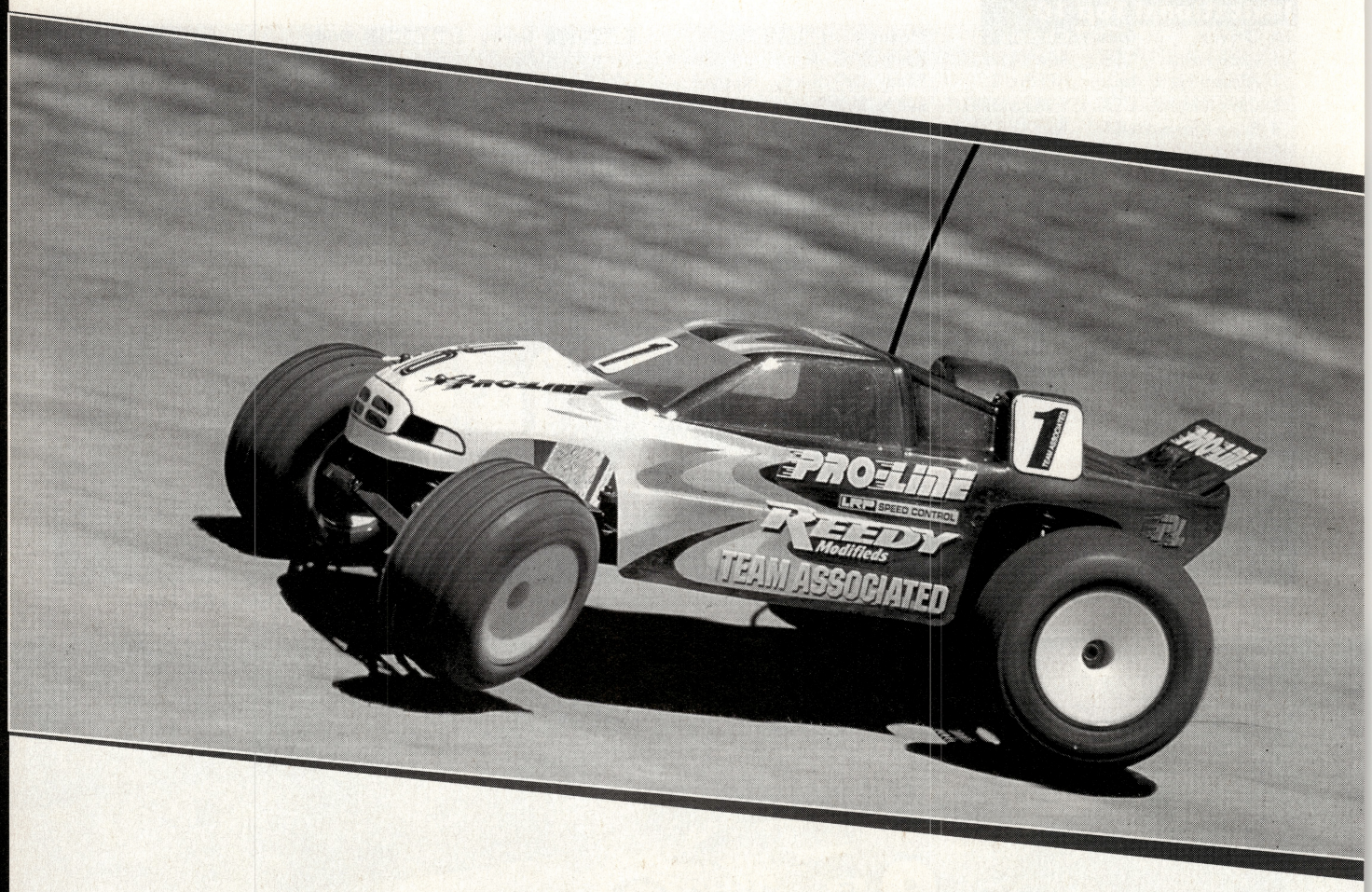


How to Set your Diff & Slipper Clutch

Avoid R/C's most common pitfall

Ever hear the term "Something's got to give"? It applies well to the transmission in your car or truck. When you have a power source at one end of the transmission (your electric motor or nitro engine) and grippy tires at the other, the "stuff" in the middle ends up taking all the strain. In the earlier days of off-road, the ball differential was the go-to guy, slipping just enough to prevent damage to the rest of the gearbox caused by monster-horsepower motors and the shock of landing from large jumps. Problem was, all that slipping caused the ball diff to wear out quickly, or worse, melt! As the diff is the heart of the transmission—the thing that allows your car to hook up better in the turns and accelerate nice and straight—you can see where there would be a problem!

Fortunately, along came the slipper clutch—a relatively simple device that inherited the slipping duties from the diff. Not only did the slipper clutch greatly increase the life span of the rest of the transmission, but it also allowed for precise control of wheelspin—just the thing for slippery tracks! But just when everything seemed its rosiest, a problem had developed: many people were unable to discern between the sound and feel of a diff slipping versus a slipper clutch. As a result, there were lots of locked-up slipper clutches and burned-out diffs! How can you tell which part of your tranny is slipping? And how do you set each component correctly? Well, that's what we're here for.



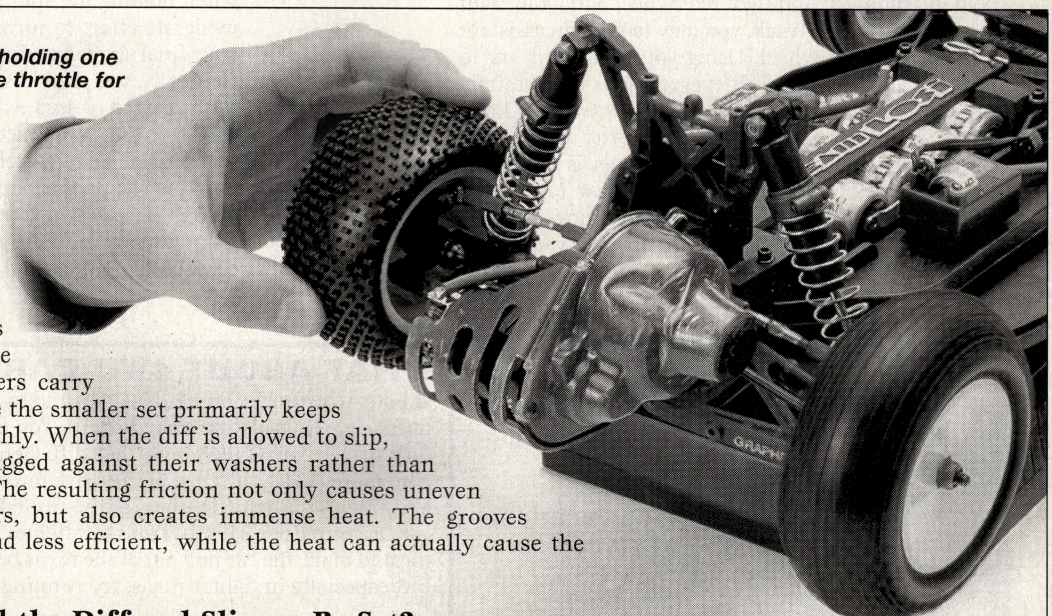
A Little Diff Basics

What is a diff? It's a clever little device that takes up the difference in rotating speed between the left and right side driven wheels. Unless a four-wheeled vehicle is traveling perfectly straight, its left and right side wheels travel on different paths, at different speeds. The diff compensates for this while providing drive force to propel the vehicle. Without a diff, one or both of the driven wheels would be dragged across the road surface, resulting in a loss of traction. Some on-road race cars actually have no rear diffs, which enables the driver to accurately slide the car through the turns. But these cars are raced on perfectly smooth surfaces. Whenever there are bumps—even small ones—a diff is needed to keep the vehicle's driven wheels in good contact with the ground to improve traction, stability and acceleration.



When assembling a new diff, you can set its tightness by holding each outdrive and trying to turn the gear—it should be very difficult.

Break-in a new diff by holding one tire and applying a little throttle for a few seconds.

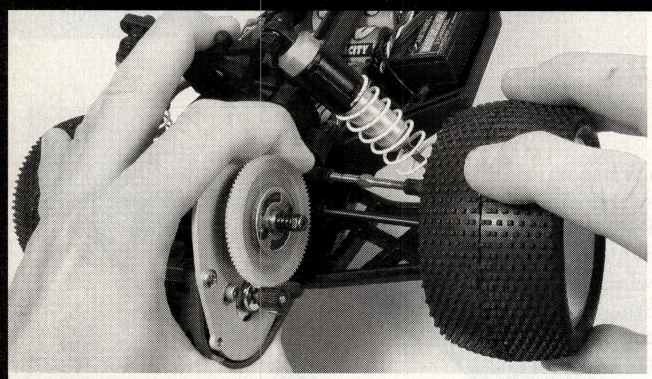


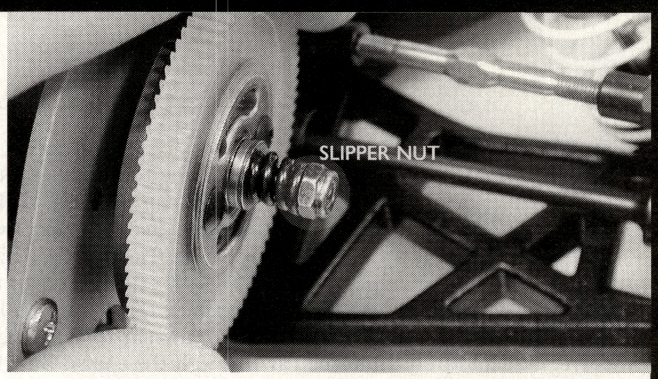
What Happens When Your Diff Slips

A typical ball diff has one large set of diff balls and washers and one small set. The larger balls and washers carry most of the load, while the smaller set primarily keeps the diff working smoothly. When the diff is allowed to slip, the large balls are dragged against their washers rather than rolling against them. The resulting friction not only causes uneven grooves in the washers, but also creates immense heat. The grooves make the diff gritty and less efficient, while the heat can actually cause the diff gear to melt!

How Tight Should the Diff and Slipper Be Set?

Even if you've built your diff and slipper perfectly, the only way to really set them correctly is to check them after the first few runs and make any necessary adjustments. When the diff is brand new, its setting will loosen—sometimes significantly—after one or two runs. This is because the diff's parts will become seated, or worn-in against each other, as the diff operates under load. To compensate for this, you can either set the diff very tightly for the initial run, or, as we prefer, you can check the diff after every few laps and make adjustments as needed. The same applies to the slipper clutch; it too will become looser as its pad or pads are worn-in against the slipper plates. Fortunately, the worse that can happen if your slipper is too loose is that your car won't go anywhere!





Checking the Diff and Slipper Settings

This is what you've been waiting for, right? So how can you tell whether it's the slipper or the diff that's slipping? There is one dead giveaway, and you'll need to use your ears. When a slipper clutch is slipping, it will make a very subtle whirring noise, but when the diff slips, you'll hear a pretty nasty sounding metallic shriek! That shriek should be your cue to stop running, or else something's going to detonate! But if your goal is to catch a loose diff before damage can occur, then all you need to do is follow these simple steps.

■ Step 1: Remove your car or truck's gear cover. With the front of the vehicle pointing away from you, hold the spur gear and right rear wheel with your right hand. If you have a truck, you may require an assistant to hold the right wheel. Using your left hand, try to turn the left rear wheel. If everything is correct, only the slipper should be slipping. How can you tell? Look at the slipper adjustment nut; if it turns as you turn the left wheel, you know that the slipper is set so that it slips before the diff can. If the nut doesn't move, yet you can still turn the left wheel, you know that the diff, not the slipper, is slipping. In this case, you'll need to re-set the diff.

■ Step 2: To set the diff, the first thing to do is lock-down the slipper clutch by tightening its adjustment nut until the spring is nearly fully compressed. Now, perform the same procedure outlined in the first step. It should be next to impossible to turn the left rear wheel. If not, stop and tighten the diff about an eighth turn, then re-check. Continue this step until the diff is sufficiently tightened.

■ Step 3: Now that the diff is set, it's time to reset the slipper clutch. Begin by loosening the slipper nut a little at a time, checking its setting each time. If you run a stock motor, your slipper should be set more loosely. If you use a mod motor, you'll need a tighter slipper to deal with the additional power. Set the slipper so that, when holding the spur gear and right wheel, it takes a moderate effort to turn the left rear wheel. As a rule, your final slipper settings should be made on the track. Generally, you should set the slipper so that it slips for about a foot or two as the vehicle accelerates from a dead stop. For high-traction conditions, a tighter setting will provide better acceleration (some pro drivers even lock their slippers completely). For slippery and very bumpy surfaces, a loose slipper setting will provide more traction and will allow the vehicle to work better through the bumps and ruts.

DIFF TIPS

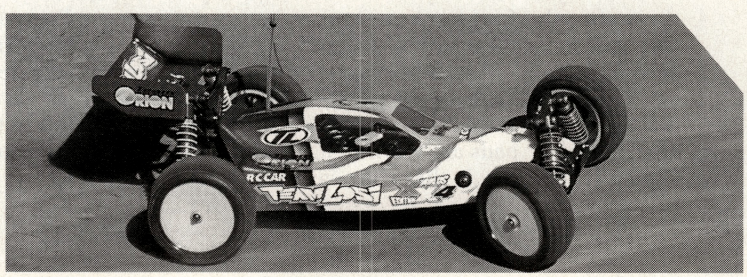
● Make it a habit to check your diff's setting after every two or three runs. If your diff does begin to loosen, you'll be able to catch it before any damage is done.

• For best performance, you should rebuild your diff when its action becomes gritty. Usually, all that's needed is a good cleaning and re-lube. You may also need to replace the large and small diff washers. As long as the diff isn't allowed to slip, the balls should last through several rebuilds before needing to be replaced.

• Fight the urge to experiment with lubes. Use only lubes that have been developed for use in ball diffs. The silicone-type lubes have special friction qualities that allow the balls to grip the washers to reduce slippage. ●

WHAT ABOUT 4WD CARS?

● Four-wheel drive off-road buggies and touring sedans often have two ball diffs—one in back and one up front. You can check the tightness of their diffs just as you would for any ball diff. Generally, you can set the front diff a bit more loosely, as most of the drive force comes from the rear of the car. You can also use the tightness of the front diff as a tuning aid. To make the car easier to drive, run the front diff tighter. This will smooth out the steering and make the car pull out of the turns better. For more responsive steering, especially in tighter turns, try running the front diff more loosely. ●





XXX-T
2000
- National Champion- Modified
- National Champion- Stock

2001
- Midwest Off-Road Winter Championships- Modified
- Midwest Off-Road Winter Championships- Stock
- Cactus Classic- Modified
- Cactus Classic- Expert Stock
- Rumble in the Rockies- Modified
- Rumble in the Rockies- Stock

XXX-NT
2000
- NORRCA National Champion
- ROAR Regional Champion
- Euro-Champion

2001
- Nitro Challenge
- Midwest Winter Gas Championships
- Silver State Nitro Challenge

XX-4WD World's Edition
1999-2000
- IFMAR World Champion
- ROAR National Champion
- Euro-Champion

2001
- Midwest Off-Road Winter Championships- Modified
- Cactus Classic- Modified
- Rumble in the Rockies- Modified

XXX & XXX Graphite Kinwald Edition
1999-2000
- National Champion- Modified
- National Champion- Stock

2001
- Midwest Off-Road Winter Championships- Modified
- Midwest Off-Road Winter Championships- Stock
- Cactus Classic- Modified
- Rumble in the Rockies- Modified
- Rumble in the Rockies- Stock

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Inside Mark Pavidis' Reedy Race Winning TC3

A closer look at the race-winning sedan

The most amazing thing about the Reedy Touring Car Race was that there were so many fast drivers with fast cars—there were at least 20 different guys in the invitational class who had the speed it took to win! In the end, though, there could be only one winner, and we have his car for you to check out. Congratulations go out to Mark Pavidis and Team Associated/Reedy Modifieds on this big win!





Mark Pavidis' Winning TC3

Front Suspension:
- Caster—2°
- Kickup—2°
- Toe—0
- Camber—1.5° negative
- Ride height—4.5mm
- Anti-roll bar—None
- Bump steer—.100
- Ackerman setting—Standard

Front Shocks:
- Body—Aluminum
- Shaft—Standard
- Limiters:
  - Inside—None
  - Outside—None
- Droop gauge—4
- Piston—#2
- Oil—50wt.
- Spring—Red

Shock mounting location—Inside hole on tower
Camber link—Inside upper hole

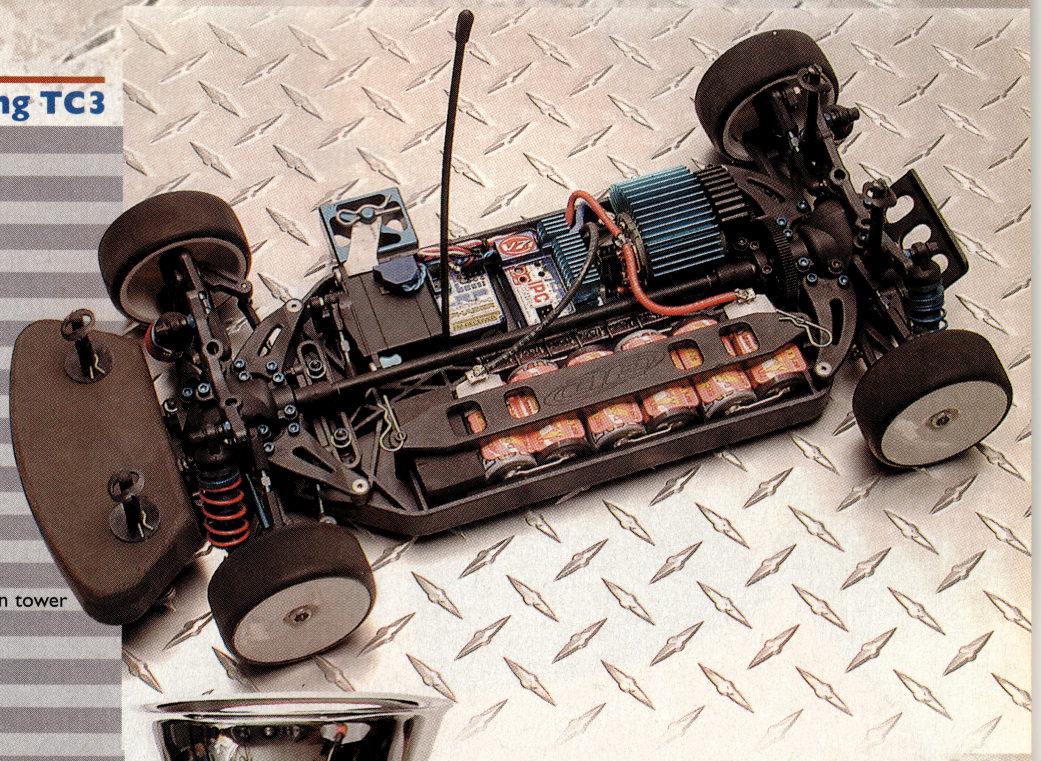
Rear Suspension:
- Anti-squat—2°
- Anti-roll bar—None
- Toe-in—3°
- Camber—2° negative
- Ride height—5mm
- Wheelbase adjustment—Medium

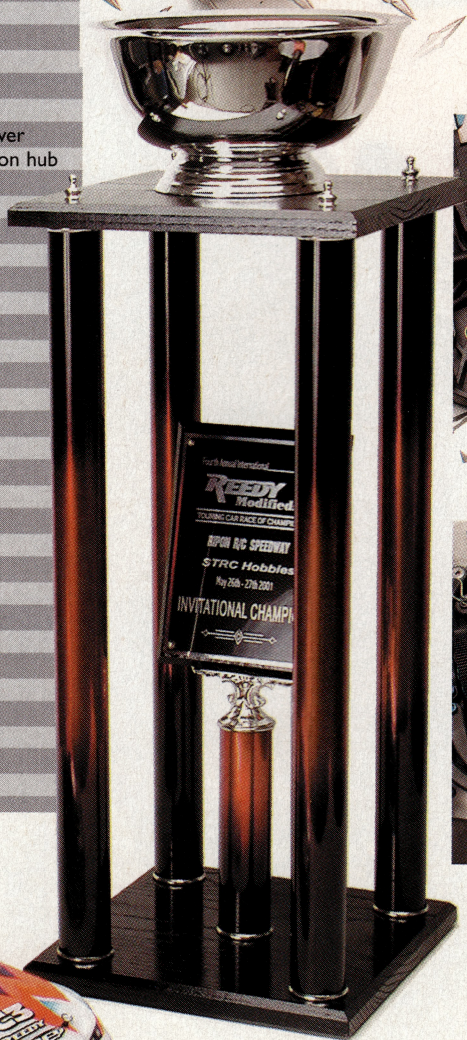
Shock mounting location—Inside hole on tower
Camber link—Inside upper hole/Upper hole on hub

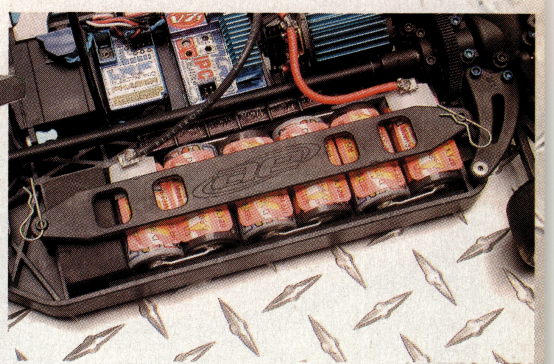
Rear Shocks:
- Body—Aluminum
- Shaft—Standard
- Limiters:
  - Inside—None
  - Outside—None
- Droop gauge—3
- Piston—#2
- Oil—30wt.
- Spring—Blue

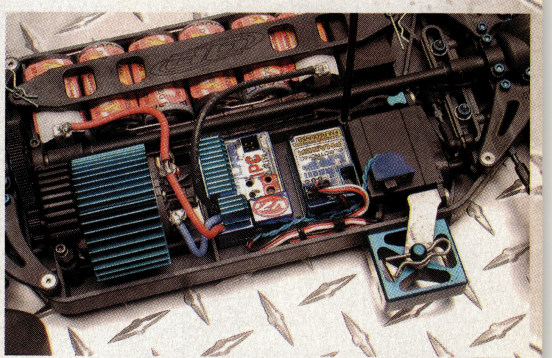
Miscellaneous:

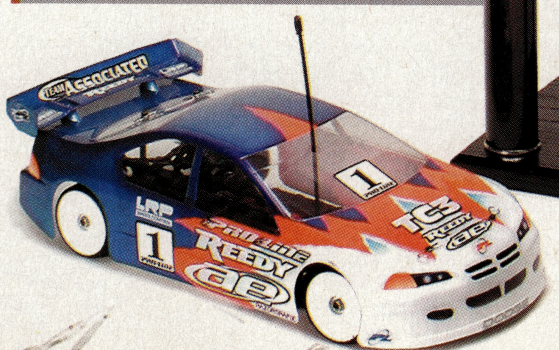
Front tires—H13 Pro-Line
Rear tires—H13 Pro-Line
Wheels—Pro-Line Velocity
Batteries—Reedy 3000s
Motor—Reedy Ti (10-turn)
ESC—LRP Quantum
Steering servo—Airtronics
Radio/receiver—Airtronics M8/Phaser
Battery placement—Back
Chassis—Carbon fiber
Front/Rear drive—One-way
Spur/pinion—104/32
Body—Protoform Stratus
Wing—Stock
Tire additive—None









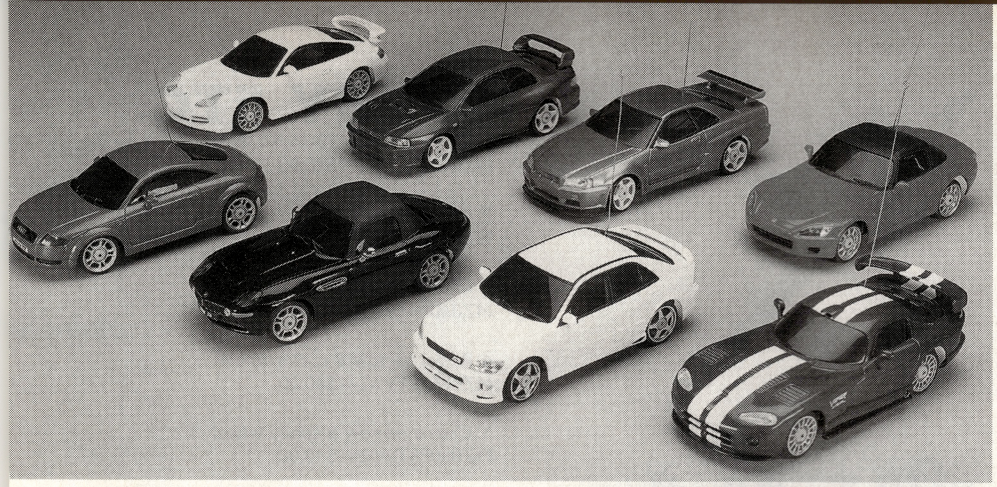


Kyosho Mini-Z Buyer's Guide

Getting the most out of your mini!



It's no secret that we're more than a little bit fond of Kyosho's micro-machine, the Mini-Z. You can race this diminutive racer almost anywhere, indoors or out. We've had more than a few boardroom battles here at the swanky *R/C Car* office with our Mini-Zs, and have had a blast! But, as with all forms of racing, the inevitable hop-ups started showing up. First, one guy showed up with stickier tires, then the next was sportin' some new racing springs. Finally Doogie showed up with a hotter motor, and it was all over! Now, don't get us wrong—you don't need to hop-up your Mini-Z to the moon in order to have fun. That's definitely not the case! But these cars are so much fun they just scream out for cool hop-ups! Well, for all you Mini-Z enthusiasts out there, we've compiled the latest Mini-Z kits and hop-ups available. Don't say we didn't warn you, though—these cars can become addictive!



KYOSHO

Mini-Z Car Kits:

1. Kyosho Honda S-2000
30005R-B—$169.99 (red)
30005Y-B—$169.99 (yellow)
30005S-B—$169.99 (silver)

2. Kyosho Toyota Altezza
30006Y-B—$169.99 (yellow)
30006MB—$169.99 (blue)
30006W-B—$169.99 (white)

3. Kyosho Skyline
30931R—$149.99 (red)
30931S—$149.99 (silver)
30931MB—$149.99 (blue)

4. Kyosho Impreza
30932W—$149.99 (white)
30932BK—$149.99 (black)
30932MB—$149.99 (blue)

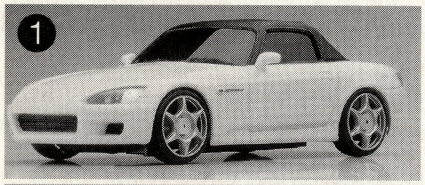
5. Kyosho Porsche GT-3 Yellow Ltd. Mini-Z
30003Y-B—$149.99

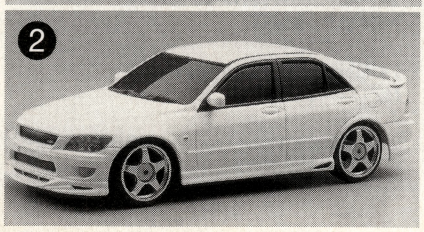
6. Kyosho Dodge Viper
30004MB—$169.99 (blue/white)
30004R-B—$169.99 (red/white)

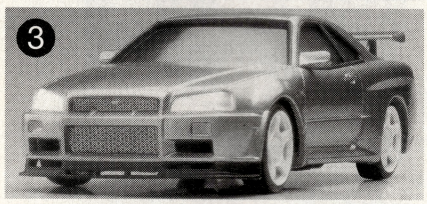
7. Kyosho Porsche 911 GT-3
30003R-B—$149.99 (red)
30003S-B—$149.99 (silver)

8. Kyosho BMW Z8
30001BK—$149.99 (black)
30001S—$149.99 (silver)
30001R—$149.99 (red)

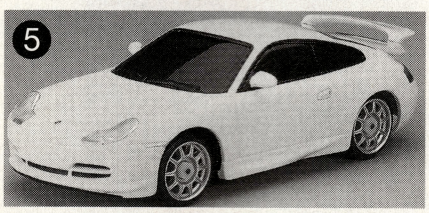
9. Kyosho Audi TT
30002BK—$149.99 (black)
30002S—$149.99 (silver)
30002B—$49.99 (blue)

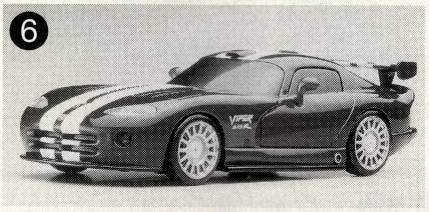


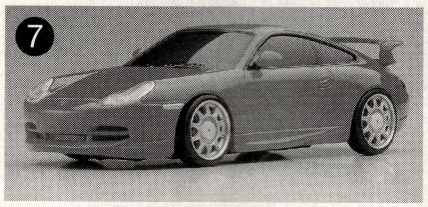


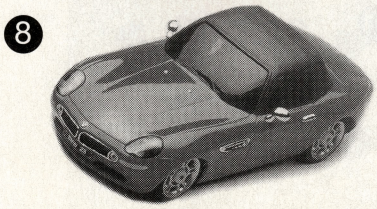


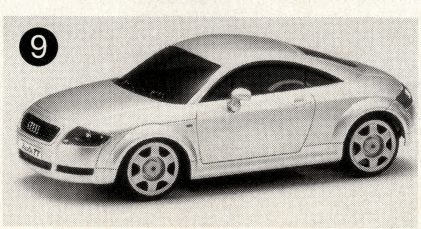












Body Kits:

• Kyosho BMW Z8
MZB004-BK—$16.85 (black)
MZB004-R—$18.49 (red)
MZB004-S—$16.85 (silver)

• Kyosho Audi
MZB005-BK—$16.85 (black)
MZB005-BL—$18.49 (blue)
MZB005-S—$16.85 (silver)

• Kyosho Skyline
MZB001—$19.99 (white)



Tires:

• Kyosho Tires 50 Hard
MZ012—$7.29

• Kyosho Hi Grip Tires Soft
MZW002-30—$7.99

• Kyosho Hi Grip Tires Medium
MZW002-40—$7.99

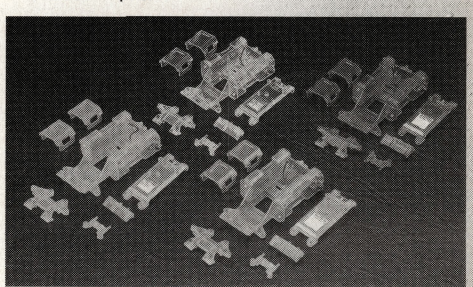
• Kyosho Hi Grip Tire Hard
MZW002-60—$6.29



Motors:

• Kyosho X-Speed Motor V
MZW008V—$19.99

• Kyosho Stock Motor
MZ009—$13.49



Chassis Parts:

• Kyosho Main Chassis
MZ001—$9.49

• Kyosho Clear Chassis
MZW011C—$15.49

• Kyosho Blue Chassis
MZW011CB—$14.99

• Kyosho Green Chassis
MZW011CG—$15.49

• Kyosho Dark Pink Chassis
MZW011CP—$15.49

Miscellaneous Accessories:

1. Kyosho Diff Gear Assembly
MZ005—$13.49

2. Kyosho 42T Spur Gear
MZW007-01—$21.99

3. Kyosho Pinion Gear Set
MZ006—$7.99

4. Kyosho Metal Parts
MZ007—$7.29

5. Kyosho Motor Case
MZ003—$7.29

6. Kyosho FRP Rear Suspension Plate MZW005—$17.99

7. Kyosho Servo Gear Case Set
MZ008-02—$12.49

8. Kyosho Chassis Parts
MZ002—$7.29

9. Kyosho Stainless King Pin
MZW010—$7.99

10. Kyosho Front Spring Set
MZW0040—$12.49

11. Kyosho Rear Shock Set
MZW006—$16.99

12. Kyosho Rear Spring Set
MZW006-01—$9.49

13. Kyosho Roll Shock Springs
MZW014-01—$10.99

14. Kyosho Roll Shock
MZW014—$32.99

15. Kyosho Shock Set
MZ004—$7.99

16. Kyosho Shaft Set
MZW007-02—$29.99

17. Kyosho Front Stabilizer Set
MZW012—$20.49

18. Kyosho Pylon Set
MZ011—$7.29

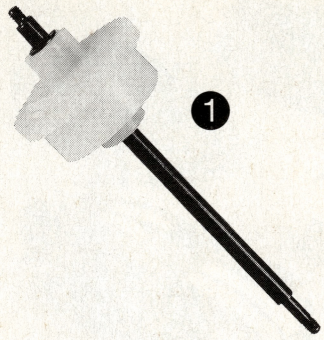
19. Kyosho Blue Wheel Nuts
MZW013BL—$7.79

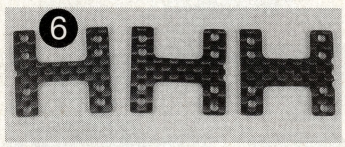
20. Kyosho Red Wheel Nuts
MZW013R—$7.79

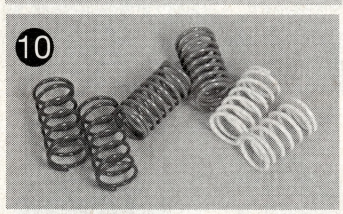
21. Kyosho Corner Bar Set
MZW009—$28.99

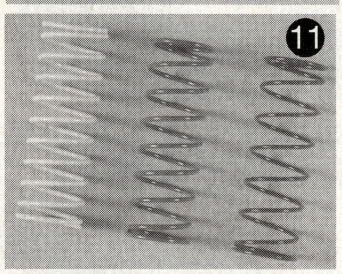
22. Kyosho Crystal Set
MZW003-01—$16.99

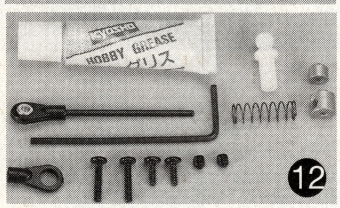
23. Kyosho Servo Gear Set
MZ008-01—$14.79

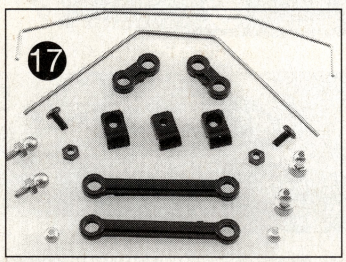


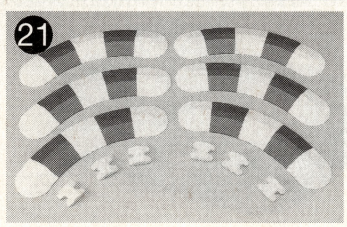












DURATRAX

• DuraTrax Bearing Set (7)
1386—$19.99

HOBBY ETC.

