Radio Control
CAR ACTION
THE WORLD'S LEADING R/C CAR MAGAZINE
January 1997

BIGGEST ISSUE EVER

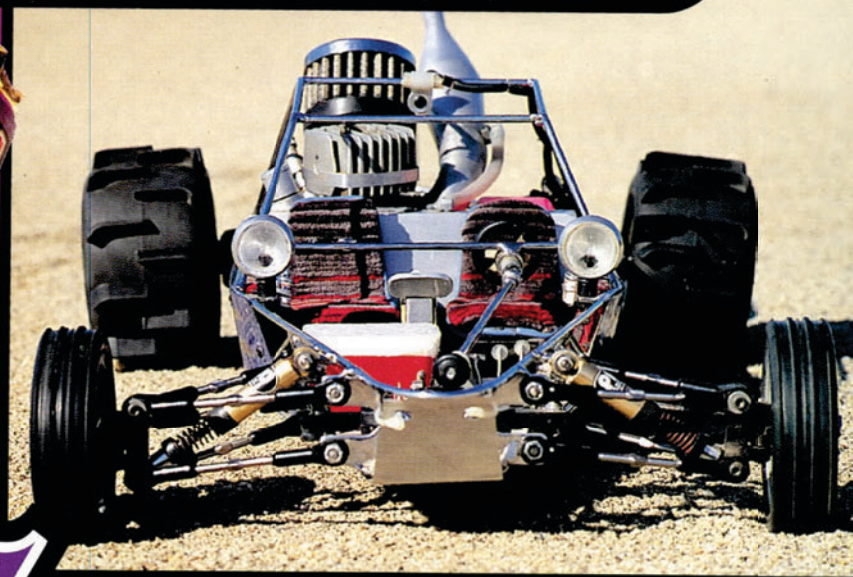
7 CAR SHOOTOUT

Which touring car is tops?

NEW for '97

OVER 80 HOT NEW PRODUCTS

Secrets of longer run times



Reader's Ride of the Year

Inside Losi's new 4WD

01>
0 09128 47380 2
USA $4.95
CANADA $5.95

Radio Control
CAR ACTION
VOLUME 12, NUMBER 1 • JANUARY 1997

features

29 New for '97
All the hottest goodies for the coming year • by John Howell & George M. Gonzalez

46 Sneak Peek: Team Associated's Budget RC10B2
A Worlds-winning design without the Worlds winner's expense • by Frank Masi

58 Reader's Ride of the Year
Home-Built Nitro Sand Rail • by George M. Gonzalez

102 Product Watch: Trinity Dirtinator 2
The New Mod Squad • by John Howell

106 Sedan Shootout
Which touring car is tops? • by Frank Masi

116 ROAR Off-Road Nats
Battling in Butler • by John Howell

pg. 106

163 Kyosho Off-Road Gas Challenge
Nitro nuts attack Freedom Hill • by Dave Ditner

176 Inside Team Losi's XX-4
The savior of the 4WD class • by Frank Masi

220 How to: Extend Your Run Time
Big wheels keep on turnin' • by Peter Vieira

256 How to: Clean Your Tires
Get better grip off the line • by Dominic Tuso

pg. 66

DEPARTMENTS

18 Editorial
20 Letters
24 Readers' Rides
222 Grassroots Racing
246 What's New
253 Classified Ads
288 Index of Manufacturers
288 Index of Advertisers

COLUMNS

48 Pit Tips
by Jim Newman

51 Troubleshooting
by George M. Gonzalez

52 R/C Doctor
by Doug Mertes

290 Chris's Back Lot
by Chris Chianelli

THRASH TESTS

66 CEC Opel Calibra
Is bigger better?
by Greg Vogel

70 Wood Racing X-13
Victory is a left turn away
by Rick Schwartz

82 OFNA Pirate 10 DTM
Back-lot brawling Benz
by Greg Vogel

94 Tamiya Volkswagen Beetle
This beetle is buggin'
by Dave Ditner

ON THE COVER: the top touring cars stretch out and pose for our staff photographer, Walter Sidas; all the hot new products of '97 were also shot by Walter Sidas; the Reader's Ride of the Year coincidentally was shot by Walter Sidas; and you'll never guess who shot the photo of Team Losi's new XX-4. You guessed it! Walter Sidas.

THIS PAGE: Walter Sidas is a very busy man! Here, he snapped the glorious zoom shot of the touring cars featured in our main cover story; we'll give you five bucks if you can guess who also shot the CEC Yankee Calibra (nah, we'll tell you. It was Walter Sidas).

Our Biggest Issue EVER!

I know this may sound rather clichéd, but this is the biggest issue of *Car Action* ever! Not the biggest of this year or of the '90s, but the biggest darn issue since we launched this baby back in '86. Go ahead! Feel the weight! Looking back as I start my sixth year as a member of the *Car Action* staff, I can't remember ever having as much pure *stuff* in one single issue as we've packed into this one.

What is this car, and why is it causing such a stir? Find out in this issue.

New Toys for the New Year

The fall/winter season is always exciting and busy for the R/C car industry. It's exciting because this is when companies announce the release of their new products. It's busy because we have to scramble just to keep on top of the pile of press releases and samples that are sent our way.

As has become tradition, much of this month's issue deals with this avalanche of new products. We've temporarily taken over Chris Chianelli's "Inside Scoop" pages to accommodate the "New for '97" feature. This special, enlarged edition of "Scoop" contains info on every new product release that we could get our hands on. Many editors gave their lives to bring us this information, and I promise to return the space to Chris next month.

On the subject of new products, don't miss our look inside what many feel is the hottest R/C off-road product of the '90s—Losi's new XX-4 4WD buggy. I feel the same way about this car as I did about the Dodge Viper and the new Plymouth Prowler hot-rod; I never *really* thought that they'd actually make the darn thing! You may have read about the XX-4 and seen the spy shots we published in the November issue; we at last nabbed one of the prototypes for a full photo session, so we can reveal all.

Sedan Slam

Touring car racing is hot! In fact, I haven't seen this much enthusiasm since the big off-road fever of the late '80s. This month, we gather seven of the world's top touring cars for a head-to-head comparison. If you're looking to get into touring car racing, you must check this feature before you visit your hobby shop. I'm sure you'll find a few surprises.

Finally, I'd like to welcome aboard our newest contributing writer, Peter Vieira; I think you'll agree that he pens some of the most informative—and humorous—articles in the magazine. Check out his "How to Increase Run Time," and you'll see what I mean.

Frank Masi, Executive Editor

Radio Control CAR ACTION

■ EDITORIAL
Group Editor-in-Chief TOM ATWOOD
Executive Editor FRANK MASI
Senior Editor CHRIS CHIANELLI
Editor JOHN HOWELL
Associate Editor GEORGE M. GONZALEZ

■ COPY
Copy Director LYNNE SEWELL
Senior Copyeditor KATHERINE TOLLIVER
Copyeditor JULIE GORDON
Assistant Copyeditors
THOMAS J. HURLEY
JUDITH L. SCHWEITZER

■ ART/DESIGN
Managing Art Director ALAN J. PALERMO
Art Director BETTY K. NERO
Assistant Art Directors
MICHAEL BOUSE
ANGELA A. CARPENTER
MATTHEW A. CHIAVELLI
LESLIE COSTA
Staff Photographer WALTER SIDAS
Image Technician CHRISTOPHER HOFFMASTER

■ MARKETING
Director of Marketing GARY DOLZALL
Marketing Manager DANIELLE RUGGIERO

■ CIRCULATION
Circulation Director NED BIXLER

■ OPERATIONS
Director of Operations DAVID BOWERS
Production Assistant ARLENE MELKO

■ ADVERTISING
Director of Advertising SHARON WARNER
Assistant Manager JILL ELLEN MOLINARO
Advertising Account Executives
TOSHA CRAWFORD
KATHY FARRELL
Advertising Traffic Administrator SIRI A WHEELER
Advertising Coordinator ANN T. WIEBER

■ PUBLISHING
Group Publisher LOUIS V. DeFRANCESCO JR.
Publisher YVONNE M. DeFRANCESCO
Associate Publishers
GARY DOLZALL
SHARON WARNER

■ CORPORATE
Chairman DR. LOUIS V. DeFRANCESCO
President and CEO MICHAEL F. DOYLE
Vice President G.E. DeFRANCESCO
Secretary L.V. DeFRANCESCO
Treasurer YVONNE M. DeFRANCESCO

AirAGE PUBLISHING

Member Audit Bureau of Circulations

PRINTED IN THE USA

Stop Picking on George!

I've been an avid reader of *R/C Car Action* for many years, and I always appreciate the humor in most of the "Thrash Tests"—especially George's articles. I also really enjoy "Chris's Back Lot"—so much so that I read the magazine backwards. In the October '96 issue, I noticed that George was the victim of some rather negative press, which is unusual because John Howell, or Doogie as he's referred to, is usually the butt of Chris's jokes.

In this particular "Back Lot," however, Chris stated that George spends tons of money hopping up his cars, and he still can't prevent his car from flying off the track. In fact, Chris mentioned that all these hop-ups only cause George's car to go further into the woods. Is George really that bad a driver, or does Chris just like picking on his coworkers? Well, keep up the good work. I definitely plan to continue reading your articles. Who knows? Maybe someday George and John will get even with Chris.

THOMAS MORAN
Pacific Palisades, CA

Hey Thomas, thanks for coming to my rescue. Yeah, Chris does like to make fun of his coworkers, but he does it only because we make fun of him every time he walks through the door. We just can't help it; he's one of those guys that you can't resist teasing because his ideas, beliefs and habits are far from mainstream (unless you live on the dark side of the moon!).

I have to admit, though, that my cars do always end up in the woods. But that's only because I drive very modestly, and my coworkers drive as if their lives will be in jeopardy if they don't win the race. Naturally, my car always ends up getting punted into the woods. Then I have to put up with comments like "What's the matter, George? Is your car glitching?" or "George, George, George of the jungle; watch out for that tree!" I think you get the picture. They'd better watch it, though; if I hear a Georgie-Porgie reference, there may be some bloodshed!
Georgie-Porgie*—arghh! Yeah!—** ***Doogie

Racer Needs Reassurance

There's a big trophy race coming up at my local track (R'n'L Hobbies, Portage, MI), and I have a couple of questions because I've never raced before and I'm a little nervous. The racing format is A, B, C, so will there be enough time to discharge and recharge a battery pack between races? Also, I know I need new tires, but should I also buy an extra battery pack and set of radio crystals?

I have a Losi XXT with purple screws, aluminum front-bulkhead brace, aluminum tranny brace, full set of graphite parts (including the long chassis) and an aluminum slipper shaft. Electronics include a Trinity Midnight, a 1400mAh sport battery, a Novak Racer ESC and JR AM 75MHz radio equipment. I'm thinking of racing in the "non-competitive" race because I don't think I'm as good as the other drivers even though I've been heavily into R/C for three years and counting. Please help me.

STEVEN QUADA
[via email]

Don't worry; you'll be fine. Just remember these simple tips: always check which qualifying heat you're scheduled for, and keep track of which heat is running, so you'll be ready when yours comes up. You really need at least two battery packs. If there isn't much time between qualifying rounds, you won't be able to let your pack cool sufficiently before recharging it. With two packs, you'll be able to charge one while the other is cooling.

Most important, have fun and don't let any uptight, so-called "fast guys" give you a hard time! Really fast drivers such as Mark Pavidis and Matt Francis know how to drive around slower traffic, and they don't get angry because a beginner is in their heat or Main. Good luck!
Frank

Clever Readers, Part 3

Dear Miss White,
Your column is great. You are really good at this R/C stuff. Does the Tekin Rebel have current limiter? Does Tekin Titan have current limiter?
ICECONE
icecone@aol.com

Thank you. No. No.
Cindy

Dear Mr. Howell,
Your column is great. I think you are really smart at this R/C stuff. Does Tekin Rebel have current limiter? Does Tekin Titan have current limiter?
ICECONE
icecone@aol.com

Thank you. No. No.
Doogie

Dear Mr. Gonzalez,
Your column is perfect. I think you are really good at this stuff. Does Tekin Rebel have current limiter? Does Tekin Titan have current limiter?
ICECONE
icecone@aol.com

Thank you. No. No.
George

Dear Mr. Masi,
Your column is very helpful. I think you are really good at this R/C stuff. Does Tekin Rebel have current limiter? Does Tekin Titan have current limiter?
ICECONE
icecone@aol.com

Thank you. No. No.
Frank

Dear Mr. Chianell,
Your column is cool. I think you are really good at this R/C stuff. Does Tekin Rebel have current limiter? Does Tekin Titan have current limiter?
ICECONE
icecone@aol.com

Thank you. No. No. That's "Chianelli," by the way.
Chris

WRITE TO US! We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Air Age Inc., Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

INTERNET ADDRESSES:
Frank Masi: frankm@airage.com
John Howell: johnh@airage.com.
Chris Chianelli: chrisc@airage.com.
George Gonzalez: georgeg@airage.com

READERS' rides

SPONSORED BY NOVAK ELECTRONICS, INC. RACING TEAM

"Readers' Rides" is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers' Rides, R/C Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. If we choose to feature your creation, you'll receive a 6-month subscription to Car Action, or an extension of your existing subscription. You'll also be eligible for the seventh annual "Readers' Rides of the Year Contest" in the fall of 1997. The winner will be awarded $500 and an assortment of electronic R/C equipment furnished by Novak Electronics Inc. Our second and third choices will also receive an assortment of Novak electronic R/C equipment. In case we need to contact you, write your address and phone number on your letter and on the back of every photo you send. Good luck!

GRIM RIDE

This graveyard destroyer is equipped with as many hop-ups as a body has bones. Kenneth Valdez of Valdez, NM, sent us this photo of his Clod Buster truck. He has equipped it with ESP Hobby Mfg.'s Clodzilla IV Pro Race kit chassis and Clodzilla Powerup motors. Kenneth uses a Novak Hammer Pro speed control, a Futaba Magnum Jr. radio, JPS Wheels, Duratrax V-Spike racing tires, Duratrax oil shocks and a Bolink '53 Chevy body painted and "decaled" by hand. This truck will keep even ghosts at bay.

GOT MILK?

Old Jay Campbell had a farm, e-i-e-i-o; and on that farm he had some "cows"—seven of them, to be exact. Jay and his sons, Cody and William, of Starbuck, MN, sent us photos of their "herd." This family doesn't enter their cattle in competition at the state fair, though; they're entrants in national R/C races. They took a Losi Double-XT, Losi Double-X and Kyosho 4WD Lazer ZX to the Off-Road Nationals this past year, and Cody put two out of the three moo-mobiles in the A-Mains and won the E-Truck Main. "Team Holstein"—as they refer to themselves—practice and race weekly on the indoor track on their dairy farm. Sounds like "udder" madness, guys!

TOO MANY HOP-UPS?

"There are too many hop-ups on this RC10GT to list individually," says Matt Pyle of Sitka, AK. He did mention a few, though. It's powered by an O.S. CZ-Z and equipped with an MIP heat sink, butt sink, Golden shock shafts and 4-N-1 clutch, HPI universal shafts and Lunsford Punisher titanium tie rods. He controls his ride with a Futaba Magnum FM radio and Futaba 9304 servos. The hot-looking paint job is by KVB Custom Painting in Anchorage, AK.

STARS AND STRIPES FOREVER

Michael Bisaccio of Garden City, NJ, sent in this photo of his Tamiya Mustang Cobra he has nicknamed "Venom." He equipped it with a Futaba Magnum Sport radio system, a Tekin Rebel ESC, a Trinity Green Machine 2 motor and a full set of ball bearings. For a unique design, he customized the body by matching blue paint to his decals and individually cutting and placing each star. He says the effort was painstaking, but he is pleased with the results. Looks good, Michael!

SPEEDY STOCK

Jeb Livengood of Reading, PA, tells us he souped up his Tamiya Civic VTI with a Trinity Midnight motor and ball bearings so that the car would race faster than it would in standard stock form. He controls his ride with a Futaba Magnum Sport radio and Novak NESC T-4 speed control. Jeb used Pactra paints to spray the four-color body and to tint the windows. He would like to credit his friend, Keith Krick, a photography student, with the sweet photo that allows us to share his car with you, our readers.

A FAMILY AFFAIR

Lilly Kennedy of Sacramento, CA, wrote to tell us about the interest she and her husband share in R/C cars and trucks. Although they claim dual ownership of both vehicles, there seems to be a his and a hers. She powers her Tamiya Volkswagon with an Airtronics Rival Sport radio and Tekin Rebel ESC. Her husband, Albert, controls his Team Losi Double-XT truck with an Airtronics XL2P radio, and he equipped it with a Trinity Onyx motor, Lunsford titanium tie rods and a Tekin P-12 ESC. Albert did the airbrushing on both vehicles, and he customized the bug by painting Lilly's name on the back.

MULTIPLE MOTORS

Sean Karns of Santa Fe, NM, customized the paint job on his new Associated RC10T2's body using spray paint and following *R/C Car Action* painting tips. He powers his desert cruiser with a Reedy Sonic "B" modified motor—or a Trinity Midnight stock motor when he's racing just "for fun." The truck is equipped with Futaba Magnum Jr. radio gear, a Futaba S9101 coreless ball-bearing servo, a Novak Hammer Pro ESC, a Novak Polaris AM receiver, Orion 1700mAh matched battery packs and Deans Ultra Plugs. Sean also outfitted his

truck with MIP CVDs, MIP Golden shock shafts, Lunsford Punisher turnbuckles and hinge pins and Trinity purple-anodized, lightweight screws.

GET OUT OF JAIL, FREE

Roger Serafin of Union City, CA, replaced his full-size, nitrous-assisted street drag-racing Honda Civic with this R/C sedan loaded with trick components. This Yokomo YR-4 is equipped with MIP CVDs, a Tekin 411-G2 speed control, an Airtronics 94737 servo and an Airtronics radio system. The car is powered by a Maxtec 11-turn motor. He used a Frewer Nissan Silvia body and Tozai rims with HPI low-profile tires. Extremely satisfied with his new ride, Roger is only sorry he didn't discover the R/C hobby before spending so much money in traffic court.

NEW for '97

by George M. Gonzalez & John Howell

A SPECIAL EDITION
INSIDE SCOOP

ROUND THIS TIME of year, we start to hear rumors and rumblings about all the hot new products that are about to be released to the eagerly awaiting public. Most of these products made their debut at the Chicago RCHTA show or shortly afterward.

Product-wise, this year is by far one of the most exciting that we've seen in a while, and that's a good indication that our hobby is growing steadily. So strap yourself in and check out all the hot products that are sure to make this an epic R/C year for us all!

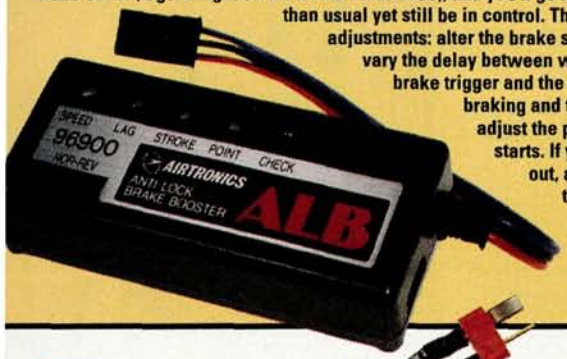
To contact the companies listed here, just turn to our Index of Manufacturers for address and phone details.

All** the **hottest** **goodies** for the **upcoming year!

Airtronics
Anti-Lock Brake Booster

Need to slow down yet stay in control of your gas or glow-powered vehicle? If you do, check out the Anti-Lock Brake (ALB) Booster. Install the unit between your receiver and brake servo (it goes right on the brake servo case), and you'll go into the corners faster than usual yet still be in control. The Booster has a ton of adjustments: alter the brake servo pumping speed, vary the delay between when you activate the brake trigger and the ALB system activates braking and the brake release, and adjust the point at which ALB starts. If you race gas, check it out, and stop locking up those wheels.

Part 96900, $69.95.



Trinity
Opal Motor

New in the Speedgems lineup is the Opal machine-wound modified motor. Designed with oval racing in mind, this 10-turn triple produces 39,700rpm at 6 volts and features Trinity's new 5.1 motor magnets, a 1.2mm thick can, 4495 brushes and adjustable timing.

Part RC9208, $49.99.

Trinity
Team Gold Dust Modified Motor

Gold Dust motors are drill-balanced and hand-wound with winds selected by Team Trinity's Brian Kinwald and Greg Hodapp. Brian and Greg's motors have all their favorite off-road winds and specs and feature EPIC motor technology; drill-balancing the armature reduces production costs, and that means more speed for your dollar.

Part GD211-GD313, $69.99.

Deans
Black Box

Bulb battery dischargers are arguably the most cost-effective way to discharge your battery packs; but you always have to wait around to disconnect the pack at exactly the right moment to avoid damaging it with an excessive voltage drop. Well, the Deans Black Box is what we've been waiting for. Designed to be used with Deans' discharger or any bulb-type discharger, it's simple and effective. Just plug the Black Box into you discharger, then plug in your pack. With its built-in current delay, it eliminates the risk of connector-contact arcing. When the preset voltage has been reached, discharging stops—no more battery damage caused by excessive voltage drop.

Part 2035. List price: not yet determined, but probably around $30.

Airtronics
94157 Servo

This light (2.07 ounces) 94157 servo combines lightning-fast response and high torque. The latest version features a double-ball-bearing-supported output gear; super-tough aluminum drive train; a new, custom, high-output coreless motor; custom IC with FET motor drives; surface-mounted components; and a high-quality, long-life potentiometer. The servo features 95 oz.-in. of torque and a 0.06-second/60 degrees rotation transit speed.

Robinson Racing Products
GTX Gears

These Losi GTX case-hardened clutch bells were designed to work with the truck's fixed engine position and offer a much wider range of gearing choices.

NEW for '97

Tekin
G-12c III

The Tekin G-12c III builds on the very successful G-12 Series. New are GoldFET III transistors, which, according to Tekin, are the newest breed of high-power MosFETs and produce 40 percent less resistance than any comparable product. They offer 400 amps of continuous power and take the operating resistance of the Series III to a low 0.00075 ohm. As Tekin says, "It's like having eight MosFETs in the space of five." A 32A built-in Schottky diode increases efficiency, and you also get adjustable brakes and Tekin's Log-Anti-Log throttle response, which ensures that you use the right amount of throttle or brake quite effortlessly.

Editors' HOT Pick

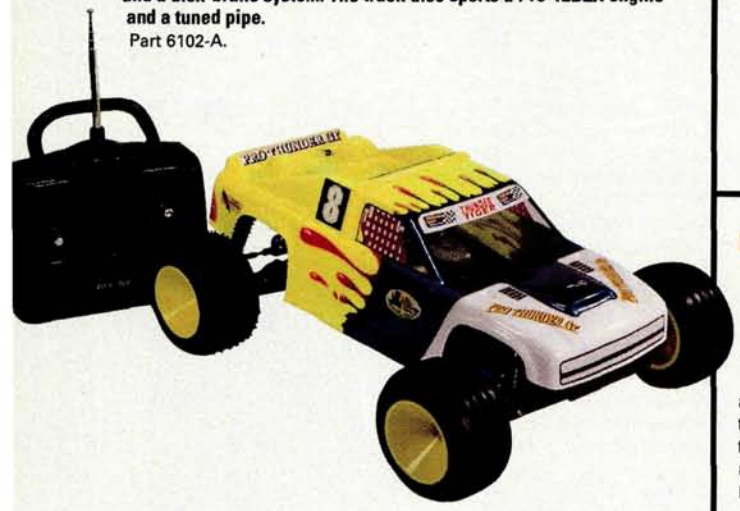
Trinity
Sanyo 2000mAh Cell

Yes, that's right! Sanyo has developed a super cell just for the R/C car market. This 2000mAh unit offers more capacity and voltage output while being more durable and consistent. Available in 20A, 25A and 30A configuration as well as 30A GM-VIS conditioned.

- 20A—part EXS204, $62.99 to $115.
- 25A—EXR204-207, $72.99 to $137.99.
- 30A—EXW204-207, $82.99 to $153.
- 30A—GM-VIS—VIS2004-2007, $103 to $180.

Thunder Tiger
Pro Thunder GT Gas Truck

The Pro Thunder GT gas truck features a heavy-duty aluminum chassis and radio tray, glass-filled nylon front and rear suspension arms, aluminum shock towers, a ball-diff-equipped tranny, a slipper clutch, a 75cc flip-top fuel tank, and a disk-brake system. The truck also sports a Pro-12BZX engine and a tuned pipe.
Part 6102-A.