1. Classic narrow 10-spoke wheel
MZ010FRTW-2—$40.00

2. Radial narrow 10-spoke wheel
MZ011FRTW-2—$40.00

3. Classic narrow 8 spoke wheel
MZ060FRTW-2—$40.00

4. Radial narrow 8 spoke wheel
MZ066FRTW-2—$40.00

5. Classic narrow 6 spoke wheel
MZ060FRTW-2—$40.00

6. Radial narrow 6 spoke wheel
MZ066FRTW-2—$40.00

7. Classic wide 5 spoke wheel
MZ050FRTW-2—$40.00

8. Radial wide 5 spoke wheel
MZ055FRTW-2—$40.00

9. Classic narrow 5 spoke wheel
MZ058FRTW-2—$40.00

10. Radial narrow 5 spoke wheel
MZ059FRTW-2—$40.00

11. Rear motor mount pod
MZ013—$45.00

12. Front Coil Springs (0.4mm)
MZ04SP—$4.00

13. Large gold body clips (10)
AC02M04—$4.00

14. Front steering arm (2)
MZ021—$25.00

15. Antenna set
MZ010—$5.00

16. Ball diff set
DMZ100—$45.00

17. Steering bar
MZ2049—$20.00

18. Single alloy damper w 2 spring
MZ350—$45.00

19. Alloy First Servo Gear
MZ621T—$25.00

20. Alloy 2mm Lock nuts (5 pcs.)
MZ02—$6.00

21. Delrin motor pinion
DMZ012T—$5.00

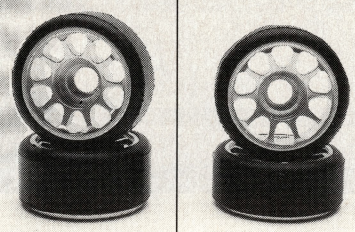
22. Motor pod – finned
MZ013A—$50.00

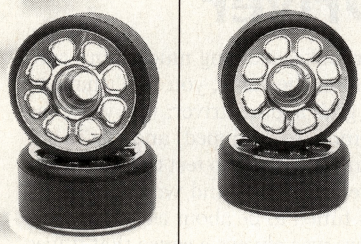
23. Alloy Third Servo Gear
MZ623T—$16.00

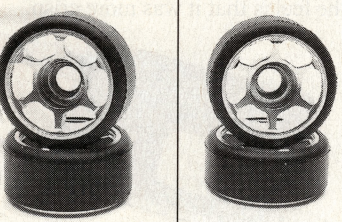
24. Fibre Soft H-Bar (0.8mm)
MZ154—$4.00

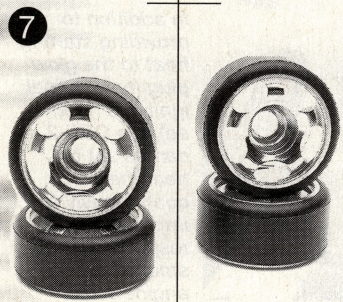
25. Alloy and Fiber Front Anti-Roll Bar Set
MZ311—$20.00 ❑

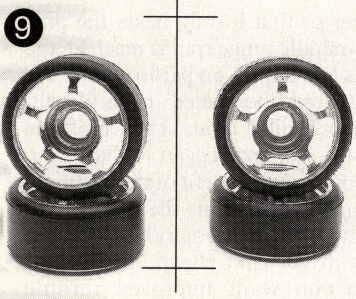
Kyosho Mini-Z Buyer's Guide

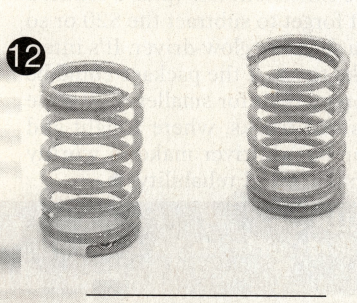


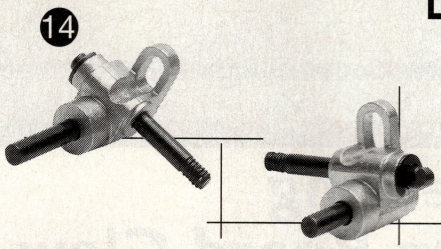


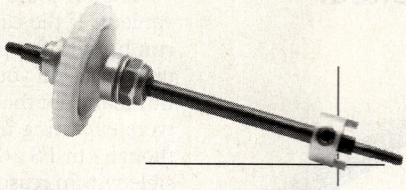


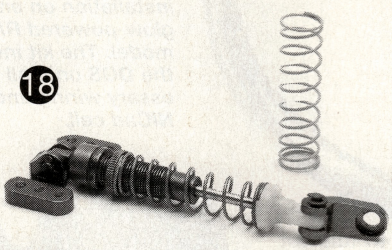


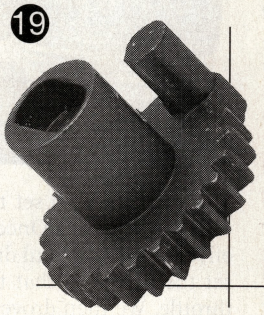


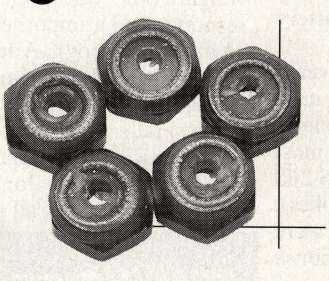


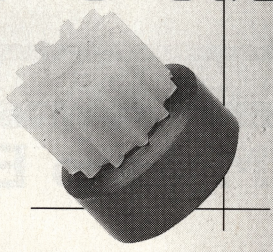


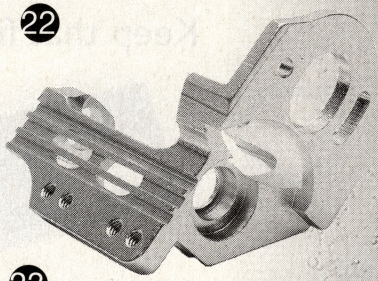


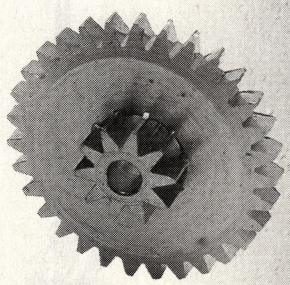


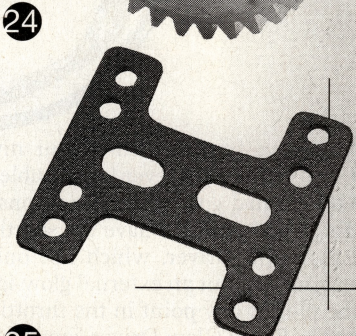


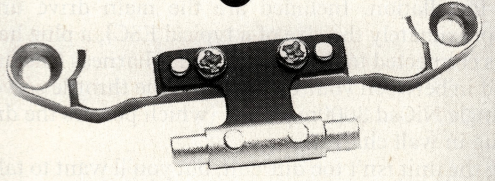


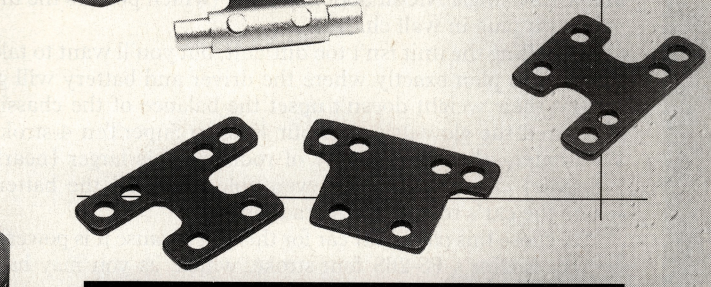












SOURCES

Kyosho, distributed by Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826-9021; Phone: (217) 398-6300.

DuraTrax, distributed by Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826-9021; Phone: (217) 398-6300.

Hobby Etc., 90 West Pearl St., Nashua, NH 03060; Phone: (603) 883-4919.

JHM Aero Engineering On-Board Glow Driver

Keep that fire stoked!



Ever have trouble getting your nitro engine to idle correctly? Have you ever had trouble tuning your engine so that it had good throttle response at lower rpm? JHM Aero Engineering might have the solution with its DGS 2 on-board glow-plug driver, which not only allows you to start your engine without an external glow-igniter, but can be set to heat the plug at any point in the throttle travel.

The On-Board Glow Driver comes with everything needed for a clean installation. Included are the main drive unit (which is approximately the size of a typical ESC), a plug harness that gets connected to the glow plug, a Y-harness (the driver is plugged in between your receiver and the throttle servo) and a 1.2v single NiCad 3000mAh cell (which powers the driver) with plug-in wall charger.

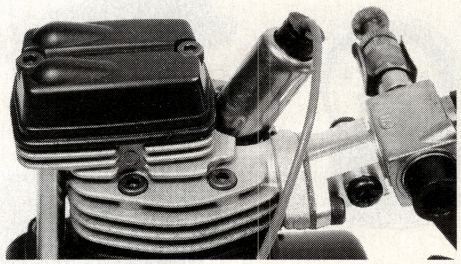
Installing the unit isn't too difficult, but you'll want to take the time to plan exactly where the driver and battery will go so that their weight doesn't upset the balance of the chassis. We tested the glow-driver in our Kyosho SuperTen 4-stroke. Fortunately, there was plenty of room on this larger (nearly 1/8-scale) chassis. We were even able to install the battery inside the car's roomy plastic radio box.

We chose this particular car for this test because it is powered by O.S. Engine's FS-26S four-stroke, which, as you may have guessed, fires every other cycle rather than with every cycle as does a two-stroke engine, so we felt that it could benefit most from the heated plug. We have always noticed that the FS-26S had a rather "lumpy" idle (as is characteristic with four-strokes), and that although throttle response was quite good, we were curious to see if the on-board driver could improve response throughout the lower region of the engine's powerband.

The on-board driver makes starting much more convenient. If the car stalls on the track, you don't have to run back to the pits to grab a glow-driver; just yank the pull-starter (if your engine is so-equipped) and you're off. But that's not the reason we wanted to test the driver; we were expecting improved response, and we got it. Even though our FS-26S was tuned to be about as lean as possible within reason, there was always a sense that it was a bit "fat" on the bottom end. With the on-board glow-driver, this feeling went away almost entirely. There was a noticeable improvement in throttle response from idle; the best way to describe the feel is that it was more crisp.



The DGS-2 on-board igniter comes with everything needed for installation on any glow-powered R/C model. The kit includes the DGS unit, all necessary wiring and a NiCad cell.



In addition to providing starting heat to the glow plug (no external igniter is needed), the DGS-2 can be set to heat the plug continuously to improve throttle response and to smooth out the engine's idle.

The trick is to set the driver so that it only heats the plug where it's needed. Once low-to-middle range rpm is reached, the effect of the on-board driver has less impact on performance. We set the driver so that the plug would be heated up until half-throttle. We then drove a few laps, pulled in and backed-off the driver until the improved throttle response began to disappear. This is the right setting, as it provides the benefit of the on-board driver without sucking too much juice from the battery (or shortening the plug's life any more than necessary).

At $66, the on-board glow driver isn't cheap, and it adds weight. The question is: do you want improved throttle response and a smoother, more consistent idle (plus a reduced chance of stalling)? And don't forget to subtract the $20 or so that you would have paid for a separate glow-driver. It's interesting technology, but we'd like to see if the package could be made smaller if we are to recommend it for smaller 1/10-scale nitro vehicles. For larger cars and trucks, where weight and size are less of a factor, the on-board driver makes a worthy contribution to overall performance and reliability. ◆

SOURCE

JHM Aero Engineering, 123 Radford Cir., Marietta, GA 30060 • (770) 438-7146; (770) 438-9654 fax

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Ask your hobby dealer for complete details about the Great Futaba Rebate. It's your best opportunity ever to own the ideal system for backyard fun or big-time action! For the location of the participating dealer nearest you, call 1-800-682-8948 and mention code number 2942B.

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- *Ergonomically engineered for a comfortable, natural grip.*
- *Assembled with top-quality components and state-of-the-art manufacturing methods.*
- *All include 1-year warranty protection and excellent Service Center support!*



3-Channel Systems



$15.00 Merchandise Certificate

or $10 Cash Rebate

Stock#	System	Servo (QTY)
FUTJ31**	3PJFS FM	
FUTJ36**	3PJS PCM	(1) S9101
FUTJ30**	3PDF FM	(2) S3003
FUTJ35**	3PDF FM	(2) S3003



FUTJ47**

2-Channel Systems



FUTJ21**

$10.00 Merchandise Certificate

or $5 Cash Rebate

2-Stick Systems

Stock#	System	Servo (QTY)
FUTJ47**	2ER AM	(2) S3003
FUTK07**	2VR AM	(2) S3003
FUTK12**	2VR AM	(1) S3003 (1) S3802
FUTK13**	2VR AM	(1) S3003 (1) S3801

Pistol Grip Systems

Stock#	System	Servo (QTY)
FUTJ04**	2PC AM	(1) S3003 / MC230CR ESC
FUTJ20**	2PC AM	(2) S3003
FUTJ24**	2PC AM	(1) S3003
FUTJ42**	2PC AM	(1) S3003 (1) S9304
FUTJ43**	2PC AM	(1) S3003 / Spike ESC
FUTJ45**	2PC AM	(1) S3003 / Explorer II ESC
FUTJ03**	2PCKA AM	(1) S3003 / MC230CR ESC
FUTJ21**	2PCKA AM	(2) S3003
FUTJ28**	2PCKA AM	(1) S3003
FUTJ27**	2PEKA FM	(2) S3003

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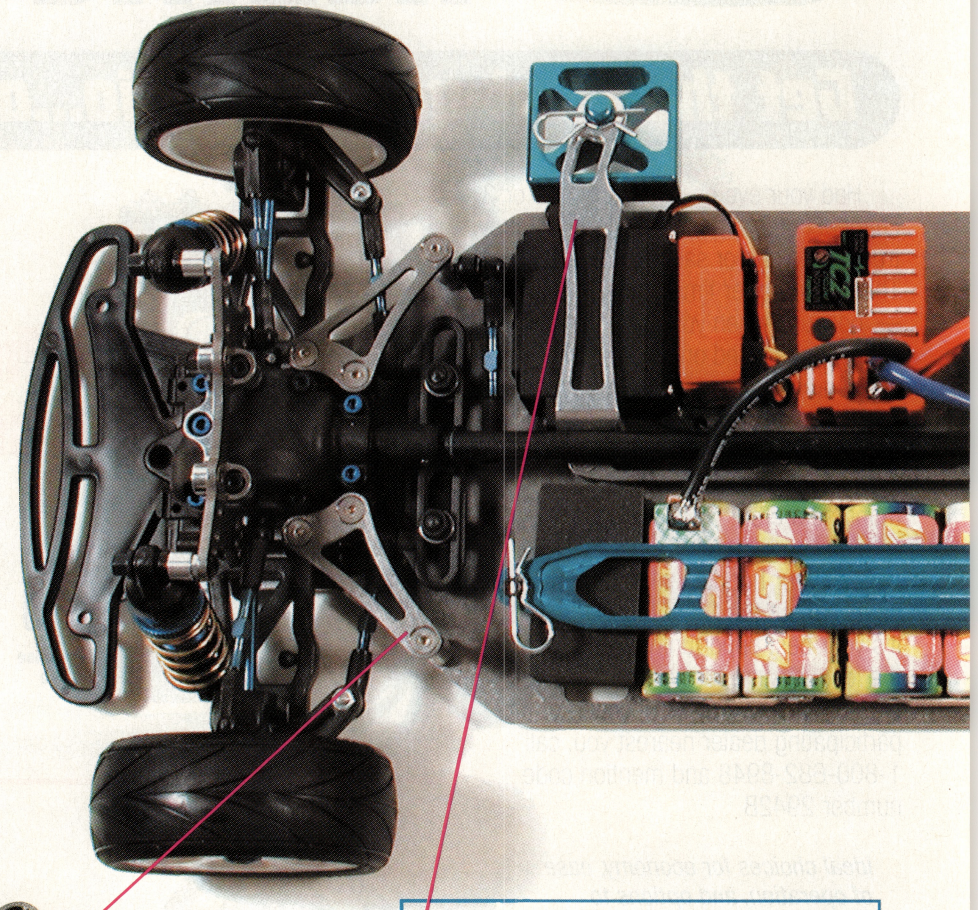
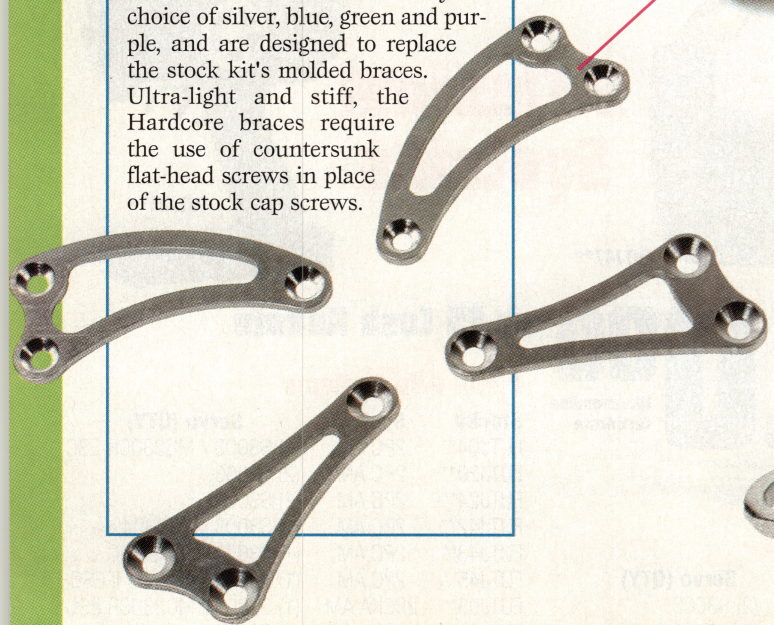
Top TC3 Tuners

Trick out your Associated sedan with these awesome upgrades!

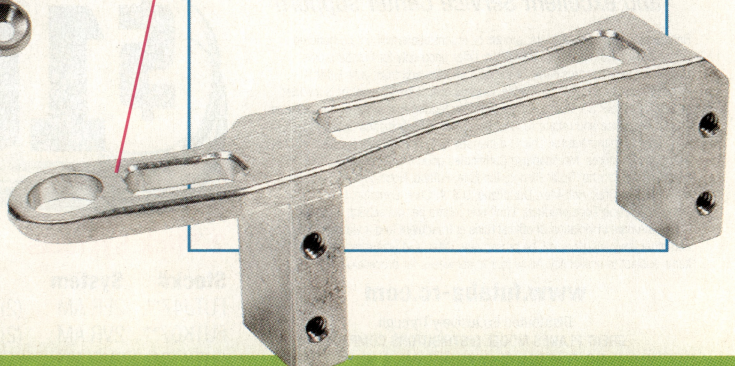
One of the ways to judge a car's popularity is by how much attention it receives from the aftermarket. And if you go by this rule, then Associated's TC3 touring car is the life of the party! We raided the extensive catalogues of two of today's hottest aftermarket companies—Hardcore Racing and IRS—to build a pair of totally tricked-out TC3s.



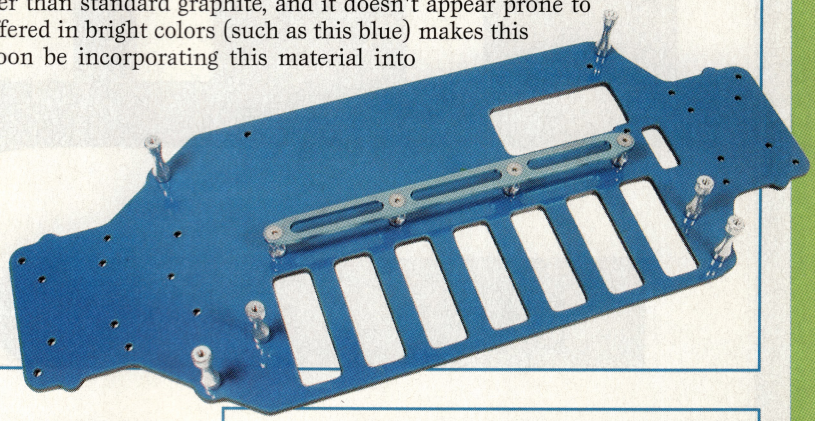
Available as an option for the stock TC3 or for use with Hardcore's chassis kits, these titanium diff braces are available in your choice of silver, blue, green and purple, and are designed to replace the stock kit's molded braces. Ultra-light and stiff, the Hardcore braces require the use of countersunk flat-head screws in place of the stock cap screws.

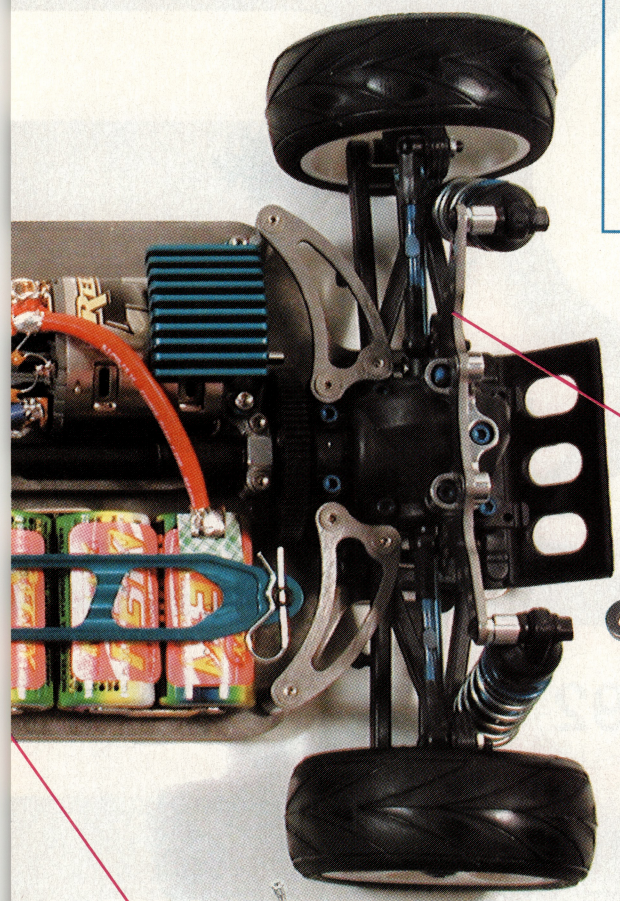


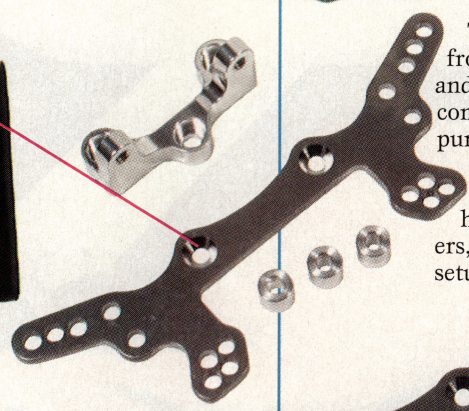
This billet-aluminum servo mount provides rock-solid security for your TC3's steering servo (the servo will never flex this mount under strain) and incorporates a mount for an auto-score transponder (or for a "fake" transponder for practice days). The mounts are available in silver, blue, green and purple.



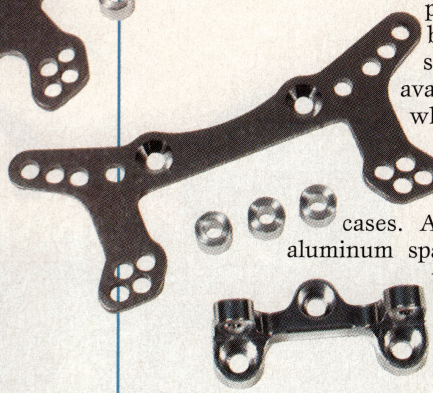
When we showed a photo of Hardcore's Hyperlaminate material in the June '01 issue, Hardcore was bombarded with phone calls from TC3 owners inquiring about this proprietary laminate. Hardcore has been working to fine-tune the Hyperlaminate so that it has the best combination of strength and stiffness, yet still weighs less than stock. The chassis here is a production prototype that is 90-percent final. Aside from minor changes to the machining program, this is what the Hyperlaminate TC3 chassis will look like. The production chassis will come with Hardcore's titanium center brace (the same piece that comes with the titanium chassis) as well as a full set of aluminum standoffs, making the Hyperlaminate a simple bolt-on conversion. Our opinion of this material is that it feels both lighter and stiffer than standard graphite, and it doesn't appear prone to tweaking once bent. Aside from this, the ability to be offered in bright colors (such as this blue) makes this material very trick. Word has it that Hardcore will soon be incorporating this material into designs for other car and truck models.

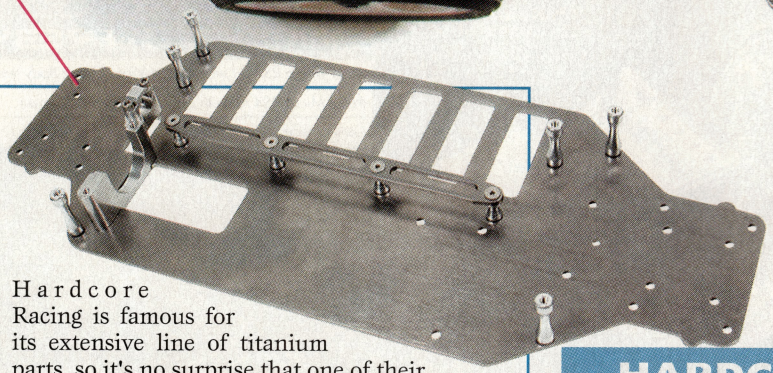






These titanium shock towers from Hardcore are super-stiff and are very light weight, and come in silver, blue, green and purple. Both the front and rear towers feature the same shock and camber-rod mounting holes as the stock molded towers, so you can keep your hot setups. The towers also come with precision machined billet-aluminum standoffs (also available in colors), which are used to attach the towers to the TC3's molded diff cases. Also included are aluminum spacers to maintain the correct shock angles at all four corners.





Hardcore Racing is famous for its extensive line of titanium parts, so it's no surprise that one of their first hop-ups for the TC3 is this beautifully finished replacement chassis kit. Available in silver, blue, green and purple, the Hardcore titanium chassis is a direct bolt-on replacement for the stock molded chassis, and includes a titanium center brace with lightweight, machined aluminum standoffs for extra rigidity. The kit also includes aluminum standoffs for the diff braces as well as for the battery holding strap. An antenna mount isn't included.

HARDCORE TC3 PARTS CHART

Part no.	Description	Price
HCR00220	Titanium Chassis Kit	$ 219.00
HCR00230	Hyperlaminate Chassis Kit	189.00
HCR00227	Titanium Diff Brace Set (front)	36.00
HCR00224	Titanium Diff Brace Set (rear)	36.00
HCR00222	Titanium Shock Tower w/Billet Mount (front)	42.00
HCR00223	Titanium Shock Tower w/Billet Mount (rear)	42.00
HCR00221	Billet Aluminum Servo/Transponder Mount	$32.00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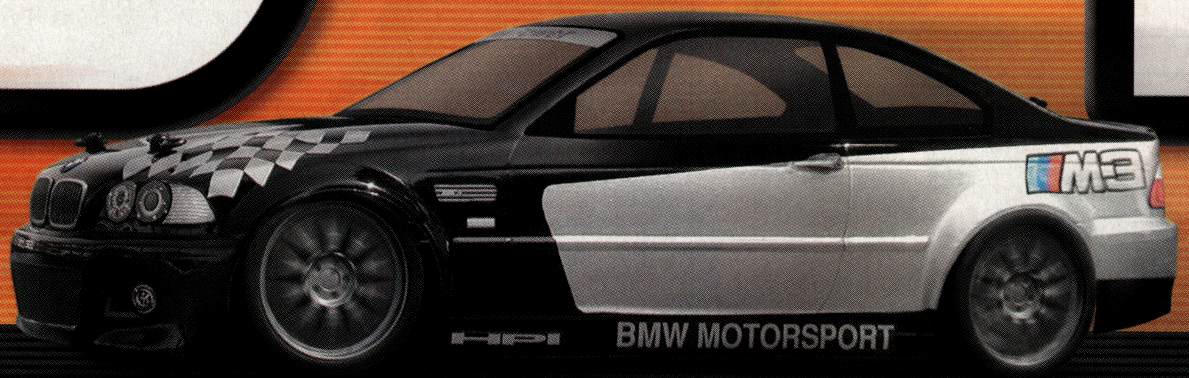
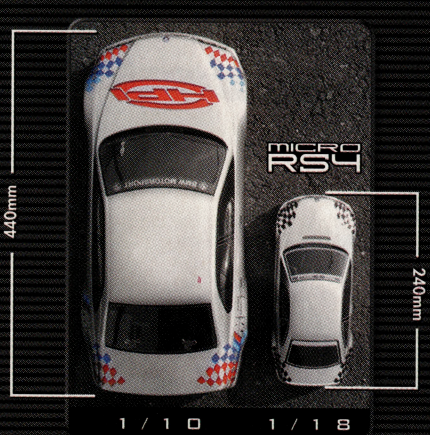
Mopar PERFORMANCE
BOSCH
BBS
MICHELIN
ORECA
• Full-time 4WD
• Complete set of ball bearings
• Front and rear gear differentials
• Uses standard size electronics
• AA or AAA batteries
• 15 to 40 minutes runtime
• Adjustable wheelbase
• Adjustable width
• Front bumper
STANDARD SIZE ELECTRONICS
[Electronics are not included in this kit.]
MICRO RS4
#601 Micro RS4 Kit with Dodge Viper GTS-R Body (W.B. 140mm)
#602 Micro RS4 Kit with BMW M3 Body (W.B. 150mm)
Coming soon . . . Nissan Skyline GT-R . . . and more!
Panasonic
Rechargeable
1100
THREE WHEEL STYLES ARE INCLUDED IN KIT
15 TO 40 MINUTES RUNTIME
SINGLE BELT 4WD DESIGN
ADJUSTABLE WIDTH
COMPLETE SET OF BALL BEARINGS INCLUDED
FOUR WHEEL DRIVE
4WD
MAXIMUM TRACTION ON ANY SURFACE

MICRO RS4





Nearly half the size of a 1/10th scale car, but it handles just like the big cars!

1/18 SCALE 4WD

Introducing the all-new HPI Micro RS4 1/18 scale 4WD kits. The Micro RS4 uses standard sized electronics so you can have race-quality steering and throttle response. Front and rear suspension plus a 4WD system make the Micro RS4 handle great on nearly any hard surface - wood floors, concrete, clean asphalt, low-pile carpet, tile and more! Set up a small track in your garage or living room, the Micro RS4 is perfect for practicing your driving skills... it handles just like a 1/10th scale touring car and lasts almost 40 minutes on a 4 cell Ni-Cd battery pack. But don't let the long run time fool you, the Micro RS4 is fast, almost too fast if you bolt in an optional modified motor. The Micro RS4 is loaded with standard features, and we'll have a wide variety of hop-up parts and optional body styles.

Get ready for the new Micro RS4 . . . small scale, big fun!

Free vinyl decals included in kit... with simulated disk brakes!



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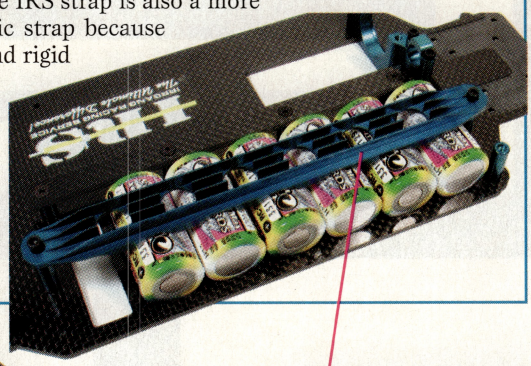
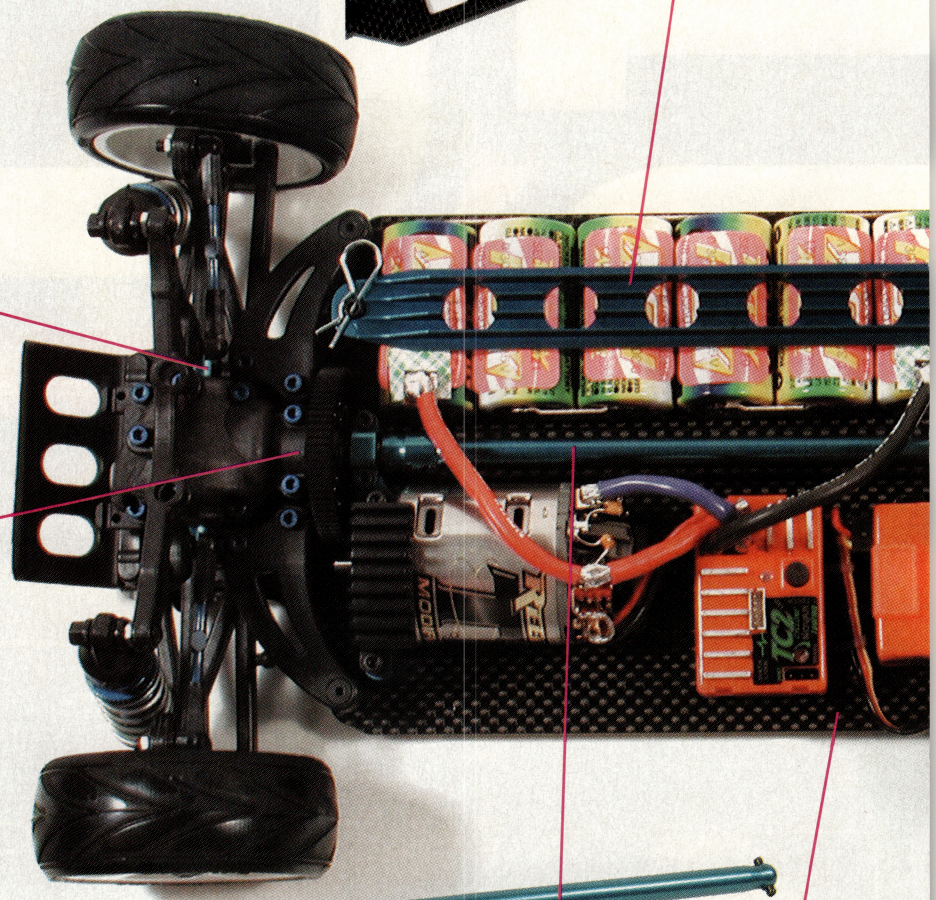
Top TC3 Tuners

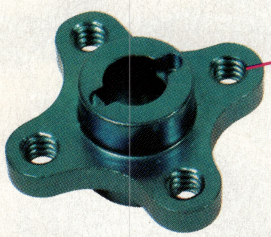
If you want to keep your batteries cool, the IRS Battery Heat Sink Strap is the way to go. With plenty of surface and edge area (thanks to its four large cooling fins) to speed heat dissipation, the IRS strap is also a more secure than the stock TC3 plastic strap because it's machined from lightweight and rigid aluminum (which has been blue-anodized). The downside? Unlike the Associated Factory Team strap, it can't be flipped over to fit stick-type packs. But you're a racer, right? You wouldn't touch a stick-pack with a ten-foot driveshaft!



IRS's Lite Drives replace the stock TC3's molded plastic diff outdrives, and are machined from 7075-T6 aircraft-grade aluminum that's been hard-anodized to minimize wear to the pin-slot area. Although slightly heavier than stock (according to our scale, the Lite Drives are approximately 0.08 ounce heavier), the difference is minimal, and of no consequence when compared to the improved durability offered by the alloy.







IRS's blue-anodized aluminum spur-gear adapter replaces the stock TC3's molded-plastic piece, and offers increased strength at approximately the same weight, plus it looks great!

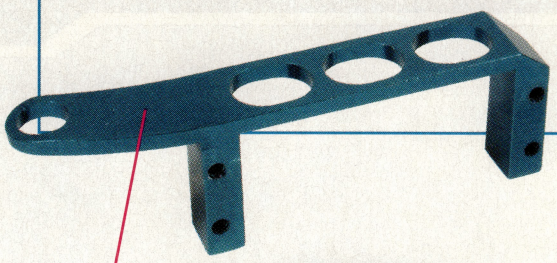
IRS also offers a replacement for the TC3's spiral-wound graphite main drive shaft. Made from lightweight aluminum, the one-piece IRS shaft has press-fit roll-pins at either end, is nearly impervious to twisting forces, and is anodized in a great-looking blue finish.



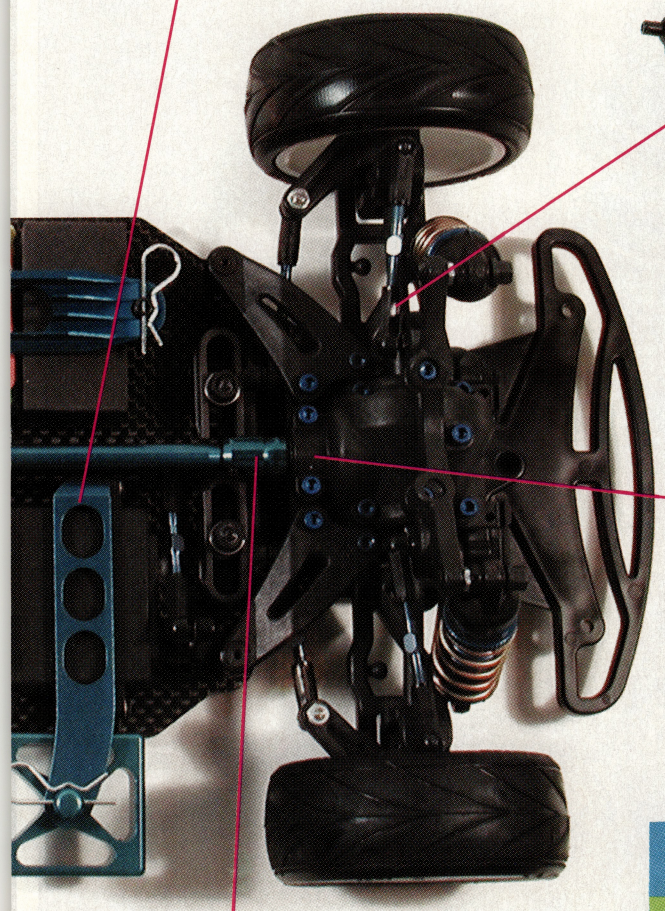
The Graphite Chassis Conversion Kit includes a 1/8-inch thick graphite plate that has seven battery slots, which are in the stock TC3 locations. As this chassis is thicker than the stock molded piece, areas such as where the gearboxes and suspension are mounted have been milled-down to preserve the correct chassis geometry. Additional rigidity is provided by a centrally located graphite brace that is held to the lower chassis by a set of four aluminum standoffs. Removing one or two of the center standoffs provides a way to tune the flexibility of the chassis for different track conditions. A nicely machined blue-anodized aluminum motor-mount is also included, which provides more cooling than the stock chassis' molded mount. Also, IRS includes blue-anodized aluminum standoffs for the stock upper chassis braces as well as for the stock battery strap.

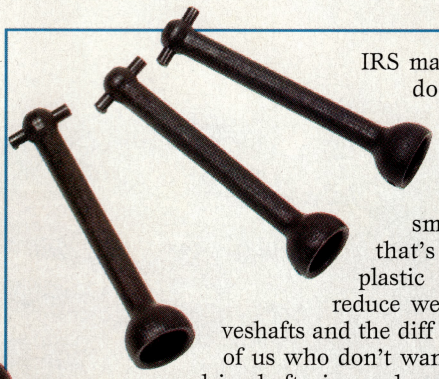


Associated includes a neat Lexan transponder mount with the TC3 kit. But why be ordinary when you can have IRS's combination servo mount/transponder mount? Anodized in blue, this one-piece aluminum piece incorporates a pair of servo standoffs with a "bridge" that extends to form a convenient and secure way to attach a lap-counting AMB-style transponder.

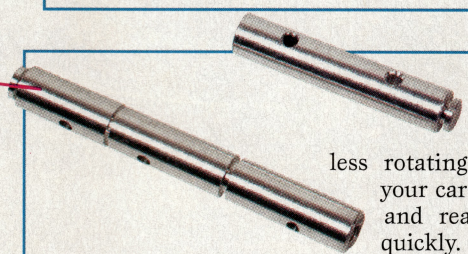


Keeping your motor cool is the only way to get the most power and longevity from this significant investment. IRS has a very nice clip-on heat sink that is designed to work with the stock TC3 motor-adjustment clamp (not the finned Factory Team clamp, which has its own heatsink).

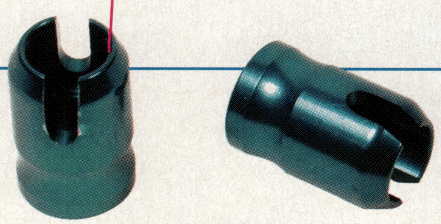




IRS makes these neat little doo-dads called Pin Cushions. What they do is replace the steel pin in the driveshaft with a smaller-diameter pin that's wrapped with a plastic sleeve. The sleeves reduce wear between the driveshafts and the diff outdrives. For those of us who don't want to remove the old driveshaft pins and replace them with the Cushions, IRS now offers a set of four lightweight composite CVD bones with pre-installed Pin Cushions. Reduce drivetrain weight while preventing those annoying notches that develop in your diff outdrives. Sounds like a win-win situation to us.



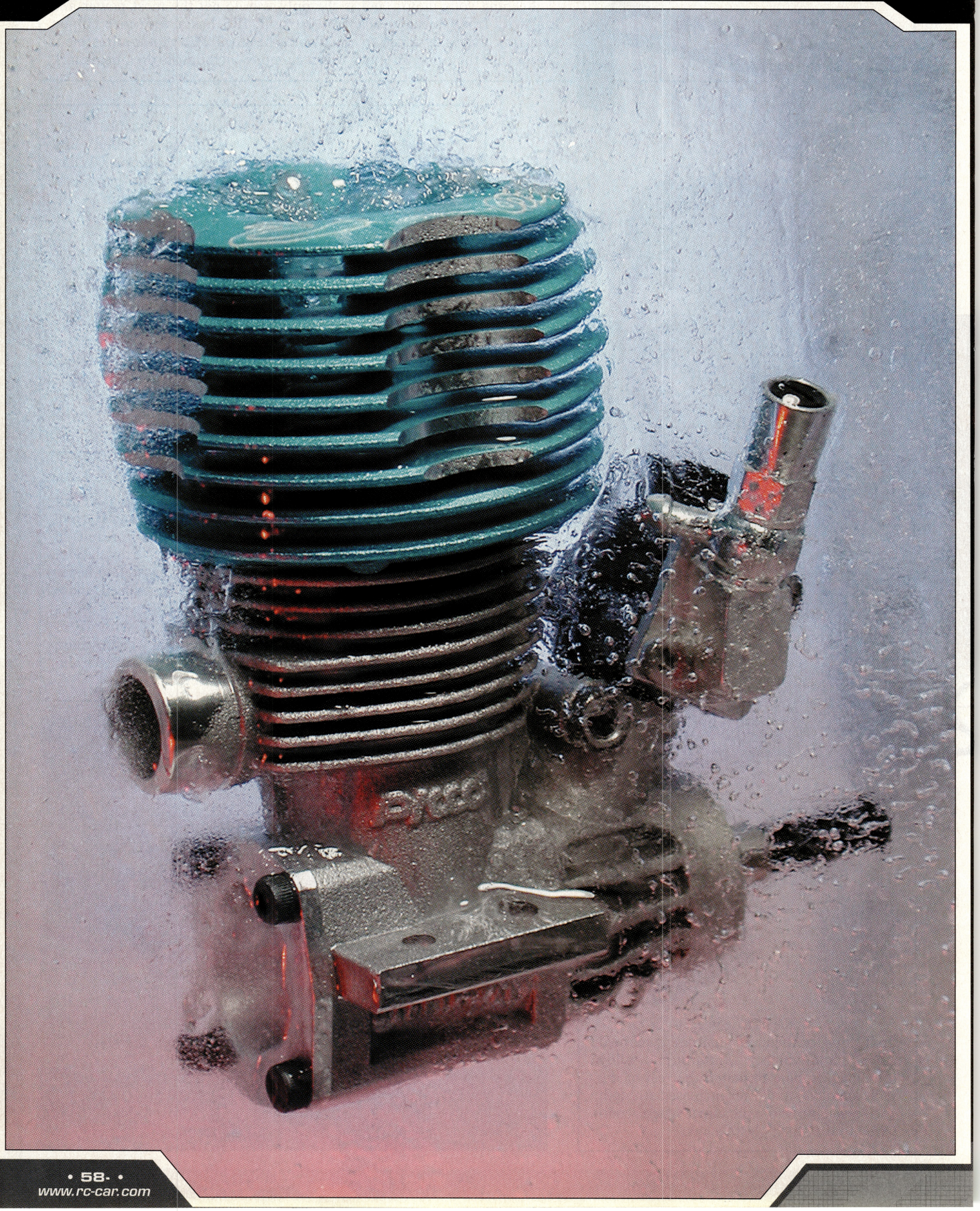
Shedding weight in the car's drive train will result in less rotating mass. Translation: your car will accelerate faster and reach top speed more quickly. Replacing the TC3's steel input shafts with IRS's lightweight aluminum shafts saves quite a bit of weight (more than the difference between the stock outdrives and IRS's aluminum Lite Drives). Well worth the money.



Replacement drive cups for the main shaft are machined from lightweight aluminum alloy (anodized in blue to match the rest of the IRS catalogue) and offer increased strength and resistance to spreading when compared to the stock plastic cups.

IRS TC3 PARTS CHART

Part no.	Description	Price
IRS140	Lite Drives for TC3	$ 30.00
IRS141	TC3 Heat Sink	30.00
IRS142	Battery Heat Sink Strap	28.00
IRS143	TC3 Main Shaft Drive Cups (pr.)	17.50
IRS144	Spur Gear Adapter	20.00
IRS145	Aluminum Input Shafts	17.00
IRS146	Aluminum Main Shaft	22.50
IRS147	Pin Cushions (pr.)	4.00
IRS148	TC3 Servo/Transponder Mount	27.50
IRS149	Composite CVDs w/Pin Cushions (4)	15.00
IRS150	TC3 Graphite Chassis Conversion Kit	179.95
IRS151	Complete TC3 Graphite Chassis Kit (includes 2 pair of Lite Drives, motor heat sink, battery heat-sink strap, drive cups, spur-gear adapter, input shafts, aluminum main shaft, transponder/servo-mount, composite CVDs and IRS150 Graphite Chassis Conversion Kit	329.95
IRS152	Replacement Graphite Chassis & Brace	109.95
IRS153	Replacement Motor Mount & Bearing Cap	54.95
IRS154	Replacement Standoff Set for IRS150	39.95
IRS530	D-Ring Diff Rings (10)	9.00

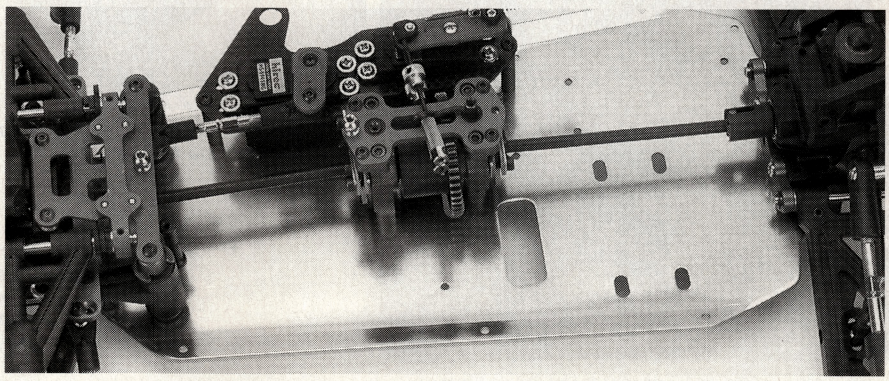


How to Keep Your Engine Running Cool

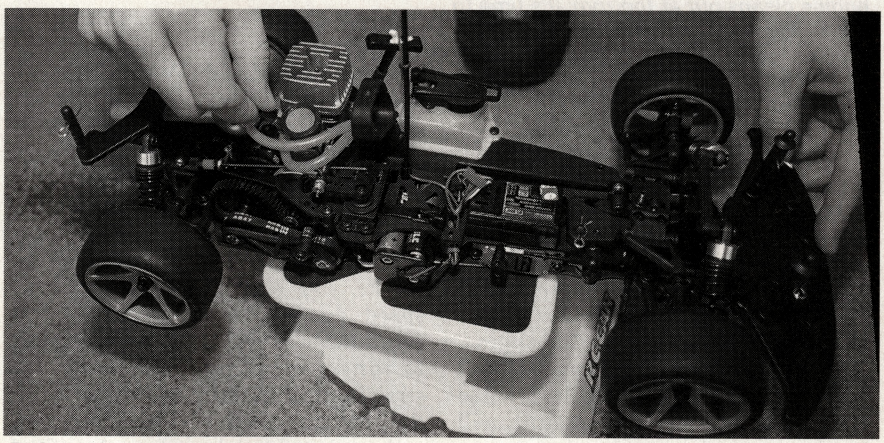
Tips and tricks on how to get maximum engine performance!

By Jack Johnson

As most of you are already aware, a key factor in finishing races or extending your leisure time with any fuel-powered vehicle is keeping the engine running. Fuel-powered cars and trucks are very durable these days. Ending a session due to a broken part is far less common than the dreaded flame-out. Engine temperature is very important in keeping the engine running for long periods of time. The ideal temperature range for .12- to .15-size engines is 220 to 260 degrees. Optimum temperature range for .21-size engines is a bit lower, around 210 to 250 degrees. If you find that your engine is running hotter than this, keep reading; some of the following pointers are sure to help you. If you don't have access to a temperature gauge, but keep suffering from engine flame-outs, these tips can still help you keep your engine running—and running cooler!



To help keep your engine cool, make sure your drivetrain is free of binding



Before you change any needle settings, make sure your engine is up to temperature.

Free and Easy

Just as in electric-powered vehicles, but for a bit of a different reason, the drivetrain of the vehicle should be as free as possible. Blown bearings, rubbing axles, or any other drag in the drivetrain will result in increased engine temperature, not to mention less top speed. The drivetrain should be maintained regularly. Any damaged or seized bearings should be repaired or replaced. Any moving parts rubbing on other components should be corrected by adding clearance. Basically, the more free the drivetrain, the better. A smooth drivetrain can go quite a ways in reducing engine temperature.

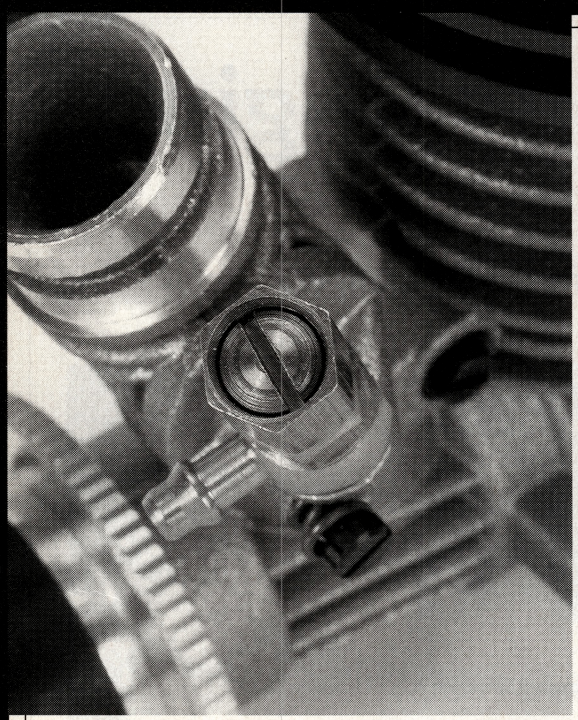
The right "Go-Go Juice"

It is very important to only use fuels specifically formulated for use in R/C cars. Fuels for R/C airplanes just won't work. Due to the fact that car engines are nested in the center of the vehicle, allowing for very little airflow, different types and percentages of oils are required in the fuel to keep temperatures lower. A few common brands of fuels available are O'Donnell, Trinity, Blue Thunder, and Byron Originals. All of the top fuels are very good.

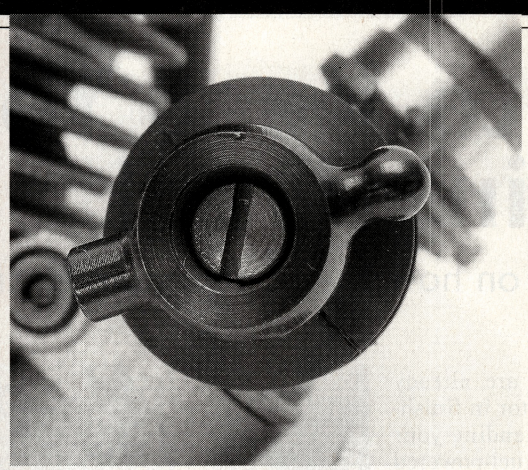
For .12- to .15-size engines, 20-percent fuel works well. A higher nitro content could be used, but the end result would likely be too much horsepower and increased engine temperatures. For .21-size engines, 30-percent is the most common. Again, a higher nitro content could be used, but the engine will run a bit hotter. There is really no reason to run higher than 20-percent for .12- to .15-size and 30-percent on .21-size engines.

Be Patient

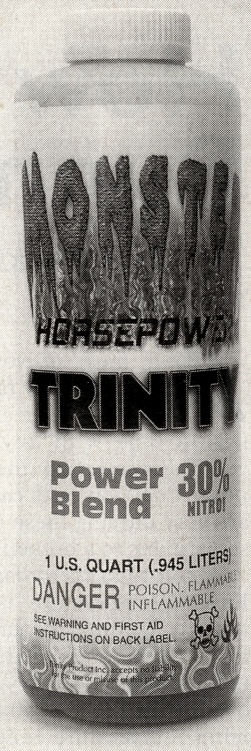
Probably the most common mistake made when tuning engines is not waiting until the engine is warmed up. If you attempt to tune an engine immediately after starting it, the engine will run very hot. The reason for this is that as the engine warms up, the tune will become leaner. Less fuel flow (leaner tune)



The high-speed needle should be tuned first when dialing-in your engine. Once the engine cleans out at top rpm, it's time to adjust the low-speed needle.



Adjusting the low-speed needle has the most impact on engine temperature.



Certain nitro contents are better suited for different size engines. This bottle of 30-percent Trinity fuel is best used in a race-oriented .21 engine.

can increase top speed a bit, but the engine will run much hotter as a result.

If racing, try to start your engine a few minutes before the start of your warm-up session. This will get the engine up to temperature and allow you to tune it during warm-up. If you are not racing, simply run your vehicle for three or four minutes before attempting to tune the engine. Adjusting the needle valves (both high- and low-speed needles) while the engine is up to temperature will produce a much more consistent tune and help keep the engine running cooler overall. You will notice that a properly tuned engine will run a bit rich immediately after starting it—prior to warming up.

Adjusting the Needles

The easiest way to adjust the needle valves is to start with the high-speed needle. You will want the engine to "clean out" on the long straightaway. Once you have the engine running good at high speed, with little to no "gurgle," it's time to take a look at the low-speed needle.

The low-speed needle has the most impact on the overall engine temperature. As the vehicle slows down, and airflow is reduced, the only means the engine has to stay cool is the fuel flowing through it. This low-speed fuel flow is controlled by the low-speed needle. You should see a good deal of smoke coming from the pipe during acceleration. If there is little to no smoke you should richen the low-speed needle setting by turning it counterclockwise. If the engine tends to run-on or rev up at the end of a straight after backing off of the throttle, the low-speed needle is too lean and needs to be richened up. As a final test, try letting the vehicle idle for 10 to 15 seconds and grab full throttle. The vehicle should accelerate with little hesitation. If the engine starves for fuel, you need to richen the low-speed needle. If the engine chokes on too much fuel, or spits excessive fuel out of the pipe, you should lean out the low-speed needle a bit.

Once you are comfortable with the low-speed needle setting, run the vehicle for a minute or so. Check the temperature. If the temperature is a bit high, richen the low-speed needle. Run for another minute or so and check again. Remember those magic temperature ranges: 220 to 260 degrees for .12- to .15-size and 210 to 250 degrees for .21-size engines. Try to adjust the low-speed needle to allow your engine to fall within these ideal ranges.

Mama Needs a New Pair of Shoes

A frequently overlooked area which can also increase engine temperature is the clutch. If the clutch is engaging too soon, the engine will bog and temperatures will rise. Another indication that the clutch is engaging too soon is a hesitation in acceleration. If the engine rpm rises and the vehicle start to move, then hesitates before continuing on, the clutch is engaging too soon.

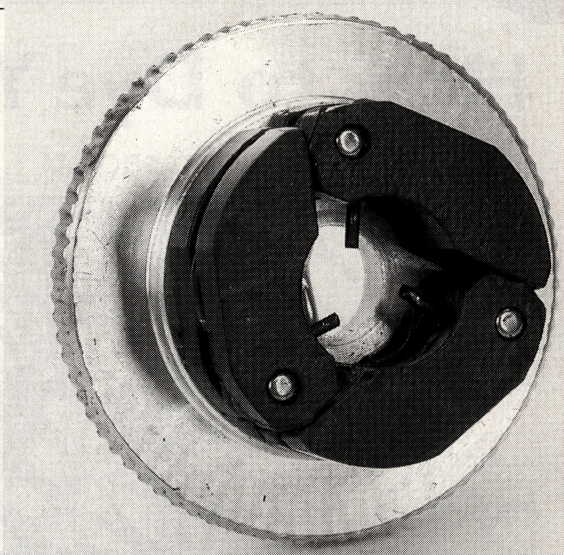
In order to force the clutch to engage later, you will need to lighten the clutch shoes. Techniques for this could span an entirely separate article. We'll cover the basic concept here. It is recommended that you check with your local hobby shop or stop by a nearby track for some guidance with this adjustment.

The gist of the idea is to remove a bit of clutch shoe material from the area of the clutch shoe not contacting the clutch bell. This will cause the

clutch to engage later—once the engine reaches higher rpm. The end result of this adjustment is less engine bog and, as an added bonus, reduced engine temperatures. The vehicle may also benefit from quicker acceleration.

Following these few pointers should help you keep the engine temperatures below that of "melt down." It is really helpful to use a temperature gauge when tuning any engine. There are a couple of good manufacturers of temperature gauges available. One manufacturer is Raytek. Raytek offers two models of temperature guns—one with a laser sight and one without. Another manufacturer is Exergen. The D-Series models from Exergen work great.