Motor Man
Modified Motors

Check out these machine-wound modified motors: the Hurricane (14-turn double), the Typhoon (16-turn triple) and the Tornado (17-turn single). All have adjustable timing and ball bearings.
Parts MM1115, MM1116, MM1117, $45.

Motor Man
R/C Tool Kit

Here's a tool kit that comes with Allen drivers in all the most useful sizes (0.050 and 3/32 inch, 2.5mm and 1/16 inch), two nut drivers (3/16 and 1/4 inch) and a convenient stand.
Part MM8010, $34.

Motor Man
Commutator Cleaning Tools

One is for cleaning; the other is for polishing. It's that simple!
Part MM1320, $7.

Editors' HOT Pick

Trinity
Dirtinator 2

The Dirtinator 2 (D2) features Trinity's newest 5.4 wet magnets, which are even stronger than those in the original Dirtinator and have an even greater resistance to magnetic-field loss caused by excessive heat in the can. The armature blank was completely redesigned and now has a thicker, more efficient web and more horsepower. All of Trinity's winds have been updated with the new magnet and armature specifications to maximize their performance.
Part D2106-D2217, $95.

MIP
Lite Drives Outdrives

Lite Drives outdrives are available for most current Team Associated and Team Losi off-road vehicles. Made of a super-high-grade steel from which all the excess material has been removed, their lower rotating mass improves acceleration.
Part 1188-1191, $21.95.

Trinity

Tire Tweak 2000

Tire Tweak 2000 conditions and softens on-road foam tires. Apply it the night before a race to soften rubber tires, and use it on top of tire-traction additives such as Zip Grip and Paragon to prevent them from drying out. It works well with standard and exotic foam tire compounds.

Part RC6684, $6.99.

Dirt Bagz USA

Tranz Bag

This trick-looking Tranz Bag will hold almost any popular pistol-grip radio, and there's a pocket for small items such as a potentiometer screwdriver, or sets of additional crystals. The bag is made of durable, 600D vinyl-backed polyester, and its 1/4-inch-thick foam liner will protect your costly investment from being jarred around.

Part JJ3, $29.95.

MIP

CVDs and Center CVD

Editors' HOT Pick

If you run a Kyosho MP-5 1/8-scale buggy, these new CVDs and center CVD will complement your vehicle nicely. Machined of high-grade steel and hardened for strength, like their electric counterparts, they have near zero backlash. They will initially be available for the MP-5, Mugen Athlete and Super Athlete.

Part 1153-1152, $60.

Dynamite

Starter Box

The Ultra-Start is Dynamite's top-of-the-line starter box, and its compact, powder-coated, aluminum case is only 12 inches long. Its twin Kevlar timing belts perform very smoothly. Two 7.2V battery packs (not included) provide power for the dual 540 electric motors that turn the starter wheel with plenty of torque for quick, easy starting. The Ultra-Start comes with adapters for Associated and Losi gas trucks.

Part DYN5700, $129.95.

Dirt Bagz USA

Pit Apron

This is a must for serious gas racers—and any other racers who find they're always getting dirtier than they want to be. A large front pocket stores a bottle of fuel and a glow driver for quick and easy pit stops. The slit in the bottom allows you to move around freely.

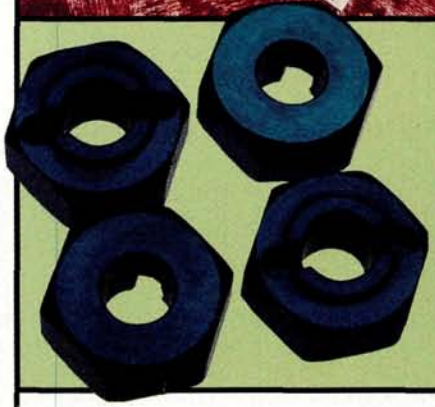
Part GLJ3, $29.95.

Parma/PSE

Diehard Sponsor Decals

If you're looking to deck out your Chevy Supertruck, you have to check out Parma/PSE's Diehard sponsor decals—three decal sheets.

Part 10781.



CRC

Hex Adapters

Available in a variety of hot anodized colors, these aluminum hex adapters replace the standard Tamiya pieces and include a driver for all four wheels.

Part 4246, $14.99.

Take-Off

Belted Tires

Belted tires are starting turn heads at tracks, and these Take-Off slicks are sure to get their fair share of attention. Available in a variety of compounds and widths, they have a fabric liner that helps reduce "ballooning" and the chance that the tread will "squish" under itself when the car is turning at speed.

Part T0-100-202.

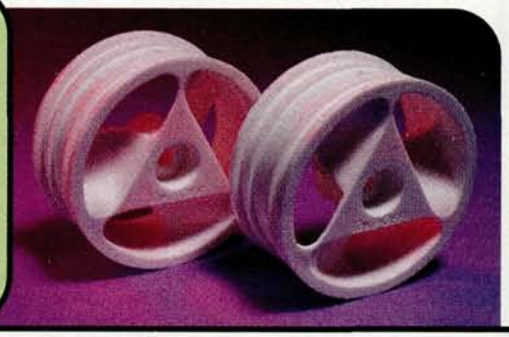
NEW for '97

HPI
Bushing Modified Motors
Available in 12-, 13-, 14-, 17- and 23-turn double winds, they're perfect for modified sports racers who want high performance at a low price. Fixed timing, pre-soldered capacitors, bullet connectors, diamond-trued armatures and self lubricating brushes—and you're ready to roll!
Part 113-1123, $39.99.

Trinity
Point Blank 1400 Power Pack
Trinity hasn't forgotten the guys who like to bash around in their backyards. The 1400 Power Pack's main advantage is its low, low price.
Part P-536—$24.99.

Take-Off
Tornado Wheels
These wild-looking wheels live up to their name. The three uniquely designed spokes force air inside the car's body to help cool your motor, batteries and ESC. They also help create more rear downforce.
Part T0-310.

Sonic
Fiddlestick Adjustment Tool
The Fiddlestick allows you to adjust and check your motor-spring tension. When your motor runs, heating and cooling will alter spring tension, but the Fiddlestick allows you to readjust the spring for optimum effect. Also use it to bend sets of springs to make the perfect set for your specific application.
Part 50-1, $12.49.



WITH TRINITY EX-TECH AND VIS-MATCHED BATTERY PACKS YOU KNOW WHATS IN THE BOX BEFORE YOU OPEN IT!

All EX-Tech and VIS-Matched battery packs have their numbers printed right on the outside of the box. This way you can see exactly what you are paying for. The sticker is equal to the lowest cell that is in the pack. No more surprises when you open up the box like you get with the other brands of matched batteries.

Team Losi

Street Tires

Here's the first in the Team Losi Street Tires (LST) series for pavements and other hard surfaces. Long respected as a leader in off-road racing-tire technology, Team Losi has once again produced a real winner—the T-90 on-road truck tire. Made of the exclusive, soft, Silver compound, the tire's advanced, low-profile carcass drastically reduces squirm and ensures a superior contact patch. Its unique tread pattern is a result of relentless testing and collaboration between Team Losi and top Indycar racing tire engineers. The tread's unique directional channels displace dust and allow maximum traction. Look for additional Losi Street Tires in the near future.

Part A-7690S, $17.95.

Trinity

X-Star Stock Motor

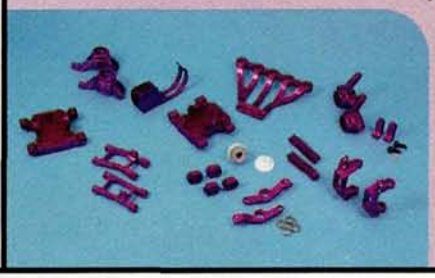
This is similar to Trinity's hottest stocker, the Midnight, but it goes a few steps further and faster. It has the same, stronger, 5.4 wet magnets as the new Dirtinator 2, and they're more resistant to heat and to being de-magnetized. There's also a new short-stack tri-rotor armature and a new chrome can. You'll find the same reduced surface bushings and steel flux collector as are in the Midnight. The new X-Star turns 25,000rpm while the Midnight turns 24,300.

Part RC2098, $39.99.

Trinity

Tamiya TA03 Aluminum Parts

Trinity has released a ton of hot Tamiya TA03 aluminum parts. The Steering Assembly kit has ball bearings, and all the pieces are precision milled out of a super-strong, super-light aluminum.



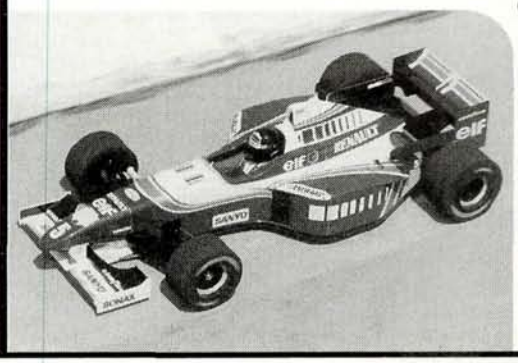
- Front Pivot Arm Plate/Under Cover Set—part TA-100, $39.99.
- Rear Pivot Arm Plate—TA-101, $29.99.
- Steering Assembly—TA-102, $41.99.
- Suspension Arms—TA-103 (upper), $13.99; TA-104 (lower), $22.99.

Hub Carriers—TA-105, $22.99 (front "C"), TA-106 (rear), $21.50.

Tamiya

Williams-Renault F1

And Tamiya hasn't forgotten about all you F1 fans. Here's the new Williams-Renault F1 car—a perfect replica of the cars driven by Damon Hill and Jacques Villeneuve in the most recent circuit. Based on Tamiya's race-proven F103 chassis, the Williams-Renault includes an adjustable friction damper plate that's optional on all other F103 cars. The front and rear spoilers are made with an entirely new mold and offer plenty of downforce, so this wicked ride can soon be dialed on any track.

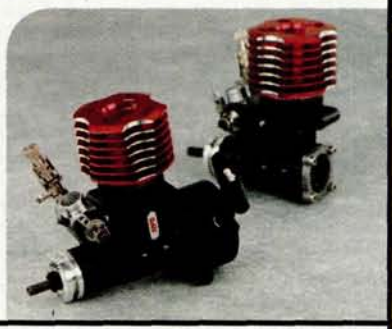


Part FW18—58179, $267.

NEW for '97

Dynamite
12PD .12 Engine

Designed by the "nitro king," Ron Paris, the 12PD .12 engine is sure to be a winner. Its revolutionary, new, dished-piston design and new combustion-chamber shape provide an increase in power over a broad rpm range. As a result, you'll get much more power than with a conventional .12 engine, and you'll still have a smooth, linear throttle response—no peaks or flat spots. The 12PD also looks different: see the heat-dissipating black finish on the crankcase and the large, red, Dynamite heat-sink head? In addition, the 12PD also features a sealed front bearing, CNC-machined super rod, O-ring-sealed low-speed needle and true chrome-plated cylinder.



Novak USA
Cyclone ESC

Here's a programmable, high-frequency (24000Hz), electronic speed control that boasts the lowest resistance (0.00167ohm) and the smallest size in the industry. The minimum brakes, dead-band, minimum drive and operating frequency can all be adjusted. The Cyclone also has Polar Drive Technology™, Hyperfet II™ transistors, One-Touch Set-Up™ and brake-light LED circuitry and kit. Brian Kinwald and teammate Greg Hodapp used the Cyclone to win national titles at the ROAR Off-Road Modified Nats.
Part 1765, $249.

MIP
Shiny CVDs

The Shiny CVDs that made their debut at the Florida Winter Champs have now been released to the public. The CVD bone has a top-secret coating that gives the illusion of chrome plating and makes them harder and more wear-resistant. Shiny CVDs will be available as replacements for all CVD kits now on the market.

Trinity
Buggy Blast

Trinity developed Greg and Brian's Buggy Blast cleaning spray not only for cleaning motors, but also to spruce up plastic, shocks and suspension components. ROAR champs Greg Hodapp and Brian Kinwald use it exclusively.
Part RC4443, $5.99.

Robinson Racing Products
Absolute Spur Gears

These goodies are definitely worthy of your consideration. Designed for the Associated RC10B2 and T2, Absolute Spur Gears are machined (not molded) of a revolutionary new material that runs more smoothly and more quietly. They fit more closely to the motor plate, so the pinion gear can be mounted lower on the motor shaft. A special rubber gasket, which the company calls a "sound inhibitor," reduces vibration, while an aluminum load spreader inhibits warping. The gears are available in from 80- to 91-tooth versions, and all come with a great chart that gives final gear ratios—not pinion and spur ratios.

Editors' HOT Pick

Take-Off
Aluminum Goodies for the RS4

Distributed by HIT Corp., these trick, blue-anodized Take-Off aluminum pieces for the RS4 are now available.
- Motor Heat Sink—part T0-011.
- Wide Camber Block—T0-009.
- Variable-Caster Block—T0-015.

Protoform
Peugeot 905B Body

This Peugeot 905B body was molded after the Peugeot Group C racers that dominated the Group C series in Europe and the 24 Hours of Le Mans in the early '90s. It's available in high-, medium- and low-downforce versions to allow racers to tune their cars for any conditions. One of the versions even has a molded-in front wing that provides more steering.
- Peugeot 905B—parts 1707H (high downforce), 1707M (medium downforce), 1707L (low downforce), $19.95.

Team Associated
RC10T2 Sport Truck

Based on Associated's winning RC10T2, the RC10T2 sport truck kit comes with a mechanical speed control, bushings, Gold-anodized shocks, Pro-Line tires and a stock motor. Whenever you're ready (skills and budget!), you can upgrade it to a race-ready T2.
Part 7012, $305.

Hammad Ghuman
Aluminum Parts for Associated RC10L, LS, SS and RC12L

The machined aluminum-alloy parts for the Associated RC10L, LS, SS and RC12L cars are well worth a look. The Aluminum Alloy Left Side Pod Plate is strong and rigid and combines good looks with unrivaled performance. The plate also allows a racer to work on the motor while it's still mounted on the car. The unit is available in three different offsets for precise tuning, and this company also offers a kit that contains all three ride-height adjusters.

Steering Blocks and Axles

Alloy Front Steering Blocks with Threaded Titanium Axles are a must for hardcore pavement pounders. Machined of T-6 aluminum for exceptional strength and rigidity, their threaded titanium axles have been permanently pressed into the blocks for maximum security. These light axles will never bend, and their unique, E-clip locking-back design ensures that they'll stay put. Locknuts are included.
- Aluminum Alloy Left Side Pod Plate—part AL3100, $29.95.
- Aluminum Ride Height Adjusters—RH1000 (low), RH2000 (medium), RH3000 (centered), $9.95/pair.
- Aluminum Ride Height Adjuster Kit—RH1230, $25.
- Alloy Steering Blocks with Titanium Axles—AL4110, $39.95.

NEW for '97

Protoform
Touring-Car Bodies
This awesome, highly detailed, Audi A4 touring-car body is a replica of the one that has been dominating the British Touring Car Championships (BTCC), and it's sure to be just as successful. Those of you who like the slammed-down look will appreciate its style and handling. Made of lightweight 0.030 Lexan—so it's the ultimate parking-lot body—it comes with two wings for tunability.
• Audi A4—1408, $21.95.

CRC
Aluminum Hub
This aluminum hub for the Tamiya TA02 helps reduce steering slop. The strong aluminum hub has 5x8mm bushings (bearings are available separately).
Part 4220, $24.99 (with bushings).

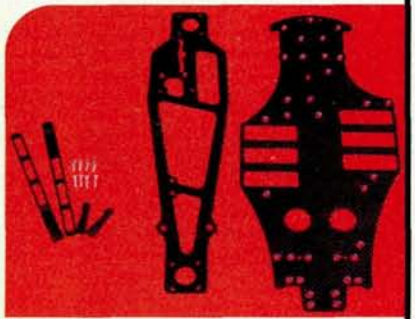
BRP
Dual Sport Wing
Need a little extra downforce for your Associated Dual Sport? This new BRP wing kit uses BRP's popular no. 5238 Air Flow Bi-Level wing. Installation is easy: marked and bent wing wire, aluminum wing tubes and pre-punched wing-mounting holes mean you just can't go wrong.
Part 5249, $14.95.

Pro-Line/Jaco
M3 Race Compound
The M3 race compound is beyond sticky; it's beyond Pro-Line's super-sticky M2 compound. Developed for demanding hard tracks, it's softer yet gets more traction than anything Pro-Line has previously come up with.

Factory Works
Super Van
Inspired by the 800hp, V10 Renault ESPACE F-1 Concept Van, the Super Van is the perfect choice for all Mini Cooper (M-chassis) racers who want that aerodynamic edge. It has a front air dam, a molded bi-level wing, molded-in roof wing mounts, a super-sleek front end and a smooth rounded rear end that provides plenty of downforce. Put one of these bodies on your M-chassis car, and you'll be the talk of the track.
• Super Van—part 7352, $16.95.

Aero-Car Technology Inc.
Racer Pack—Lubes
If you look inside any serious racer's toolbox, you'll probably find several Aero-Car products because their stuff works. Well, guess what folks? Aero-Car now offers a Racer Pack that includes all five of its greatest lubes. Take, for instance, the Super Speed Gear Lube. Many factory team driver swear that it makes their car's tranny function more quietly and more smoothly, and many claim it actually makes the gears last longer. Many top on-road racers use Aero-Car Goo Loob on their ball diffs—long-lasting lubricity with just the right amount of tackiness. One drop of Bearing Lube and you won't see a hint of friction, and your bearing will be protected from dirt and dust. Conducta Comm Drops have been around for some time and are the choice of champions. Motor Bearing lube withstands the high rpm of today's powerful electric motors. Tested at 100,000rpm, it will keep your motor bearing operating in top form as long as the motor lasts. One pack contains all!
Part AC-8008, $25.

Schumacher
Graphite for the SST 2000
How would you like to deck out your SST 2000 with a few graphite goodies? Check out this carbon-fiber saddle-pack chassis with upper graphite chassis brace. If you get the chassis set, you can tape the cells in place or use these new saddle-pack battery straps.



BRP
Super Machine Kingpin Kit
This kingpin kit is for any Associated IS, Trinity EV10 and other similar front ends. Made of a self-polishing spring steel, the kingpins allow the use of BRP's longer, progressive-rate springs. On the bottom of the kingpin, a unique spring-tension ring centers the spring. According to BRP, "Silicone O-ring damping and easy-to-remove setscrew collars make these kingpins just the ticket!" The kit includes one pair of kingpins and two pairs of BRP's progressive rate springs.
Part 5522, $10.95.

Holeshot Racing Products

Threaded Shock Bodies

Gone are the days of stripping those plastic spring retainers just before your race. Threaded Shock Bodies for Associated cars and trucks are just what you've been waiting for! And they're Associated Team shocks that have been threaded by the folks at Holeshot—not some cheap imitation. They're the real thing!—just like the ones used on full-scale racecars. Adjust spring pre-load with a high degree of accuracy: each complete turn moves the spring up or down 1/32 inch (two turns equal 1/16 inch). What could be easier? Available in three lengths to fit most Associated cars and trucks.

Tamiya

Volvo 850 BTCC Touring Car

Check out Tamiya's new Volvo 850 BTCC touring car. No; this isn't like the one your mom drives—unless, of course, she races in the British Touring Car Championships! Underneath this beautifully detailed body, you'll find Tamiya's legendary FF chassis (front engine, front wheel drive). The kit includes a 540 motor and resistor-type speed control; to start racing, you'll also need a battery pack and some radio gear.
Part 58183, $276.

Tamiya

Entry-Level TA03F-Pro

These kits will appeal to those who would like to get involved with the parking-lot craze without having to cash a T-bill in the process. Tamiya will soon offer several entry-level versions of the TA03F-Pro. The kits will include bushings, a plastic tub chassis, a 540 motor, a speed control and a body set with decals. The kits will also appeal to those who would like to customize their 03 with some of the available hop-ups. Shown here, the Audi A4 is the first to be released in the States.

Novak USA

Mercury Shielded FM Receiver

Over two-years in the making, this narrowband micro receiver—one of the smallest available (1.10x1.54x0.47 inches)—features Novak's Chrome-Shielded Protection™. According to Novak, a vacuum plating process deposits a layer of metal directly onto the case's surface—inside and out—to provide superior protection against motor, battery, ESC and servo noise.
Part 2327, $99.

CRC

Aluminum Drive Shaft

Available for the TA02 is this trick-looking aluminum main drive shaft. It's lighter than the stock steel drive shaft, and it's anodized in many sizzling colors.
Part 4242, $19.99.

Schumacher

Fireblade 2000 2WD Racing Buggy

The Fireblade has a low center of gravity, so it corners well. Other features include an SACS active caster system, steel "Blade" drive shafts, adjustable rear toe, anti-squat and camber, adjustable front toe, camber and Ackerman, a super-low-inertia tranny, full ball bearings, adjustable oil-filled shocks, a ball diff and a "lay-down" suspension system.

Futaba

Magnum 2PCKA

Would you like to start racing, but are on a limited budget? The Magnum 2PCKA 2-channel pistol-grip radio (the Junior) has the features you need to be competitive. It has the same goodies as the Sport, plus steering and throttle dual rates and ATV. It includes an R122JE receiver and two 3003 servos, or one 3003 servo and an MC210CB ESC.

Great Planes

O.S. Engines

Designed for serious 1/10-scale nitro on-road racers, the .15 RX delivers maximum performance. The engine cranks out 50 percent more power than the leading .12 engine. It features ABC construction and a durable, hard-chrome-plated cylinder, and the included heat-sink head provides excellent cooling. An integral, rear-exhaust outlet reduces leaking and improves heat distribution.
Part OSMG2035, $299.99.

Pro-Line/Jaco

Speed Hawg Tires

These allow you to turn your pan car into a mean parking-lot racer. Speed Hawg III tires fit 1.65-inch Pro-Line narrow front and rear Street Wheels. Use Speed Hawg I tires for the 1.65-inch Pro-Line wide rear Street Wheels. The new Street wheels are available in two styles—BBS spoke and Pro-Line Performance Six-Spoke.

- Speed Hawg I—part 1081.
- Speed Hawg III—1083.
- Narrow Street Wheels—2601 (front), 2602 (rear), 2603 (wide).

Schumacher

Chrome Wheels

Hot chrome wheels would be a nice addition to your Schumacher SST 2000 touring car. Top them off with Schumacher's soft-compound rubber slicks, and you're all set to tear up the parking-lot.
Part U1935.

NEW for '97

Editors' HOT Pick

Futaba

Magnum 3PDF

For serious racers who would like to step up to a 3-channel FM system, the new Magnum 3PDF might be just right. It has the same ergonomic design as the company's top-of-the-line 3PJ and includes: three-model memory with a custom ID feature; three fully proportional channels; throttle and steering dual rates; ATV; ATL; expo; assignable dials; and LCD display with digital trims. For more information and prices on these cool new radio systems, give Futaba a call.

A Main Racing Products

Mach-12 On-Roader

A-Main Racing's entry in the highly competitive on-road racing segment is the Mach-12, 4-cell 1/12-scale on-road kit—a car so trick that it will have your competition shaking in their boots: graphite chassis and front suspension with rising-rate caster and camber, zero bump steer, quick-adjust pre-load and infinite front ride-height adjustment, ultimate fiberglass rear axle with O-ring seated diff rings and clamping left side hub, bolt-down battery-mounting system, and a floating-link rear suspension with three shocks to transform forward momentum into maximum downforce for the ultimate in cornering traction. What more could you want?

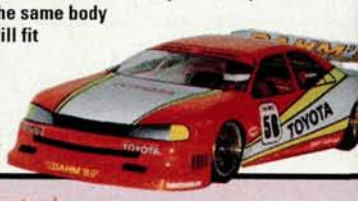
Part AMR 50000, $399.

Dahm's

Cyber Sedan

Dahm's always has something new in the works. The Cyber Sedan was designed so that it can be painted to look like several sports cars and luxury compact sedans. As you can see here, one looks like a Toyota Camry while the other is a Honda Accord—the same body on both. The Cyber Sedan will fit most wide touring cars and most narrow superspeedway cars.

- Cyber Sedan—part D231, $20.98.



JR Remote Control

2700G Servo

With its hard-anodized aluminum-and-brass gear train and ultra-quick 0.09-second/60 degrees transit time, the 2700G servo is perfect for 1/10- and 1/18-scale cars, buggies and trucks. Because it reaches maximum torque immediately off-center—a unique characteristic—this R/C wonder aggressively maintains the desired steering angle even over serious jumps and bumps. This means better lines, faster recovery and easier driving.

Part JRPS2700G, $184.95.

Editors' HOT Pick

Team Losi

XX-4 4WD Buggy

In the hands of Team Trinity/Team Losi driver Brian Kinwald, the eagerly anticipated XX-4 4WD buggy not only TQ'd at the ROAR Mod Nats, but it also took home the championship. For more info, check out Frank Masi's article, "Inside the XX-4" elsewhere in this issue.

Part A-0010.

Pro-Line/Jaco

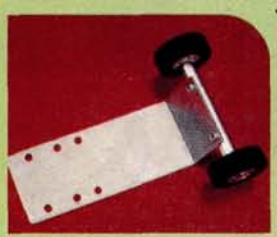
Capped Tires

If you're into superspeedway racing, check out this hot capped tire from Jaco. They've coupled their world champ wheel with light, durable foam and then bonded Pro-Line's exclusive racing rubber to the foam with a high-impact, temperature-resistant adhesive—light yet extremely durable.

ESP

Aluminum for Traxxas Stampede

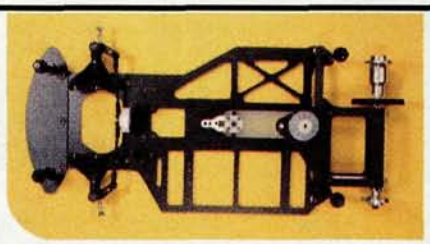
"Must have" ESP items for Traxxas Stampede and Nitro Stampede monster truck owners include a machined-aluminum front bumper/skid plate (offers plenty of protection while giving your truck that custom look), a working light-bar set (for moonlight madness) and a wheelie bar for wheel-standing fun. Add all three items and you'll be the envy of your friends.



- Front bumper/skid plate/lights—part ESP051, $49.95.
- Stampede wheelie bar/with skid plate—ESP052, $29.95.
- Nitro Stampede wheelie bar/with skid plate—ESP053, $29.95.

Bolink

LTO Extreme



Made for all-out racing, this LTO Extreme chassis has it all, and it's sure to be a regular in the winners' circle. A quick glance reveals: far-left-side motor mounting (but remains right-side drive); adjustable battery position; special offset rear hubs; Associated front end; and nine ball bearings. You'll still need to get an Associated shock, plus tires and a body, but that isn't much to ask for when you're getting a highly tunable, very competitive chassis kit. Also available is a kit that will allow you to convert your Associated RC10L and other similar chassis into an LTO Extreme.

Sport 200

This car is targeted at beginners, but it has all the basic features you need to be competitive on high-bite tracks. Check out the car's adjustable-length wheelbase; independent front suspension; adjustable camber, caster and ride height; aluminum motor and axle mounts; stainless-steel rear axle with ball diff; computer-designed/cut fiberglass chassis; and stock-car body. Bolink also offers several inexpensive upgrades that greatly enhance the car's overall performance.

- LTO Extreme—part BL-1388-R, $239.95.
- LTO Extreme Conversion Kit—BL-5088-A, $139.95.
- Sport 2000—BL-1320, $99.95.

NEW for '97

Futaba

Magnum Sport 2PC 2

Get ready for the Magnum Sport 2PC 2-channel pistol-grip radio. It replaces the popular Magnum Sport and is the perfect choice for those who would like to start R/C economically. You'll enjoy its sleek new styling, comfortable hand grip that provides a well-balanced feel, steering and throttle trims, battery-level LEDs, servo-reversing, 27- or 75-band R122JE 2-channel AM receiver, and two S3003 servos or one S3003 servo and one MC210CB ESC.

Hot Bodies

'97 Ford F-150

The '97 Ford F-150 is the fifth in the Hot Bodies Super Truck body lineup. With super detailing and scale appearance, it's sure to be a winner both on and off the track. The body comes with trim lines, Hot Bodies decals and a 2-inch rear spoiler and roll bars for that extra touch of realism. The "ground-attacking" front end is sure to get your superspeedway car dialed in a hurry. The body is available in regular and lightweight Lexan.

Parts 10112 and 10112L (lightweight), $20.95.

Hot Bodies

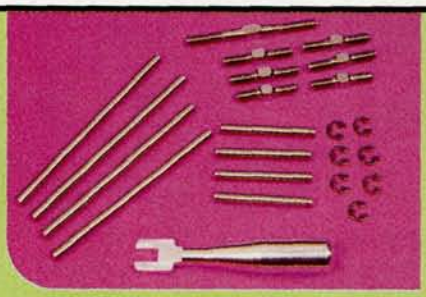
Nissan GTP Body

Completely adjustable to suit all track conditions, the Nissan GTP body was designed to fit all 1/10-scale standard-width on-road chassis, and it's also available for 1/12-scale on-road cars. It's ROAR- and NORRCA-approved and comes with four pairs of unique, Vortex, custom cut-outs, add-on front-wheel side dams, high-kick-up rear spoiler, center stabilizer fin, larger molded-in rear side dams plus an add-on rear wing. Every body comes with a tuning guide and Hot Bodies decals.

- Nissan GTP 1/10-scale—10201, 10201L (lightweight), $19.95.
- Nissan GTP 1/12-scale—12201, 12201L (lightweight), $12.95.

Lunsford

Titanium for Tourers



Need titanium products for your touring car? Lunsford's titanium kingpins are lighter, stronger and easier to install than most stock touring-car kingpins, and they're available for Tamiya, Yokomo, Kyosho and HPI cars. Light, strong, titanium turnbuckles for the HPI RS4 are the perfect choice for racing, and there's a complete titanium Turnbuckle and Hinge Pin Kit that comes with all the necessary items and a sedan tie-rod wrench. This kit is available for the Yokomo YR4/YR4M, Kyosho Spider, and HPI RS4/RS4 Wide.

Finally, the Sedan Turnbuckle wrench. Adjust your Lunsford tie rods with this new narrow wrench, which is CNC-machined of 2024 aluminum for a long life.

- Titanium Sedan King Pins—parts SD-620 (Tamiya), SD-621 (Yokomo), SD-622 (HPI), SD-623 (Kyosho), $12.
- Titanium Turnbuckles for HPI RS4—PS-38, $8.50.
- Titanium Turnbuckle and Hinge Pin Kit—PS-630 (Yokomo), PS-631 (Kyosho), PS-632 (HPI narrow), PS-633 (HPI wide), $35.
- Sedan Turnbuckle Wrench—W-103, $2.50.

Editors' HOT Pick

HPI

Pro Belted Slicks

Made of a modified compound that gives them even more grip than HPI's "Super" compound tires, the Pro Belted Slicks are perfect for competition. They feature an inner belt that's molded directly into the inside of the tire and helps to prevent the tire's contact patch from "squirming" during hard cornering. It also reduces tire ballooning, and that means improved grip during high-speed cornering and uniform tire wear. The life of the Pro compound is about two-thirds that of the Super Slick.

Super Dish Wheels

The Pros are shown on HPI's newest Super Dish Wheels; these wheels feature a 3mm offset that helps to widen the standard RS4 to 190mm. The wheels come in two widths—Standard and Super Narrow (21mm for use with Super Narrow tires). According to HPI, the new wheels go perfectly with their new 190mm bodies, e.g., the A4 Quattro, MB DTM and new Honda Accord touring car.

- Pro-Belted Slick—parts 4400—(Super Narrow), 4415 (Standard), $15.50.
- Super Dish Wheel—3670, 3682, $6 ($9.50 for Satin Chrome).

Hitec RCD

HS-225BB Servo

The amazing HS-225BB servo is ideal where high speed, high torque and small size are critical. It weighs only 0.98 ounce, has 70 ounces of torque and an amazingly fast 0.10-second transit speed at 6 volts. The best part, however, is the price tag!

$49.95.

Dahm's

Tornado SS

The aerodynamic Tornado SS body was designed for race-winning speed and handling. A perfect choice for superspeedway cars such as the Associated RC10LSS and the Trinity Evolution EV10SS, it will also fit most wide sedans. And it's available in light 0.030 Lexan and the stronger 0.040 Lexan.

Part TD228 (0.030 Lexan), $19.98, D229 (0.040 Lexan), $20.98.

Digital Discharger: *20, 25, 30 amp discharge rates, digital display shows capacity in mAh. An internal cooling fan keeps the electronics cool for accurate results. Use it at the track to test packs after each run to help adjust run time and gear ratio.*

Super Charger: *1 to 6 Amp charge rate, digital peak detection, reverse voltage protected, Hi-Mid-Low pulse selector, charges 4 to 8 cell packs, dual LED indicator, output shock protected, MOSFET pulsed charge. Team Orion has the technology to accurately charge your packs for maximum performance.*

EQUIPPED.

Digital Super Charger: *Digital display, digital peak detection, 0.5 to 5.5 Amp charge rate, reverse voltage protected, discharge function. This is the ultimate charger for serious racers.*

Delta Peak Charger: *Safe, reliable charger for 6 to 7 cell packs. 4 Amp charge rate, delta peak detection, 12V input, led charge indicator. Easy to use and easy on your racing budget, the Delta Peak Charger from Team Orion is the perfect choice for sport racers.*

New Team Orion Active Sport Packs!

Active Sport Packs...
Perfect for sport driving and parking lot competition. High performance at a great price.

Active Discharge Device:
Auto 0.5V cut-off for each cell, no reverse voltage damage, the perfect equalizer for your packs. Improves the life of the cells. Every racer needs at least one of these things...

Orion Battery Bars...

Team ORION World Champions

Team Orion products are distributed in North America by:

Peak Performance
23352-J Madero Road
Mission Viejo, CA 92691
714-707-4683

Trade inquiries to: Neidhart Distributing, 363 Rue de Bernex CH-1233, Bernex, Switzerland FAX 4122 757 4186

NEW for '97

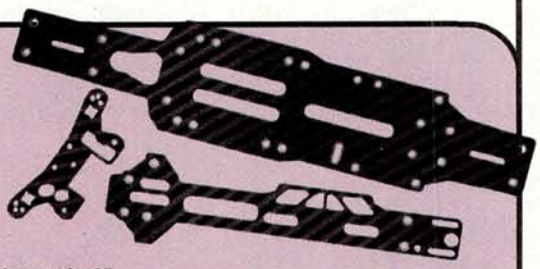
Factory Works
Super-Mod Oval Truck Body

The Super-Mod Oval Truck body was designed to fit the Associated T2 racing truck, which is decked out with the company's T2 Oval Shock Towers. Features include super-low, flat, wide top; aggressive front air dam; molded-in roof and rear-deck spoiler; optional air scoop; and a molded-in, fuel-injected V8 that's offset to the left and includes optional air filters.
Part 7350, $20.95.

Global Hobby Distributors
T2M Nitro BMW 318i

As Global puts it, "The T2M Nitro BMW 318i is designed for the young and upwardly mobile." It has all the great racing features that experienced racers crave, but it's listed at a price that tells another story altogether. Just check out these features: blue-anodized aluminum main chassis and shock towers; black fiberglass upper deck/chassis stiffener; ball-bearing-supported drive train; metal diff gears; slipper clutch; tuned pipe; telescoping drive shafts; oil-filled, coil-over shocks; front and rear swaybars; adjustable, double-wishbone front and rear suspension; flip-top fuel cell with built-in primer; and a beautifully detailed BMW 318i body. Wow! that's a lot of cool racing stuff!
Part 361900, $340.

Kose
TA03 Hop-Ups



Kose's line of Tamiya TA03 hop-ups is so comprehensive that it would take pages to list them all. Here are just a few of the items that caught our attention. The ultralight Carbon Fiber (CF) Chassis is extremely rigid, so you can shave weight off the TA03 chassis while increasing its strength and rigidity.

You'll have the coolest ride in town if you complement the CF Chassis with the CF Upper Deck—the utmost in rigidity.

While on the subject of carbon fiber, why not add Kose's CF Front and Rear Shock Mounts (towers). Again, these units are lighter and more rigid than the stock pieces, and they'll give your car that ultra-trick look. Want to be able to set camber on your TA03? Well Kose's Adjustable Upper Arm Set will allow you to do so. Bolt these units right on to your TA03 without any modifications, and you'll be able to dial in your car to suit most tracks.

Finally, Kose's Adjustable Steering Turnbuckle Set makes it much easier to alter toe-in/out while making your car look pretty slick.

- CF Chassis Set—K-1262, $75.
- CF Upper Deck Set—K-1263, $37.
- CF Shock Mount—K-1272 (front), K-1273 (rear), $22.
- Adjustable Upper Arm Set—K-1265, $13.
- Adjustable Steering Turnbuckle Set—K-1275, $8.

Kyosho
Entry-Level Mantis Series

With the new Mantis Series electric- and nitro-powered, 90-percent-built, entry-level kits, Kyosho makes it even easier to get started in R/C. A low parts count and simple assembly puts beginners on the track in just a few hours. Great entry-level features include 4-wheel independent suspension with coil-over shocks, one-piece tie rods, simplified throttle and brake linkages, a mechanical speed control and extra-grip rubber tires. Highly detailed injection-molded parts enhance the cars' scale lines. Plenty of hop-up potential combined with economical pricing makes the Mantis Series ideal for backyard fun and parking-lot racing.

Based on the automotive legends, the Mantis Series 2WD EP includes the '67 Corvette Stingray, the '62 MG-B MK-1, The Shelby Cobra (shown here) and the Volvo 850 BTCC. All are available with a stock 05 motor; the Volvo is also available with a powerful Kyosho GX-12 engine for even more realistic racing action.

- '67 Corvette Stingray 2WD EP—part KYOC0145, $169.99.
- '62 MG-B MK-1 2WD EP—KKYOC0146, $169.99.
- Shelby Cobra 2WD EP—KYOC0140, $169.99.
- Volvo 850 BTCC 2WD EP—KYOC0142, $169.99.
- Volvo 850 BTCC 2WD-GP with GX-12 engine, $279.99.

Hot Bodies
'97 Ford Gas Truck

The '97 Ford Gas Truck is definitely an eye-catcher. Designed to fit the Losi GTX and Associated RC10GT (with standard and new rear shock tower), the body includes two sets of trim lines to suit each of the trucks. Also included are Hot Bodies decals, an add-on rear spoiler, number plates and molded-in roll bars that give the truck its super scale appearance. A '97 Chevy Gas Truck is also available.
Part 10403, $19.95.

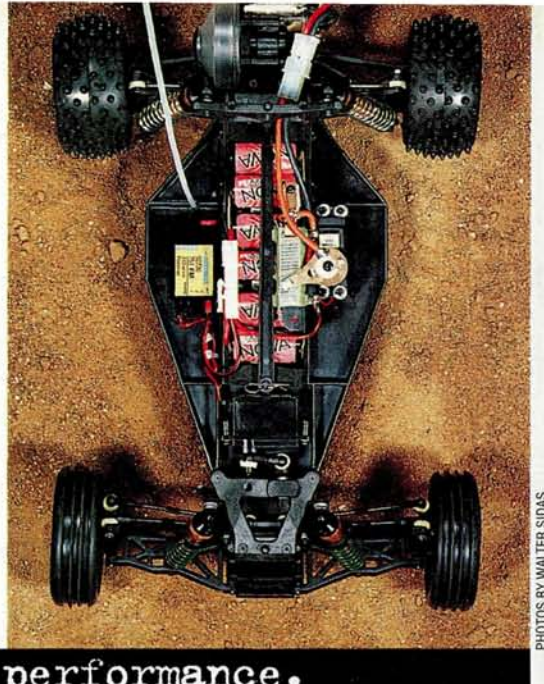
Hitec RCD
Lynx Radio

Tear up the track with Hitec's newest pistol-grip radio system! The 2-channel AM Lynx includes hot features such as servo-reversing, variable dual rate for steering-travel adjustment, quick-change dual-rate override switch for instant maximum steering, three LED battery-indicator lights, and an ergonomic pistol-grip design with a smooth, accurate steering wheel. The Lynx includes Hitec's super, narrowband HS2RMB receiver and two HS-303 servos. If you prefer, pick up the Lynx with one HS-303 servo and the company's SP-520P reversible ESC.

SNEAK PEEK

RC10B2 Sport

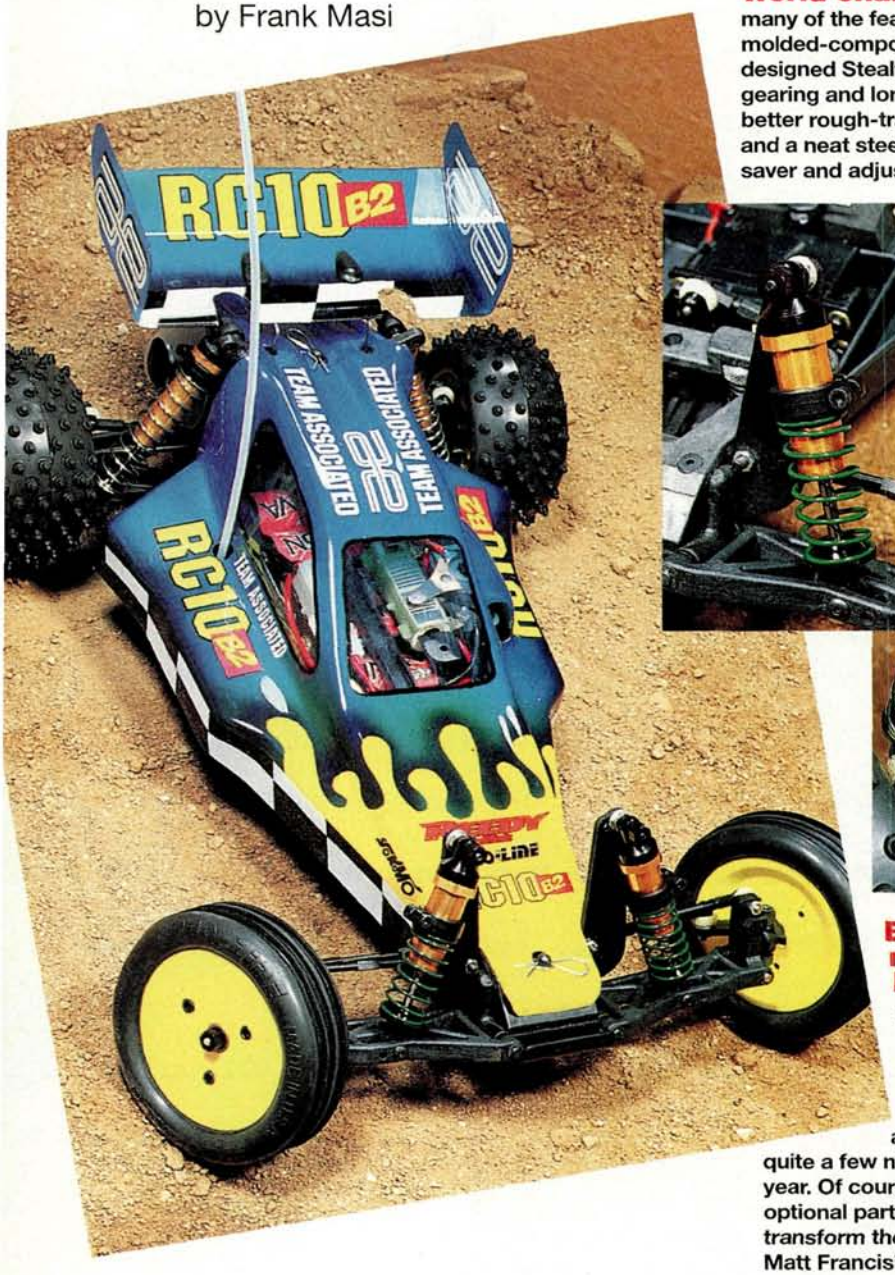
You're new to the hobby and you want to go off-road racing. But money's tight and most entry-level buggies can't cut the mustard against the "real" race machines. What are you gonna do? You could buy a "play type" buggy, get really good at driving, save your money, then buy your dream buggy. Or you could start off on the right foot by getting a real racing machine from the get-go. "They cost too much," you say? Not any more. Associated* now offers this "sport" version of its *world champion* RC10B2 buggy! World champ? You can't get any better than that!



PHOTOS BY WALTER SIDAS

Team Associated lowers the price of performance.

by Frank Masi



World champ on a budget. The new B2 Sport has many of the features that made the B2 a world-beater: a molded-composite chassis and suspension; specially designed Stealth transmission with a low, 2.4:1 ratio for easy gearing and long life; long-arm and long-travel suspension for better rough-track handling; adjustable battery placement; and a neat steering-bellcrank system with a built-in servo-saver and adjustable Ackerman.

Sporty features. To make the Sport model attractive to budget racers, Associated replaced the regular B2's hard-anodized shocks with gold-anodized ones; supplied Oilite bronze, metal bushings instead of ball bearings; and replaced the universal-joint drive shafts with separate dogbone/stub-axle units.

What you get with the Sport and what you *don't* get with the regular, more expensive B2, is a nifty mechanical speed-control unit, long-wearing Pro-Line XTM tires mounted on three-piece wheels (so you can switch tires without buying new rims) and a new low-profile buggy body made to accommodate the speed control (the body has a built-in air scoop to cool the speed control's resistor).

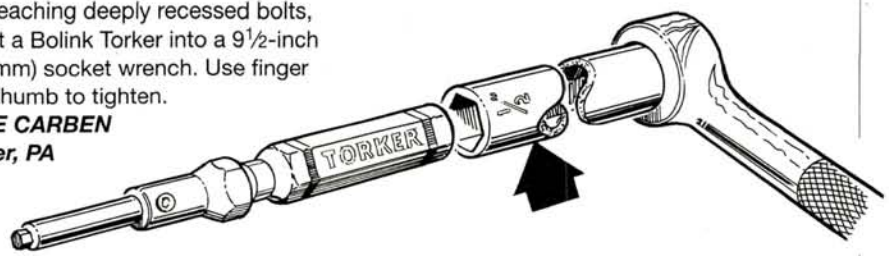
Break track records, not the bank. The B2 Sport (part no. 9011) will be in hobby shops by early January '97, and with a list price of $250 (the "street" price, or, what *you* pay, will be around $135), expect to see quite a few new racers at your track this year. Of course, the addition of a few optional parts (bearings and shocks) will transform the Sport into a replica of Matt Francis' world-champion B2. ■

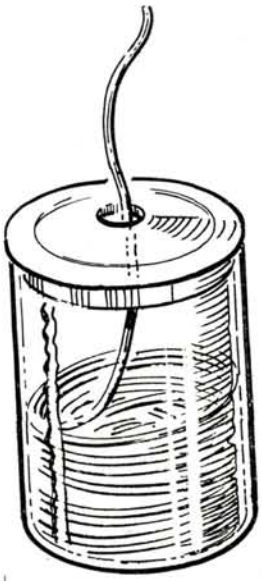
PIT TIPS

Deep Torker

For reaching deeply recessed bolts, insert a Bolink Torker into a 9½-inch (240mm) socket wrench. Use finger and thumb to tighten.

MIKE CARBEN
Butler, PA





Solder Dispenser

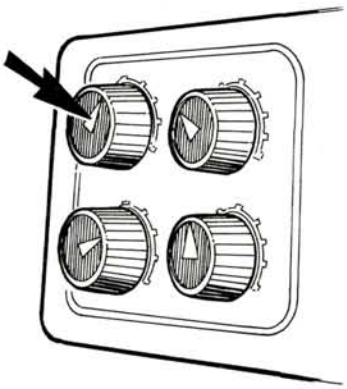
Drill a small hole in the cap of a transparent film canister, and place a coil of solder inside. Dispense it through the hole as required for a neat, tangle-free supply.

YVES TOURIGNY
Hanmmer, Ontario, Canada

Tell-Tale Arrows

To see at a glance whether trim knobs have been moved, cut large triangles from brightly colored stickers, and place them on the knobs.

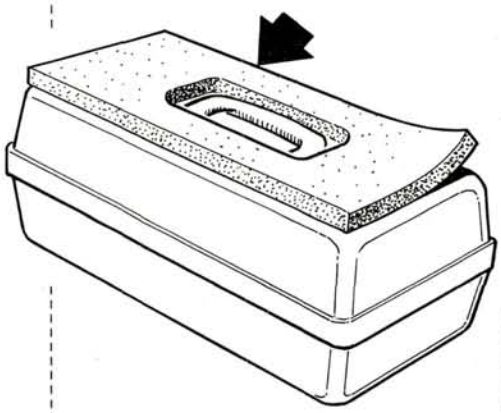
STEVE MORELLI
Ventura, CA



Caddy and Stand

Cut the center out of an inexpensive computer mouse pad, and glue it to the top of your tool caddy. Pop the handle through the hole, and it doubles as a car stand.