If you don't happen to have a temperature gauge, it is recommended that you stop by a local track and see if you can get a hand from someone there. They should be able to either help you tune you engine or let you borrow their temperature gauge while you tune your engine. ❑



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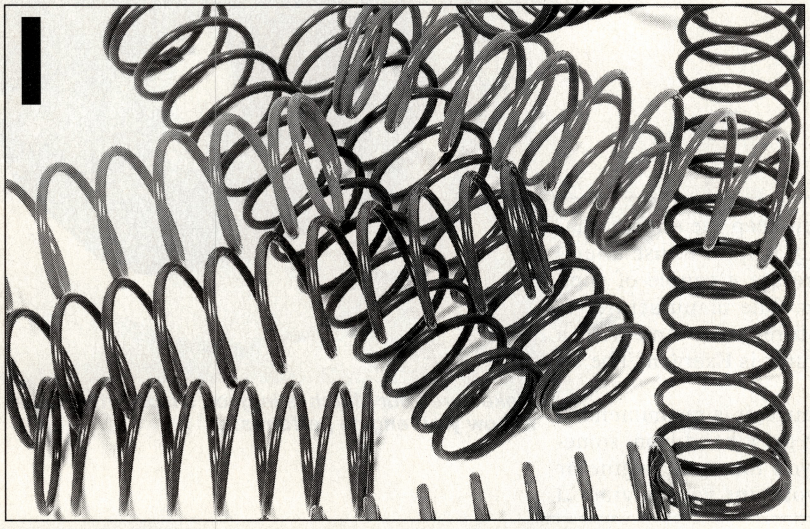
How to Dye Your Shock Springs

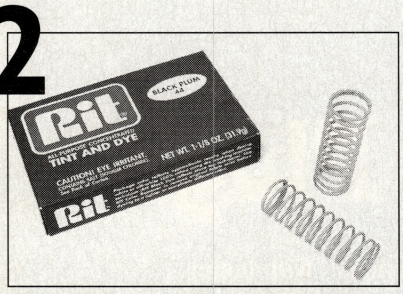
Keep your hot setup secret!



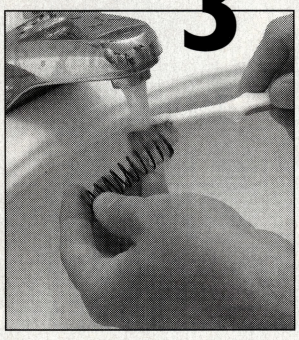
Most manufacturers color-code their springs by stiffness. This makes for easier identification, but also allows your rivals to figure out your hot setup. Many pro drivers use fabric dye to change spring color and throw their competitors off the scent.

Whether it's setup, paint or hop-ups, every racer likes to make his car or truck stand out from the crowd. But what do you do when you've already got all the hot bolt-ons, and your paint job is dialed? How do you give your ride that ultimate factory one-off look? If you've ever seen a pro driver's car up close, you may have noticed that they often do things to "hide" their hot setups from their competitors. One of the most popular techniques is to remove or modify the color-coding of the shock springs.

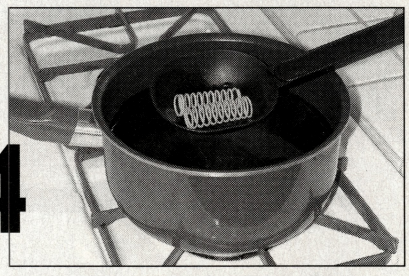
In the past, the hot setup was to actually grind away the factory powder-coating, which left behind a "works" looking raw steel finish. However, unless you had access to a bench grinder, this technique was very time-consuming (it once took us 20 minutes just to strip one spring), and because it's important to change shock springs with regularity (as they eventually lose some of their tension), the effort was not worth the look. Fortunately, clever racers have discovered an easier method of disguising their springs—regular old fabric dye! The following steps will work on most types of powder-coated shock springs, and just about any colored fabric dye will be adequate, although we recommend Rit brand.



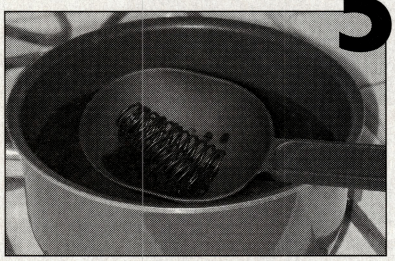
Most any type of fabric dye will work, but darker colors such as black work best. If you try to dye your darker springs to a lighter color, you might end up with an ugly mix of both colors—the original spring color and the color of the dye.



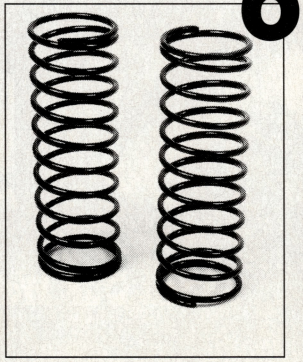
Unless you are going to be dying new springs, you must clean all dirt and oil from the springs prior to dying them. Use any form of cleaner or solvent and a stiff toothbrush. Make sure that the entire spring is clean, or else the color will turn out spotty.



First, bring a pot of water to a boil (this helps the dye to penetrate the powder coating). Add the dye to the water as it boils and mix it thoroughly.



Reduce the heat so that the water stops boiling, then add the springs to the dye solution. The brightness, or penetration of the color, depends upon how long the springs are allowed to sit in the solution.



Once the springs are the desired color, remove them from the solution and rinse them well with cold water to remove any excess dye and to cool the springs. Allow the newly dyed springs to dry and they'll be ready for use. Now you'll have that ultra-trick factory look, and your competitors will be scratching their heads wondering where you found those trick springs!

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TEST DRIVE

Nuova Faor SF501 Motorcycle

When we first stumbled across the Nuova Faor SF501 motorcycle at the recent ROAR Gas Nats in Hemet, California, we were blown away! In particular we were blown away with the stunning quality of the machine. For those of you who are into gas racing and are familiar with the Nuova Faor name, then this should come as no surprise. The Italian company Nuova Faor has made a name for themselves by producing some of the most spectacular aftermarket products for 1/8-scale off-road buggies. This new 1/5-scale motorcycle is just a continuation of the high-quality product that comes out of their factory.

The bike was on display in the National R/C pits—for those of you who don't know, the good guys at National R/C are the importers of the complete line of Nuova Faor parts. A week or two after the race, we were greeted with a nice little care package from National—our own SF501 kit to try out! Needless to say, we split from the office right away to start working on putting the bike together. Let's check it out!

Things you'll need

- Motor (24-degree stock motor recommended for first-time cyclists!)
- Radio gear (with one servo for steering)
- ESC
- Six-cell battery pack
- Battery charger
- Paint for Lexan body and driver figure
- CA for tires

First and foremost, we have to tell you that unless you are an experienced R/C builder, this kit is a total pain to build! If you are new to the hobby, spare yourself any headaches and have an experienced R/C builder help you along. It's not that the kit itself is difficult; our criticism is based on the poor instruction manual the kit comes with. Nowadays we've become so spoiled with all these high-tech instruction manuals, with all their explicit detail, step by step photos and exploded views, that nothing less will do! The Nuova Faor instructions can be vague, and while they do have some exploded views and minimal photos, it's just not enough. So with that bad bit of news out of the way, let's get on to good news and discuss the bike's otherwise outstanding features!

Exquisite Chassis Design

Once you have the main chassis assembled, take a break and step back and look at how cool it looks sitting on your workbench. Without the Lexan motorcycle side fairings and driver figure, you are greeted with an ultra-unique looking chassis design. As a matter of fact, the main chassis is so unique-looking that it's tempting to run the bike without the Lexan coverings! The chassis itself is made up of a variety of different size aluminum alloy plates positioned together to make a rigid skeleton. Here are some of the chassis design's more unique features, as well as the other significant items found on the bike—

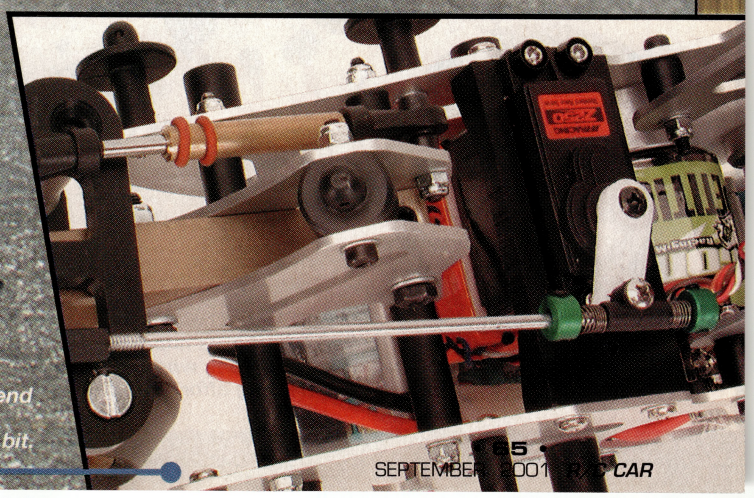
- Nestled in between the chassis plates are the steering servo mount and a receiver bracket. The ESC can be mounted directly in front of the motor, balanced between the two lower aluminum bars that hold the chassis pieces together.
- A six-cell battery pack is used to power the bike, which is positioned at the very bottom, underneath the chassis, helping to provide as low a center of gravity as possible.
- Mated to the front of the chassis is a set of fully-functional, spring-loaded forks. The alloy-tube front forks are made from fairly beefy material and should hold up quite well if you should smack head-first into an object. Which brings us to…
- A spring-loaded anti-impact system helps protect the front forks in the event of a head-on collision with an object—like that curb that keeps getting in the way.
- A solid, gold-anodized, one-piece aluminum rear swingarm compliments the gold anodized aluminum three-spoke wheels. Handling the rear suspension damping is a single oil-filled coil-over shock with a threaded body for quick and easy spring pre-load adjustment. The shock comes pre-assembled which helps speed things up a bit. In addition, it had ultra-smooth action to it—one of the



WHY, OH WHY CAN'T WE BE ACTION FIGURES?

Equipment Used

- JR XR3
- Novak Cyclone ESC
- JR Racing Z250 servo
- Fantom 24-degree stock motor
- Reedy 3000mAh battery pack



Check out the steering damper on the front end (the piece with the two rubber O-rings). This piece helps smooth out the steering quite a bit.

Nuova Faor SF501 Motorcycle

smoothest shocks we've ever come across!

• The SF501 gets the power from the 540-size motor (not included) to the rear wheel via a pinion/spur initial drive, through a chain driven counter sprocket/sprocket final drive arrangement. And we have to tell you that the metal chain is very realistic! It even has a small master-link that you need to pop-off to take the chain on and off. In addition, there is a chain-tension adjustment screw on the back of the swingarm to take away any unnecessary slop.

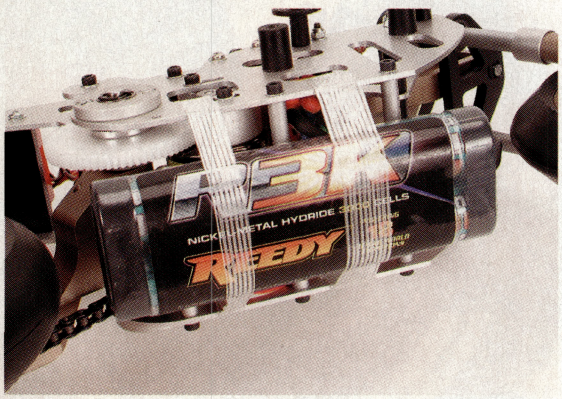
• A solid rubber front tire helps the bike carve through the streets like it's on rails, while a slightly softer, more hollowed-out rear tires helps the bike get the grip it needs to launch off the line.

• A Lexan body (complete with front and rear fenders) and separate Lexan driver figure come with the motorcycle. The Lexan figure takes most of the abuse after many hours of spills and thrills—we've seen examples of SF501 owners eventually replacing the Lexan rider with a similar scale-sized action figure from a toy store. G.I. Joe better get that Kung-Fu grip nice and ready if he wants to take this bike for a spin!

• In order to help preserve the motorcycle's Lexan body, a pair of half-circle piano-wire pieces are used as side guards. These "crash-guards" are mounted to each side of the chassis, not the body itself for a more secure arrangement.



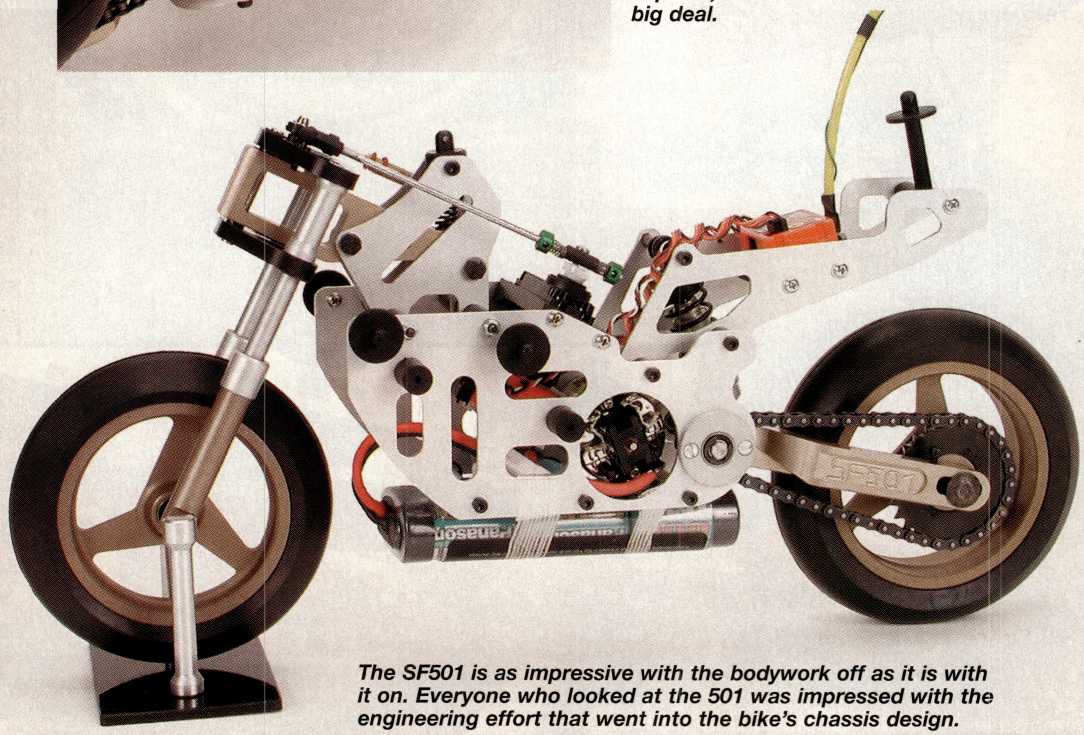
The SF501 comes with a front fork stand that helps keep the motorcycle in the "upright and locked" position.



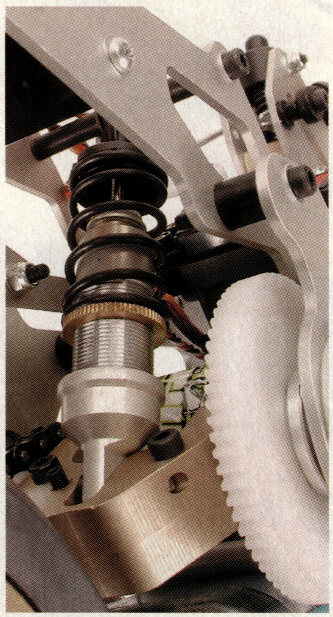
You can hold the battery in place with a thick rubberband, but we opted to use some heavy-duty strapping tape to secure our stick pack. It's a pain to do this every time, but we plan on keeping this pack in place, so it's no big deal.



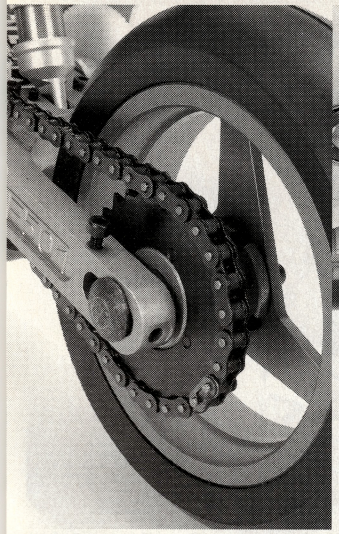
The receiver is nestled up towards the top of the chassis, above the rear tire on an included receiver "shelf."

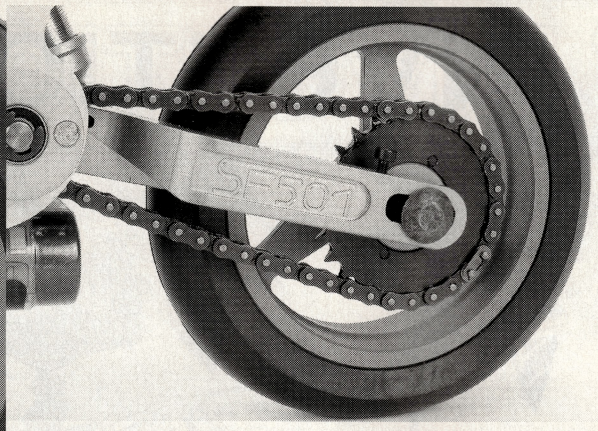


The SF501 is as impressive with the bodywork off as it is with it on. Everyone who looked at the 501 was impressed with the engineering effort that went into the bike's chassis design.



This alloy, threaded, adjustable rear shock is one of the smoothest shocks we've ever felt.

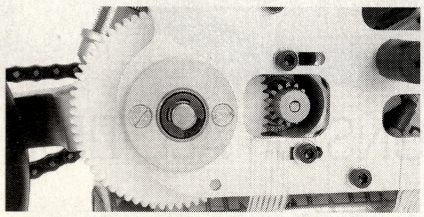




The ultra-realistic drivetrain on the SF501 uses a chain-drive setup with a steel rear sprocket. Chain droop can be adjusted by loosening a screw and re-positioning the rear sprocket.



The front forks use springs to handle the damping action.



A nylon spur gear/pinion combination gets the power from the stock motor (stock motors are recommended) to the rear sprocket.

Performance

With radio in hand we set out to the widest parking lot we could possibly find for our initial run—your first time running the bike should be on a wide enough area to ensure you don't smack the bike up too much! First and foremost, the most important thing you need to do is to reverse your steering servo on your radio. The reason being is that the motorcycle doesn't actually "turn", it leans over which then initiates the turn in the opposite direction. Also, another tip is to use the crash guards even though it takes away from the bike's scale looks—your body set will last much, much longer.

With that said, with our charged up Reedy 3000 pack we fired up the bike. It took a little time to get a handle on driving the bike (what we mean to say is we crashed it a few times...), but after a few attempts, we started to get the hang of it. The soft rear tire really helps the bike get started and also provides good traction on asphalt, and the stock motor propels the machine to decent top speeds! After we went through the first pack, and charged it again, we were much better at driving the bike the second time around—like we said earlier, it does take time to get used to its quirky handling traits. It's a blast watching the bike zip around a parking lot. Luckily, we managed to keep the thing on its wheels more than off. With time we expect we'll be pulling big wheelies up and down the street!

THE GOOD

- Nuova Faor quality—it doesn't get any better! All the pieces used are made from top-of-the-line material.
- It's tricky to get the bike moving, but once you've mastered the necessary driving technique, be prepared for some of the most unique and exciting R/C driving you'll ever experience.
- The 1/5-scale SF501 looks awesome driving around out on the street—we can't even remember the number of people that had to stop and ask us questions about the bike.

THE BAD

- As we mentioned earlier, Nuova Faor's instruction manual is pretty bad, and at times during assembly, the manual is no help at all. The exploded views on some of the pages were so faded that we couldn't tell what went where. If it weren't for the actual step-by-step photos in the manual, we would have never gotten finished. It's not the most difficult kit to assemble, but if Nuova Faor would re-vamp their manual, it would be a breeze to put together!

THE VERDICT

If you are into street bikes, then you owe it to yourself to check out the Nuova Faor SF501. Even those who aren't interested in street bikes but are interested in really unique R/C engineering should give it a look. Without a doubt, Nuova Faor's quality is top-notch, and the overall design of the machine is one of a kind. As stated earlier, the instruction manual isn't the greatest on the planet, but we feel that the overall quality of the machine far outweighs that minor grievance. It takes a few times out to get used to how it drives (it's a little awkward at first), but once you get the hang of driving it, you'll be carving around the streets with the SF501 like an old pro! ❑

SPECIFICATIONS

Type	RWD electric motorcycle
Scale	1/5
Retail price/street price	$349.99
Length	410mm
Wheelbase	290mm
Height	240mm
Weight (RTR)	1150g.

Transmission:

Type	Chain driven/rear-wheel drive
Differentials	None
Driveshafts	None
Bearings	Full set ball bearings

Suspension:

Type	Front forks/adjustable oil-filled coil over shock for rear
Material	Plastic/Steel

Front end:

Caster	Non-adjustable
Camber	Non-adjustable
Toe	Non-adjustable
Down-travel	Non-adjustable

Rear end:

Anti-squat	Non-adjustable
Camber	Non-adjustable
Toe	Non-adjustable
Down-travel	Non-adjustable
Shocks	Threaded-body, oil-filled coil over
Springs	Stock kit black
Wheels	3-spoke alloy wheels
Tires	Racing slicks
Insert	None
Body	Stock Nuova Faor motorcycle with Lexan rider figure

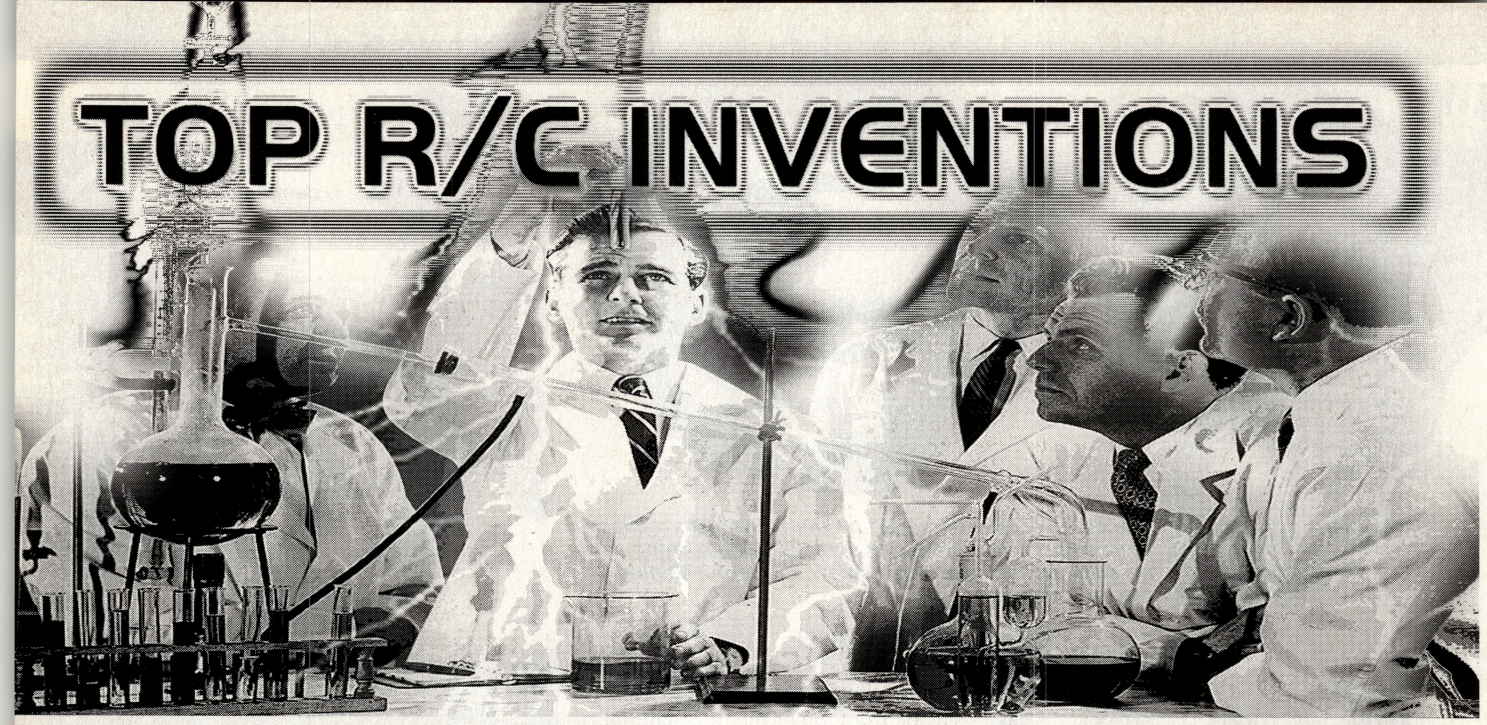
SOURCES

National R/C, 2112 Madison St., Suite 6, Everett, WA 98203 • (425) 265-1199

JR Racing, distributed by Horizon Hobby Distributors Inc., 4105 Fieldstone Rd., Champaign, IL 61821 • (217) 355-9511

Reedy Modifieds, distributed by Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626 • (714) 850-9339; (714) 850-1744 fax.

TOP R/C INVENTIONS



THE BEST RADIO CONTROL INNOVATIONS OF ALL TIME

In the relatively short history of R/C cars, there have been many innovations—some good, some not so good. But among these, there have been several significant developments that have served to make the hobby easier and more fun for all of us. Here are some of what we feel have been the most significant and clever inventions in the world of R/C cars.



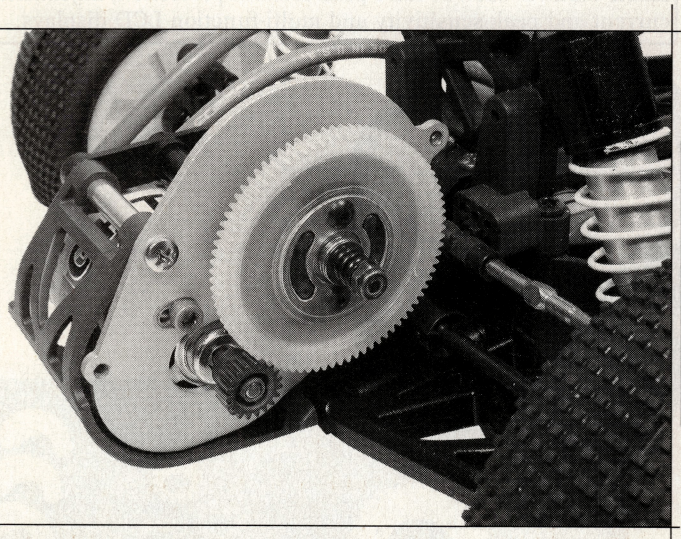
Multi-model memory

Before the advent of computer radios, we had to either buy one radio for each car we owned, or we had to re-set the trims and travels to switch from one car to another. With the multi-model memory feature found in computer radios, we could store settings for several cars (the Airtronics Caliber, the first car radio to offer multi-model memory, could store settings for three models) on one transmitter. Modern computer radios can store as many as 10 or more models, and with the help of expansion memory cards, some can store over 20!

Electronic speed control

Along with the advent of the SCR NiCad cell, no other R/C invention has had the impact on the electric market as the electronic speed control. Early electric cars used mechanical resistors and wiper arms that were inefficient and unreliable. The electronic speed control replaced bulky servos and resistors with efficient, solid-state security and reliability far beyond any mechanical speed control. As an additional bonus of the ESC's improved efficiency and smoother throttle response, motor manufacturers could make hotter winds without over-taxing the current battery technology. Today, ESCs are more powerful than ever, with programmable features, incredibly efficient transistors and they're half the size of the original models. We shudder to think of where electric racing would be today were it not for the ESC!





Slipper clutch

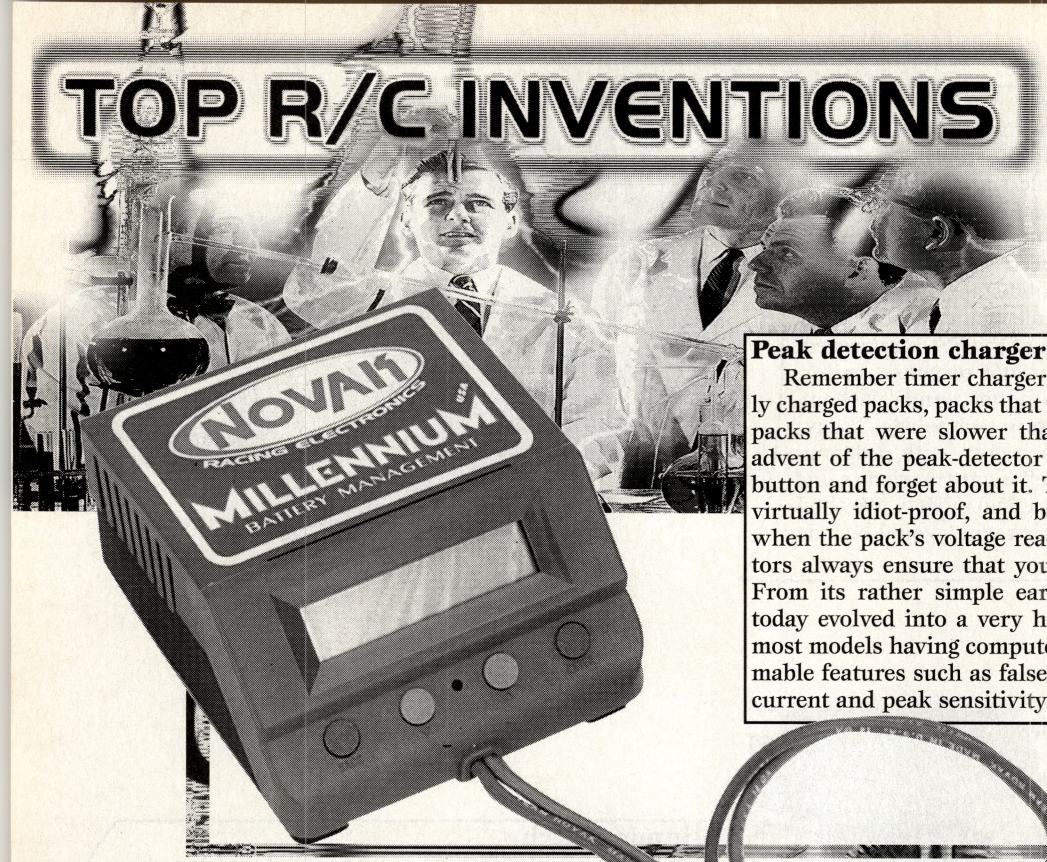
When the ball differential was introduced for off-road cars, it ushered in a new era of performance. However, in order to reduce wheelspin and drive rain wear, the ball diff had to be allowed to slip slightly. Unfortunately, this slippage resulted in reduced diff performance and decreased longevity. Enter the adjustable slipper clutch, which shouldered the brunt of the slipping duties and allowed the diff to perform as it was intended, and with a much longer life.

Tamiya TA01

When Tamiya modified its Manta Ray 4WD buggy to function as a street chassis, they had no idea that the resulting car—the TA01 Nissan Skyline GTR—would spawn a class that, nearly one decade later, would rival the popularity of off-road. Prior to the TA01, on-road cars weren't even remotely to scale, but the 190mm-wide Skyline was a near perfect scale replica of the full-size car. Since the TA01, touring cars have become increasingly sophisticated and are capable of speeds and handling far beyond their progenitor. For us, however, the TA01 remains the most important touring car of all time—the one without which there'd be no TC3, RS4, XXX-S or, for that matter, Tamiya's own TA04!



TOP R/C INVENTIONS

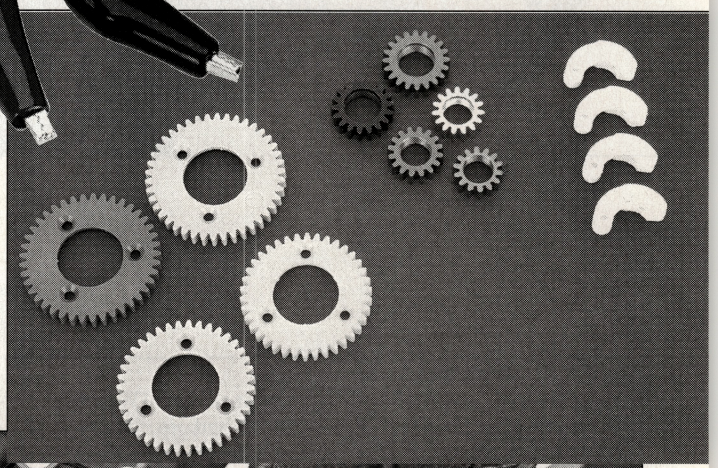


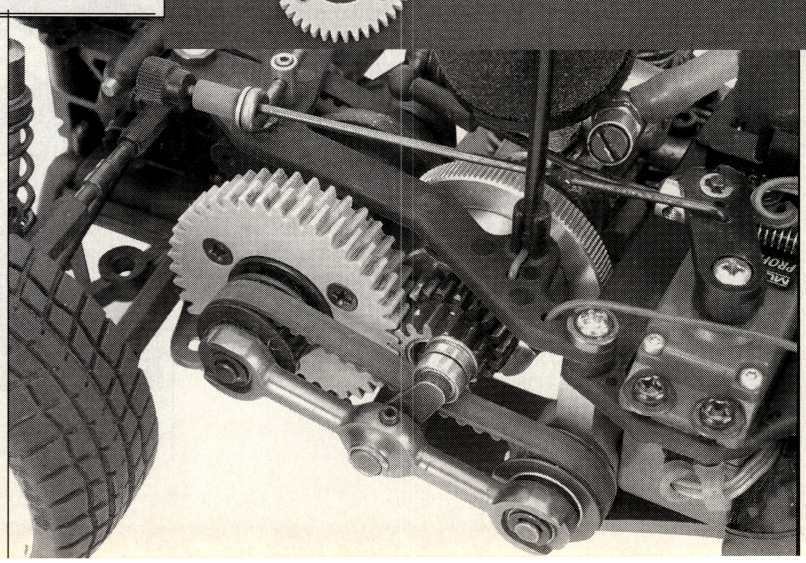
Peak detection chargers

Remember timer chargers? We do. We also remember partially charged packs, packs that were cooked from overcharging, and packs that were slower than sin. All this changed with the advent of the peak-detector charger. Plug in the pack, push a button and forget about it. The peak detector makes charging virtually idiot-proof, and because it automatically shuts off when the pack's voltage reaches its highest point, peak detectors always ensure that your batteries perform at their best. From its rather simple earliest form, the peak charger has today evolved into a very high-tech piece of electronics, with most models having computerized control and myriad programmable features such as false-peak lockout protection, adjustable current and peak sensitivity and multi-function LCD displays.

Two-speed transmissions

The problem: how to make a nitro engine car accelerate quickly on the tight infield turns, yet pull hard all the way down the straights? The solution? Multiple-speed transmissions. Originally developed for 1/8-scale on-road racers, multi-speed transmissions allow the car to maximize the powerband of the engine without compromise. During the early years of multi-speeds, several designs used as many as three gear ratios; however, it was later determined that two speeds were plenty. The basic construction of the modern two-speed is utterly simple and effective, using a centrifugal clutch to switch between ratios at a pre-determined rpm. Today, two-speeds aren't relegated to 1/8-scale; they are being widely used on 1/10-scale on-road and off-road vehicles with great success.u





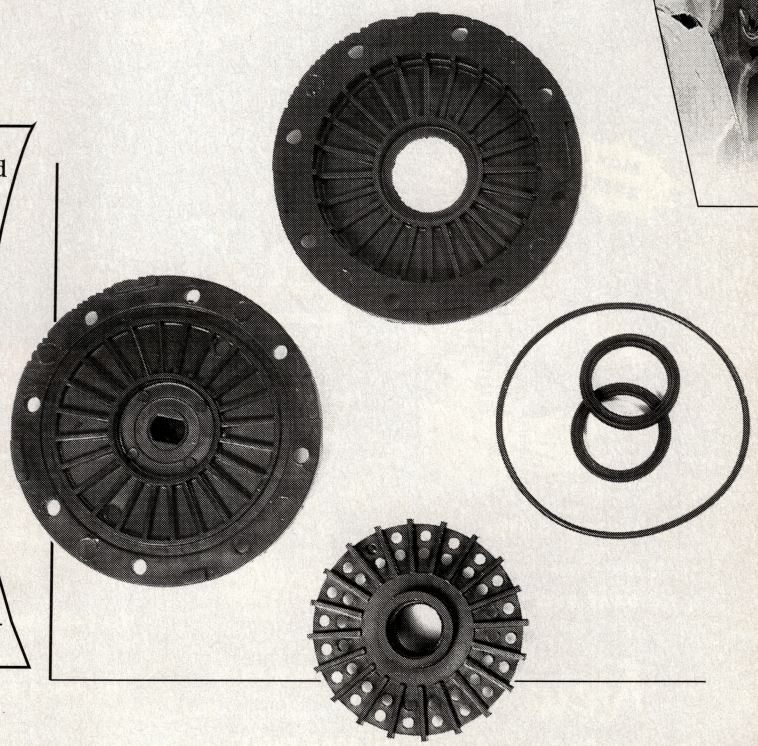


Synthesized radios

Hitec pioneered a revolutionary synthesized radio transmission system for its airplane radios which essentially made standard frequency crystals obsolete. With the release of its Spectra module for the Lynx 3D radio, Hitec has brought this technology to the R/C car market. With the Spectra, there is no need for a transmitter, or Tx , crystal; you simply dial-in the desired frequency and the Spectra does the rest. Of course, you still needed a standard receiver crystal; that is, until Novak unveiled its own synthesized receiver, the XXtra, which, we've been told by Novak, will be able to work with the Hitec Spectra. The result is crystal-less communication between the radio and receiver, and no more frequency conflicts at the track!

Losi Hydra Drive

The scene was the '91 IFMAR Off-Road World Championships in Detroit. The loamy track was by far the bumpiest any of the competitors had seen, and the cars were being thrown about like clothes in a dryer. The prototype Losi "XX" (actually prototypes of the Pro SE) buggies, however, seemed to have an advantage through the gnarly sections. This was in fact due to a unique device called the Hydra Drive. Designed by Gil Losi, Jr., the Hydra Drive was a fluid-filled, viscous coupler that worked in conjunction with the traditional slipper clutch to greatly decrease wheel slip on bumpy and slick surfaces. Although Losi driver Kyle Reed lost the 2WD to Masami Hirosaka, the Hydra Drive made its mark and was put into production as an option for the Pro SE, then as standard equipment on the Double-X buggy and Double XT truck. Softer tires and smooth, blue-groove tracks have made the Hydra Drive less effective, but Gil Losi, Jr. still believes that the Hydra Drive provides an advantage in certain conditions.



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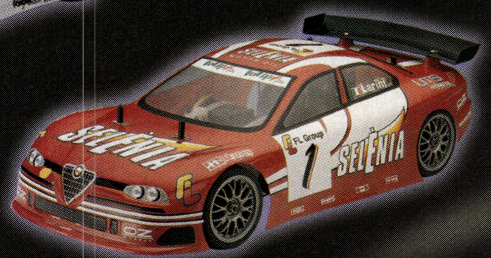
The TS4n Super Combo comes with either the Viper or Mercedes body. Seven other painted bodies are available separately.

TTR 6181-F TS4n Mercedes Super Combo
TTR 6186-F TS4n Viper Super Combo

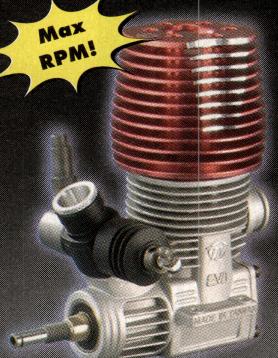


PD1101 Alfa Romeo



Wheelbase: 265 mm
Front Track Width: 200 mm
Rear Track Width: 200 mm
Weight (dry): 1660 grams

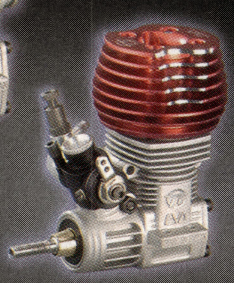
Max RPM!



No. 9470 EVO-21RL
2,500~31,000 Practical RPM
2.1/29,000 Output (BHP/RPM)

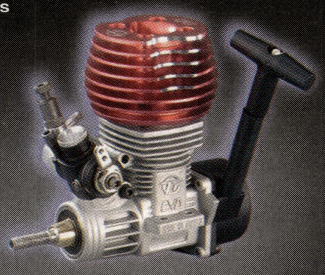
No. 9471 EVO-21RS
3.000~40,000
2.1/31,000

EVO COMPETITION ENGINES



No. 9460 EVO-12 (P)
2,500~31,000 Practical RPM
0.8/30,000 Output (BHP/RPM)

No. 9464 EVO-12
2,500~31,000
0.9/30,000



No. 9461 EVO-12X (P)
2,500~31,000 Practical RPM
0.8/30,000 Output (BHP/RPM)

No. 9465 EVO-12X
2,500~31,000
0.9/30,000



Radio Included and Installed



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New Race Engines

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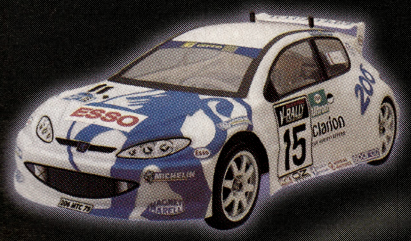
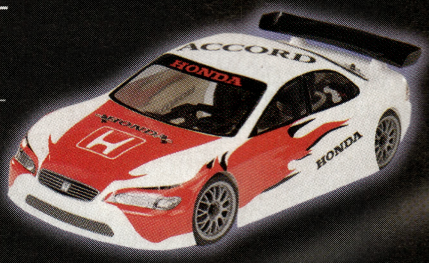


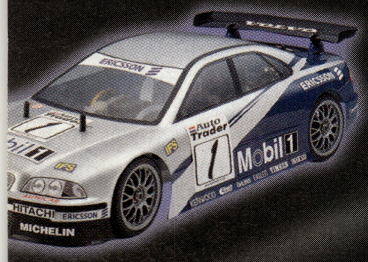
PD1071 Peugeot 206



PD1095 Honda Accord



PD1068 Subaru Impreza



PD1097 Volvo S-40



PD1091 Dodge Stratus



PD1065 Ford Focus

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Front Kick-Up:	5°
Rear Anti-Dive:	2°
Weight (dry):	3300 grams

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TEST DRIVE

GS Racing Storm

When 1/8-scale off-road racing was at its height of popularity, there were two major players—Kyosho and Mugen. Nowadays that's not necessarily the case as more and more companies are pushing 1/8-scale off-road development. One of the newest players to enter this segment is General Silicones—a company with many years involvement in the R/C industry providing accessories and hardware to many manufacturers since 1970. The new car, named the Storm, is available in a variety of different trim levels. At a glance, the car looks like it has what it takes to run with the front-runners. Let's take a look at what the kit offers.



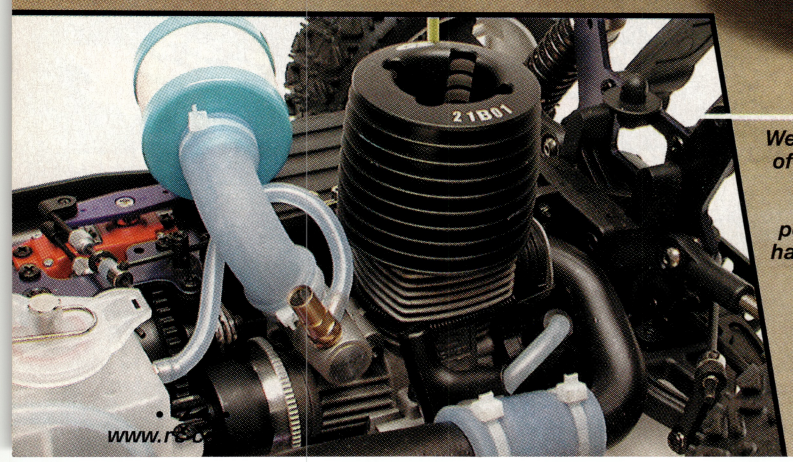
Things you'll need

- Radio gear (with two servos—high-torque for steering, fast for throttle/brake)
- .21 engine
- Starter box*
- Glow fuel
- Glow igniter
- Receiver pack
- CA for tires

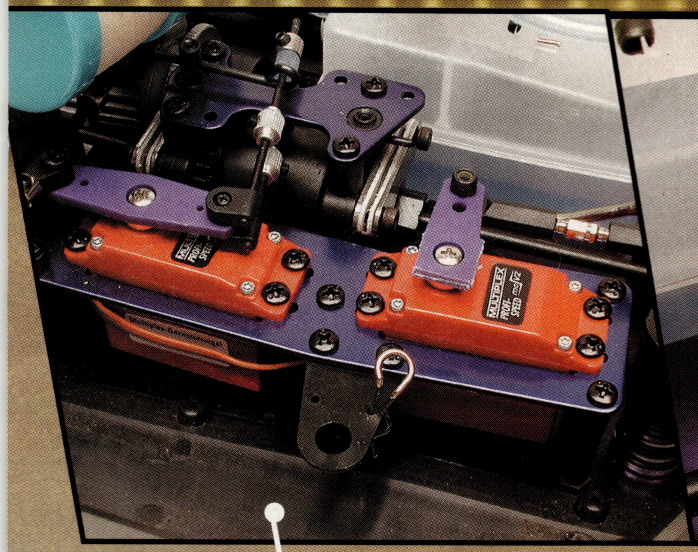
* Unless a pull-start .21 engine is equipped

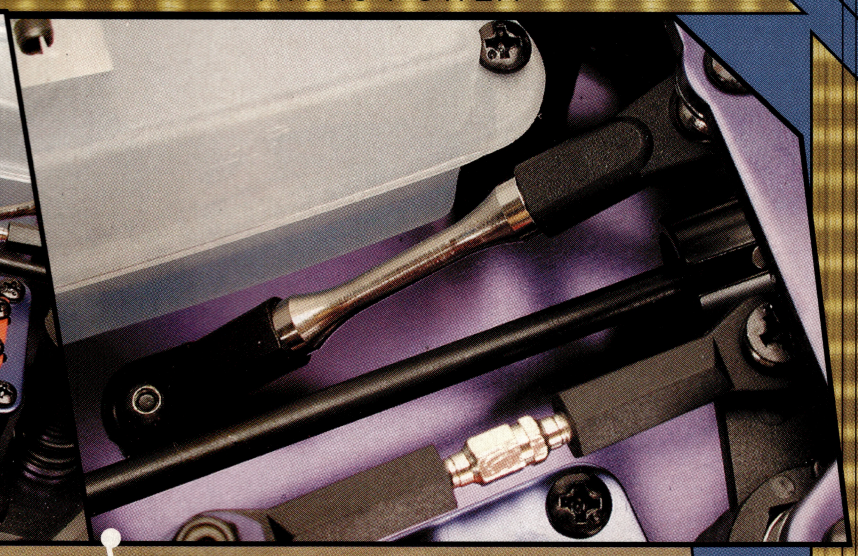
Equipment Used

- JR R1
- 2 Multiplex profi speed mcV2 servos
- GS Racing 21B01 (pull-start) engine
- Trinity 5-cell NiMh receiver pack
- Blue Thunder 20-percent fuel



We tested the Storm with one of GS Racing's GSC pull-start .21 engines. We were very happy with the amount of power this engine puts out—it has a stronger powerband than most sport-oriented pull-start engines we've tested.



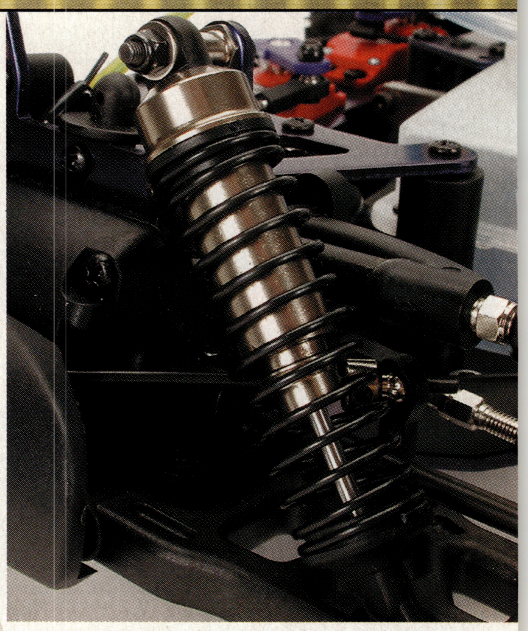


For steering and throttle/brake, we chose to run two Multiplex profi speed mcV2 servos. Notice that transponder mount hanging off the radio tray—this car was designed with racing applications in mind.

The Storm comes equipped with a set of turnbuckle-style chassis braces (front and rear) to help stiffen the car from front to back.

A NEW PLAYER ENTERS THE 1/8 SCALE OFF-ROAD RACING SCENE!

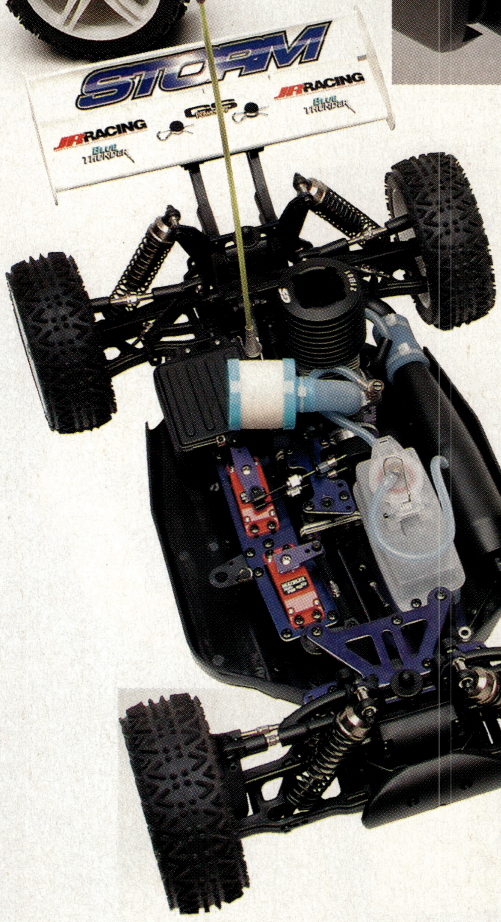




Aluminum-bodied shocks come pre-built and are silky-smooth. We found the stock oil to be spot-on for the track conditions where we raced the car (relatively bumpy track conditions).



A heavy-duty rear nylon wing helps stabilize the back end of the car over big jumps.



The GS Racing Storm is a highly competitive 1/8-scale buggy that comes almost ready-to-run.



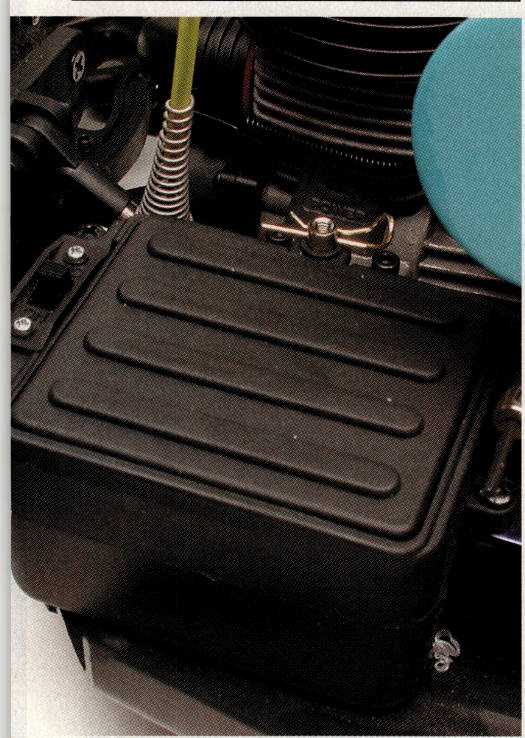
The tires that come with the kit work well on loose, loamy track conditions, but if you plan on racing the car on hard-packed tracks, a change in tires might be in order.



The underside of the Storm is completely countersunk, giving the car a smooth surface. No screw-heads to snag on!

SPECIFICATIONS

Type	4WD buggy
Scale	1/8
Retail price	$449.95
Average street price	$339.95
Length	19.3 in./490mm
Width	12 in./305mm
Wheelbase	12.6-12.8 in./320-325mm
Track	10.2 in./258mm (front)/ 10.3in./261mm (rear)
Weight (RTR)	3350g/7.4lb.
Transmission:	
Type	Shaft Drive 4WD
Differentials	Front, Rear and Center gear diffs
Driveshafts	Steel universal joint/shafts at front, dogbones in rear and center
Bearings	Full set ball bearings
Suspension:	
Type	Oil-filled coil over
Material	Plastic/Steel
Front end:	
Caster	Adjustable
Camber	Adjustable
Toe	Adjustable
Down-travel	Adjustable
Rear end:	
Anti-squat	Adjustable
Camber	Adjustable
Toe	Adjustable
Down-travel	Adjustable
Shocks	Oil-filled coil over
Springs	Kit Black
Wheels	5-spoke
Tires	V-block pattern
Insert	Standard foam
Body	Stock GS Storm



A sealed radio box houses the car's receiver and receiver pack. This setup is becoming standard equipment on most race-oriented 1/8-scale buggies.

Storm in a Box

The new GS Storm is available in three different versions—a complete ready to run version (#GS2003); an almost-ready-to-run 80-percent assembled without engine (#GS2000), and a "Pro" version is currently in the works.

For our test we received kit #GS2000—the 80-percent assembled car. Once out of the box, we were very impressed with not only the parts quality, but the build quality as well. None of the suspension parts were bound up, the turnbuckles were evenly matched on each side, the shocks felt good, etc. And as previously mentioned, parts quality is very good—rivaling that of any of the top 1/8-scale buggy manufacturers.

For starters, the kit comes with a blue anodized 5052 T6 3mm-thick aluminum main chassis. The anodizing used on the aluminum throughout the kit is an ultra-deep color and it looks very good—a deeper color of blue than we've become accustomed to seeing. Both alloy front and rear shock towers, as well as the alloy radio plate, front support plate, center support plate, and the steering plate are all anodized the same color blue. The chassis is ultra-stiff, and with the stiffeners in place, there is little to no flex to the complete package.

The car features a drivetrain all 1/8-scale racers are familiar with—there are differentials at the front and rear ends of the chassis as well as a center diff that is used to bias power between the front and rear wheels. Each diff uses metal bevel gears inside beefy nylon cases, and as with most 1/8-scale buggies, each diff is O-ring sealed so they can be filled with thick silicone fluid (not included) to tune the car's performance. Also included in the drivetrain is the brake system. The car's dual-disc brake system is located on the center diff section and is activated via a lever thrown by the throttle/brake servo. One nice feature found on the Storm is the use of front universals. Front universals provide better steering through rough sections than standard dogbones do. Yet another nice feature is that the entire drivetrain is equipped with full ball bearings. Overall, the car's drivetrain is very similar to every 1/8-scale buggy on the market, so you know it's a proven design. Our kit sample had a very free drivetrain—there were no noticeable high-spots when inspecting the drivetrain by hand turning it.

As with the drivetrain, the suspension design used on the Storm is also industry standard. Heavy-duty nylon suspension arms coupled with long aluminum shocks handle the damping duties both front and rear. With the sport version of the Storm, the shock towers only have a few shock mounting locations to choose from—two up front, and three in the rear. The pro-version will have more tuning holes to choose from. At each end you'll find very beefy turnbuckles. They look to be able to hold up to quite a bit of punishment—track testing will give us the final results in this category.

Now that we've gone over the basics, it's time to move on to the fine details that make up the Storm.

- A low-profile, dust-proof radio box houses your receiver and receiver pack. The top piece of the box comes completely off—other style boxes we've seen like this work on a hinge design, but we like the fact that you can completely remove the top part.
- Cast alloy steering knuckles provide a beefier front-end design. Other ready-to-run 1/8-scale buggies don't include this as standard equipment.
- A steel spur gear is included. Obviously the advantage to using a steel spur gear is that it won't easily strip out. All .21 engines (even sport-based units) put out enough power to melt a plastic gear after only a few tanks. We've yet to grenade a steel gear.
- Included is an industry standard 125cc fuel tank that meets all racing regulations. GS includes some very high-quality fuel tubing with the kit.
- Left and right plastic side chassis guards help keep dirt out of the chassis. This is particularly advantageous when running on muddy tracks.
- A one-piece, white nylon wing comes with the kit, and the wing angle is adjustable. The wing flexes just right—too stiff a wing could easily snap during a rollover.
- Front and rear torque rods (more commonly known as chassis stiffeners) come standard. The pro kit comes with one-piece units, but the kit's turnbuckle style stiffeners do the job just fine.
- Also standard are front and rear swaybars. The swaybars can easily be removed via two screws on the gearcase and then one screw on each suspension arm.
- The car is highly adjustable—you can adjust front caster, camber, toe, anti-squat, and steering Ackerman, as well as rear toe, anti-squat, and camber. In addition you can also alter the sway bar stiffness on both front and rear swaybars by altering their length. All in all, the Storm is a highly adjustable car.

GS Racing Storm

PERFORMANCE

Location: Hot Rod Hobbies, Saugus, California
Conditions: Damp hard-packed dirt. Large stadium-style course with large banked turns and several technical jump sections.

Normally, the Hot Rod Hobbies track is setup for smaller 1/10-scale racing, and its obstacles rarely pose a challenge for 1/8-scale buggies. On this occasion, a new layout had been installed for the upcoming T-Maxx/E-Maxx Shootout, and there were plenty of larger-scale jumps, berms and elevation changes that made the track better suited for the Storm. For our testing, we used the stock Storm setup and Trinity's Monster Horsepower fuel (20-percent nitro content).

Horsepower department—The GS Racing S-Power 21B01 engine was well-matched with the Storm. We were at first quite skeptical of a pull-start engine in a racing buggy, but aside from getting tangled in the rear wheel with regularity (caused by our failure to tuck the starter handle under the body where it belonged), this pull-starter saves you the $100 you'd normally spend on a starter box, and it doesn't require taller engine mounts as do most 1/10-scale pull-start engines (which need additional chassis clearance).

The S-Power engine ran, for all practical purposes, like a high-end .21; it was easy to start and break-in, and the settings of its slide-valve carb remained consistent throughout testing. We've tried some sport-level .21s that were just plain horrible; the S-Power was a pleasant surprise and made plenty of power. You might not want to race the nationals with this engine, but for every other type of event, it provides more than enough go-power.

Handling—Although the Storm's three gear-diffs are O-ring sealed, they come "dry" from the factory, i.e., with no silicone fluid. As we wanted to test the Storm as it came from the box, we elected to leave the diffs in this "open" state. Open diffs tend to make a car more responsive, but they reduce acceleration and cause the car to be less stable through bumps. With this in consideration, the Storm scored highly in most categories; its steering is very quick for a 1/8-scale buggy, and despite the loose center diff, acceleration was very good. The car tended to be a little darty when accelerating through bumps, but it otherwise felt stable and easy to drive.

As the suspension and drive train of a 1/8-scale buggy are so closely intertwined, it can be difficult to determine just how well each component is working. We felt that the Storm's overall geometry and layout—which is very similar to that of Kyosho's MP-7.5—provided excellent handling in the rough. The stock springs and oil felt a little stiff for extremely bumpy surfaces, but for most conditions, they were close to perfect.

Stopping—The Storm's fiber-lined pads and steel brake discs provided strong, fade-free stopping power and were very easy to modulate. Knurled knobs on each brake linkage makes it easy to fine-tune the braking bias to the front or rear.

Durability—During the entire test, nothing actually broke or bent, but we noticed that one of the suspension hinge-pins, which are secured by small setscrews, had worked itself loose and was on the verge of falling out. Normally, we like any suspension that doesn't make us use E-clips, however, for a nitro buggy, the setscrews may not be sufficient. To prevent failure, the suspension setscrews should be checked before each run. The only other area of concern are the suspension-arm mounts. The lower arms are secured to the chassis with molded blocks—there aren't any tie-plates to strengthen them during a collision. We've been around enough 1/8-scale cars to recognize this as a shortcoming even though the blocks held up fine during our test.

Overall rating—The Storm was definitely inspired by the MP-7.5, and this is a very good thing. What GS has done is create a car that can be raced at any level (the GS team competes at all major gas races using the Storm), yet can be purchased as an RTR or pre-assembled kit for nitro beginners. If you are looking for a competitive buggy—both in performance as well as price—the Storm has everything you'll need, including items such as sway-bars and universal shafts that are considered options on just about every other car in its league.

THE GOOD

- Excellent parts quality.
- Pre-built quality is also excellent.
- The Storm handles well and has proven to be very durable.

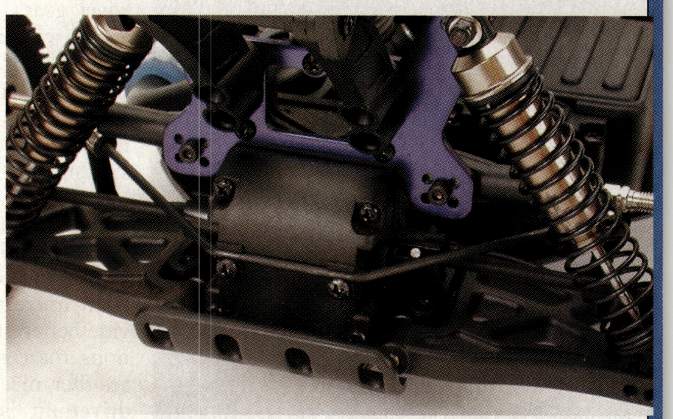
THE BAD

- Included engine mounts didn't fit the original engine we had in mind (another pull-start unit), so we had to call GS last minute for one of their engines.
- While the stock tires work well on loose, loamy track, they don't excel on hard-packed surfaces. Still, one tire can't really do it all, and if we were the folks at GS Racing and it was our decision to pick just one tire, this would be a safe pick.

THE VERDICT

When we first saw the pre-production car a while back (*R/C Car* Oct. '00), we didn't know if the final production car would be a race-worthy car, or an inexpensive "backyard-basher" style buggy. Well, the Storm met and even exceeded our expectations once we got it out on a track. The car handles well, and not once did we encounter any problems. We must have put two dozen tanks through the car without a single part failure—a strong indicator that this car is in fact race-worthy. Overall we were very impressed with the car, and feel comfortable recommending it to anyone looking to get their first-ever 1/8-scale buggy.