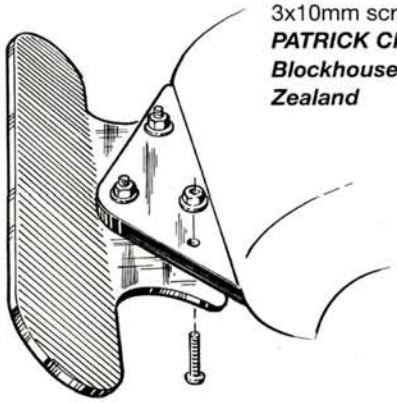
JOE CHOO
Methuen, MA

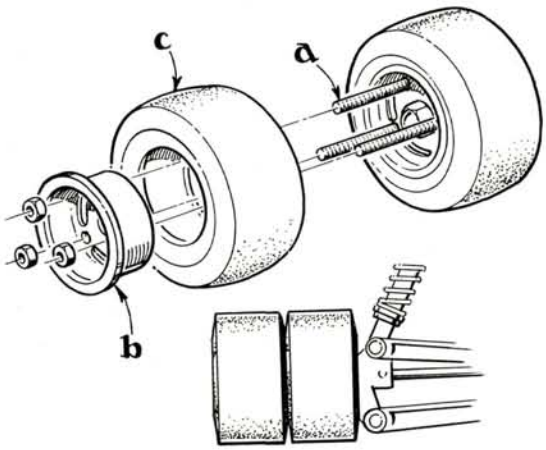


Loose Bumper Blues

To secure the thread-cutting ties on Tamiya sedan bumpers, drill through them, and tighten with flanged locknuts on 3x10mm screws.

PATRICK CHIU
Blockhouse Bay, New Zealand





RC10 Duals

To install RC10 Duals, place 2-inch (50mm) 4-40 bolts (a) in the stock no. 6011 modular wheels, and use only the outboard half of the rear wheel (b) to mount the extra tire (c). Drill ⅛-inch (3mm) bolt holes where required.

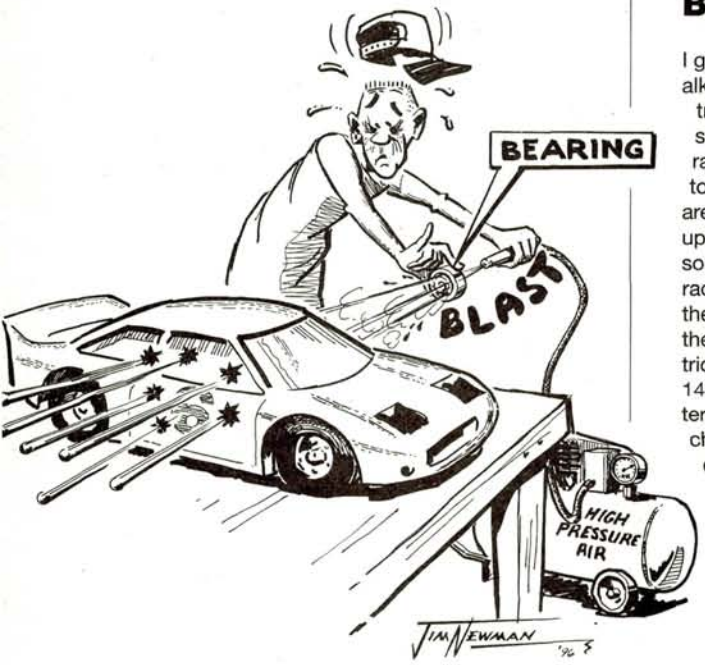
DAVE COWGER
Seattle, WA

Radio Control Car Action will give a one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send a rough sketch to Jim Newman, c/o Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one, nor can we return unused material.

TROUBLE SHOOTING

by George M. Gonzalez

If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.



Down and Dirty Diff

I own an RC10GT nitro truck. I've rebuilt the diff several times but it still feels gritty. I've replaced the diff balls and the diff rings, and I've re-lubed the thrust washer, but nothing seems to work. The people at the hobby shop tell me that I might have a bad bearing in the tranny. Any help you could pass along would be appreciated.

JOSE RAMOS
Pomona, CA

Jose, changing the diff balls and diff rings was definitely a step in the right direction. You said you re-lubed the thrust washers, so I assume you didn't replace them. You didn't lose one of the balls did you? You must have six balls for the diff to work properly. I've found that nine times out of 10, a diff that feels gritty is usually caused by worn-out thrust balls and washers.

The smaller 5/64-inch thrust-washer balls can develop flat spots that can make the diff feel gritty. I would replace the thrust balls and the thrust washers. You can also flip the thrust washers over, which will give the thrust balls a new surface to ride on and also save you a couple of bucks. I also highly recommend Associated lubes for your tranny. Associated Stealth diff lube and black grease are the best combination for the Stealth tranny.

While you're rebuilding your tranny, you might as well clean the bearings. Remove all the bearings, and submerge them in a good solvent, such as turpentine or motor spray. You don't need to clean the sealed outdrive bearings, but make sure that they're working smoothly and haven't lost a seal. After you've cleaned all the bearings, make sure that they work well by placing them on the pointed end of a pencil, and give them a spin. If some of the bearings feel gritty, give them a blast of motor spray, and rotate them back and forth. Sometimes dirt gets trapped inside the bearing and, if you're lucky, you can work the dirt free. Good luck.

Those Pesky Little Batteries

I got tired of replacing the alkaline batteries on my transmitter. For some reason, I always leave my radio on, and when I want to use it again, the batteries are dead. I decided to pick up a set of 600mAh Ni-Cds, so if I forget to turn off the radio, I can at least charge the Ni-Cds again. The guy at the hobby store sold me a trickle-charger, but it takes 14 hours to charge the batteries. Is there a way to charge them on my quick-charger that I use for my 7.2V R/C car battery? Also, no matter how long I charge the transmitter batteries, my battery-level indicator only reads 80 percent. What gives?

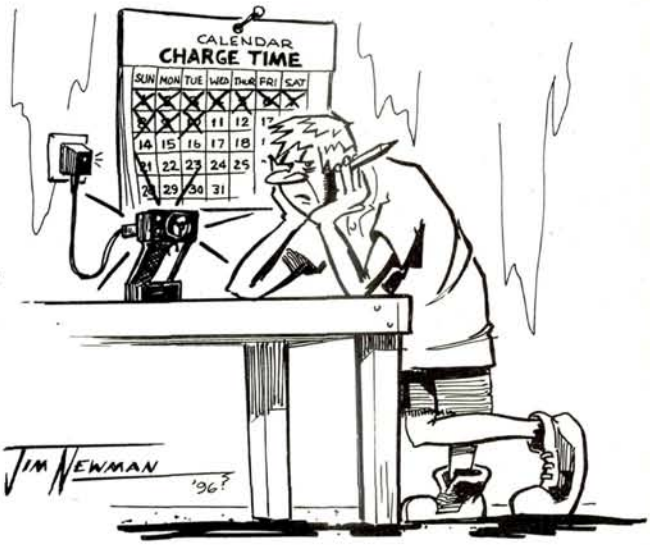
MATT DECASTRO
Rockford, IL

Well, Matt, if your quick-charger is equipped with a current-adjust knob, you'll be able to charge your 600mAh batteries in less than 10 minutes. Just be sure to charge them at 2 amps or less. I usually peak-charge my transmitter batteries at 1½ amps, just to be on the safe side.

If your charger has a current-adjust knob but no peak detection, it will typically have a 15-minute timer instead. In this case, set the charge current between 1½ and 2 amps, and set the timer for a 5-minute charge; then check to see if the batteries are warm. If they aren't warm after a 5-minute charge, charge them for another 2½ minutes and, once again, check to see if they're warm. Cut the subsequent charge times in half until the cells are slightly warm.

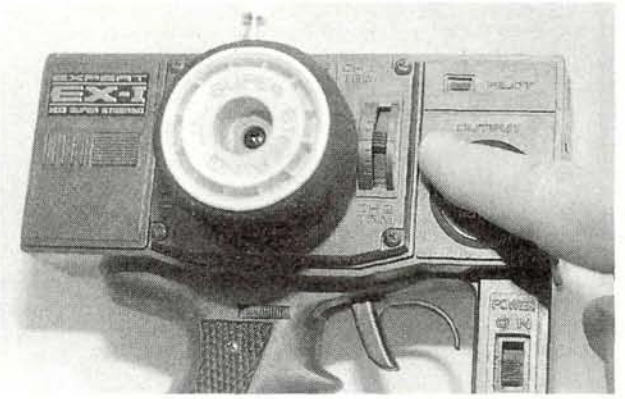
If your charger doesn't have a current-adjust knob, don't attempt to charge your transmitter batteries with it. Most chargers without a current-adjustment feature are usually designed for 6- and 7-cell use only, and they have a fixed charge rate that's too high for 600mAh cells.

The reason your transmitter's battery-level meter only reads 80 percent with the fully charged Ni-Cd cells is because they have a lower voltage than alkaline cells (Ni-Cd cells put out 1.2 volts; alkaline cells put out 1.5 volts). For example: most transmitters use eight cells; therefore, eight Ni-Cd cells provide a total of 9.6 volts, and eight alkaline cells provide 12 volts. Your transmitter will work just fine at 80-percent power, and it won't suffer any signal loss, so I wouldn't worry too much about it. I've been using Ni-Cd cells to power all my transmitters for years, and I'm very pleased with the results.



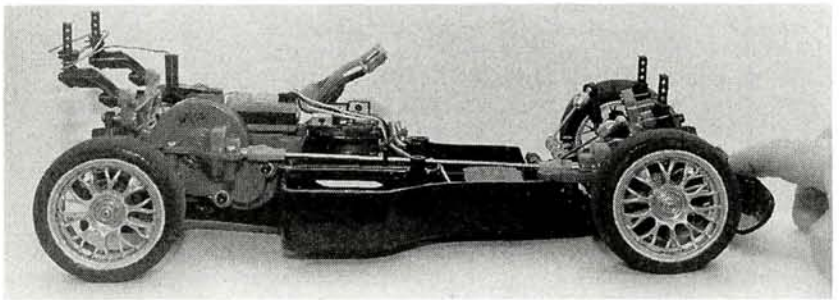
by Doug Mertes

Understanding One-Way Diffs in Touring Cars



Set up your car to coast, instead of braking hard when you let off the throttle. A one-way sends all of the braking power to the rear, and you can spin out if you brake too hard! Most radios use the throttle trim to reduce braking.

TOURING CARS have become the most popular vehicles of the parking-lot set. They range in price and complexity from simple to outrageous, and they appeal to many racers because of their scale appearance, four-wheel, independent suspensions, their ability to run on rough and bumpy asphalt surfaces and because many drivers can understand the suspension designs. This makes it easier for them to set up the car, because the tuning changes they make appear to affect the chassis in the same way that drivers would expect their full-scale car to react. Most of us can relate to the changes that we would experience with a change of tires, shock springs or shock fluid in our full-scale cars. Even anti-roll bars, those much-maligned and often misunderstood bad boys of the parking lot, can be found on many of the sedans we drive every day. One-way diffs and bearings, on the other hand, are strange and exotic devices that fall into the same category as voodoo; most drivers don't know how they work or what they do. They just know that some of the fast guys use them, and therefore, one-way diffs and bearings must be worthwhile. I would like to clear up some of this confusion, so that you can make an informed decision as to whether you need, or can use, these pieces of tuning ammunition.



When the car is braking, the front suspension collapses, and the rear suspension rises. If your rear wheels are doing all of the braking, you better be traveling in a straight line!

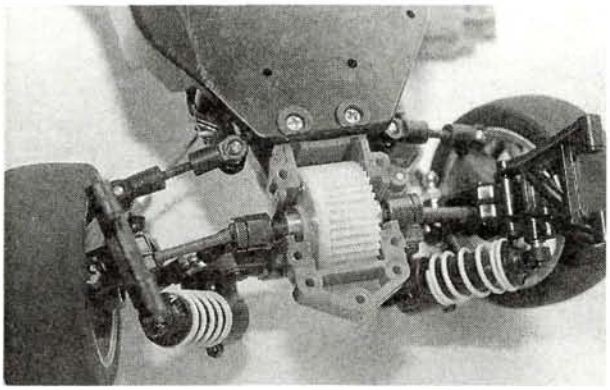
Simply put, a one-way front differential is a mechanical device that allows the front wheels to freewheel unless they're going slower than the rear wheels. That's why they're only found on 4WD cars (the front wheels on 2WD cars freewheel all the time). Going down the track's front straight, only the rear wheels push the car along, but when exiting infield turns under power, the front wheels add their pulling traction to yank the car through the turn that much faster. It's an easy way to gain efficiency, speed and extra cornering ability.

At the same time, a one-way can effectively turn your sedan into a 2WD car at some inopportune moments: at the end of the straight, at the entrance to turns or when you're turning in while off power or on the brakes. Because of the one-way, all of the braking power of the motor is applied to the rear wheels. Today's wet-magnet motors produce awesome braking power—enough to lock up the tires on most sedans. At the same time, the suspension is diving down in front and rising in the back, which effectively transfers much of the car's weight to the front wheels, and this unloads the rears. The result under braking is a tail-happy car that can easily spin out just as it's reaching the apex of the corner. You'll get whacked, and whacked and whacked—as the entire field takes a bite out of your car while it sits helplessly in the middle of the corner—and you'll go from first to last in the blink of an eye. That's not much fun, and it's the reason many drivers take a one-way out of their car after only a run or two. The secret to using a one-way bearing is to know when to use it and how to adjust your car and driving style to take maximum advantage of the changes the one-way will produce in the drivetrain.

THE QUESTIONS

Start by analyzing your driving style. Do you pitch the car into the turns, always on the power, and slide it around the tight corners? Or, do you finish your braking before entering the turn, clip the apex tightly and set yourself up for the next turn as you move from one side of the lane to the other? Do you use the brakes a lot, or is your car set up to coast when you let up on the gas? Is your motor warmer than those of your pit buddies when you finish a race, or do your batteries sometimes dump before your race is over? Do you find that your car pushes more than you'd like it to, but when you try to soften the front suspension, the car wants to swap ends instead? I'm sure you fit into one of those descriptions; maybe even several of them.

If you pitch your car around a lot, forget the one-way; using that technique, you'll hate the way it makes the car swerve



Some one-ways, such as the unit on this Tamiya car, use a pair of one-way bearings on the front diff housing to provide freewheeling action off-power.

and sway. The same holds true for those who use the brakes to get around tight turns. The car will spin out more often than not, and you'll spend the entire race playing catch-up and moving over to let the leaders get by. Drivers who have super-hot motors after their heats or those who dump on a regular basis are on and off the gas too much to enjoy the benefits of a one-way. Your car will seem nervous and twitchy, and you'll never get comfortable with it.

One-ways reward smooth drivers who realize that hard braking will unload the rear wheels on the chassis. If you can coast through the turns because you've done your braking while the car is going straight, you'll find that you can apply power a little sooner with the one-way installed. By hitting the apex and setting your car up for nice, smooth, rounded turns, you'll be able to maximize the momentum your car retains as it pops from corner to corner. You'll get the additional steering you need, because, unlike full-time 4WD cars that push while cornering off-power, sedans equipped with a one-way have huge amounts of off-throttle steering.

Different brands or types of tires may have different diameters. A one-way will eliminate any handling problems caused by tire size.

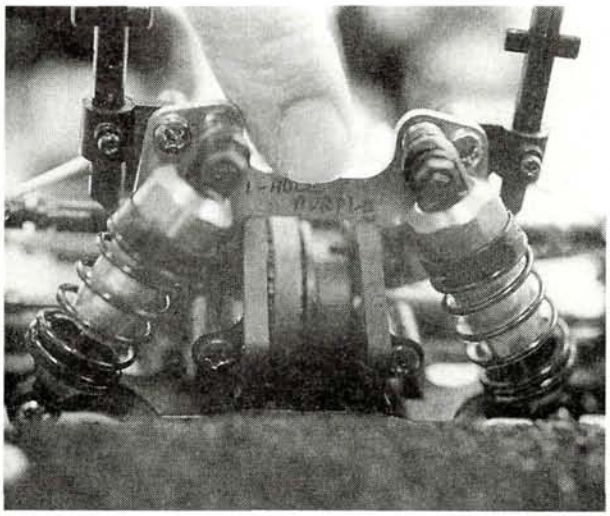
IS ONE RIGHT FOR YOUR CAR?

Even for those drivers who can use them, however, a one-way is not always the best setup for your sedan. For one thing, you can't use reverse with a one-way, because the wheels only turn in one direction. Put the car in reverse, and you'll drag a flat spot on the front wheels as they lock up. So, it's definitely not the option of choice when you're fooling around with your friend in the parking lot and doing some self-marshalling.

They also won't work on every surface. Put a one-way in your car, and you'll discover all of the handling evils that can plague rear drive pan cars and converted off-road gearbox cars. One-ways work best on surfaces with a high traction component, such as smooth, hot, sticky asphalt or indoor carpet tracks.

That said, I think that a one-way is an absolute must-have on carpet tracks. Indoor sedan racing has become more

(Continued on page 249)



Other one-way bearings are built into the diff itself, such as on this Kyosho TF-2.

Reader's Ride of the Year

Home-Built

Nitro Sand Rail

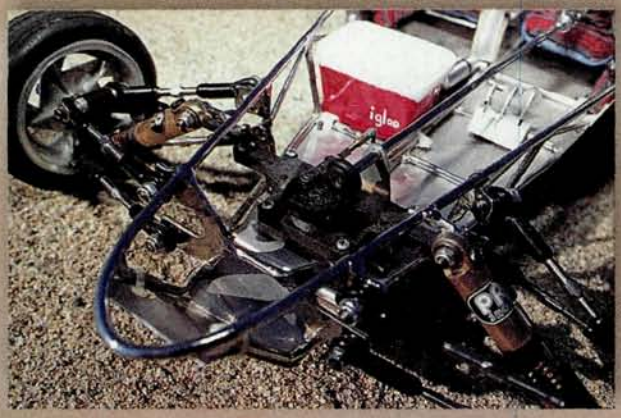
EVERY JANUARY, we are faced with the difficult task of picking the *Radio Control Car Action* Reader's Ride of the Year. Sometimes the choice is obvious; such was the case with last year's winner—the Terminator 3 Spy Assault vehicle built by Randy Coolbaugh. This year, however, the competition was a little fiercer, and this only confirms what we've known all along: we have some very talented readers. But in the end, to coin a phrase from one of my favorite movies, "Highlander," "There could be only one." There could be only one first-place winner, that is, because this year, we've picked second- and third-place winners as well. Prizes, you ask? Yes, all three winners receive some great prizes from Novak Electronics*—our gracious "Readers' Rides" sponsor. So without any further ado, here's the 1996 *Radio Control Car Action* Reader's Ride of the Year.

by George M. Gonzalez

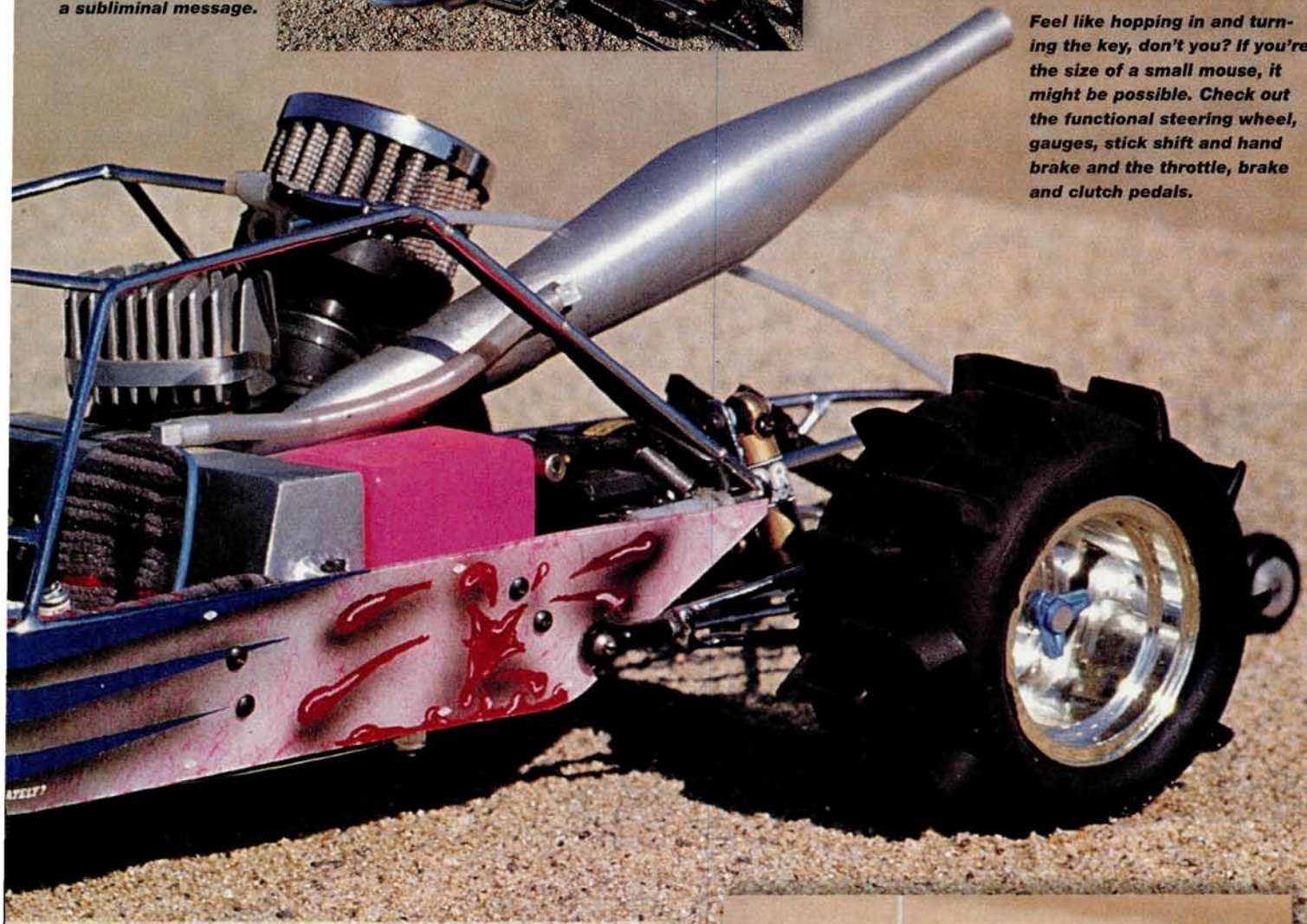
PHOTOS BY WALTER SIDAS

How do you win the R/C Car Action Reader's Ride of the Year contest? Details, details, details.

Tubular chassis, multi-link upper and lower control arms, oil-filled shocks, rack-and-pinion steering ... hey, we're talking R/C, aren't we? This front suspension adds a whole new meaning to the term "scale looks." Are you getting thirsty while you read this? I think the Igloo on the chassis floor is sending out a subliminal message.



Feel like hopping in and turning the key, don't you? If you're the size of a small mouse, it might be possible. Check out the functional steering wheel, gauges, stick shift and hand brake and the throttle, brake and clutch pedals.

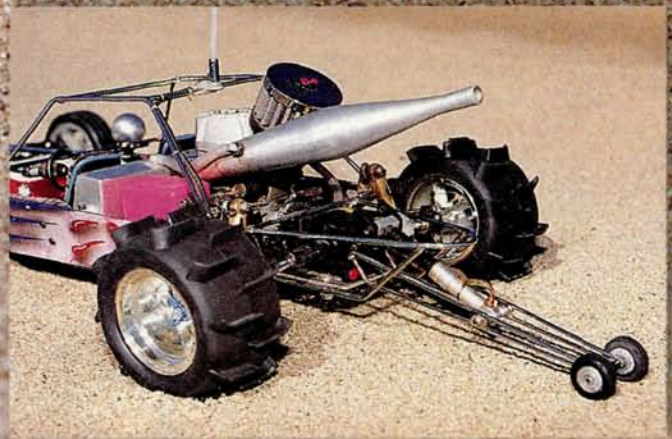


THE SAND RAIL FROM HELL

Dale Badger from Phoenix, AZ, created this nearly perfect 1/10-scale replica of Corey Mack's uphill sand drag rail from a 5x7 black and white photograph he found in a magazine. The accompanying text revealed the car's overall wheelbase, and this was the only technical data he had on the full-scale sand rail. Fortunately, the photograph was very detailed and provided a good view of the car's entire chassis and suspension, so Dale had what he thought was enough information to scratch-build a 1/10-scale R/C version. As you can see by the photos, he did an awesome job!