Our future plans consist of outfitting the car with some of GS Racing's hop-ups to turn it into the full-blown race version. We plan on racing it out at The Dirt in Hemet to see how it stacks up against the competition—we'll keep you informed. ❑



Sway bars front and rear come stock on the Storm. Sway bars normally come as optional items on other car kits.

SOURCES

General Silicones Co., distributed by Horizon Hobby Distributors Inc., 4105 Fieldstone Rd., Champaign, IL 61821 • (217) 355-9511.
Multiplex, 560 Library St., San Fernando, CA 91340 • (818) 785-2401; (818) 785-3946 fax.
JR Racing and Blue Thunder, distributed by Horizon Hobby Distributors Inc., 4105 Fieldstone Rd., Champaign, IL 61821 • (217) 355-9511.
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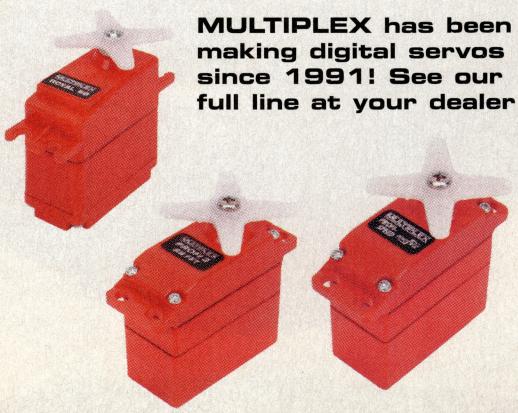

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TEST DRIVE

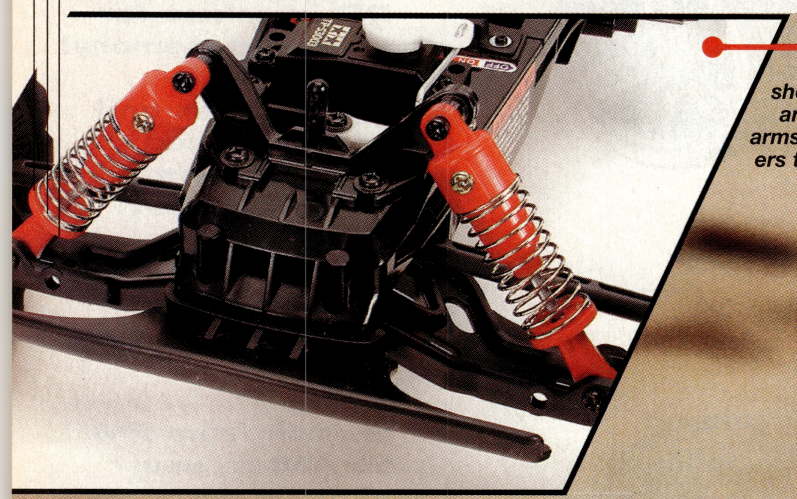


Tamiya XB Mad Bull

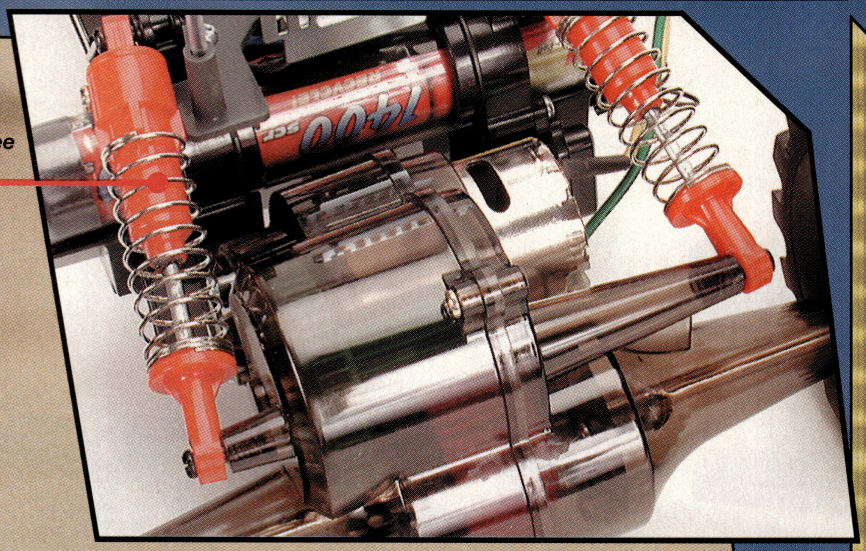
By Frank Masi

I was working for my father's construction company during the Summer of '84, and one day while up on the roof of a customer's new room addition, I saw the homeowners' teenaged son playing with the most incredible radio-controlled car I'd ever seen. Unlike the toy cars I had owned, which could only be driven inside on the kitchen floor, this one was able to spin its tires in the dirt, plow through the grass and take to the air on a makeshift plywood ramp. And the speed! I had no idea R/C cars could be this fast.The car that had captivated me that day turned out to be a Tamiya Grasshopper, which along with its cohorts the Frog and Hornet, were the cars that essentially started R/C off-road. Not long after, I had my own Tamiya car, this one a Hornet, which shared much of its design with the Grasshopper. I wore the tires off that car, and although I have since owned dozens of off-road machines that, in terms of performance, speed and handling, vastly outclassed the Hornet, none of them provided me with as much excitement and fun as that first car, the one that got me hooked.

Why am I droning on about the past? It's because all of those fond memories came back in a flood when I opened a box last week from Tamiya and saw the new XB Mad Bull—a car that, for all intents and purposes, is a new-millennium spin on the old Hornet and Grasshopper. Like those cars from R/C's early days,



Although they resemble oil shocks, the Mad Bull's dampers are spring-loaded only. Long A-arms end with extended hub carriers to widen the stance of the Bull for greater stability.



Memories: The Mad Bull's live rear axle is the same as that used on the earlier Hornet and Grasshopper models. The Bull's rear axle is molded from translucent plastic so you can see what's happening inside.

REVENGE OF THE GRASSHOPPER

Tamiya XB Mad Bull





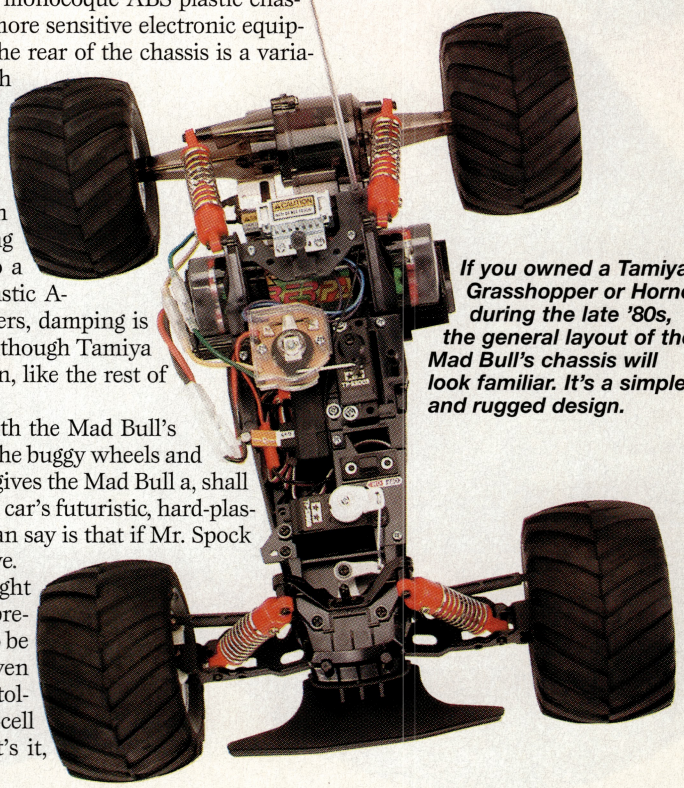
The "XB" stands for Expert Built, and this describes the Mad Bull well. The kit comes fully assembled and with a pre-installed Tamiya Adspec GP radio.

SPECIFICATIONS

Type	RWD buggy
Scale	1/10
Retail price	$256.00
Average street price	$150-160.00
Length	15.5in./394.4mm
Width	12.25in./312mm
Wheelbase	11.1in./282mm
Weight (RTR)	3lb., 14oz.
Transmission:	
Type	RWD
Differentials	Gear differentials
Driveshafts	Solid axle
Bearings	Plastic bushings
Suspension:	
Type	Lower wishbone/solid rear
Material	Plastic
Front end:	
Caster	Non-adjustable
Camber	Fixed links/non-adjustable
Toe	Fixed links/non-adjustable
Rear end:	
Camber	Fixed links/non-adjustable
Toe	Non-adjustable
Shocks	Coil-over (non oil-filled)
Springs	Silver kit springs
Wheels	Chrome-plated
Tires	Off-road tread
Body	Buggy

the Mad Bull is the definition of simplicity with its monocoque ABS plastic chassis, which serves as backbone and protector of the more sensitive electronic equipment such as the servos and receiver. Attached to the rear of the chassis is a variation of the Hornet/Grasshopper live rear axle, which houses the transmission and motor. On the Mad Bull, the entire rear axle assembly is molded from translucent plastic so you can see what's happening inside.

The rear suspension resembles that of an ATV in both form and function, with the entire axle pivoting up-and-down as well as from side-to-side (albeit to a lesser extent). Up front there are a pair of long plastic A-arms and fixed-length upper links. At all four corners, damping is provided by plastic coil-spring shocks (no oil here, although Tamiya offers oil-filled shocks as an option). The suspension, like the rest of the chassis, is simple, rugged and effective.



If you owned a Tamiya Grasshopper or Hornet during the late '80s, the general layout of the Mad Bull's chassis will look familiar. It's a simple and rugged design.

Tamiya has thrown in a more modern touch with the Mad Bull's truckish wheels and tires, which are far larger than the buggy wheels and tires used on the old Hornet and Grasshopper. This gives the Mad Bull a, shall we say, unique appearance when combined with the car's futuristic, hard-plastic buggy body. Is it a "trucky" or a "bruck"? All I can say is that if Mr. Spock were to enter the Baja 1000, this is the car he'd drive.

In terms of sheer convenience, the Mad Bull is light years ahead of its ancestors. The entire car comes pre-built, pre-painted and pre-anything else that needs to be done. The body is already painted and decaled. Even the radio gear is installed (a Tamiya Adspec GP pistol-grip radio is also included). You'll need to supply a 6-cell battery pack, charger and eight AA batteries. That's it, and the Bull is off and running.

For this test, I used a Reedy 1400MAh Cyber Pack, as it is made of inexpensive and durable Panasonic SCR cells. At full-throttle, the Mad Bull ran for about eight minutes. The included mechanical speed control has three speeds (plus reverse), but I preferred to keep it pinned, as memories of endless donuts and sandy slides entered my brain. The Mad Bull is the ultimate thrashing machine. It's fast enough to be fun, and durable and cheap enough so that you'll be tempted to try things that you'd never attempt with a more expensive machine. Yes, there are entry-level vehicles out there that are more capable than the Bull, and aren't that much more expensive. However, I still wouldn't hesitate to recommend the Mad Bull to any younger person looking for his or her first hobby-grade R/C car. After all, this is how most of us got started, right? ◆

SOURCES

Reedy, distributed by Associated Electrics, Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626 • (714) 850-9342; (714) 850-1744 fax

Tamiya America, Inc., 2 Orion, Aliso Viejo, CA 92656-4200 • (949) 362-2240; (949) 362-2250 fax

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THE RADIO CONTROL CAR MAGAZINE

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Schumacher SST AXIS Pro; Tamiya Tao3R-S TRF; Team Associated TC3; Thunder Tiger EB-4; New for 2000; *R/C CAR* interviews Mike Reedy; Volvo Challenge II; Trinity Real Time 2 battery discharger tray; Sierra Radio Control Racers PC Game.

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10 Steps to Preventing and Resolving Receiver Problems

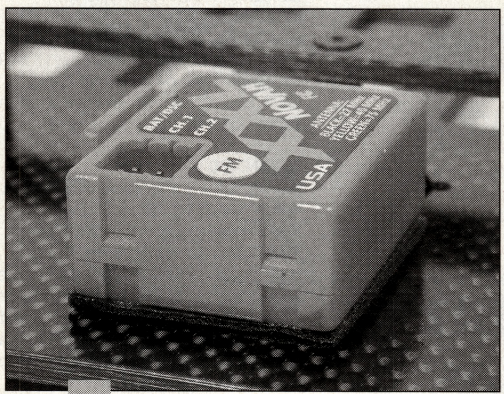
Tips on how to stop the Glitch!

by Lito Reyes

The radio receiver is the central nervous system of an R/C car. But being electronic devices, and ones that rely on RF (radio frequency) at that, they can be a bit finicky from time to time. Below are 10 steps (with a few more thrown in for good measure) to help prevent or resolve receiver problems. Some are simple, and some are a bit more complex, but none require any clergy to be involved. And no, we are not going to mention that aluminum foil trick!

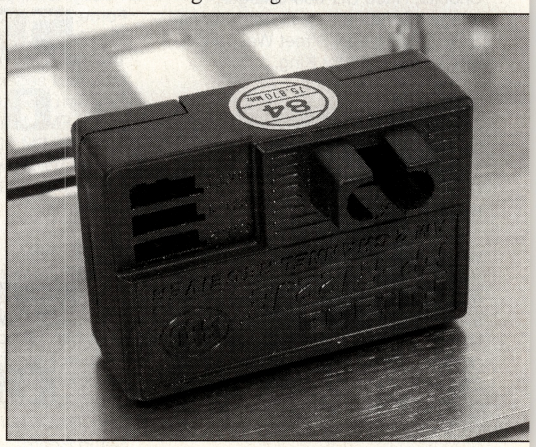
1 Mount your receiver with an extra layer or two of servo tape.

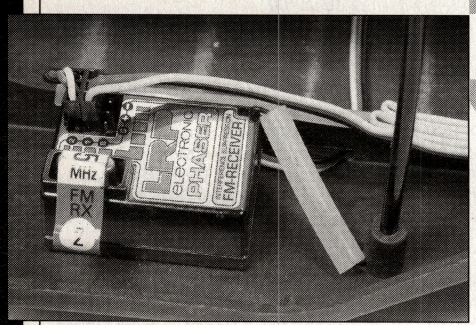
Glitching can happen when your receiver is subjected to extreme amounts of vibration—especially in nitro-powered cars. The extra tape acts as a cushion to buffer those vibrations. Don't forget that unbalanced wheels or a bent axle can cause unwanted vibration, too.



2 Install your receiver on its side.

If your receiver is mounted on a graphite or metal chassis, the proximity of the crystal to the chassis could be causing interference. Mount the receiver with the crystal as far off the chassis as possible. Even if it raises the CG a little bit, that is still better than a glitching car.



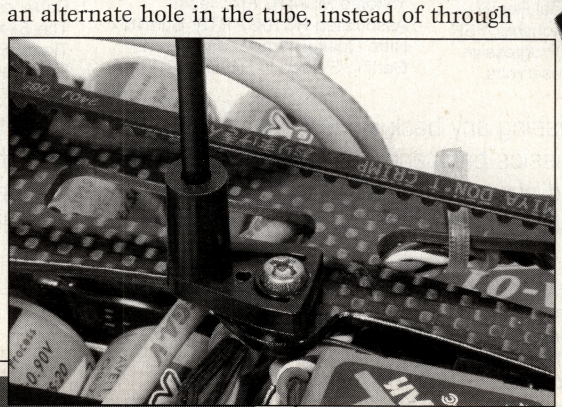


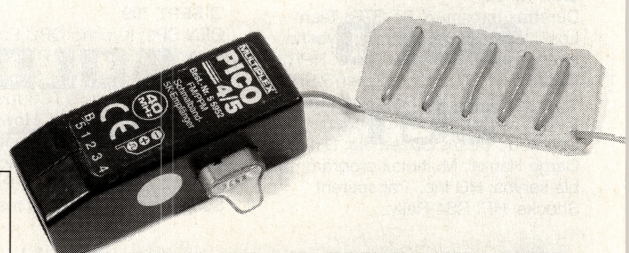
3 Insulate exposed portions of antenna with fuel line.

The few inches of antenna between the receiver case and the antenna mount can also be a source of chassis interference. Use lengths of fuel tubing to further insulate the antenna. And be sure to use fuel tubing that is color-coordinated with your chassis' color scheme!

4 Opt for the plastic antenna mount.

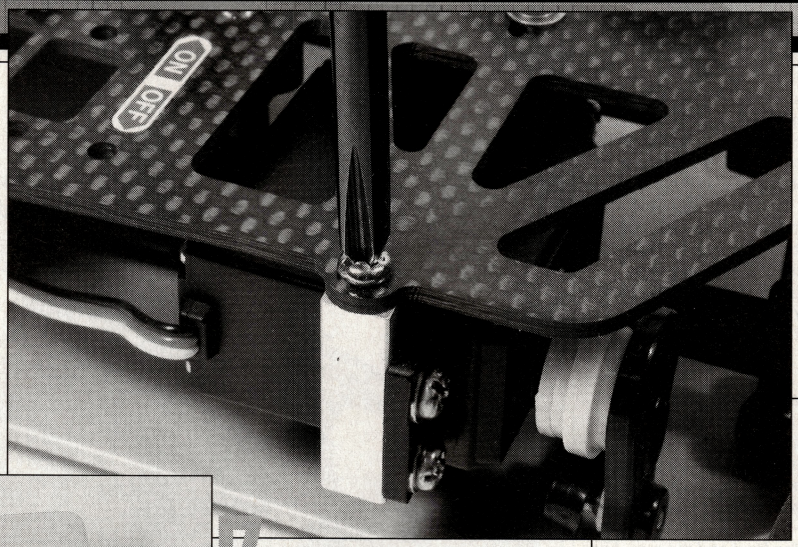
Aluminum antenna mounts may look great, but most of them have sharp edges that can cut right through the antenna wire's insulation and ground it to the chassis. The plastic ones from HPI, Losi, and Associated work just fine. But if you must use the aluminum one, route the antenna through an alternate hole in the tube, instead of through the bottom. Use a fresh X-acto knife to make a hole one inch from the bottom of the tube. Make the hole just big enough to fit the wire, and "drill" it at an angle so the antenna can easily feed up into the tube.





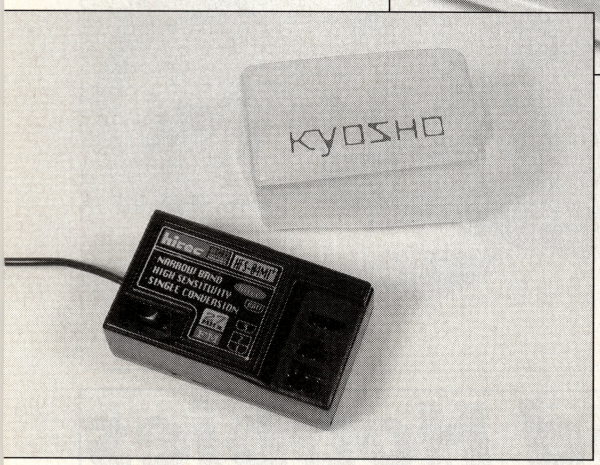
5 Use a loom to manage excess antenna wire.

Tightly coiling up or wrapping the antenna wire will decrease the effective range of the receiver. If your antenna is too long, make a loom out of a 3/4-inch x 2-inch piece of cardboard or Lexan. You could even get fancy and make it a bit longer so you can mount it on the chassis so the excess antenna is raised off of it.



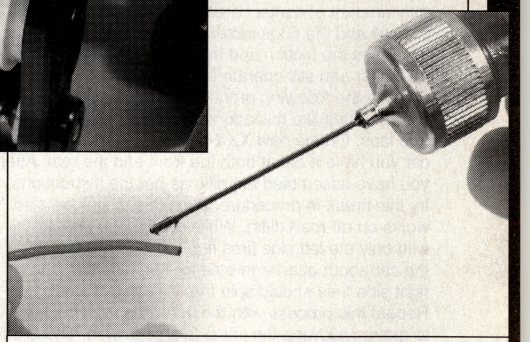
6 **Check all metal to metal contact.**

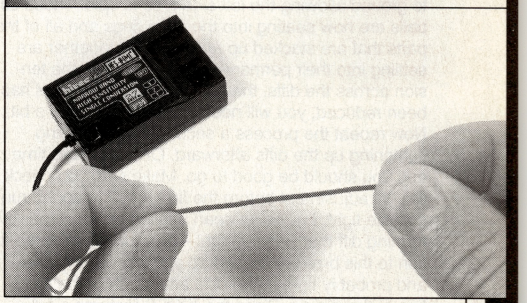
A loose set screw, a bad bearing, a fractured screw head—all these can be sources of RF noise on a vibrating car. Yes, it is a last resort, but check every screw and nut to make sure that one isn't the culprit; we've seen it happen before.

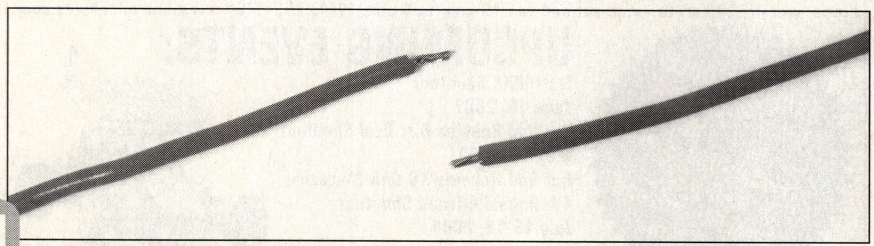


7 **Use a receiver cover on nitro cars.**

We've seen it happen too many times: a race is lost because a pit man inadvertently doused the receiver in fuel causing it to short out. Yes, a cover can make it difficult to change crystals, but it really can help prevent serious damage to the receiver or the whole car.







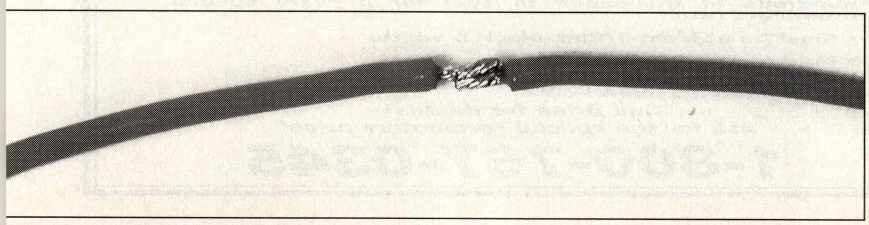
8 **Oil the antenna wire.**

This is probably the most basic piece of antenna advice we can give. Use a drop of two of bearing oil on the length of the antenna wire before installing it in the tube. Also, run the wire between your fingers (and maybe a shop rag) a dozen times or so to straighten the kinks out before installation.

9 **Fix your broken antenna.**

It will probably happen eventually: your antenna wire gets cut or broken. If you decide to fix it yourself, there are two options: replace it at the board (requires opening the case and exposing vulnerable electronics to your shaky soldering iron, which is better left to a professional), or just repair it at the break. When repairing it at the break, there are just a couple of things to keep in mind.

- First, keep the exposed wire to a minimum; 3mm is all you need.
- Second, don't twist the ends of the wire together—that will make it too big to fit through a tube. Instead, solder the ends of the wires overlapping each other.
- Third, use a low power soldering iron and minimal solder so you don't melt the surrounding insulation. If the break is going to be inside the antenna tube, you don't really need to insulate it. However, if the repair is exposed, small diameter heat shrink tubing or fuel line will work. And don't forget to cut it to the original length as specified by the manufacturer!



10 **Protect your crystals.**

Some receivers have an excessively large hole for the crystal. Stretch a small piece of fuel tubing around the crystal to keep it from wiggling around and possibly breaking. If you don't have any fuel line, wedge pieces of folded paper (don't use plastic—it may hold static electricity) between the crystal and the receiver hole on both sides. ❑

TEAM LOSI TECH-TALK

Tech Tips #9

What a difference a diff makes..... Yes, among other things, we are going to look at differentials again, except this month we are looking at diffs as used on the new Team Losi XXX-S touring car. Just like off-road cars, on-road cars also use ball type differentials. This type of diff offers numerous advantages, but they must also be allowed to break in and need to be adjusted during this process to prevent undue wear or failure. Team Losi differentials use high quality ultra hard (carbide) balls running against precision ground and polished high carbon steel drive rings. Since the balls are harder than the rings, they will quickly wear a groove into the rings. As this groove develops, the metal of the rings is compressed, creating a denser surface much like squeezing a sponge until it's solid. As this groove forms, the total amount of contact area between the surface of the ball and the rings increases dramatically. This increases the friction and allows the diff to be adjusted looser and still operate freely without slipping. So if you use the following procedure, you should get a diff that operates like this and will give you lots of trouble-free laps. On the new XXX-S all-wheel-drive touring car you have a diff at both the front and the rear. After you have assembled the diffs as per the instructions, try this break-in procedure. (Yes, this technique also works on off-road diffs). While holding the chassis with only the left side tires firmly on the ground, give the car about quarter throttle for ten seconds. The right side tires should spin freely — backwards! Repeat this process with the right side tires held firmly to ground allowing the left side tires to spin. Those diff balls are now seating into the drive rings and all of the parts that are stacked up and screwed together are settling into their permanent position. Since the tension across the diffs, the balls and the drive rings has been reduced, you will need to tighten them up a bit. Now repeat the process a second time, including tightening up the diffs afterward. OK, one more time and you should be good to go. Make sure you check the diff adjustment before the first run. If in doubt, run it a little tight, I've never seen a failed or poorly performing diff that was too tight—only too loose! In addition to this break-in procedure you will want to check and probably tighten the diffs after each of the first two or three runs. Since the XXX-S features a fully enclosed drive train, you will find that the diffs will not require service for quite a while. When they finally do, you will be pleased to see that you need only to remove six screws to access them.

Nitro racing is in full swing around the country now and it seems that with the great power handling capabilities of the new XXX-NT a lot of you have the "Tim Taylor Syndrome".....that's right, you want more horsepower! The tuned pipe included with the XXX-NT offers a broad range of tuning opportunities. Pick up a new silicone coupler (part# A-9325) and try running the pipe as long as you can get it. You will probably have to adjust the high speed needle a small amount. Do not run it up and down the street but out on the surface you will be racing on. You should see a difference in the power band, which affects the acceleration as well as the top speed, and how quickly it wants to get there. Reduce the pipe length by 1/4 to 1/2" at a time and take care to note the difference. Continue to do this until the pipe is coupled as short as possible. If the coupler is too long to butt the pipe against the exhaust manifold, cut your old coupler to fit. As the pipe is made shorter the response will change noticeably. Use a small flexible tape measure to document the length and performance characteristics as you do this. This procedure will do several things for you. Obviously, you will find the spot where that particular engine is "happy" making the most raw horsepower. More importantly, you will learn how to adjust the pipe to produce a power band that is suited to particular track conditions. Next time we are going to look at another frequently asked question, "What's the best gear ratio for electric and nitro vehicles"

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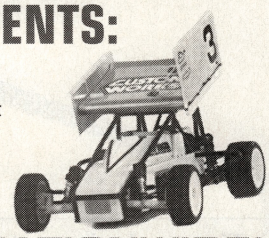

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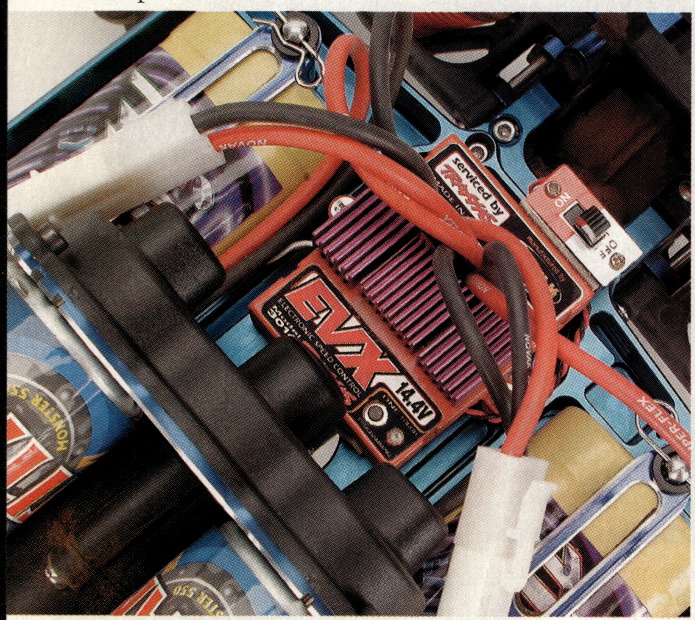
Testing Traxxas' New EVX Speed Control

Novak & Traxxas team up to take on the E-Maxx!

Last month in "Newsflash" we dropped the big news that Traxxas and Novak Electronics, through a joint venture, had developed an all-new, highly sophisticated 14-volt system speed control for the E-Maxx. Since we were so close to going to press with the issue, we were unable to fully put the prototype through any sort of extensive testing other than running it in the truck for a pack or two. Well, we've since had more time to test with the prototype that Traxxas sent us, and all we can say is that we're highly impressed! For those of you who may have missed our announcement on the EVX in our last issue, we'll recap.



EVX FEATURES AT A GLANCE

• In our opinion, the EVX's most impressive new feature is that the E-Maxx now has brakes, thanks to Novak Electronics' Smart Braking system (the original speed control featured forward/reverse only). For those of you who race your E-Maxx and your club doesn't allow reverse, no need to worry—it can be cancelled out using one of the drive profiles built into the speed control.

• Speaking of drive profiles, the new EVX has three different profiles the user can select. The first mode, "Normal", gives the unit forward, reverse, and uses Novak's Smart Braking system. The second drive mode, "Racing," switches the unit in forward/brake mode only (reverse is cancelled out). And finally, the "Marine" mode sets the unit with forward drive and 20-percent reverse, and no brakes. All in all, a very versatile speed control!

• As with the unit it replace, the EVX has an input voltage of 12 cells (14.4 volts nominal).

• The speed control has a motor limit of 19 turns (550 size)

• On-Resistance is 0.006W—can you say highly efficient?

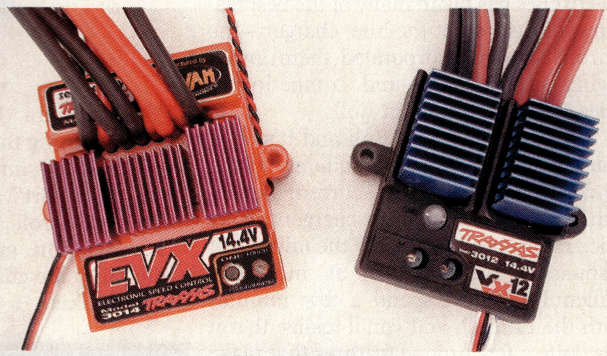
• Novak makes it ultra-easy to set up just like all their other speed controls. With their exclusive One-Touch Set-Up, you can have your new speed control tuned to your radio in seconds!

• Thanks to Novak's Thermal Shutdown Protection, you don't need to worry about cooking your brand-new speed control if something were to start heating up the unit—for example, if your gearing isn't exactly right, and the system starts to heat up too much, it shuts itself off before any damage is done.

• The EVX is microprocessor based, and uses gold plated battery connectors for the ultimate in efficiency.