TUBULAR CHASSIS

The backbone of Dale's sand rail is the custom-made tubular chassis. Made of 1/8-inch-thick stainless-steel piano wire, each tube was bent and welded in place before the entire chassis was sent out to be chromed. He cut and shaped the rear motor plate from a piece of 3/16-inch T6 aluminum, and he bolted it to the chassis with six screws. He made the chassis floor of thin aluminum sheet and secured it to the chassis with button-head screws. The Lexan body panels are secured to the chassis with six button-head screws each. Dale also laid down the cool airbrush paint job as well. At a glance, the chassis may appear fragile, but let me tell you, this chassis is tougher than nails!



An older Kyosho Outlaw Rampage gearbox with hardened-steel gears transfers the power to the ground. The trailing-arm suspension is an exact replica of the one on the full-scale sand dragster. Check out the Mac tuned pipe; kinda looks like a stinger, huh? Is that wheelie bar really necessary? The engine puts out 2 1/2hp. What do you think?*

The Winners & Their Loot

Novak Electronics has become the proud sponsor of *Radio Control Car Action*'s "Readers' Rides" department. As always, the editors pick the winners, but Novak now passes out the prizes. Here's what the 1996 first-, second- and third-place winners will receive.

FIRST

Dale Badger,
Phoenix, AZ

Supreme Sand Rail

Prizes

- $500
- Novak Cyclone programmable ESC
- Mercury FM receiver
- Cyclone Programming Software (or Programming Box if winner does not have access to a PC or laptop computer)
- Novak USA T-shirt
- Novak USA hat
- Limited-edition Novak USA logo decal pack

Total value: over $1,000

SECOND

Larry Zimmerman, Regina, Saskatchewan, Canada

The Energizer Bunny

Prizes

- Tempest Pro ESC
- Mercury FM receiver
- Novak USA T-shirt
- Novak USA hat
- Limited-edition Novak USA logo decal pack

Total value: $350

THIRD

David Glassman,
North Oaks, MN

The Bigger, the Better Jeep

Prizes

- Duster II Sport ESC
- Rhino digital peak-charger
- Novak USA T-shirt
- Novak USA hat
- Limited-edition Novak USA logo decal pack

Total value: $295

Prizes courtesy of NOVAK ELECTRONICS, INC. RACING TEAM

JUST DO A WHEELIE!

The wheelie bar is also made of stainless-steel wire; however, a thinner gauge wire was used. Dale handmade the brackets and welded them onto the wheelie bar so that he could mount an older Kyosho* motorcycle fork that he found in a hobby shop's bargain scrap box. The shock has a coil spring inside the fork body and is hydraulically damped—pretty cool! He snagged the wheels and rubber tires for the wheelie bar from the landing-gear system of a wrecked model airplane he had.

RACK 'EM UP

The car's Holeshot Racing* Pro Steer 3000 steering rack system was very popular with the dirt-oval crowd at one time. The steering servo is hidden all the way in the back of the car where it will not be seen, and this greatly adds to the car's scale appearance. A piece of stainless-steel wire, which rests inside an antenna tube, runs along the chassis floor, and airplane-type clevises connect the steering arm from the servo to the rack system.

The radio receiver is hidden under the Kyosho receiver box. Check out the mount for the whip antenna.

SUPER SCALE SUSPENSION

The front suspension is exactly like the full-scale car's multi-link, control-arm suspension. In R/C terms, it has upper and lower A-arms with adjustable links that allow camber adjustment. Dale used Rocket City* ball ends, which make excellent miniature heim joints. He used Lunsford* Punisher titanium turnbuckles to make the upper and lower A-arms. The caster and steering blocks are from a Traxxas* Nitro Hawk.

The front buggy wheels are from Imex*, and they're decked out with Pro-Line* ribbed buggy tires. Dale used old Kyosho oil-filled shocks that he found in his R/C junk box because they're smaller than most oil-filled shocks, and this makes them more scale in appearance. Dale slipped shock springs that he found in his toolbox onto the shock shafts, not the

shock bodies. Overall, the system looks great and works incredibly well.

In the rear, you'll find a trailing-arm suspension that mimics the full-scale car's rear suspension perfectly. Dale handcrafted the trailing arms out of stainless-steel wire (same thickness as the chassis). Tamiya* Super Champ optional universal joints mate to the tranny's 5mm outdrives. He made the axle shafts of 5mm stainless-steel shaft material, then cut the axles to size and threaded them on one end to fit a 4mm nut; this secures the wheels to the axles. He slipped an old transmitter antenna tube over the 5mm shafts for scale appearance and to act as spacers for the rear hubs and universal joints. In addition, he modified RPM* RC10GT hub carriers to house 5mm bushings. Imex wheels and Pro-Line Sand Paw paddle tires finish off this great-looking rear end.

DRAGGIN' DRIVELINE

Dale used an older Kyosho Outlaw Rampage Gearbox to give him the gear reduction he was looking for. He upgraded all the stock gears with the optional Kyosho hard steel gears that were available way back when. Of course, none of these parts is available today, so I'm sure he's glad he opted to install the hard steel gears when he had the opportunity. In addition, he replaced the stock bevel ring and pinion gear that mates to the center outdrive with a heftier OFNA* hard steel bevel and pinion-gear set. An optional Kyosho Outlaw Rampage steel spur gear is secured to the center outdrive and mates with the engine's clutch bell.

PACKING THE PONIES

Dale bolted a Kyosho Inferno heat-sink engine-mount system onto the chassis' motor plate; the mount system provides a place to install the O.S.* SER .21 side-exhaust engine with slide carb. Slight overkill? Oh God, yes, but what a rush it must be to race this bad boy on a barren sand dune! He shortened an old Mac airplane tuned pipe and attached it to a homemade header. The air filter is a K&N crankcase breather filter from a Chevy small block.

Dale designed the fuel cell on paper and then sent the plans, along with some scrap pieces of 1/8-inch-thick T6 aluminum, to a local welding shop that does heliarc welding. In about a week, he received a completed fuel cell that fits perfectly behind the driver and passenger seats. The fuel cap is actually an automotive air-conditioner-valve stem cap. A drum-brake system from a Traxxas Nitro Hawk stops the rail on a sand dollar.

CONCOURS-WINNING COSMETICS

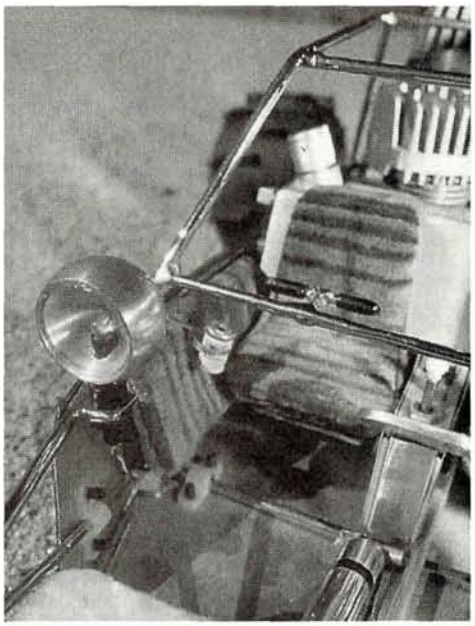
Dale designed a functional steering wheel that actually rotates when the wheels are turned in either direction. He made the steering wheel out of a plastic ring that he purchased at an arts and crafts store. He made the steering wheel's center post out of thin aluminum strips and painted them to look scale. He used a lengthened RC10GT universal shaft as a steering column, and it looks incredibly realistic. A small rubber wheel at the end of the steering column rolls on a circular servo horn that is attached to the steering-rack system, so when the servo horn rotates, the steering wheel rotates as well. He applied nonskid adhesive tape to the servo horn to give the small rubber wheel plenty of traction.

To light up the road, Dale mounted Ram* no. 28 9V running lights that are designed to fit on the company's roll bar set for a Tamiya Blackfoot on the chassis. He mounted a small, four-function computer dipswitch on a scratch-built aluminum center console, and one of the switches turns the running lights on and off. The other three switches are not used yet.

Dale made the seats of cut-up portions of plastic Simple Green bottles after he noticed that the lower parts of the bottles have the perfect shape for bucket seats. He covered the seats with automotive upholstery material, and he even added padding for extra comfort (ha, ha). He secured the seats to the floor with Velcro®-brand fasteners for easy removal and to gain access to the 4-cell receiver pack and 9V battery that powers the running lights. He shaped the side panels out of Styrofoam and then upholstered them with the same material as the seats. Velcro was also used to attach the side panels to the chassis.

Things can get pretty dry and dusty in the desert, so Dale added an ice chest with a Styrofoam lid to keep those scale sodas nice and cool. And what's a desert dueler without cup holders? He made the cup holders of thin, shaped pieces of aluminum and made the ice chest of painted Lexan packaging material.

The fire extinguisher is made of a plastic tube that Dale found in his scrap box, and it happened to be just the right size to complement the car's scale appearance. He used silver MonoKote* to make it look like aluminum, and he made a nozzle, which actually makes the thing look functional. Some of the final touches include clutch, brake and throttle pedals that he cut and shaped from thin aluminum sheet, and the stick shift is actually a Radio Shack toggle switch that turns the radio system on and off. There is no doubt that Dale's creation was well worth all the time and effort he put into it. Hopefully, the $500 grand prize and cool Novak products will help him recover some of his investment.



Ram lights illuminate the desert once the sun has gone down. There's even a handle for the passenger. Things can get pretty bumpy out on the sand dune. There's a fire extinguisher on the floorboard; better safe than sorry.

SPECIFICATIONS

SCALE 1/10

DIMENSIONS
- Length (overall) ..... 26 1/2 in.
- Width (F/R) ..... 11/11 3/4 in.
- Wheelbase ..... 15 7/8 in.

WEIGHT (w/empty fuel tank) ..... 5 lb. 4.6oz

CHASSIS ..... Stainless-steel tube chassis cage

DRIVE TRAIN
- Type ..... Sealed gearbox
- Primary ..... Clutch bell/spur gear
- Transmission ..... Universal-joint drive shafts
- Engine ..... O.S. 3.5cc
- Exhaust ..... Modified Mac model airplane tuned pipe
- Fuel capacity ..... 9 oz. fuel cell w/350 scale mile capacity

SUSPENSION
- Front ..... Adjustable multi-link w/upper and lower control arms
- Rear ..... Adjustable trailing arms
- Damping (F/R) ..... Oil-filled shock bodies w/shaft-mounted coil-springs

WHEELS
- Front ..... Imex Chrome 2.15 in. buggy
- Rear ..... Imex Chrome 2.2 in. truck

TIRES
- Front ..... Pro-Line 2.15 in. 4-row ribbed
- Rear ..... Pro-Line 2.2 in. Sand Paw paddle

OPTIONAL EQUIPMENT
- Rack-and-pinion steering
- Velour interior
- Four on the floor w/close ratio shifting
- Instrument panel with tachometer
- Passenger hand grips
- Fire extinguisher
- Running lights
- Cup holders and Igloo cooler

Addresses are listed alphabetically in the Index of Manufacturers on page 288. ■

CAR ACTION THRASH TEST 1/5 SCALE GAS

CEC Opel Calibra

by Greg Vogel

Do you find that you say, "Been there; done that!" each time a new 1/12-, 1/10-, or 1/8-scale gas or electric car is released? Here is a car about which most of you won't say that: Yankee's 1/5-scale 25cc-powered touring car distributed by Custom Electric Cars* (CEC). Is it big? *Big*? Yeah, I guess you can say that; it takes up the back of my Jeep. I have to put my pit bag on the passenger seat. Besides its size, other features round out the car, including full pre-asssembly, composite parts, an aluminum chassis, 4W independent suspension, disk brake and tuned pipe. But the best feature has to be the engine, which runs on regular gas with a 2-stroke oil additive. It provides hours upon hours of running for considerably less cost in fuel.

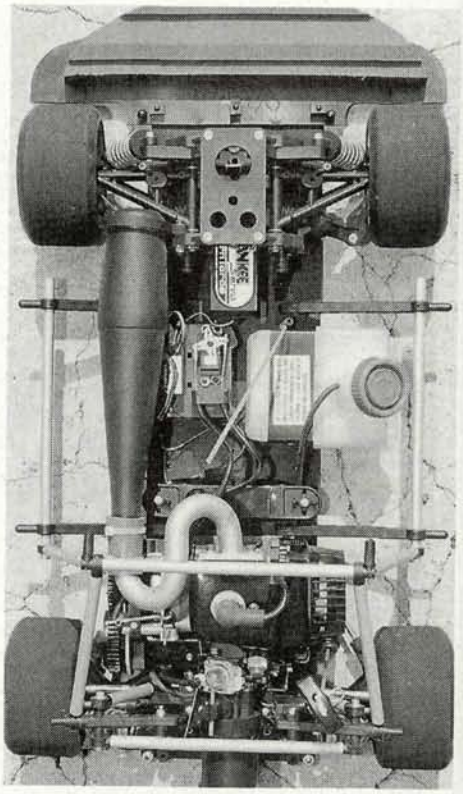
Contributing author (and male model) Greg Vogel likes big toys. It looks as if he has finally found an R/C car that's almost as big as his ego!

KIT FEATURES

After you pop off the body clips to remove the Opel Calibra body, you'll find the heart of the ultimate road machine. The only items I found to be the same on this car and my 1/10-scale cars were the throttle servo and receiver. What about the steering servo, you say? It has been replaced by a large Yankee Turn Force servo capable of keeping the big front wheels in the turned position while cornering. The independent front suspension contains oil-filled, coil-over shocks and composite upper and lower arms, with the lower arms housing the unique swaybar. The swaybar is a steel rod that slides into and out of the arms in a pivot action, and when the car corners, this keeps the chassis nice and flat. The steering knuckle is attached to the arms with large pivot balls which, when screwed in or out, adjust the camber. The front wheels ride on ball bearings recessed in the knuckle.

Toward the center of the car, you'll find the radio tray for the receiver and throttle servo with large flexible push cables exiting to the carburetor and brake lever. There's also the gas tank, which can hold enough fuel for up to 40 minutes of running.

A Zenoah 25cc engine with header and tuned pipe powers the car. The engine has been modified to accept the header and pipe—instead of a wimpy little muffler—for more power. The carburetor is bored to 11mm, which is pretty big. Are you getting the point that *everything* on this car is big? The engine is fitted with a centrifugal clutch so that it can idle while at a standstill. On the end of the clutch bell is a composite pinion gear that transfers the power to the composite spur gear. The spur is notched to hold the fiberglass disk brake, and when the brake is fully clamped, the wheels lock. From the spur, a shaft is connected to the idler gear, which drives the steel gear differential. Unlike some other large-scale cars I have seen, the Calibra has a sealed, planetary-gear differential that greatly aids in the car's cornering and reduces tire wear. The power is transferred through large steel dogbones to the rear wheels. Of course, the drive train is also equipped with ball bearings, and the rear suspension components are fully adjustable. The rear suspension also has large-bore, oil-filled, coil-over shocks. You can adjust the track width, toe-in, or toe-out and camber. The car has one-piece rubber racing tires with wear indicators to show when to rotate or replace them.



There is no doubt that this car is anything but typical. Besides being big, the Opel shares many features with full-scale racecars.

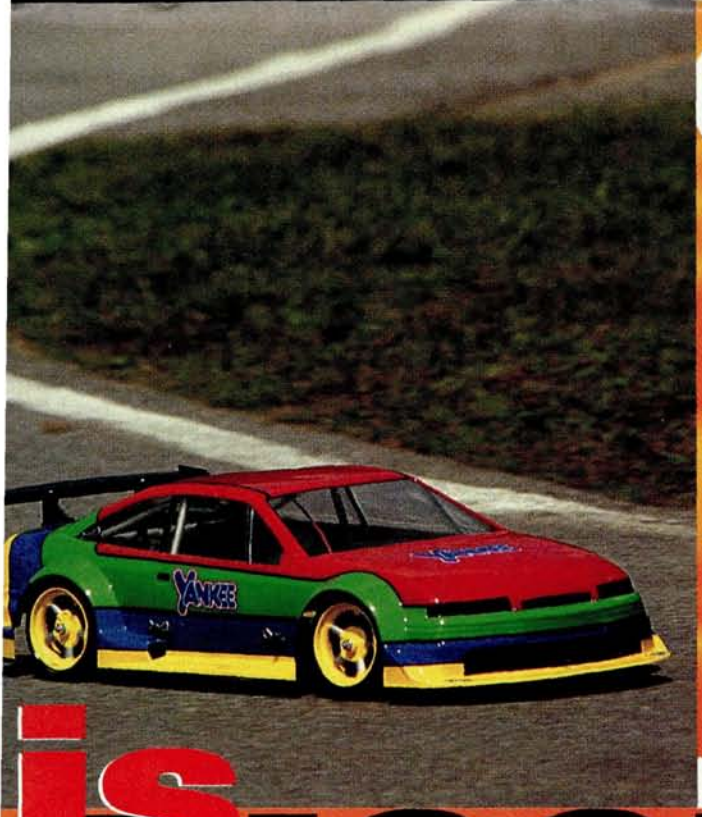
TEST GEAR

- Five-cell, 900mAh receiver pack.
- Yankee Turn Force servo.
- An Airtronics* CS2P FM radio (an FM radio is required for the car because the Turn Force servo is calibrated to FM), receiver and 94102 servo.

PERFORMANCE

I set off to the nearest home and lawn center, where I spent around $10 on a 1-gallon gas bottle and a bottle of 2-stroke engine oil. Next, I headed to the gas station and I poured the recommended amount of oil into the gallon container and filled it with gas. It cost me $1.37! Hmmm, let's do the math: $10 + $1.37 = $11.37. Running this car costs virtually pennies when compared with nitro-pow-

PHOTOS BY WALTER SIDAS



bigger is better?

SPECIFICATIONS

SCALE	1/5
LIST PRICE	$1,495
DIMENSIONS	
Length overall	34 in.
Wheelbase	18.5 in.
Width	15 in.
WEIGHT (gross, RTR)	More than the author!
CHASSIS	
Type	Lower plate
Material	Coated aluminum
DRIVE TRAIN	
Type	Composite/steel gear
Primary	Clutch bell/spur
Transmission	Steel dogbones/axles
Differential	Sealed planetary-gear differential
Bearings/bushings	Bearings
SUSPENSION (F/R)	
Type	Lower arm w/adjustable upper arm/rod
Damping	Large-bore, oil-filled, coil-over shocks
WHEELS (F/R)	Molded 5-spoke
TIRES (F/R)	Rubber w/ inner liner
POWERPLANT	
Engine	Zenoah 25cc F-7 racing motor
Pipe	Header and tuned pipe
Carb	11mm big-bore

ered vehicles. You need to buy only one gas container, and the 2-stroke engine-oil bottle has enough mixture to make a dozen gallons of fuel. Now I had to find a parking lot big enough to run the car.

To test the car, I went to my usual location, a bank parking lot. The lot is very smooth, flat and clean because of regular maintenance with an industrial vacuum. To fill the tank, pour the gas in with the nozzle or a funnel—as I did—because it will catch the splash. Starting the car is fairly simple. First, pump the primer bulb a couple of times until you see gas in it. Next, use the bar behind the primer bulb as a "choke" to close the airway a little on the top. Pull the rope a couple of times. The engine may start instantly, but if not, open the airway fully. When the engine starts, let it warm up for about 30 seconds. Now you're ready to lay down some serious power!

After I yanked the throttle, the 20-pound Calibra took off quickly and picked up speed—rapidly! The Calibra is capable of reaching speeds between 35 and 40mph, so I had to quickly apply the brakes to avoid colliding with the fast-approaching curb. As I hit the brakes, the car slowed pleasantly, but then it spun as I went through the turn. A little confused, I proceeded slowly for a couple of laps to let the

(Continued on page 243)

LIKES

- **Fully preassembled.**
- **Durable composite components.**
- **Fast for its size.**
- **Excellent distributor support.**
- **Ninety-day guarantee.**

DISLIKES

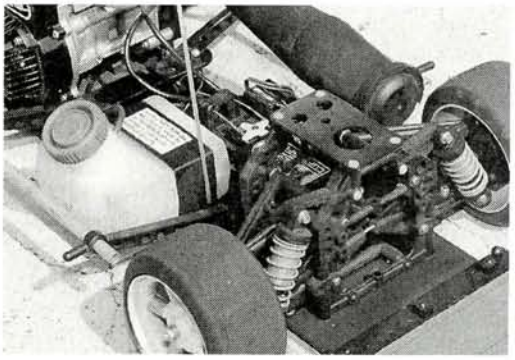
- **The only miss was a near miss with a light pole.**

THINGS YOU'LL NEED

- FM radio with receiver and throttle servo.
- A 5-cell 900mAh battery pack is recommended.
- Gas container.
- 2-stroke engine oil.
- Paint.
- A big parking lot.

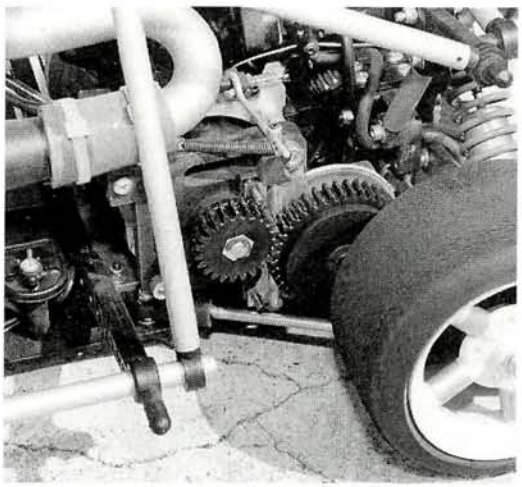
Factory Options

- 2-speed automatic transmission—part no. 80450000.
- Front disk brake—80236000.

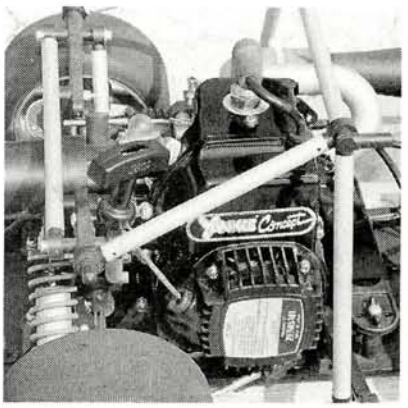


The front end features huge, oil-filled, coil-over shocks, upper and lower wishbones and a very effective front bumper. The front wheels ride on some of the biggest bearings I have ever seen.

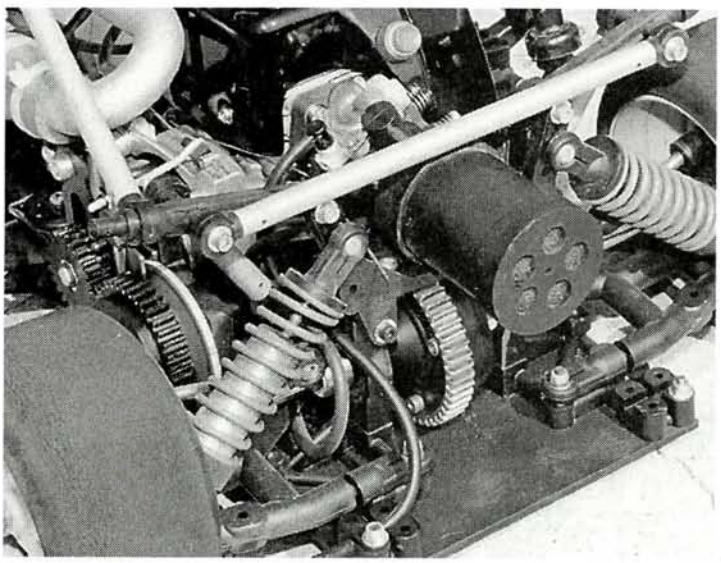
A very large and powerful 1/4-scale steering servo probably has enough torque to steer my full-scale Jeep with authority, so I don't think it will have any trouble maneuvering the Opel on a tight roadcourse.