• Last but not least, the EVX is sold, warranted, and serviced exclusively through Traxxas Corporation

The EVX (model #3014), retails for $180.00. The best part is that if you have one of the Traxxas VX12 speed controls, all you have to do is ship it back to Traxxas, and they'll send you a replacement EVX free of charge—what a deal!



Side By Side Comparison

● How does the EVX rate against the VX12?

In an effort to see just exactly how different the new EVX is from the unit it is replacing, we decided to do a little back to back comparison between the two units. We used the same exact truck, the same motors, and the same batteries and over a period of two days (to allow the batteries time to properly cool down and stabilize so their performance wouldn't affect the outcome) we ran the original Traxxas VX12 against the new Novak/Traxxas EVX. So what was the result?

First, the most noticeable difference between the two units was in the braking department (the EVX has them, the VX12 doesn't). And what a difference the brakes make—especially on a truck with large wheels and tires! We took our E-Maxx out to an off-road track and raced it both days, and on the day using the EVX, our lap times were noticeably improved. We were able to tap the brakes over large jumps and reposition the truck in mid-air to bring the front-end down to help "downslope" the backside of doubles much better. We could also go deeper and faster into turns and then tap the brakes to help slow the truck.

In addition, we timed our runs with each speed control and found an average increase in runtime of close to 40 seconds in favor of the new EVX! Overall, we were very impressed with our initial testing with the pre-production sample we received, and can honestly say that you can really tell the difference between the two units. Traxxas and Novak have joined forces and made a real winner!

Sources

Traxxas Corporation, 12150 Shiloh Road Dallas, TX 75228 • (972) 613-3300; (972) 613-3599 fax.

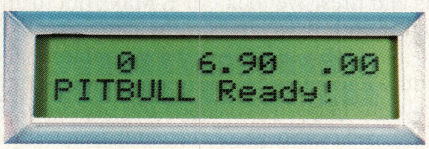
Competition Electronics Pit Bull

Truly a racer's best friend

For over a decade, Competition Electronics has carved out an exclusive niche in the world of high-end R/C electronics. Its Turbo Matcher has become the standard for the commercial battery matching industry, and its TurboCharger line of battery charger/-cyclers has remained the favorite of many top-level racers. Now, Competition Electronics has taken many of the best features of its top-of-the-line charger—the Turbo35—and incorporated them into a highly user-friendly and competitively priced unit called the Pit Bull.

One look at the Pit Bull and it's clear that CE has set its sights squarely at the Novak Millennium—the current benchmark among competition chargers in its price range. But don't make the mistake of dismissing the Pit Bull as merely a Millennium copy; spend a few minutes with the Pit Bull, and you'll realize that it has quite a few unique features that make it suitable for racers of all levels. And it's fun to use (more on this later).

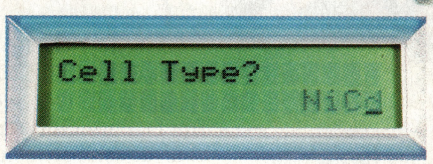
Despite its compact size, the Pit Bull has quite a lot of features and data that you'll need to become familiar with, but fortunately, navigating through the menu-based interface couldn't be easier or more intuitive. All charging data is displayed on the PB's backlit 16x2 alphanumeric LCD display. Five buttons, located beneath the LCD, allow you to scroll through the various functions and select the parameters that best suit your charging needs.



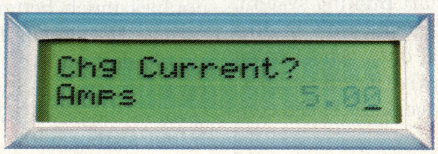
Navigating the Pit Bull

The PB has two pre-programmed charge profiles, one is labeled for use with NiMH (Nickel Metal-Hydride) cells, while the other is for NiCad (Nickel-Cadmium) cells. Should you have your own charging preferences, you can easily alter the factory settings, and the PB will automatically save your profiles as its own until you decide to change them. So you have a choice when you first fire up your PB; you can begin charging using the factory settings by simply pressing the "start" button, or you can scroll through the charge-option menus to custom-tailor the charge parameters to your liking.

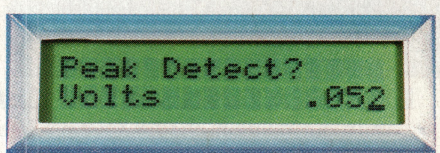




To access the menus, press the "charge setup" button when the PB is at its initial "ready" screen. The first option screen you'll encounter is the "cell type" menu. Here, you can toggle between the factory "NiCd" or "NiMH" settings. Incidentally, you can change both settings to whatever parameters you wish; there is no one perfect mode for either NiCad or NiMH cells. Once you've selected which "folder" you want to work with, press the setup once again to confirm your selection and to move on to the next menu.

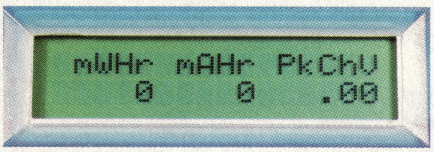


You then come to the "Chg Current" screen, in which you'll be able to choose the rate of charge from between 0.15 to 7 amps. The pre-set rates are 5A for NiCad cells and 4A for NiMH. For more voltage and punch, a higher rate is recommended; however, for greater run time and smoothness, go with a lower rate. This feature also allows the PB to easily charge smaller cells such as those used for transmitter and receiver packs; just make sure to select a lower rate (generally less than 1A for these types of cells). Once you've chosen the correct rate, press the setup button once again to advance.

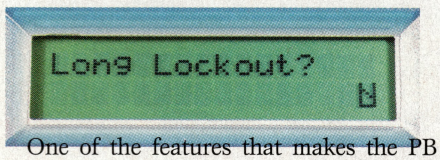


Next, you can adjust the sensitivity of the PB's peak-detection circuitry from between 0.012 to 0.192V. Why is this important? Because the sensitivity of the peak-detection function is what tells the charger to shut off once the battery is fully charged. If the peak-detection voltage is set to high, the pack may overheat. If set too low, the pack may continuously false-peak (a condition in which the cells "trick" the charger into believing that they are charged when they're really not). As a general rule, new batteries and NiMH cells require a lower peak-detection voltage setting, while older batteries, which are more prone to false-peaking, will usually need a higher setting. The PB's factory settings are 0.052V for NiCad cells and 0.032 for NiMH.

Following the peak voltage menu is the

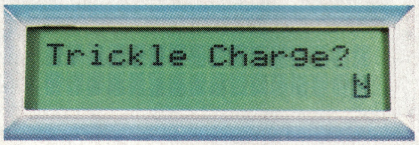


"Charge Data" screen, in which the PB displays information from the last charge cycle (from the "NiMH" or "NiCd" folders, depending on which one you're in). Here, you are shown the milliwatt-hours (mWHr), which is a measurement of the total power put into the battery during charging, the milliamp-hours (mAHr), or the total current put into the pack, and the pack's charge voltage (PkChV), which shows the highest voltage reached by the pack during charging. I'm not quite sure why CE chose to place this screen here (it would probably have been better to place it at the front of the menus), as there are still two charge functions left to go.



One of the features that makes the PB unique is its "lockout" function. Most competition chargers have a period during initial charging when the peak-detection circuit is disabled. This aids in the prevention of false peaks, as they most often occur during the first minute or so of charging. The PB gives you option of using a standard lockout period of 60 seconds, or you can select the "Long Lockout" feature, which disables the peak-detection function for a full 10 minutes. CE recommends the longer lockout for use with NiMH cells, which have a more subtle voltage peak and are more prone to false peaks, or for old cells. If you decide to use this feature, make certain that the battery has been discharged; placing a charged pack on the PB in the long-lockout mode could result in cell damage, overheating and venting of gases! As a safety feature, the PB will automatically default to the normal lockout period after each charge.

The final menu in the setup mode is



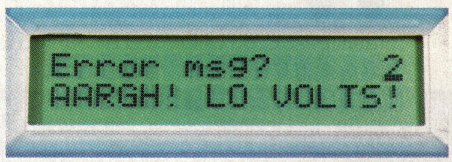
the trickle-charge feature. Here, you can set the PB to automatically place the pack on a low-amperage trickle charge (0.15 amp) as soon as the peak-detection circuit is tripped. This slow-charge rate will maintain a full charge within the pack. For maximum voltage, you should turn the trickle-charge feature off and time your charging so that the pack is peak-charged right before the start of your race.

Pit Bull: Hours of Fun

Thus far, the PB seems like a pretty serious piece of equipment, doesn't it? We told you earlier that the PB is fun to use, and I wasn't lying. By pressing the "Sound and Graphics" button, you will be able to assign one of 21 distinct sounds to each of the PB's functions. Besides providing hours of entertainment, this feature is useful in that it allows you to know precisely what the charger is doing at all times without having to drop what you are doing to glance at the screen. To be honest, we were of the opinion that this feature was a bit on the frivolous side, but once we began playing with the sounds (some of which are downright hysterical), we changed our minds. Additionally, you can select between three types of display graphics for each of the menus. The display can be set to simply appear, or you can have it "slide" into view from the right side of the screen, or have each individual letter and number slide in one at a time. Fun!

Oh, Yes, It Charges Batteries, too!

Now that you've selected your favorite charging parameters and have tweaked the sound and display options to your personal liking, it's time to charge! Assuming that you've already hooked the PB to a suitable power supply (of between 12-15A with at least 7A), all you have to do is hook the charge leads to your battery and hit the start button. During charging, the PB lets you know all is well by emitting a sound (of your choosing) every 10 seconds. Also, the PB's display will alternate between the initial "ready" screen, which shows the elapsed time of the charge, the instantaneous voltage of the pack, and the charge current being put into the pack. The display will also periodically show which of the three phases the PB is in, i.e., lockout, the normal charge mode, and the final peak-detection mode.



What We Didn't Like

The PB uses a pair of 10A automobile fuses to protect itself from reverse-polarity hookups of either the input or output leads. This means that you could be left without a charger if you should forget to buy replacement fuses (none are provided). By comparison, Novak's Millennium (the PB's closest competition) has solid-state protection against shorts, reverse-polarity and overheating—no fuses needed.

What We Like

There's a lot to like about the PB, not the least of which is its user-friendly interface. We liked the wide range of adjustments in the charge parameters—especially the peak-voltage—and that any changes you make are automatically stored in the PB's non-volatile memory for the next charge cycle; you won't have to keep re-entering your preferences with each battery charged. We also thoroughly enjoyed playing with the sound, and to a lesser extent, the graphics features. Overall, CE has distilled some of the best features of its much more expensive Turbo35 into an affordable, attractive and compact unit that will fulfill any racer's charging needs.

specs

Power supply	12-15V at 7A
Max. power supply voltage	15V
Cell types supported	NiCad and NiMH
Pack size	4 to 8 cells
Charge rate	0.15 to 7A
Trickle charge rate	0.15A (when selected)
Peak detection range	0.012 to 0.192V
Fuses	(2) 10A blade-style automotive fuses
Display	2x16 alphanumeric character, backlit
Case	blue translucent plastic ◆

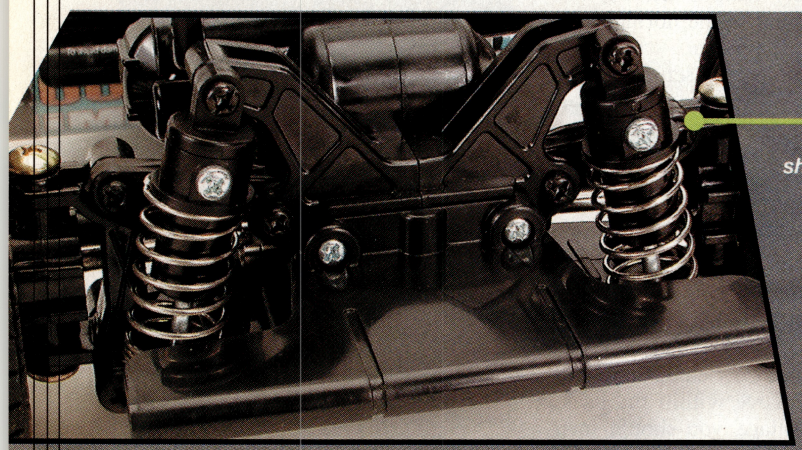
SOURCES

Competition Electronics, 3469 Precision Drive, Rockford, IL 61109 • phone (815) 874-8001; fax (815) 874-8181

TEST DRIVE

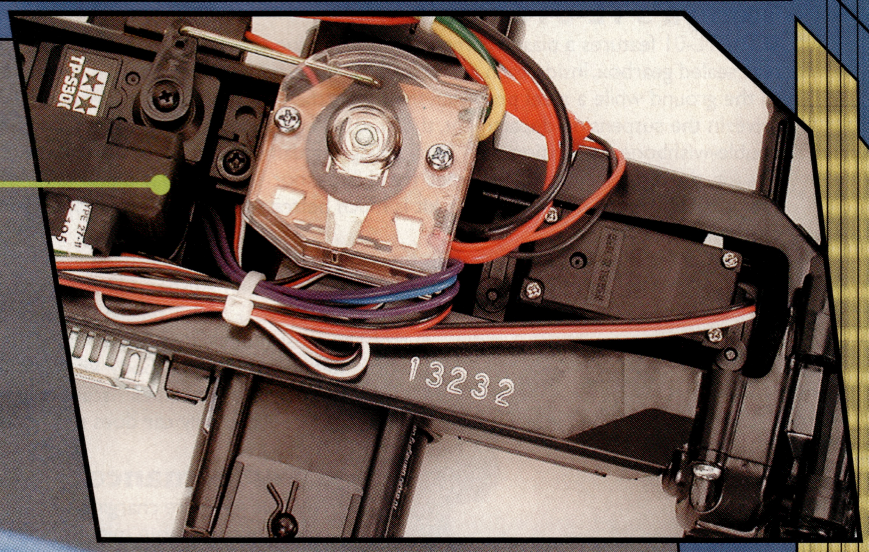
Tamiya Subaru Impreza WRX '99 XB

With their new Expert Built series, Tamiya couldn't make it any easier for you to experience their unique style of perfect-scale R/C realism. To get up and running all you have to do is take the car out of the box, install eight AA batteries in the included radio, and slap in a charged six-cell battery pack! The latest in the XB line is this Subaru Impreza WRC '99 rally car. The Subaru is based on Tamiya's popular TL-01 chassis design. Here's a little more about the car itself.



Coil-over, non-oil-filled shocks handle the front and rear damping. We were pleasantly surprised with how well the stock suspension worked.

GET READY TO RALLY WITH TAMIYA'S NEWEST EXPERT BUILT!

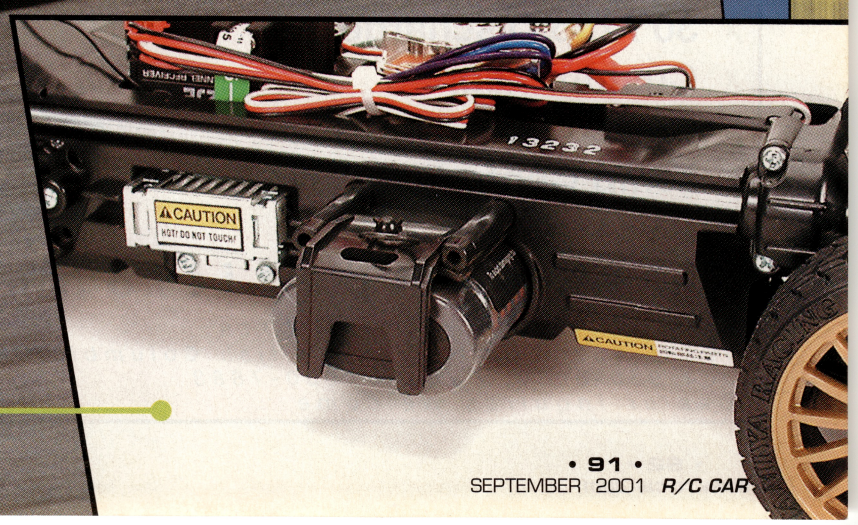


A mechanical three-step speed control comes standard with the Subaru WRC XB.



Things you'll need

- Eight AA batteries
- Six-cell battery pack
- Battery charger



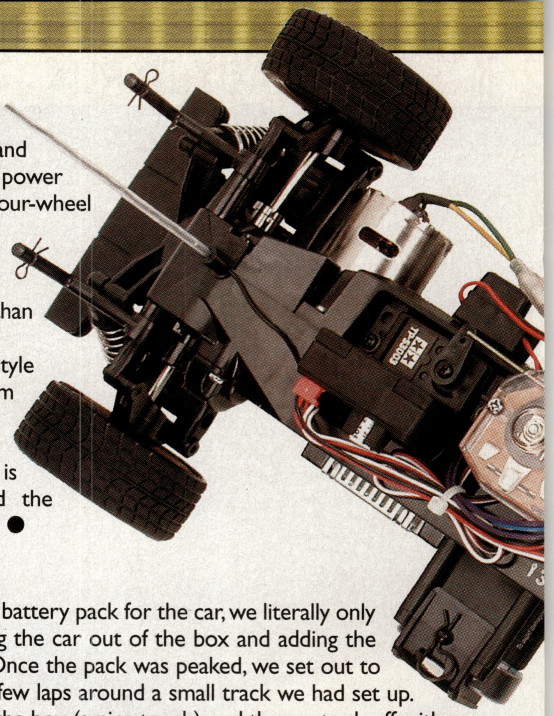
A steel propeller shaft links the front and rear gearbox, giving the car all-wheel drive.

Subaru WRX '99 XB

Tamiya's TL-01 Chassis

● The TL-01 features a plastic composite monocoque chassis design that houses a front and rear sealed gearbox. Inside each gearbox you'll find a reliable gear differential that gets the power to the ground while a steel propeller shaft joins the two gearboxes to provide full-time four-wheel drive. In the suspension department, the TL-01 is equipped with four-wheel independent, double-wishbone suspension with four coil-spring dampers (non oil-filled). In the case of this kit, the tires included are street tread tires, not Tamiya's rally-block tires which seems better in our mind, since this kit is much better suited for on-road driving rather than off-road escapades.

The Expert Built kits all come with the same running gear installed—a standard 540-style silver-can motor, an Adspec GP AM radio system (with two servos), and a mechanical speed control. The most notable item to discuss is the awesome detail found in the body kit itself. Tamiya is world-famous for their scale-realism, and the Subaru rally car does not disappoint! ●





Performance

While we were charging a Reedy 3000 battery pack for the car, we literally only spent two or three minutes tops getting the car out of the box and adding the eight AA batteries to the Adspec radio. Once the pack was peaked, we set out to the back parking lot near our office for a few laps around a small track we had set up. The trims were properly set right out of the box (a nice touch), and the car took off without hesitation and ran problem free for the entire run. The Subaru has decent acceleration, and it handles well, even without oil-filled shocks (a competition stock motor can provide higher speed with a slight sacrifice in run time). Our only recommendation is to stay off the dirt—even though it is a "rally car" and the drivetrain is sealed, your car will have a much longer life if you stay out of the sand—trust us! All in all, the XB Subaru Impreza is a fun car to drive, handles well, and most importantly, with a good battery pack (i.e. a 3000 sport pack), the amount of run time is impressive—we were out running the car for over 10 minutes! If you're looking to get a friend into R/C, this is a perfect place to start! ❑

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Here is how the chassis comes ready out of the box.

The Subaru rally car comes with treaded slicks, not rally block tires, so it is better suited for on-road running versus off-road racing.

SPECIFICATIONS

Type	4WD rally car
Scale	1/10
Retail price	$256.00
Average street price	$150-160.00
Length	442mm
Width	192mm
Wheelbase	167mm
Track	178mm
Weight (RTR)	3lb., 2oz.

Transmission:

Type	Shaft-drive, full-time 4WD
Differentials	Gear differentials
Driveshafts	Dogbones
Bearings	Plastic bushings

Suspension:

Type	Independent lower wishbone
Material	Plastic

Front end:

Caster	Non-adjustable
Camber	Fixed links/non-adjustable
Toe	Fixed links/non-adjustable

Rear end:

Camber	Fixed links/non-adjustable
Toe	Non-adjustable
Shocks	Coil-over (non oil-filled)
Springs	Silver kit springs
Wheels	Gold Subaru
Tires	Street treaded
Body	Subaru Impreza WRC '99

SOURCES

Tamiya, distributed by Tamiya America, Inc., 2 Orion, Aliso Viejo, CA 92656-4200 • phone (949) 362-2240; (949) 362-2250 fax.

Reedy Modifieds, distributed by Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626 • (714) 850-9339; (714) 850-1744 fax.

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TRM321SD 3.2mm Rear Skid	$24.50
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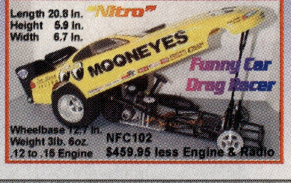

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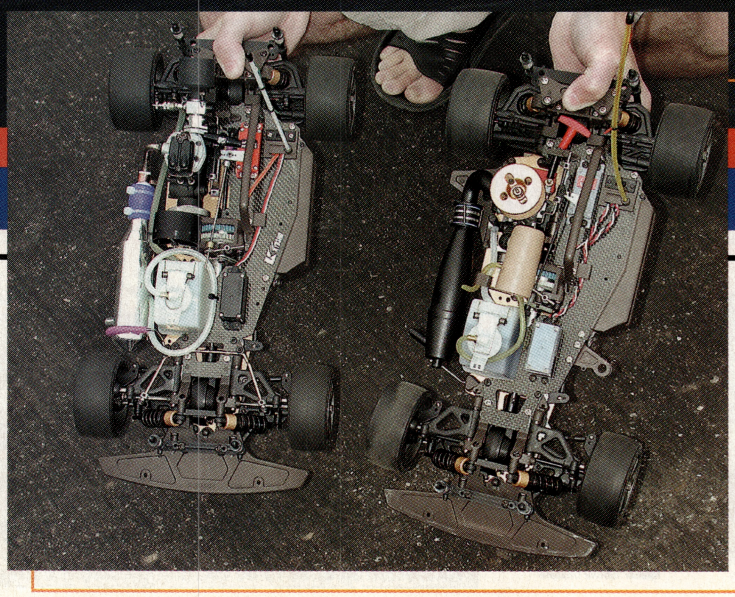
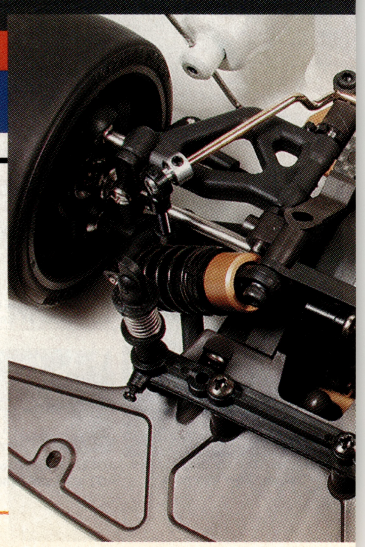




The FW-04 SuperTen four-stroke (left) uses O.S. Engine's awesome FS-26S powerplant, while the two-stroke FW-04 (right) was fitted with Kyosho's GS-15. Both engines were equipped with pull-starters.

two-stroke versus four-stroke

Are thumpers the future of nitro racing?

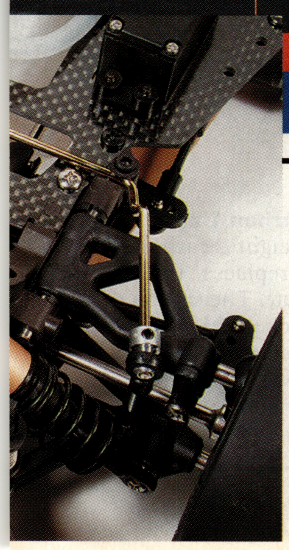


If you ride motorcycles or follow motorcycle racing, you might be aware of the EPA's stance on two-stroke engines—it hates them, claiming that they are too harsh on the environment. Those of us who ride two-stroke motorcycles live in fear of the day when our beloved bikes are outlawed in favor of the more "green" four-stroke bikes. In anticipation of this possible outcome, most motorcycle manufacturers have developed, or are in the process of developing, four-stroke alternatives to their existing two-stroke bikes. The most interesting part of this story is how the race-sanctioning bodies view the new four-strokes; in essence, the "thumpers" are allowed twice the displacement of the two-strokes against which they compete! For example, Yamaha's 250cc four-stroke motocrosser gets to race against the 125cc two-strokes. The logic is that because they fire half as many times per cycle, four-strokes must make up the power difference by being bigger. The benefit to the added displacement and four-cycle operation is tons of low-end grunt and the ability to pull much higher gear ratios.

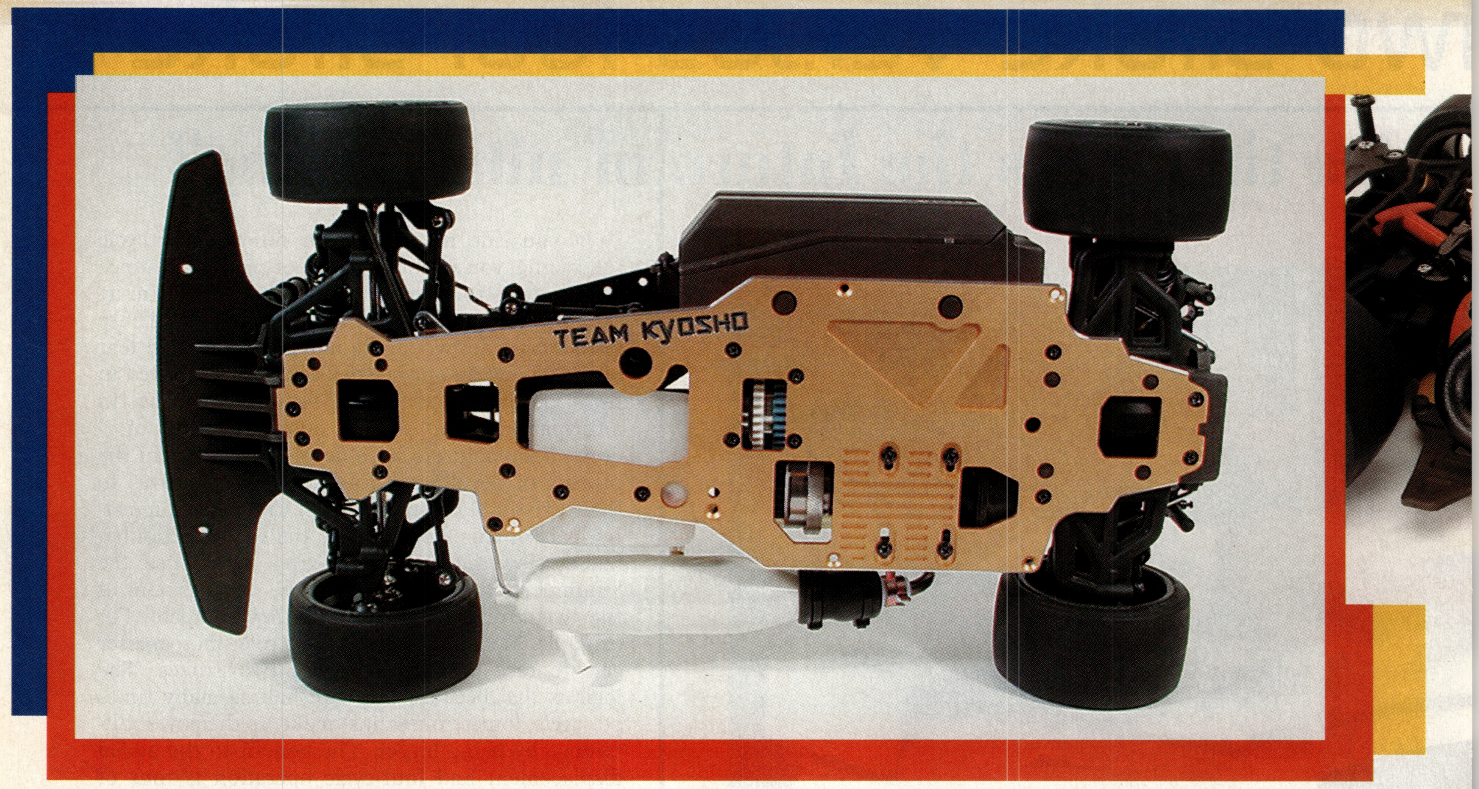
While there's little chance of a similar occurrence in the hobby industry, Kyosho, in conjunction with O.S. Engines, has nevertheless diverted some of its attention to the development of viable four-stroke engines for the R/C car market. The first, and thus far only four-stroke car kit available is a special version of Kyosho's FW-04 SuperTen. We tested this kit back in the April '01 issue and fell in love with the sound of the O.S. FS-26 four-stroke engine and the way it launched the super-size 1/10-scale touring car out of the turns. During that test, two things came to our minds. The first was how we would address the car's main shortcoming, which was its gearing; it needed a two-speed. The second was a desire to find out how the four-stroke would fare against Kyosho's two-stroke FW-04 SuperTen. Since the *R/C Car* garage contained both type of SuperTen, we decided to combine a hop-up article with a shootout. The goal? Fix any shortcomings; tune the cars for optimal performance, and take 'em to the track to find out if four-strokes really can be a viable alternative to conventional two-stroke screamers.

SUPER HOP-UPS

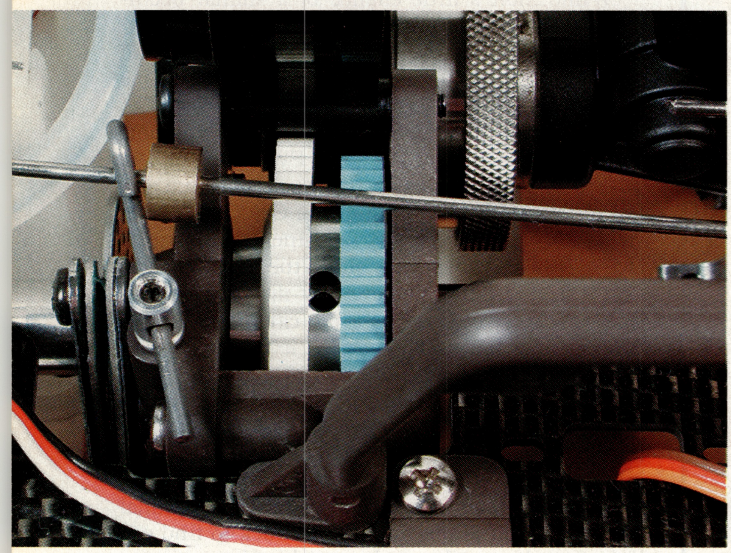
Part of our shootout between SuperTens involved the careful selection of hop-ups from Kyosho's catalogue. To ensure the most accurate performance evaluation, we did our best to outfit both cars with similar parts where possible.