From this angle, you can see how the engine's clutch bell mates with the composite spur gear. A very smooth centrifugal clutch works extremely well with the engine's power band. A heavy-duty fiberglass disk brake stops this behemoth in an awfully big hurry. If this tire were any bigger, it would have "Eagle GT" on the sidewall.



The Zenoah 25cc engine is a strong performer. The best part, though, is that it's extremely economical. It only takes a few yanks on the heavy-duty pull-start handle, and this big-block engine comes to life. With its big-bore carb and tuned pipe, you'll probably never find a track large enough to experience this engine's top end! Check out the full roll cage that protects the engine from any unforeseen wipeouts.

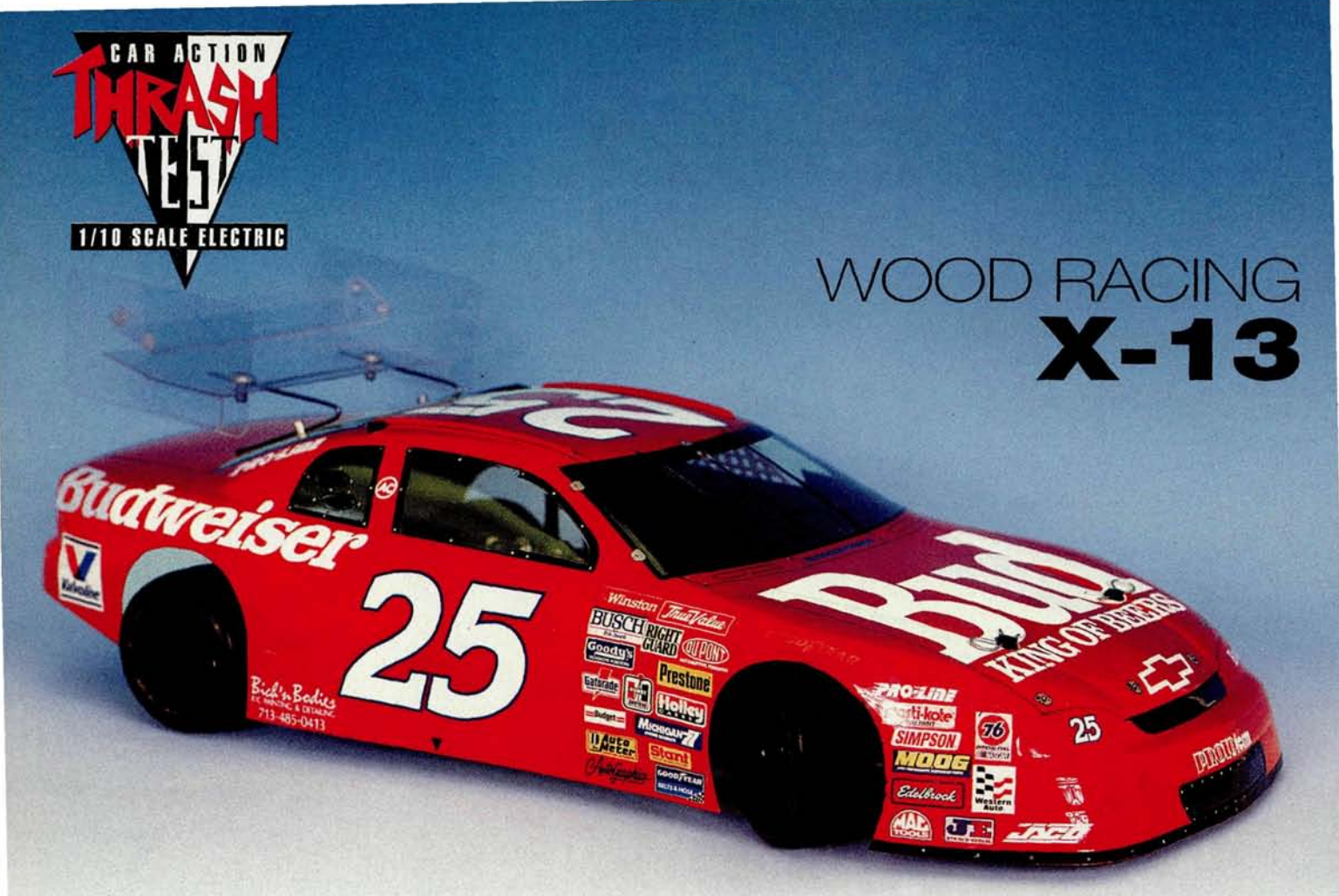


In the rear, you'll find another pair of hefty dampers and upper and lower wishbones. The overall width, camber and toe-in are adjustable. If you look closely, you can see the center-mounted solid-steel planetary-gear diff.

CAR ACTION THRASH TEST

1/10 SCALE ELECTRIC

WOOD RACING X-13



by Rick Schwartz

SPECIFICATIONS

SCALE	1/10
LIST PRICE	$439.95
DIMENSIONS	
Length overall	18.5 in.
Wheelbase	10.25 in.
Width (F/R)	7.5 /7.75 in.
WEIGHT (gross, RTR)	42 oz.
CHASSIS	
Type	Pan
Material	Graphite
DRIVE TRAIN	
Type	Direct drive
Primary	Pinion/spur
Differential	Ball
Bearings/bushings	Bearings
SUSPENSION	
Front	Reactive caster
Rear	Five-point, full-floating pivot ball
Rear damping	Three oil-filled, coil-over, adjustable shocks
ELECTRICS	
Motor, battery, ESC	Not included

ONE OF THE fastest-growing spectator sports in the U.S. is NASCAR racing. And it's not just good ol' Southern boys who got started running the country roads who frequent these events. Men, women and children are heading out to tracks across the country to see the speed and witness the thrills and chills associated with the sport.

R/C oval racing is also in the middle of a resurgence because, as we know, not everyone has the talent or inclination to be a Dale Earnhardt or a Jeff Gordon. But many people want the opportunity to experience what it's like to tool around a banked oval at high speed in a NASCAR look-alike.

One of the hottest cars on the R/C circuit is the Wood Racing* X-13. It's a pocket rocket that has captured more than its fair share of titles, but when it won the 1995 Oval Masters it really made headlines. Since then, it has gone on to TQ, win, or place at most of the large events, including a recent victory in the Stock class at the 1996 ROAR Paved Oval Nationals.

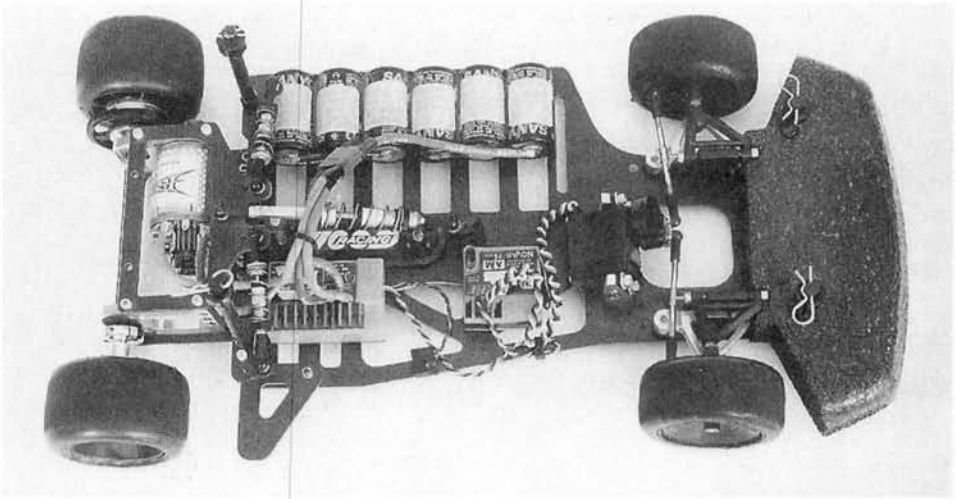
Victory is a Left Turn away

KIT FEATURES

• **Bits and pieces.** The first thing I noticed were the high-quality parts. Everything I received was either graphite, machined aircraft-grade aluminum or high-quality nylon. The chassis, upper and lower pod plates and axle were all graphite. The motor mount, lower front-suspension arms, rear hubs and all the mounting hardware were aircraft-grade aluminum. The front suspension-arm mounts and the front upper arms were tough, black nylon. In fact, the only plastic parts were the body mounts.

• **Suspension.** The front end is an Associated strut-type with on-center steering and adjustable camber and caster. The rear end features a new suspension design that Wood Racing refers to as Controlled Suspension (C.S.). Two smaller shocks take care of the side-to-side damping, and one larger shock handles the fore and aft damping. The heart of the system is the five-point motor pod, which is attached to the T-plate with five pivot balls. This unique feature allows the motor pod to float freely without binding and provides infinite adjustment. The wheelbase and front and rear width overall can be shortened or lengthened to suit track conditions. In addition, the battery slots allow for inside or outside placement, which allows you to alter the car's weight distribution. As you can tell, this car was designed so that it will never become obsolete.

The front suspension is very much Associated, but the optional aluminum lower suspension arm sets it apart from the rest of the pack. The front coil spring is located under the steering block, which makes spring changes a snap.



The optional left-hand drive is a must for hardcore oval racers. Make sure to pick up a reverse-rotation motor or a motor with adjustable timing.

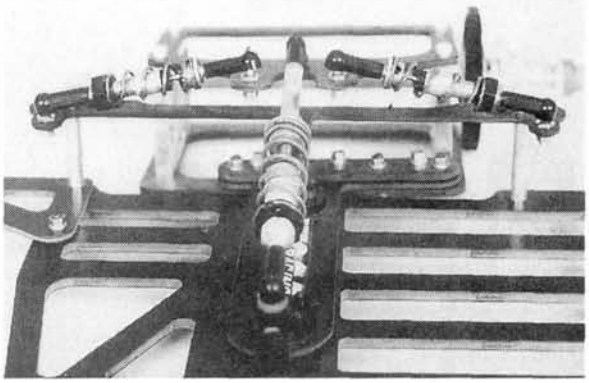
TEST GEAR

I set up the X-13 with the following equipment:

• Futaba* AM PD radio and 9601 super-fast servo.
• Novak* Tempest Pro and Polaris receiver.
• Perfect Match* batteries.
• Fantom* 12-turn double.
• BSR* Feather Lite Pro tires mounted on BSR rims.
• Deans* Ultra plugs.
• T.D. Enterprises* Protector foam front bumper.
• BRP* super air-flow body mount wing.
• Protoform* Monte Carlo SS, painted by Scot Bich from Bich'n Bodies*. It's the spitting image of NASCAR's number 25, which is driven Kenny Schrader.

PERFORMANCE

When I test a car for *R/C Car Action*, my racing buddies come out of the woodwork to come along and "help." They're



The five-point, floating pivot-ball motor pod has Wood Racing's signature all over it. It is, without a doubt, one of the smoothest motor pods available.

Building & Setup Tips

- **Remove all sharp edges on the graphite parts with a fine mill file. Dip a cotton swab in some CA and apply a thin coat along the edges of the graphite plates. This will strengthen the graphite pieces and make them less prone to chipping.**
- **Be extremely careful when you drill the holes for the servo mounts. Because the car has on-center steering, it is critical that you measure and be precise when you install the mounts.**
- **When you install the bottom plate (part no. 1097), grind a little clearance for the T-bar and spacer on the lower, inside-front corner of the pod sideplates. The pod will not pivot properly without this clearance. You may also need to grind off the tips of the 4-40 aluminum balls on the bottom side of the top plate for clearance. (New kits have been changed so this modification is no longer necessary.)**
- **On large banked ovals, fill the side shocks with 80WT shock fluid and the front shock with 40WT shock fluid. For smaller carpet tracks, try using lighter shock fluid inside the side shocks and 10WT to 20WT shock fluid in the front shock.**
- **Adjust the tweak by alternately tightening or loosening the side shock springs.**
- **A good starting point on most oval tracks is 2 degrees caster on both sides, 3 to 4 degrees negative camber on the right tire and 0 degrees on the left tire. Toe-in/out will vary from track to track and from tire to tire. One degree of toe-in is a great starting point, however.**
- **Make sure that you have a reverse-rotation motor if you use the left-side drive.**
- **Wood Racing supplies a complete setup sheet that covers every possible aspect of this highly tunable chassis.**

never around when I'm building the car and need some assistance, but they always seem to show up at test time. We went out to Broward County R/C Race Club's concrete banked oval in Ft. Lauderdale, FL, to see what the "beast" would do. Because I set up the car as a left-side motor-drive vehicle (it can be built to be either a left- or right-side drive), I wanted to ensure that it was prepared to take advantage of the setup. I set the camber and caster as recommended in the included tips. I used red springs on the left front kingpin and right rear shock and green springs on the right front kingpin and left rear shock. This would ensure that the right front would be "stiffer" and help transfer the weight to the left rear tire. Therefore, the car would stay planted in the corners and not have a tendency to "load up" and lean over.

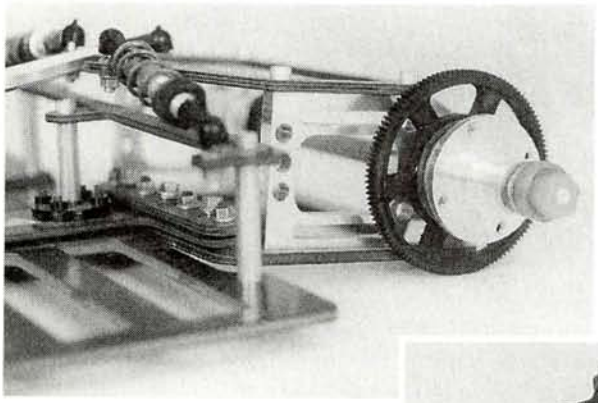
After a few warmup laps, I began to hit the gas. The car flew around the track and was so planted that I thought someone had replaced my traction compound with glue! The C.S. rear end really worked well, and it soaked up the bumps smoothly and evenly.

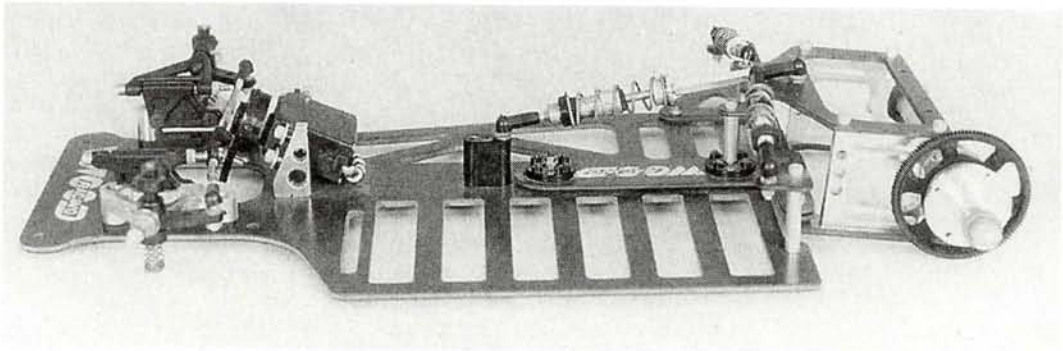
THINGS YOU'LL NEED

- 2-channel AM or FM radio transmitter w/receiver.
- High-speed steering servo.
- Motor and 64-pitch pinion gear.
- Battery charger.
- Servo-saver.
- Battery pack.
- ESC.

Factory Options

- Left-side drive.
- Lightweight aluminum A-arms.
- Pro-long kingpins with Pro-gressive springs.





Above: the optional left-hand drive is a must for hardcore oval racers. Make sure to pick up a reverse-rotation motor or a motor with adjustable timing.

Right: the assembled chassis awaits some choice electronics. This chassis is as light as a feather.

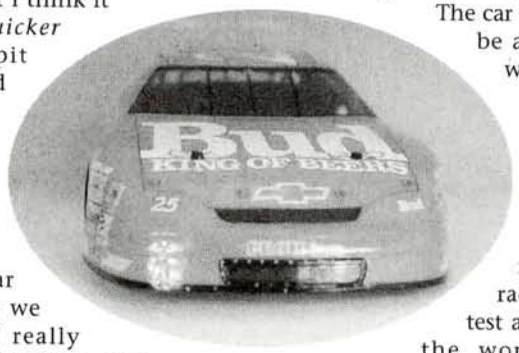
LIKES

- **High-quality parts.**
- **Mucho adjustability.**
- **Controlled suspension pod.**
- **Handles like it's glued to the track.**
- **Directions and setup tips that come with the kit.**

DISLIKES

- **Having to drill holes for the servo mount.**

The on-center steering was very reactive. Some of the guys said it gave the car more steering, but I think it gave the car *quicker* steering. My "pit crew" and I played with the battery placement, pivot-ball tension and shock adjustment—one at a time—and found the car did exactly what we asked it to do. I really liked the on-body wing. It's easy to adjust and allows the motor pod to pivot much more smoothly.



FINAL THOUGHTS

Mike Wood and his son Mike Jr. have done a great job engineering this R/C racer. The car is unique in that it can be adjusted every which way but loose. The new free-floating rear end is a torquer's dream. It has all the features you need to tune the car to all tracks. The most decisive factor is that all of the racers who were at the test are now ready to enter the world of banked-oval racing. If winning in this country weren't enough, the Woods are going international with distributors in France, England, Canada and Japan. You can reach Wood Racing on the Web at www.concentric.net/~woodam or email them at woodam@cris.com

**Addresses are listed alphabetically in the Index of Manufacturers on page 288.* ■

THE COMPETITION

	Wood Racing X-13	Bolink LTO Extreme	Trinity Switchblade	Associated RC10LSO	HPI Road Star 10GO
Width (F/R)	7.5 in./7.75 in.	7.8 in.	7.25 in./7.75 in.	7.9 in.	7.5 in./7.74 in.
Weight	2 lb., 10 oz.	2 lb., 10 oz.	2 lb., 10 oz.	2 lb., 9.6 oz.	2 lb., 10 oz.
Diff Type	Ball	Ball	Ball	Ball	Ball
Chassis	Graphite	Graphite	Graphite	Graphite	Graphite
List price	$439.95	$239.95	$299.99	$250.00	$335.00
Available at	$299.99	$179.99	NA	$129.99	$199.99
Reviewed in	1/97	—	—	—	—

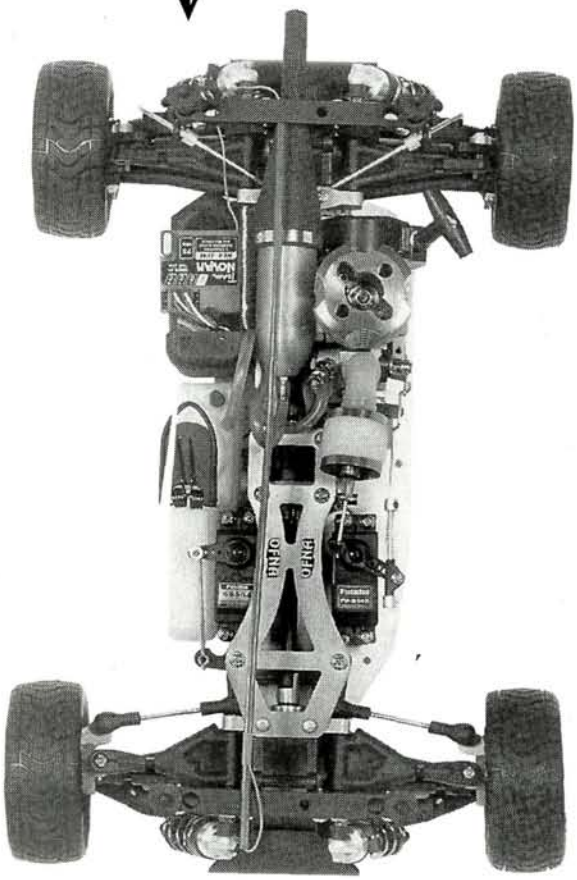
**Prices vary with location.*

CAR ACTION THRASH TEST 1/10 SCALE GAS

OFNA Pirate 10 DTM

Back-Lot Brawling Benz

by Greg Vogel

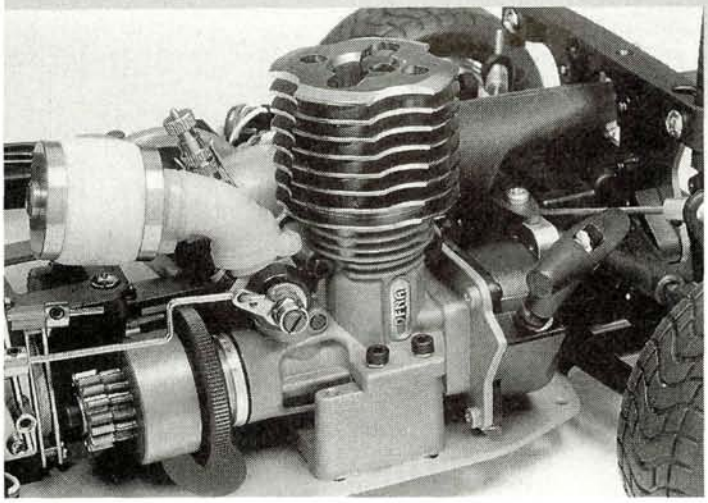


In this top view, you can see how compact the Pirate 10 SR's design is. Note that the exhaust exits the rear of the car—a definite plus. While the car is moving, who wants oil spewing out of its exhaust at the side, directly onto the rear tire?

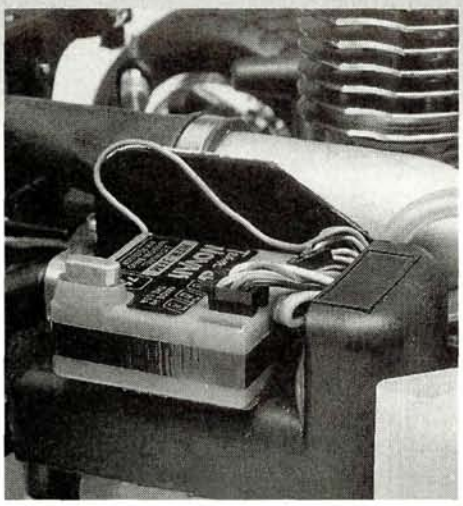
AS GAS POWER and street racing continue to gain popularity in the world of R/C, OFNA Racing* has kept in tune with the newest concepts. The OFNA Pirate 10 Street Racer (SR) is a new addition to the world of on-road 4WD gas racing. Well, maybe it's not so new. The Pirate 10 SR is a take-off of the popular off-road Pirate 10 buggy and Pirate 10T truck. Armed with similar chassis components and the necessary suspension changes, this on-road sibling has what it takes to rule the streets. In addition to necessary changes needed to create a great road racer, a couple of other features were added to enhance performance.

KIT FEATURES

The first eye-popping feature is that the chassis comes fully assembled. Just pull the car out of the box, install an engine and radio of your choice, paint the body, and you're set to go. The first noticeable difference between the SR and OFNA's off-road Pirates is the smaller rear shocks. The large, rear off-road shock tower was removed and a hard-coated aluminum tower was mounted to accompany the short shocks. The oil-filled shocks are hard-coated for long life and smooth operation. I had to take apart a shock—being the curious person I am—to check it out. After I disassembled it, I found that there was



Left: powering the Pirate 10 SR is an OFNA 15 EP engine. Mated to the 2-speed tranny, this combo provided some fairly potent speeds. Right: the receiver pack is under a nylon tray. The receiver rests on top of the tray and is protected from heat by a molded sidewall.



no oil in the shock, but oil is included to fill the shock.

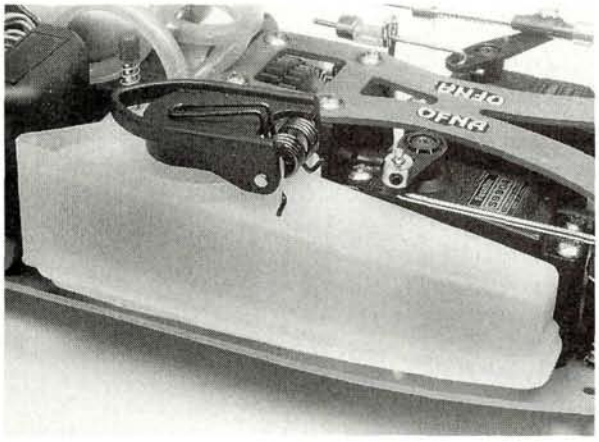
The body mounts are mounted on the towers and are adjustable by using a clamp. The mounts are notched so that they can be adjusted evenly. The mounting hole that allows the antenna to lie down inside the car is also found on these body mounts.

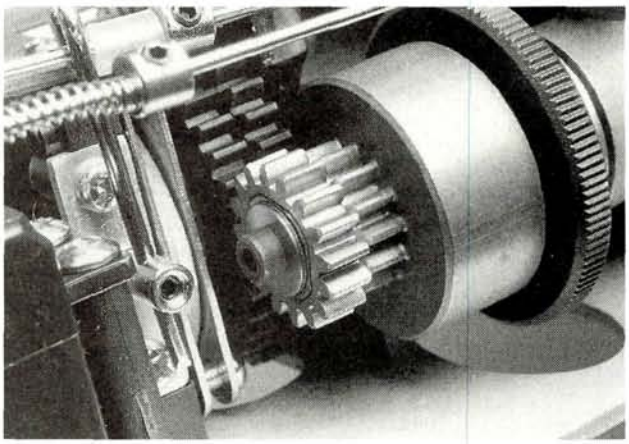
The lower suspension arms and the adjustable upper suspension arms were narrowed for better road handling. The front steering uprights are made of aluminum; they should stand up to those asphalt curbs that pop up out of nowhere. The uprights attach to the suspension arms with a large pivot ball. Slider universals transfer the power to the wheels.

OFNA uses ultra-smooth steel gears in both the front and rear differentials. The two differentials spin smoothly. When I turned the front or rear wheels in the same direction, I felt some high spots on the bevel gears; however, this is nothing to really worry about. I spoke with OFNA on the subject, and I was told that the gears were made a little larger than necessary and that after the car is run a few times, they would even themselves out. The pinion-drive gears exit through glass-filled rear bulkheads that come stock with the Street Racer only. The bulkheads provide extra support for the gear and the suspension arms. A 2-speed transmission also comes stock with the Street Racer, and a full set of ball bearings tops off the drive train.

The double-reinforced aluminum T6 chassis is quite stiff. The lower chassis has countersunk screws except for the engine mounts, which use large screws and washers. The upper chassis brace and swaybar hold-down are also hard-coated aluminum. The provided rear swaybay helps reduce chassis roll.

The 75cc racing fuel tank is mounted on one side of the



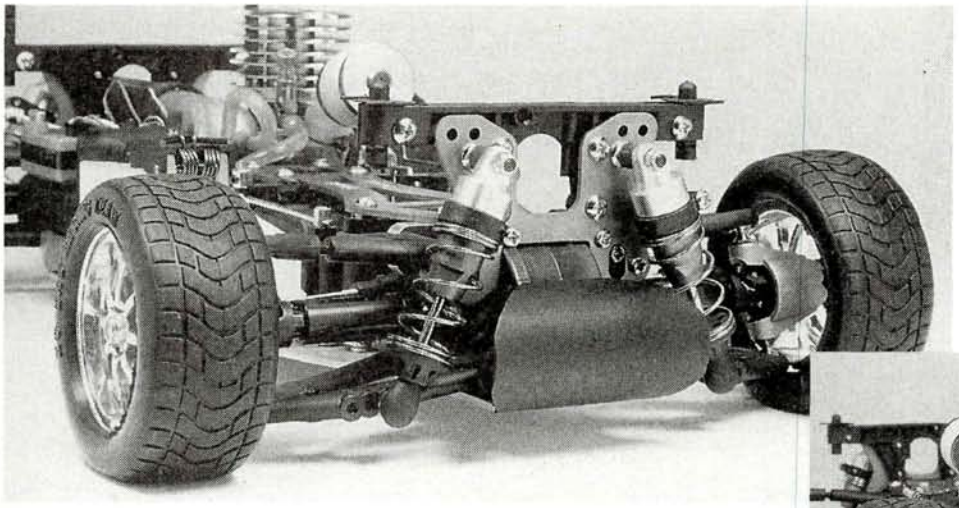


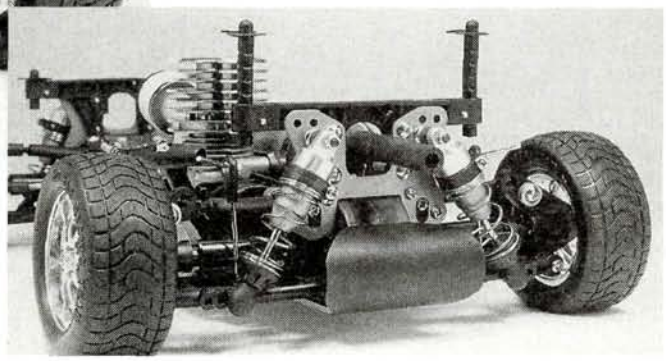
Above: the Pirate 10 SR features a great fuel-tank design. It incorporates a "spill drop," so if fuel spills while you're filling the tank, it flows into the spill drop, is funneled through a hole in the chassis and drips onto the ground. Right: a 2-speed transmission is standard on the Pirate 10 SR.

The car shot off in amazing acceleration, and when the 2-speed tranny kicked in, the SR went at blinding speeds.

SPECIFICATIONS

SCALE	1/10
LIST PRICE	$349.99
DIMENSIONS	
Overall length	14.01 in.
Wheel Base	10.625 in.
Width (F/R)	9.75/9.1 in.
WEIGHT (gross, RTR)	4 lb., 4 oz.
CHASSIS	
Type	Upper/lower plate
Material	Hard-coated aluminum
DRIVE TRAIN	
Type	Shaft-driven 4WD
Primary	2-speed clutch bell, 2-speed spurs
Transmission	Sliding universals
Differentials (F/R)	Bevel gear
Bearings/ Bushings	Ball bearings
SUSPENSION (F/R)	
Type	Independent double-wishbone
Damping	Oil-filled, coil-over shocks
WHEELS (F/R)	One-piece chrome 8-spoke
TIRES (F/R)	Soft rubber, street tread
POWERPLANT	
Engine	Not included
Pipe	Header pipe





Left: up front, you'll find hard-coated aluminum shocks as well as upper and lower wishbone-style suspension arms. Below: in the back of the car, you'll find hard-coated aluminum shocks as well as the same style suspension setup as in the front and an adjustable swaybar.

chassis. This fuel tank is one of the greatest ever developed. In addition to its flip-top lid and primer, it also has a "spill drop." When excess fuel spills out, it gathers in a walled area on top of the tank that tapers down to a hole that lets the fuel drop onto the ground and not onto the chassis. Pretty neat, huh? The radio tray is also well-designed: the receiver pack mounts under the nylon tray and the receiver mounts on top. To protect the receiver from heat, I attached heat-reflective material with double-sided tape to the large sidewall of the tray. The center-mounted muffler comes stock with the kit. A servo-saver bellcrank is used for steering, and a bent rod with rubber retainers is used to join the bellcrank system. I would have preferred to see screw-type collars, but the retainers work well.

On the four corners are chrome-plated 8-spoke rims with very soft tires. It is necessary to add foam inserts into the tires before you glue them to the rims. An AMG Mercedes Benz body tops off the Pirate 10 SR.

Now, about the instructions. Even though the car is assembled, a set of good instructions is still necessary. The provided instructions are actually for the Pirate 10 off-road buggy, but, because they are so similar, building the car is not really a problem. A separate picture sheet of the street racer is also provided so that you can see the differences.

TEST GEAR

- OFNA's 15 EP engine with pull-starter.
- OFNA blue-anodized air filter.
- Futaba* Magnum 2PD.
- Futaba 9304 steering servo.
- Futaba 148 throttle/brake servo.
- Dynamite* 600mAh, 5-cell hump receiver pack.
- Dynamite Blue Thunder 10 percent-nitro.
- Great Planes* Pro Glo Ni-starter.

Building & Setup Tips

The Pirate 10 SR comes fully assembled, but here are a few tips that will improve performance.

• When you install the engine and radio gear, be careful to study the pictures in the instruction manual.

• Work on a large, white towel to catch any parts that may drop. It also keeps the parts from rolling off the table.

• The shocks in my kit were not filled with oil. Take your shocks apart and fill them with oil. While you have the shocks apart, apply some RCPS Green Slime to the seals. The lubricant will provide a better seal and smoother operation.

• When building a gas car, it is a good idea to apply medium-grade Loctite* to the screws. Many of the screws on the car are self-tapping and do not require Loctite. However, any fine-threaded screw should have some Loctite applied to it, especially the engine mounting screws. Do not use Loctite on screws that are threaded into plastic parts.

• The kit comes with soft-rubber tires with no foam. If you're going to use these tires, you need to buy some tire foam to reduce the sidewall flex. Glue the tires with CA.

• If you're not a racer, you may want to cut out the back of the body because the rear exhaust "spews" oil all over it. The oil, combined with the road dust, results in a real mess.

LIKES

- **Fully assembled.**
- **2-speed transmission.**
- **Extremely durable.**
- **Major aluminum parts are hard-coated.**

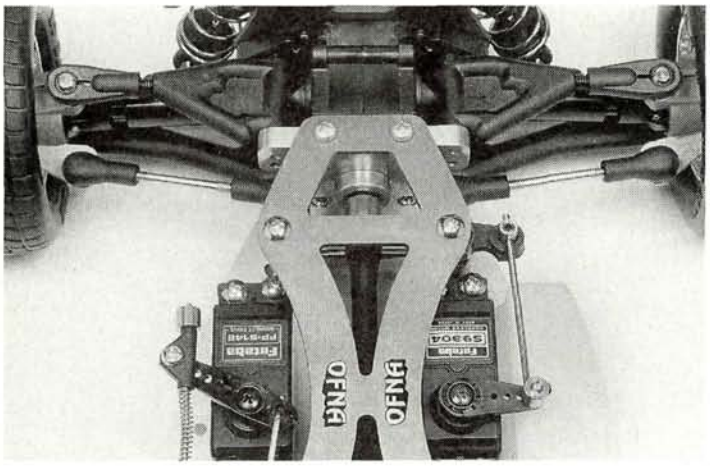
DISLIKES

- **No wing on the back of the body.**
- **Tire sidewalls are too high.**
- **Exhaust "spews" on the back of the body.**

PERFORMANCE

Now, for the moment of truth: would the Pirate SR perform as well as it looked, or would it have to walk the plank? After I broke in the engine in my garage, I set out to a bank parking lot for the street

Plastic drive shafts power the Pirate 10 SR. The included tires don't come with foam liners and are a little squishy. I had to use off-road tire foam liners to firm them up.



The steering and throttle/brake servos are near each other toward the front of the car. The drive shaft runs directly between them.

test. (I chose a bank parking lot because it was midnight and bank lots are always well-lit.) When I set the car down, I leaned the engine's high-end needle a couple of clicks for better performance. I found the OFNA 15 engine to be very finicky. It went from slobbery rich to lean within three clicks of the high-end needle valve.

After I achieved what I thought were the perfect settings, I nailed the throttle. The car shot off in amazing acceleration and when the 2-speed tranny kicked in, the SR went at blinding speeds. The car rounded turns great, did four-wheel slides under power and turned tight when I let off the throttle. When I would stab the brakes to go around turns the wheels would instantly lock, which sometimes caused the car to spin out and do donuts when I re-hit the throttle. No problem; with a little more preload on the rear springs, the problem was semi-resolved. The tires were a little tall, and this caused them to collapse in the turns, which increased the car's tendency to spin out. The problem was also compounded by the absence of a wing on the back of the body, which resulted in less downforce.

Before I knew it, the car had been running for about 15 minutes. With the engine still on, I brought the car over to check how much fuel was left. As it came to a stop, the engine stalled. I tapped my finger on the heat-sink head, and it was extremely hot. I had to wait for the engine to cool down before it would restart. Not to take any chances, I went home and installed a temperature gauge. I chose PC/RC's* Temp Graph gauge.

The next night, I set out again to cure the engine overheating problem. I richened the mixture on the needle valve. But it was so rich, the car barely moved because so much fuel was going to the engine. Another click on the high-end needle leaned the engine slightly, but it still ran a bit rich. I left the body off so I could see the bright illumination of the gauge. After I ran a full tank, the Temp Graph was at the top of the orange bars, which meant it was operating close to the proper temperature. From then on it was smooth sailing—I mean, racing.

THE COMPETITION

	Kyosho SuperTen	Tamiya TGX	Kyosho GP 10	Pirate 10 SR
Wheelbase	11.03 in.	11.75 in.	10.25 in.	10.625 in.
Width (F/R)	8.69/8.75 in.	9/8.75 in.	7.75 in.	9.75/9.1 in.
Weight	4 lbs., 8.8 oz	5 lb., 9 oz.	3 lb., 2 oz.	4 lb., 4 oz.
Diff type	Gear	Gear	Gear	Gear
Chassis	Duralumin	Duralumin	Aluminum	Hard-coated aluminum
Price	$499.99	$599	$349.99	$349.99
Available at*	$379.99	$449.99	$219.99	$184.99
Issue reviewed	7/96	9/95	3/96	1/97

**Prices vary with location.*

FINAL THOUGHTS

I first saw this car months before it was given to me and was so overly impressed by its quality and design that I actually begged the *R/C Car Action* editors to let me review it. (Yes, it was pathetic, but effective.) After I inspected the car and made preparations for running, there was no doubt in my mind that it would be an excellent ride for parking-lot enthusiasts and racers. Unfortunately, in my area, there are no racetracks for these cars. If there were, this car would probably be at the top of the podium. I've heard reports from other tracks across the country that say it's already in the winners' circle. As far as parking-lot enthusiasts are concerned, this car is fast, easy to drive and so much fun that I still go every night at midnight to run a couple of tanks through it.

**Addresses are listed alphabetically in the Index of Manufacturers on page 288.* ■

THINGS YOU'LL NEED

- 2-channel radio system with two servos (one for steering, one for throttle/brake).
- .12 or .15 engine.
- Glow starter.
- Receiver pack.
- Lexan paint.
- Fuel.

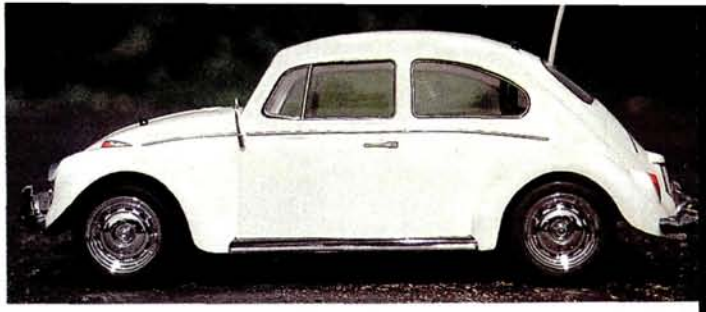
Factory Options

- Tamiya hex wheel adapters—part no. 17073.
- .15 slide carb-linkage kit—17074.
- 2-speed center kit—17075.
- Clutch bell gears—43130.
- Aluminum steering knuckles—17923.
- .12 and .15 dual chamber pipe—22810.
- Rear exhaust .15 manifold—17005.
- Glass-filled rear bulkhead—17981.
- Aluminum T6 bulkhead—17981A.
- Tuned pipe and manifold, rear center—17806.
- 270-degree manifold, center to left—22600.

The car rounded turns great, did four-wheel slides under power and turned tight when I let off the throttle.

CAR ACTION THRASH TEST

1/10 SCALE ELECTRIC



This beetle is buggin'!

by Dave Ditner

TAMIYA
Volkswagen

TAMIYA'S* M-CHASSIS have taken the U.S. by storm, and to date, the Mini Cooper has been the "king of the hill." But there's a new mini-class contender that's going to give the Cooper a run for its money: Tamiya's Volkswagen Beetle, and I've gotta tell ya—it's way smooth!

KIT FEATURES

The Beetle, or as most call it, the Bug, has the new M-02L chassis, which has a longer wheelbase than its predecessors. It's rear-wheel drive, and the largest M-chassis kit around.

When I opened the box, I was quite happy to see a really cool 4x6-inch picture of the Beetle racing a Mini Cooper. Tamiya includes these pictures with their newer kits (from model no. 150 up). I stuck the one from the Beetle on my workbench wall next to the one from my Cooper. I was also pleased to see that the parts were neatly bagged and labeled in order of assembly steps. Hooray! No more tedious blister packaging!

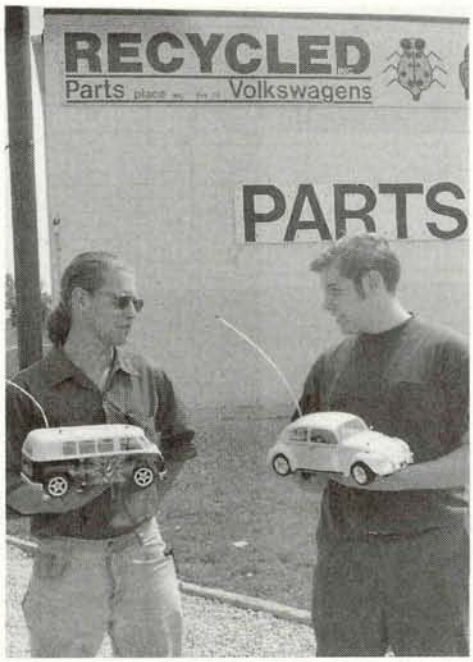
Tamiya is second to none when it comes to body detail, and the Beetle is no exception. Even the most hardcore VW freak will appreciate this 1/10-scale version of the 1967 VW Beetle. The window trim, turn signals, taillights and body trim are nicely reproduced through decals. The Beetle's body, as well as any Tamiya Lexan body, comes with a protective film molded to its top to prevent overspray as well as scratches during shipment. You even get printed window masking—just cut and stick!

The Beetle also comes with sweet-looking chrome wheels. Super Slick soft-rubber rear tires with foam inserts help put power to the ground, while the front tires are made of standard rubber and also have foam inserts.

The chassis, front bulkhead and gearbox use a different type of plastic than the suspension arms, body mounts and bumpers, which are made of a less rigid material that can withstand pretty serious abuse. The chassis layout is pretty simple, so maintenance is a snap.

The tranny comes with a bevel-gear differential mounted in a sealed gearbox. The tranny gears are quite beefy, and if you add ball bearings, they'll have no problem handling a hot modified motor. The motor mount is adjustable to accommodate the included 20-tooth pinion or the optional 16- and 18-tooth, which allow proper gearing for modified motors.

The Beetle, like the Mini Cooper, uses a horizontal monoshock front and rear suspension with friction-type (no oil) shocks. Some people may scoff at a car that doesn't have oil-filled shocks, but the M-chassis uses an unconventional suspension system that doesn't really need them. The chassis actually leans on springs that are levered from the arms. The result is a pretty wild-looking body roll that adds to the uniqueness and appeal of the M-chassis cars.



I took the completed Volkswagen to Michigan's top source for Beetle parts, called (no lie) Recycled Bugs and Rabbits. The folks there really got a kick out of the detailed body and immediately began to argue over what year the car was. One guy pointed to the taillights, made a couple of comments, then declared it a '67. Everyone else agreed; these guys really know their Beetles. They liked the bus body, too (especially the emblem).

SPECIFICATIONS

SCALE	1/10
LIST PRICE	$233.95
DIMENSIONS	
Length overall	15.6 in.
Wheelbase	9.4 in.
Width (F/R)	5.3 in.
WEIGHT (gross, RTR)	3 lb.
CHASSIS	
Type	Monocoque
Material	ABS plastic
DRIVE TRAIN	
Type	Gear-driven RWD
Primary	Pinion/spur
Transmission	Dogbones/axles
Differential(s)	Bevel-gear
Slipper clutch	No
Bearings/bushings	Plastic bushings
SUSPENSION (F/R)	
Type	4-wheel, independent, lower H-arm w/fixed link
Damping	Spring
WHEELS (F/R)	
Type	One-piece plastic
Dimensions (DxW)	1x2.3 in.
TIRES	
Front	Tall street treads
Rear	Soft "Super Slicks"
ELECTRICS	
Motor	Mabuchi 540
Battery	Not included
ESC	3-step wiper w/reverse

TEST GEAR

- Futaba* Magnum Jr. radio and S-148 servo.
- Futaba MC210CB ESC.

The Beetle comes with a mechanical speed control, but I like Futaba's ESC because you get brakes and reverse.

The Autographics license-plate kit includes four blank plates and lots of letters and numbers. It's a great way to personalize your sweet ride.

THINGS YOU'LL NEED

- "Basic Joe" tools, such as medium and large Phillips screwdrivers, needle-nose pliers, hobby knife and scissors.
- Radio gear.
- Battery charger.
- Battery pack.
- Paint.

Factory Options

- M-chassis ball-bearing set—part no. 53206.
- M-chassis front and rear stabilizer kit—53239.
- M-chassis aluminum race-steering kit—53253.
- M-chassis stainless-steel suspension shafts—53235.
- M-chassis hollow carbon gear-shaft set—53237.
- M-chassis 4x65mm aluminum screws 5pc—53234.

PERFORMANCE

For its initial run, I took the Beetle to the church parking lot conveniently located across the street from my house. The surface is rough in spots, but it's usually empty during the week, and it's large enough to allow high-speed (speed equals joy!) gearing. I was simply amazed at the performance of the Beetle. Now, I still love my Cooper; but I gotta tell you, out of the box, the Beetle will feed taillights to a Mini Cooper in a parking lot. The taller tires make the Beetle much faster and also give it the height to clear road barnacles better than my Cooper. It handles better, too, because of the longer wheelbase, Super Slick rear tires and rear-wheel drive. Man, I really dig these M-chassis cars; now I'm thinking about collecting all of them!

*"...I gotta tell you, out of the box, the **Beetle** will feed taillights to a **Mini Cooper** in a parking lot."*

FINAL THOUGHTS

The Volkswagen Beetle is yet another excellent kit from Tamiya. Their kits just keep getting better and better. There are

The Volkswagen is the longest of the M-chassis, which adds to its straight-line stability.

Building & Setup Tips

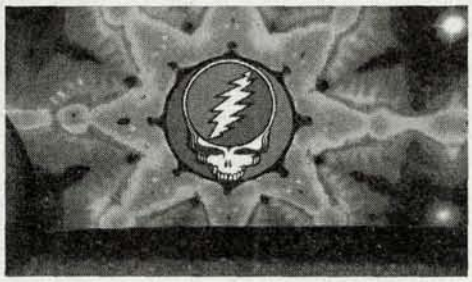
Because of Tamiya's excellent instructions, even the most "mechanically declined" R/C'ers should find the Beetle enjoyable to build. I did notice a few things that will make the Beetle's assembly easier and boost performance.

- **Go easy on the grease. A little goes a long way. You want to apply just enough grease to coat the contact surfaces of the gearbox—any more is pointless. Grease attracts dirt; lots of grease attracts lots of dirt. In fact, the only parts that I usually grease are the metal diff gears and the bushings. Don't over-grease the bushings either, because they'll goo out, mix with the dirt and then it's bye-bye bushings!**
- **I put the Stuph, by Tyler Industries, on the screw-type hinge pins. It's a fluorescent pink, oily dielectric that removes and prevents rust and corrosion. It's important because the lower outer hinge pins seemed to get corroded quickly on my Cooper. This caused the suspension to get "sticky."**
- **Glen Toma of Tamiya America told me that the key to making the suspension work is to make sure the shocks move freely. If they stick, the car will list to one side; so take heed, and make sure they're smooth.**
- **Anyone who has an M-chassis will complain about steering slop. It's not just sloppy, it's downright heinous. A quick fix, as previously mentioned in R/C CAR ACTION, is to put a rubber band around the two front ball connectors in the knuckle arms. It's not pretty, but it tightens things up a bit. Tamiya also makes an aluminum bellcrank steering unit (part no. 53253) with Teflon™ bushings that should tighten up the steering nicely. Tamiya's front and rear swaybar (stabilizer) kit (53239) should also help immensely.**
- **I would also mount the servo linkages differently from what's shown in the instructions. Instead of the funky angle shown, attach the servo-saver to the other side of the servo, at 90 degrees to the centerline of the car. You could even mount the servo backwards for even stiffer steering, but you'll have to cut the linkage. If you use the mechanical speed control, you'll also have to rotate the throttle-servo head and speed control 180 degrees to prevent the throttle linkage from hitting the steering linkage.**
- **I never cut the body mounts until the body is on the car. What if, after spending a lot of time detailing the body, you want to run a "basher" body when beating on the car? What if you want to run bigger tires or change the ride height? You get my point. If you're going to cut the mounts, make it the last thing you do.**
- **If you want to make body trimming a lot easier, get Lexan scissors; they're curved and make cutting the wheel wells and decals much simpler. It's a worthwhile investment.**
- **You may also want to apply thread-lock to the 4x65mm screws and nuts that hold the chassis halves together. I am not the only one to lose those nuts while beating on a Cooper or a Beetle.**

TRUCKIN'

Another way of sporting an R/C Volkswagen is the VW van, or Micro-Bus body from HPI* The body comes with a separate pickup bed and surfboard if you want to sport the "beach bum" look. Quite a bit smaller than the 1/10-scale Beetle, the HPI van is closer to 1/12-scale, because it's intended for use on the Mini Cooper's shorter M-01 chassis.