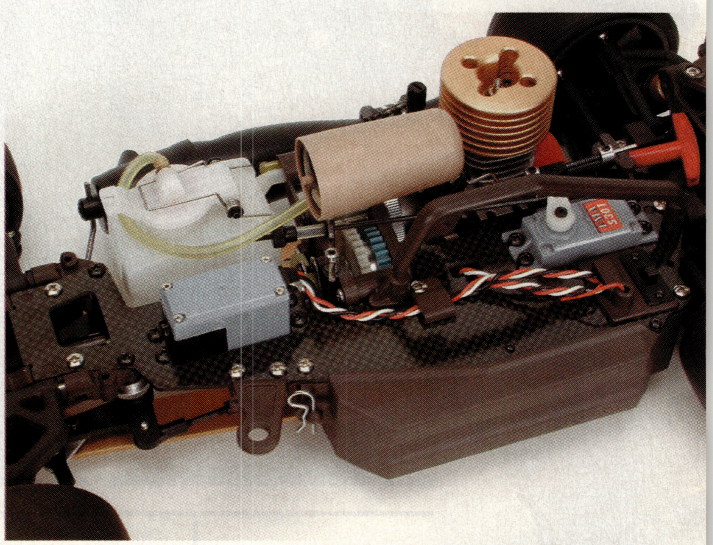


Kyosho's optional FW-04 swaybar kit keeps the SuperTen nice and flat in the turns and quickens steering. Each set (there is one for the front and one for the rear) contains three bars (of varying thicknesses) and all the hardware needed for installation.



Kyosho FZW51 Hard Main Chassis. If you want a good handling car, you have to have a rigid platform. And while the stock FW-04 chassis is fine, Kyosho's optional chassis is milled from billet aluminum and then hard-anodized in a great-looking gold color. All of the chassis' edges are chamfered to prevent snags, and the Kyosho logo has been machined into the chassis' underside should you forget what type of car you're driving.

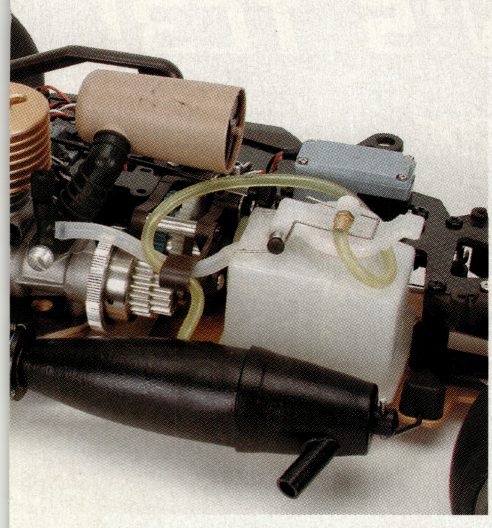




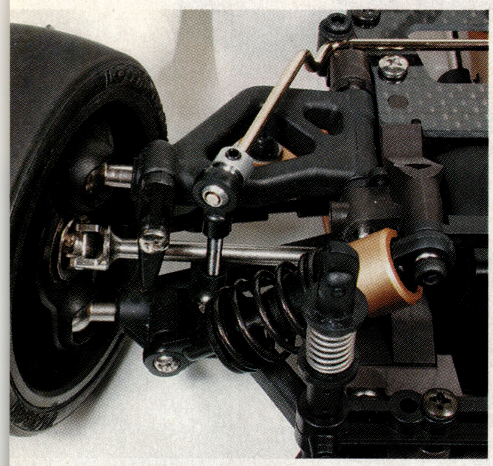
FZW56 2-Speed Transmission Kit. This is the single biggest performance improvement that can be made to the stock FW-4 SuperTen. The two-speed really brings out the best in the stock Kyosho GS-15R two-stroke engine, improving response in the tighter sections of the track, while providing greatly improved straightaway speeds. To fit the two-speed to the four-stroke car, you'll need the special two-speed flywheel from Kyosho's FZW30 four-stroke Fitting Kit.

Both versions of the SuperTen come with a 39-tooth spur gear. The difference is that the two-stroke spins a measly 15-tooth clutch bell, while the four-stroke pulls a hefty 21-tooth gear. The two-speed starts out with a lower 20/41 ratio, then shifts up to a tall 24/37 ratio. Needless to say, the changes in both low-end pull and top-speed wind-out are significant for both SuperTens.

FZW52 Carbon Upper Deck. This lightweight carbon-fiber upper deck replaces the stock Duralumin plate. The carbon deck retains the stock positions for both servos, and increases chassis rigidity. Oh, and we should add that nothing looks more trick than carbon-fiber!



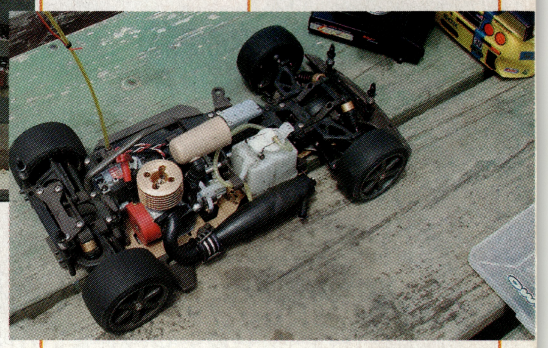
39011 Kyosho Tuned Muffler Set. Designed to fit the two-stroke SuperTen, this tuned pipe and manifold improves engine breathing for increased power and cooler operating temperature. Although the manifold won't fit the four-stroke engine, we did fit the tuned pipe itself to the four-stroke's manifold. Even without the manifold, the pipe itself is an improvement over the stock Kyosho Silent Streak muffler. We especially like the tuned pipe's cool-looking pearl-white finish.



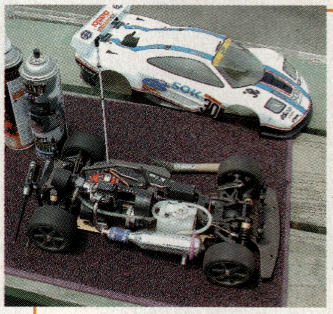
FZW53 Universal Swing Shaft Set. If you're a SuperTen owner, these are a must-have. The stock car uses dogbone/axle assemblies at all four corners. While these are fine for the rear wheels, the dogbones don't like the extreme wheel angles found at the front end. For this reason we installed the universal shafts in front only, as they transfer power with much more smoothness and efficiency. ◆



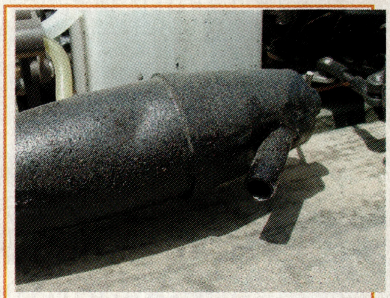
Editors Frank Masi (left) and John Howell (right) traveled to the Ventura Roadrunners track in Camarillo, California, to determine which SuperTen rules.



The two-stroke SuperTen, although matching the four-stroke on top speed, was at a significant disadvantage to the thumper on the tighter sections of the track. We will be installing an O.S. .15 for a rematch.



The four-stroke held a distinct torque advantage over the two-stroke SuperTen. Also, the thumper's broader powerband made the car easier to drive.



Hack attack: Doogie's two-stroke SuperTen suffered a bent exhaust stinger after Frank brushed into his car (i.e. didn't brake at the end of the turn). This didn't seem to affect performance though (the car had run for over an hour before noticing the damage).

TEST RESULTS

The first time we had pitted the 4-stroke FW-04 against the 2-stroke, both cars were box-stock. That time, we had felt that the 4-stroke's stock gearing was preventing the FS-26S from reaching its full potential. This time, we added a few hop-ups to both cars, hoping to squeeze the maximum performance from each. The one item that had the biggest impact on both cars was the two-speed transmission. Where the 4-stroke was all grunt and no pull, the 2-speed literally doubled the car's straightaway speed. This mod also showcased the disparity between the more expensive O.S. 4-stroke and the sport-level Kyosho 2-stroke engine. Although evenly matched on the long straightaway, the low-end torque of the 4-stroke provided a distinct advantage everywhere else, including the entrance to the straights.

Aside from the 2-speed, the benefits of some of the other mods became apparent during the shootout. The 4-stroke was equipped with Kyosho's optional sway-bar kit, and was noticeably more responsive in the turns. Since both cars were using their stock kit tires, it was easy to feel this difference. The 2-stroke was fitted with Kyosho's viscous-coupler shaft, which is designed to replace either the front-center driveshaft or the rear-center shaft. What it does is bias power, either to the front wheels if installed behind the primary spur gear, or the to the rear wheels if in front of the center gear. We suspect that this item was designed for the previous generation SuperTen, as it was too long to replace the FW-04's front-center shaft. We did install the viscous-coupler in the rear, and we could feel its effects in the form of less steering response and more "pull" from the front wheels when exiting turns. Doogie didn't like this feel, but I thought it made the car easier to drive.

The good folks at Great Planes had sent along an O.S. .15 CV engine for use in the 2-stroke SuperTen, however we couldn't fit this more powerful engine using the stock mounts. We plan on staging a "part 2" of this shootout using this engine, which should help level the field against the 4-stroke.

-Frank Masi

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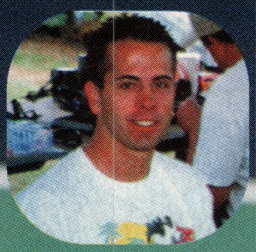

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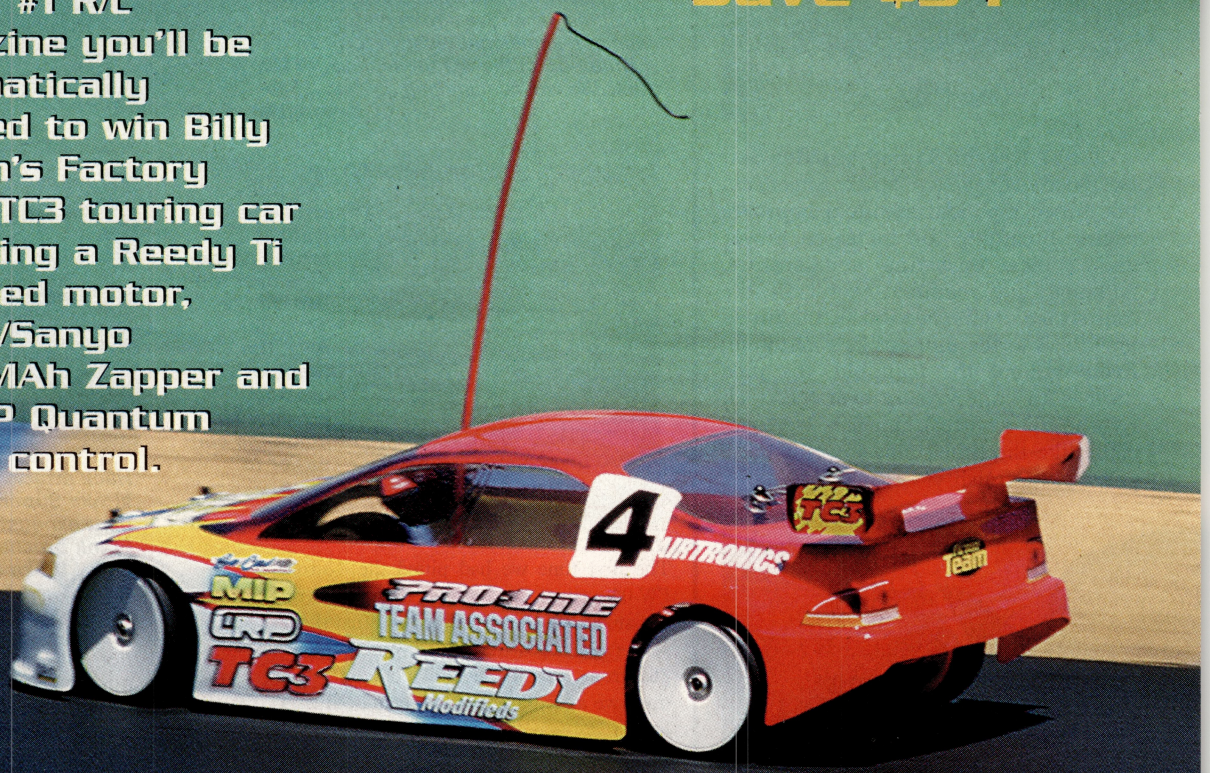

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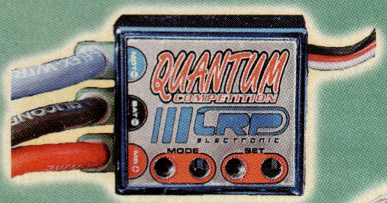



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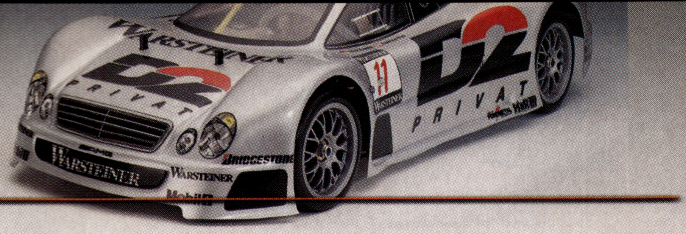

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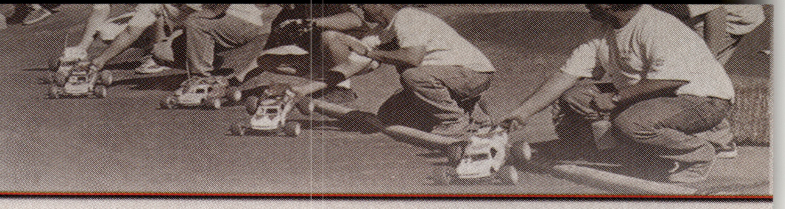

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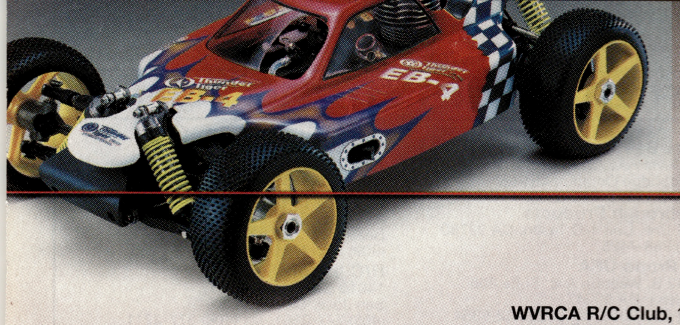

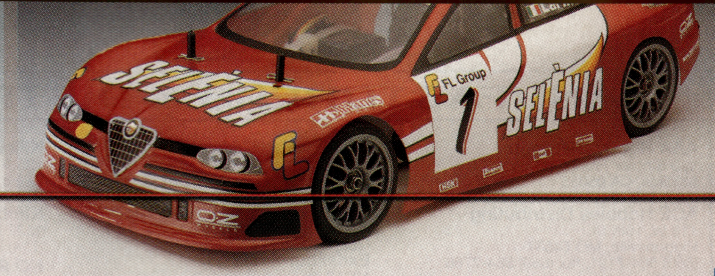

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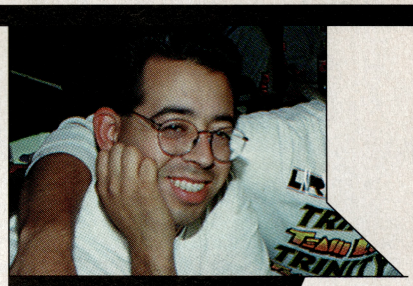
FOX HUNTING!



BY RICHARD TRUJILLO

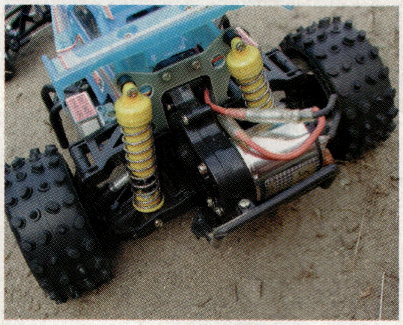
About two weeks ago, I received a package at Team Losi addressed to me. I wasn't expecting any packages, and this one was sent by one of our team drivers, Bill Bridges. Bill knows that I'm always on the hunt for any old Tamiya cars, and boy was I surprised, when I opened the box, to find a near mint-condition Tamiya Fox!

Bill told me that the hobby shop he worked for built this one as a display car for Tamiya back in the day. Bill said it was just collecting dust in the back room and thought I would like to have it to add to my collection. Heck, yeah, we can add this to my collection—thanks Bill!



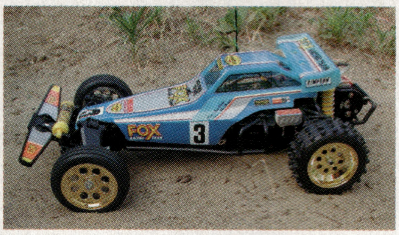
I'm not sure exactly what year the Fox was released, but I do remember it being in the early '80s. This car was designed by Tamiya to be a "serious racer". This was the first car that Tamiya released with their new bright yellow CVA molded shocks. To this day, you can still find these shocks in some of the current Tamiya kits. For the average hobbyist, these shocks were better than any shock released in any previous Tamiya kit. They came with several piston choices and preload tensioners, which made tuning to track condtions easy. Although the hardcore racers said the shocks were too inconsistent under race conditions, they definitely soaked up the bumps and jumps for the beginners.

The Fox featured a fully sealed radio box, and although nice for keeping the electronics out of the elements, it made it that much harder to adjust your radio gear, let alone change a crystal. The front suspension featured a mono-shock type suspension. The

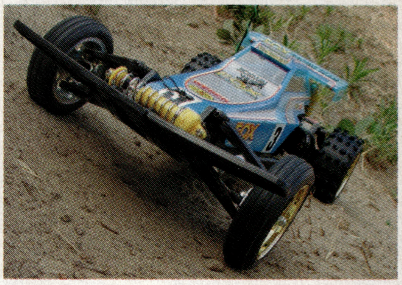


only setback to this setup was that it did not have enough suspension travel and thus bottomed out fairly easily. The rear featured independent suspension with a shock at each corner.

Many companies offered aftermar-



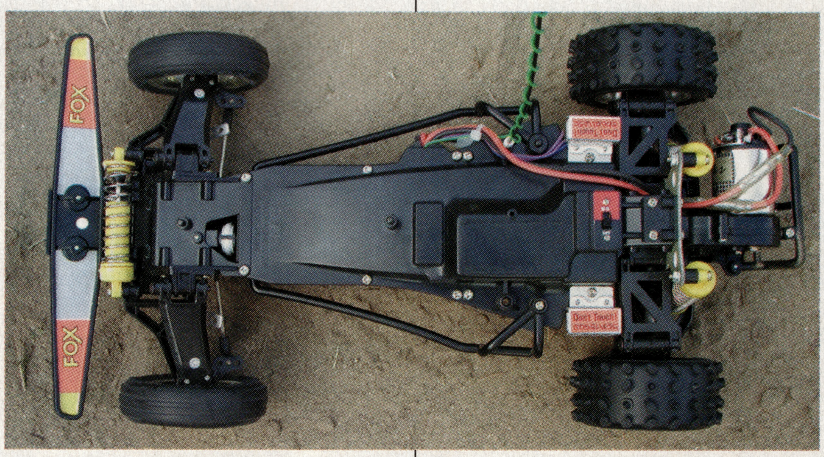
ket parts for the Fox, and this made the car pretty popular. The Fox is pretty easy to find on eBay in various conditions, and many are actually reasonably priced. If you are going to pick up one of these to add to your collection,



be sure that the wheels are in good shape. The Fox came with gold-plated plastic wheels. The gold tended to flake off fairly easily and this makes good ones hard to find.

Last month I started working on my Tamiya Hi-Lux, but the racing season has slowed my progress and all that I have done is remove the paint. As soon as the Nationals are over (which they should be, by the time you read this) I'll get back to working on it and get some pictures and updates in future articles.

Finally, I did pick up a couple of cars for my collection. The first being the Tamiya Rough Rider, and the other being the Tamiya Sand Scorcher Baja Bug. They are both in very good shape, but are going to need some work to get back to display condition. I've already picked up a new sticker sheet for the Rough Rider from my buddy Frazer at *www.blazerfrazer.com*. Now I'm looking for that hard-to-find Sand Scorcher sticker sheet! Back to the internet and eBay...◆



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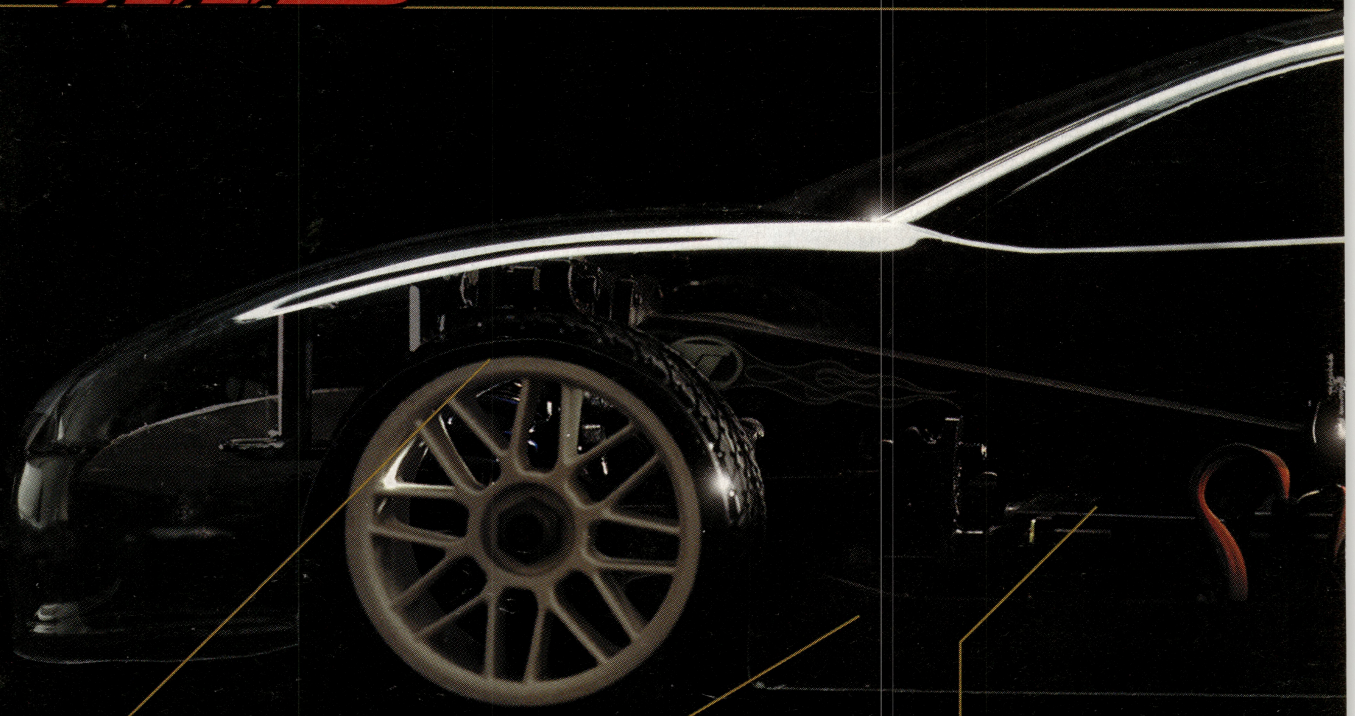
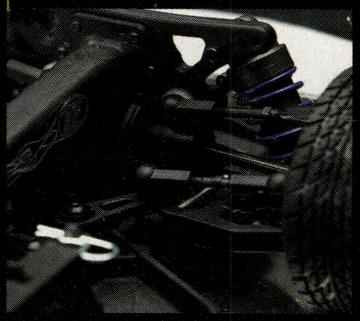
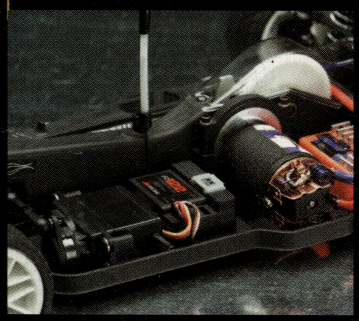
A REVOLUTIONARY CONCEPT IN A LONG LINE O



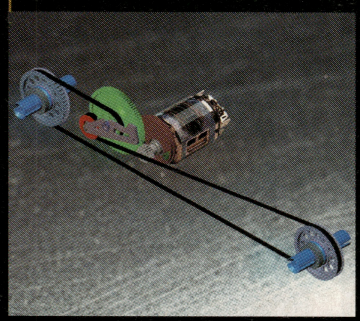
Adjustable down stops, camber link location, and shock angle on all four corners make optimizing suspension geometry easy. Front and rear pivot mounts allow adjustment for various track surfaces.



Unique, integrated, one-piece composite chassis seals the drive train from dirt and debris. The ultra-rigid design eliminates many bolt-on components that can shift on impact. Handling is consistent even after collisions.

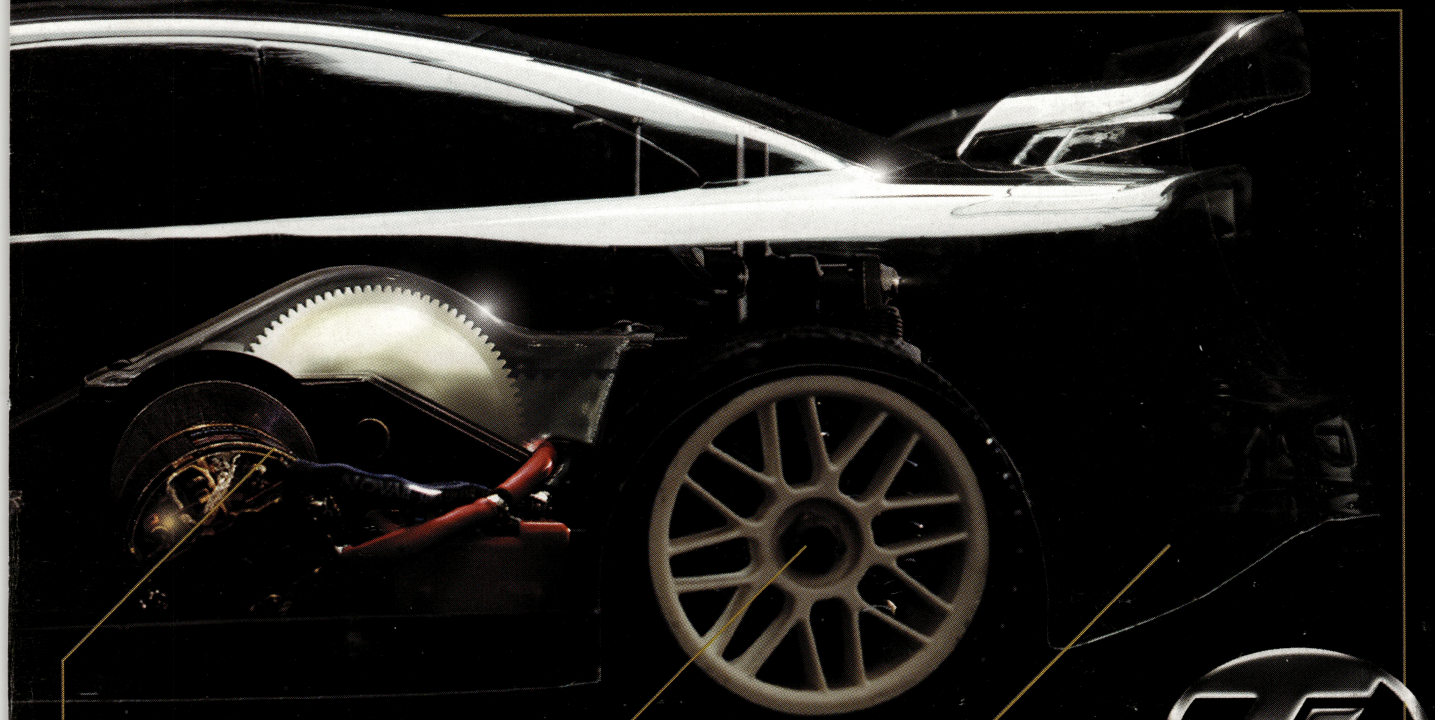


The revolutionary single belt drivetrain offers minimum friction, maximum durability and eliminates negative handling/tuning characteristics of shaft or inline drive. Gear changes and belt adjustments are quick and easy.



NG SEDAN

XCEPTIONAL RACERS. THE BRAINCHILD OF A LEGEND, IT WAS BORN TO WIN.



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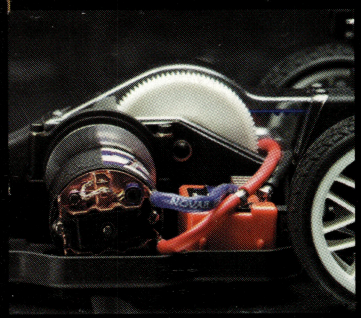

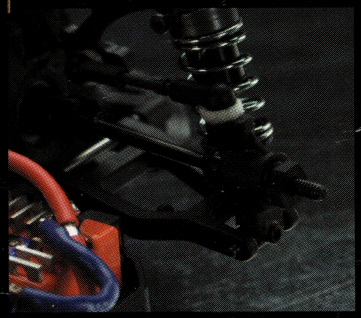

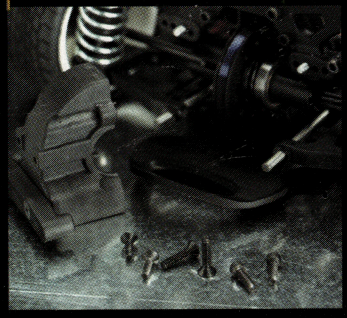

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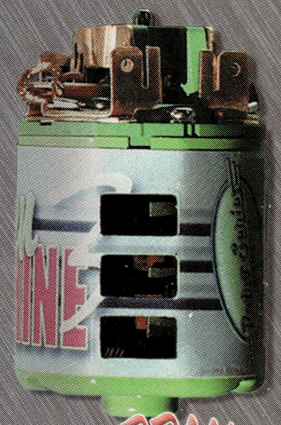
PLAY THE STOCK MARKET AND WIN!



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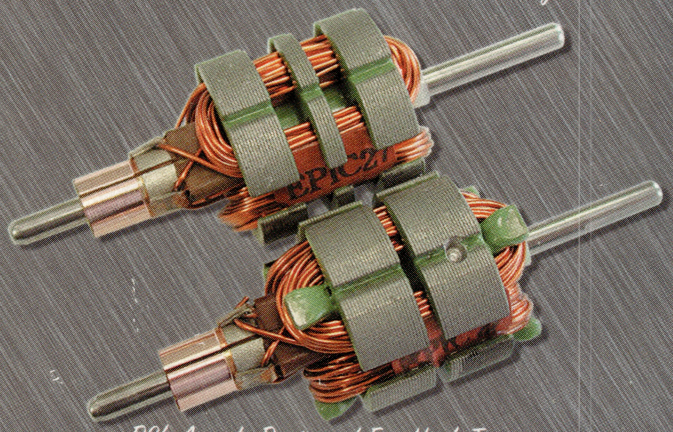



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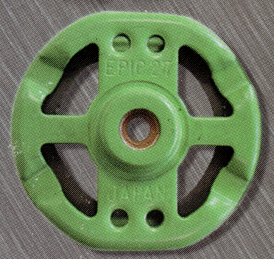

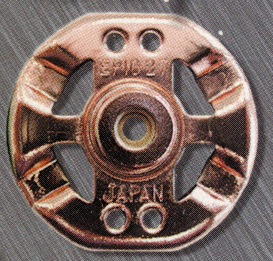



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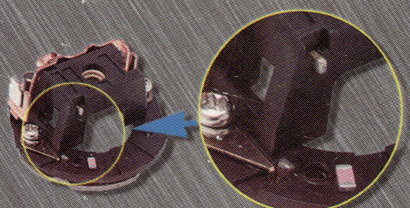



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