To fit the van body on the Beetle chassis, additional parts are required. You'll need the short front bulkhead (part no. 50651) from the M-01 chassis. The bulkhead that comes with the Beetle is too long for the van body, however, I'm quite jacked to say that it's the same length as the gearbox. (That makes it *too* easy to put a second tranny and two nasty motors in the Beetle—I can't wait!) You'll also need the long (rear) body mounts which are on the "D" parts tree (50654) that also has the arms, ball cups and bumpers. If you don't want the extra parts, aftermarket mounts and some creative engineering should work well and cost less.



My VW van *had* to sport a Grateful Dead motif. I was going to airbrush a tie-dye paint scheme on it, but then I saw these Dead bumper stickers and I changed my mind. The side graphics are bumper stickers that I cut to match the body lines. The stickers are quite thick, and it took some patience to get them to stick flat to the body. A psychedelic, tie-dyed "Steal your Face" banner with the VW emblem in the skull was the inspiration for the hood emblem. I cut out the lightning bolt, applied the sticker to the body, and made the VW logo using black Pactra* Trim Tape.

I wanted to add some rowdy wheels, and HPI's Chrome Mini-Stars (3632) fit the bill. Not only are they sweet-looking, they're also more durable than the stock Tamiya wheels. I "finished off" the Beetle and the Dead van with Autographics'* license-plate kit (10851). The kit includes four blank plates and ample letters and numbers. It's a great way to personalize your sweet ride.

LIKES

- **Excellent body detail.**
- **Great instructions.**
- **Logical parts packaging.**
- **Best-performing M-chassis to date.**

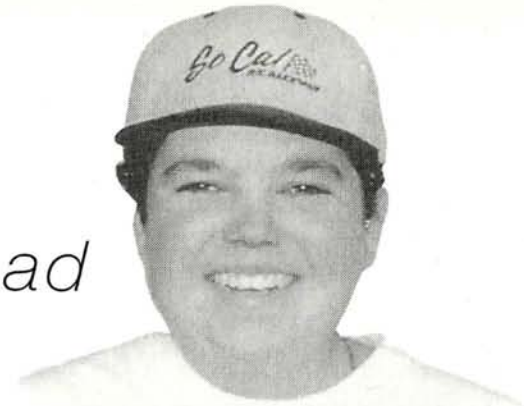
DISLIKES

- **Sloppy steering.**
- **No switch mount!**
- **Body looks so good you won't want to run it.**

so many aftermarket parts for the M-chassis that you can customize the car to your heart's content. If you're looking for a first car, second car, third car, something different, whatever, you've got to scope this one out. If you want to race in the mini class, it's a sure contender. If you're a Volkswagen freak, it's a must-have. Give it a try, and you'll be Buggin'! ■

**Addresses are listed alphabetically in the Index of Manufacturers on page 288.*

PRODUCT WATCH



The new Mod Squad

Trinity Dirtinator 2

A LITTLE over a year ago, Trinity* wowed the off-road crowd with the release of the Dirtinator modified motor. Since its release, it has helped many racers TQ and win various local, regional and national-level competitions. Team Trinity/Team Losi drivers Brian Kinwald and Greg Hodapp won the six largest U.S. off-road races in 1996 running the Dirtinator. At every race they attend, they are a major force to be reckoned with. So with all the success that Trinity has had over the past year with this motor, why would they go out of their way to change a winning design? Well, because Trinity has always been on the leading edge of motor technology, and they want to keep it that way. Enter the Dirtinator 2, the first in a lineup of Trinity's new "W" series of motors. More than a year of research and development went into the design. Let's take a look at what makes the Dirtinator 2 tick.

As you can easily see in this photo, the new Dirtinator 2's armature (above) is 25 percent thicker than the original's (right).

RADICALLY REDONE

Three major innovations set the Dirtinator 2 apart from the original Dirtinator—a redesigned can, a completely new armature blank and new version 5.4 magnets.

• **Can design.** The Dirtinator 2's 1.3mm-thick can shares its bottom-end design with the Trinity Midnight stock motor (there are four triangular cooling slots on the new can versus two elliptical cooling slots on the original). The Midnight's bottom-end design is better suited to modified motors because that triangular cooling-slot bottom end allows less magnetic field "leakage" than a typical two-slot bottom end.

The top of the endbell is the same as that of the original Dirtinator.

The only other external difference is that the motor is finished in bright purple, whereas the original had a black finish. As you can see in the photos, the can, endbell, brush hoods and posts are purple, and the screws and heat sinks are black.

Trinity may release a version with the cooling vents on the side of the can (similar to the Midnight motor can).

• **Armature blank.** The armature blank underwent the most significant changes. As a matter of fact, it is a completely new design from the ground up. All new tooling was created specifically for this armature; it is the first new armature-blank design since the inception of the Sagami-style motor. This step in motor evolution is similar to the transition from the original Igarashi motors to the Sagami/Yokomo type. This occurred around the time of the first IFMAR 1/12-scale World Championships held in Anaheim, CA, back in 1982.

The new blank is loosely based on the original Dirtinator's armature technology, but the biggest difference is that it has a reconfigured pole piece and, most important, a thicker web (the area where you wind the wire around in loops). The original Dirtinator armature web was 4mm thick, while the new web is 5mm thick (a 25-percent increase). The commutator remains the same size, but the material around the motor shaft is thicker, and this provides a better magnetic return path for the pole piece and the web. Basically, the only dimension that has remained the same is the stack's outside diameter, which is fixed by ROAR rules. As with its predecessor, the new armature will be epoxy-balanced in-house at Trinity, and it will fit directly into older-style cans.

• **Magnets.** Trinity's new version 5.4 magnets are the other major design

improvement. With a stronger magnetic field and increased resistance to being demagnetized, they help improve performance in all areas.

PERFORMANCE

So what do these changes bring to the track? Well, according to Trinity's head motor designer, Neal McCurdy, there are quite a few differences between the Dirtinator 2 and its predecessor.

The new motor will turn rpm similar to a Dirtinator with one more turn of wire, e.g., a 13-turn Dirtinator 2 will turn roughly the same rpm as a 14-turn original Dirtinator. Reduced resistance, thanks to the motor's more efficient design, allows it to do this. The one-turn decrease reduces the armature's resistance. When you reduce resistance, you also reduce heat because the motor is running more efficiently. This cooling effect is especially beneficial to the can's magnets. When magnets get hot, they aren't as efficient, and power output drops. By keeping the magnets cooler (thanks to the new motor can's bottom end with more cooling slots and the more efficient armature blank), the motor produces more power.

So in a nutshell, what you get with the Dirtinator 2 is a motor that runs cooler, lasts longer, produces a broader power curve, has more torque and produces more rpm at higher current levels because of the lower resistance. According to Neal, the motor works great in off-road as well as 1/12 and 1/10 on-road applications.

Neal also emphasized that racers who switch to this motor should make sure that they use a Dirtinator 2 with approximately one less turn than the motor they currently use. So, if you're used to racing with a 13-turn double, it's time to drop down to a 12-turn (see accompanying dyno chart—"Dirtinator vs. Dirtinator 2").

Neal also said that while testing this motor, he gave his team drivers a motor "minus the one turn that they were used to," but he told them to gear it exactly the same way. When they came back to him, they all exclaimed that they felt it pulled stronger and had more torque and a broader power curve—all while achieving the same overall rpm as their previous motors.

The new Dirtinator 2 should be on hobby shop shelves by the time you read this article. If you're interested in modified racing, you might want to check out this new motor. If it's anything like its predecessor, it's already a sure winner.

**Addresses are listed alphabetically in the Index of Manufacturers on page 288.* ■

The following motor comparisons were made using a Competition Electronics* TurboDyno.

Dirtinator vs. Dirtinator 2

13-TRIPLE Constant—5 volts

Rpm	Torque	Watts	EF	Amps
24,497	3.9	71	71	20.0
23,570	5.7	100	80	25.1
22,687	7.1	120	80	30.0
21,926	8.6	139	79	35.1
21,382	10.0	158	79	40.0
20,803	11.4	175	78	45.0

12-TRIPLE Constant—5 volts

Rpm	Torque	Watts	EF	Amps
27,201	3.6	73	73	20.0
26,166	5.0	98	78	25.1
25,056	6.6	122	81	30.0
24,348	7.8	141	81	35.0
23,534	9.2	160	80	40.0
22,727	10.5	177	79	45.0

12-TRIPLE Constant—5 volts

Rpm	Torque	Watts	EF	Amps
24,840	4.1	75	75	20.0
23,955	5.6	99	79	25.1
23,068	7.1	121	80	30.0
22,292	8.6	142	81	35.1
21,608	10.0	160	80	40.0
20,789	11.5	176	78	45.0

11-TRIPLE Constant—5 volts

Rpm	Torque	Watts	EF	Amps
26,923	3.9	77	77	20.0
26,107	5.1	100	80	24.0
25,318	6.6	123	82	30.0
24,667	7.8	142	81	34.9
23,949	9.1	162	81	40.0
23,302	10.3	178	79	45.0

WHICH TOURING CAR

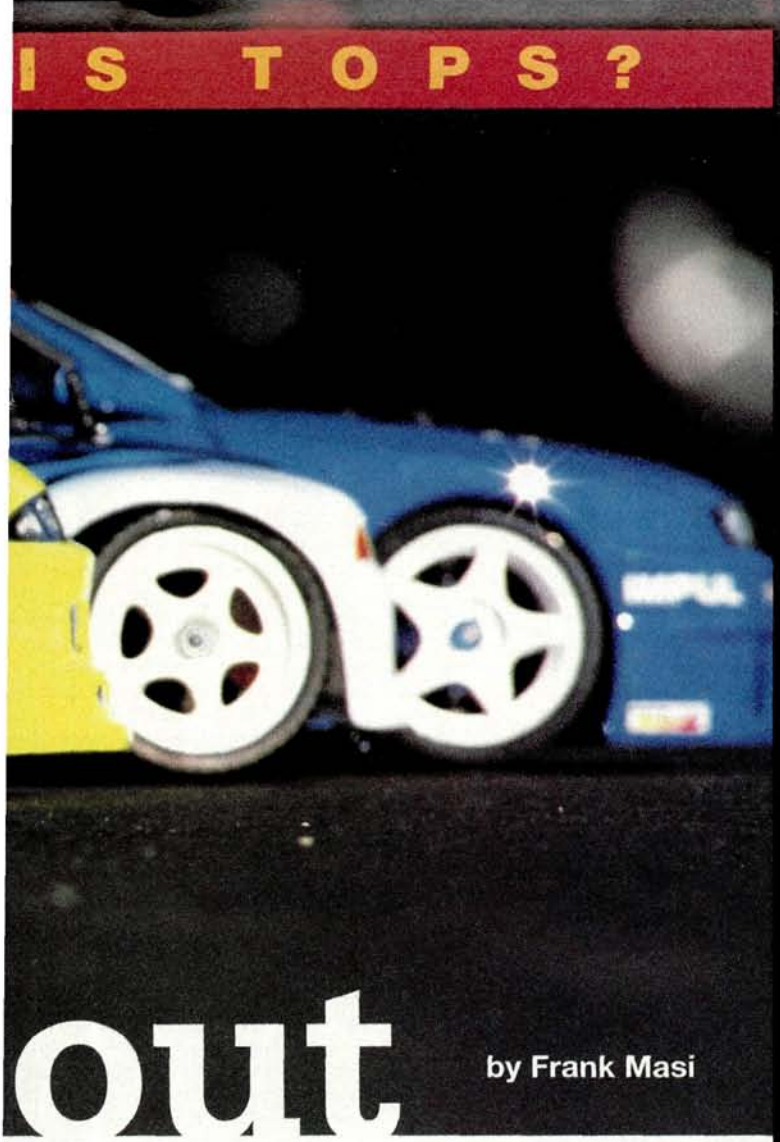
Sedan Shoot

WHO WOULD HAVE guessed that touring-car racing, a motorsport that's as down-home German as *bratwurst und bier*, would so tenaciously grab the attention of American racing fans? But there's no denying that the Deutsche Tourenwagen Meisterchaft (DTM), or the German Touring Car Championship for those less Teutonic, gives us foreign-car snobs the fender-rubbing thrills that guys named Bo and Luke would appreciate—just without the yee-haws.

As evidenced by the popularity of the 4WD touring-car class—unarguably originated by the Tamiya* TA01 chassis—R/C car racers have embraced the DTM as well as the similar Japanese, British and North American series it has spawned. But what began as a fun-type racing class has evolved into one as hotly contested as any you'll see. And as you would suspect, the cars have also changed from mild-mannered parking-lot bashers to belt-driven, carbon-fiber exotics.

To help guide you through the touring car tangle, we've gathered together seven of the latest and greatest full-race rides. The saddle-pack, micro-shocked Yokomo* YR-4 'M' is perhaps the most single-purpose racer of the bunch; the TF-2 Type R is the ultimate expression of Kyosho's* popular belt-drive tourer—truly a "needs nothing" racer. Although the new kid in town, the Roadrunner* Express is already making a name for itself on the racing circuit; with its radical shaft drive and inboard shocks, the Predator* DTM is without doubt the most unique of this group. HPI's* venerable RS4—now in its IFMAR-legal 190mm-width form—is perhaps the most versatile of the tourers; Schumacher's* new S.S.T. is noteworthy because it's the least expensive of the group; however, it also boasts a list of factory options that would make Detroit envious. And finally, Tamiya's groundbreaking, front-motor TA03F-Pro is the first competitive racer produced by this pioneering Japanese company. Ironically, all of our test cars, except the English S.S.T. and Predator, were made in Japan. No U.S. company builds a 4WD touring car yet.

IS TOPS?



out

by Frank Masi

The First Touring Car

In the June '92 issue of *R/C Car Action*, we gave you a glimpse of the future. The future of what is currently one of the hottest segments of the R/C hobby. Touring cars. The very first touring car to be featured in *R/C Car Action* was the Nissan Skyline GT-R Nismo, which was based on Tamiya's popular 4WD TA01 off-road chassis. The Skyline GT-R was the first "true 1/10-scale" on-road car and the first to use a 4WD drive train and a completely independent suspension.

Much of the car's appeal was attributed to its scale looks and performance. At that time, however, nobody knew that this car was actually a milestone. Half a decade later, with the release of the TA03, Tamiya has proven that it is still at the forefront of touring-car technology. The company presently has more than its fair share of competition, however. It's not surprising, though, that whenever we turn back the pages of time and research the conception of a particular racing class, Tamiya is usually there.

NEW TIRE TECHNOLOGY

As touring cars continue to get more and more sophisticated, the need for specialized racing tires has become an important issue. Recently, two new racing tires have appeared, and they have definitely sparked the interest of serious touring-car racers around the world. The tires in question are super-narrow and belted tires. Are these up to snuff with today's high-tech touring cars? Well, read on and decide for yourself!

SUPER-NARROW TIRES

These have proven to be the choice of serious racers. These guys are not concerned with the scale appearance that standard-width tires provide, but with getting around the track as quickly as possible. In most cases, having more rubber on the ground increases traction; however, having more traction doesn't necessarily decrease your lap times.

So, why are super-narrow tires the hot ticket? First, they are much lighter than standard-width tires. Because of this, a car equipped with super-narrow tires will accelerate and stop much more quickly. You don't have to be a rocket scientist to understand these benefits.

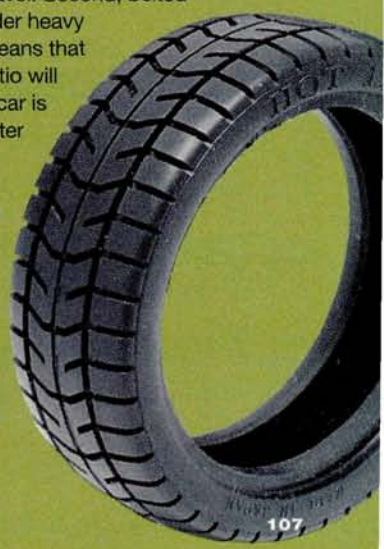
Second, super-narrow tires have less rolling resistance than standard-width tires. In other words, as super-narrows rotate, they create less friction (drag) against the ground than standard tires. Again, the result is increased speed. Third, when cornering, super-narrow tires are less prone to flexing, which means that they provide a more consistent contact patch. In other words, they may provide more traction in some corners than standard tires. Finally, they actually provide a wider track (the distance between the centers of the left- and right-side tires), so running them is almost like running a wider car.

How about disadvantages? There are a couple that you should consider before you plop down your hard-earned cash on a new set of super-narrow wheels and tires. On some bumpy tracks, super-narrows don't work as well as standard-width tires. Therefore, if you run on bumpy surfaces, you might find standard tires hook up much better. Also, super-narrow tires can make your car feel a little twitchy, or over-responsive. If you don't have lightning-fast reflexes, super-narrow tires may work against you.

BELTED TIRES

So what about these belted tires that are starting to pop up? Yokomo, HPI and Kawada have recently introduced a line that seems to be very popular in Japan, where most of the track testing has taken place. These new tires are reinforced with inner, fiberglass cloth belts that are said to increase the performance in a few ways.

First, the inner belt promotes even tire wear regardless of camber and caster settings. This is because the contact patch remains consistent regardless of chassis roll and suspension travel. Second, belted tires don't expand under heavy acceleration, which means that your car's final gear ratio will not change when the car is traveling down the faster sections of the track. Finally, belted tires won't fold under while cornering, and this means that the tire's contact patch will remain consistent even on the gnarliest of corners. So, there you have it!



Sedan Shootout

TAMIYA TA03F-Pro

The already impressive track record of Tamiya's successor to the popular TA02 has hushed the critics of its radical, front-motor design and twin gearboxes. At the '96 ROAR On-Road Nats, a nearly stock TA03 captured the TQ in the heavily contested modified class, and TA03s finished second and third in the Mains—plastic shocks intact.

The TA03's high point remains its fully enclosed drive system (although this attribute also eliminates the possibility of using a slipper clutch or 2-speed transmission), the high quality of its parts and its ease of assembly. Of course, need we mention that Tamiya's instructions are the best in the industry? Parts interchangeability is also a plus, e.g., the front suspension arms fit the back, identical front and rear diffs.

Still, the Tamiya's plastic motor mount provides no heat dissipation, so motors run hot, and because the plastic softens, gear-mesh adjustment should be checked frequently. The addition of a clip-on motor heatsink will help things, and Tamiya offers an aluminum washer that provides a stronger base for the motor screws and carries away some heat. Other than this, the only faults you may find with the TA03 are its battery holder (only stick packs fit unless you buy the optional mount) and its general lack of tuning adjustments, although judging by its performance, perhaps it should be left alone!

HIGHS:

Tamiya high quality; unique design that really works; rubber-sealed bearings are maintenance-free; best instructions going.

LOWS:

Lack of tuning options; plastic motor mount doesn't cool motor.

OVERALL:

Competent chassis and a good handler; every bit worthy of the Tamiya name.

YOKOMO YR-4 'M'

As you would expect, any car that's named after eight-time world champion Masami Hirosaka (hence, the "M" designation) is bound to be a heck of a performer. Here, the YR-4 'M' doesn't disappoint; in fact, we've unofficially made it the performance benchmark of this test, although additional time spent tuning a few of the other chassis might refute this.

The Yokomo requires no add-ons to win straight out of the box. Its carbon-fiber chassis, high-quality, sealed ball bearings and front and rear ball diffs work harmoniously to keep the 'M' zipping around any surface, from perfectly smooth asphalt to fairly bumpy parking lots. Add to this a center-mounted, one-way bearing for the front wheels and a full set of lightweight, pressurized micro-shocks, and the 'M' is a tough act to beat.

But just as Superman has Kryptonite, the Yokomo's stellar track demeanor is besmirched by a few minor annoyances. The rear-diff area is a magnet for the small debris that can quickly munch a diff pulley and rear belt, so use caution when running on anything less than a perfectly clean surface. This can, however, be fixed by cutting out the back of the rear bulkhead to allow the dirt to be ejected. Other strikes against the YR-4 'M' include building quirks that range from a lack of diff lube and any usable shock oil to instructions that, although containing helpful diagrams, suffer in the translation from Japanese to English. This is the only chassis in the test that accepts just saddle-pack batteries, and it won't accept standard hex-drive wheels without special adapters.

HIGHS:

Lightweight, carbon-fiber chassis and shock towers; super-efficient drive train; comes with Yokomo's great radial tires.

LOWS:

Pricey; accepts only saddle packs; construction quirks may baffle novices.

OVERALL:

Our current benchmark of touring-car performance.

HPI RS4

The RS4 was among the first belt-driven 4WD touring cars to be released, and at the time, it was revolutionary. How does it hold up against some of the more contemporary designs in this comparo? Quite well, actually. Thanks to its high-quality parts, adjustable suspension, silky-smooth ball diffs and rigid, double-decker chassis, the RS4 makes setting up for most tracks a breeze. The RS4 is also versatile; it can be built either wide or narrow—as can several other kits—but the RS4's clever design means that you won't have to buy an additional set of expensive drive shafts to make the switch.

The RS4's unique, three-gear rear transmission (similar to that of an off-road, 2WD buggy) is perhaps its only shortcoming. The tranny is as smooth as they come, but we feel that it creates a bit more drag than would occur in a conventional, two-belt system. On the plus side, the tranny is sealed; therefore, it requires less maintenance and longer time between diff rebuilds. HPI is rumored to be working on a direct belt conversion for the RS4, and it could possibly be available as you're reading this. The RS4 uses stick packs only (with, in our opinion, the best battery hold-downs we've seen), and comes with bushings only (bearings are optional and highly recommended, however). Because of its suspension design, gaining access to the RS4's drive parts is a little more tedious than we'd prefer.

Parts support is one of the RS4's strong suits, and in HPI's instructions, we discovered a gem. They're a combination of CAD drawings, photos and full-size parts legends with a tuning supplement that's the best in this group. HPI also offers an incredible number of tuning parts and hop-ups for the RS4.

HIGHS:

Great instructions; versatile design; parts support and tires and wheels; huge number of hop-ups available.

LOWS:

Maintenance can be somewhat more time-consuming than necessary.

OVERALL:

Still a great design that offers exceptional quality and versatility.

KYOSHO Touring Force Type R

Don't feel bad if you can't understand why we call this car a bargain. At first glance, the Type R looks similar in equipment to most of its peers, but in addition to its carbon-fiber chassis plates, hard-coated aluminum shocks and trick, narrow front wheels, Kyosho has loaded this baby up with just about every go-fast goodie in its accessory arsenal, yet has only raised the price slightly over that of the standard TF-2.

New suspension arms allow the Type R to meet the 190mm width requirement. Ball bearings are the only way to go if you want near-frictionless efficiency, and the Type R has them in abundance; everything that can spin—including the steering bellcranks and belt guide—rotates on precise, shielded bearings. A ball diff is used in back, while Kyosho's effective one-way setup is used in front. This system differs from that of the Yokomo in that each front wheel spins on its own one-way bearing. In essence, the car has both a one-way and a front "diff"—all with less weight.

Like the rest of Kyosho's TF-2 family, the Type R's chassis is durable and adjustable, and it should cope with any track surface. The only complaints we had with the TF-2 involved sloppy fitting rear-diff bearings and discrepancies with its otherwise thorough instruction manual. First, the steering bellcranks, as assembled following the instructions, suffered from terminal bump-steer (remedied by installing a series of different-size spacers). Second, it's necessary to trim part of each front suspension arm to achieve adequate steering throw, and this isn't mentioned in the manual. The Type R is the only touring car other than the Express to offer a choice of stick- or saddle-pack batteries.

HIGHS:

Great shocks; trick carbon-fiber chassis and shock towers; needs no hop-ups.

LOWS:

Assembly glitches; slight hand-fitting required.

OVERALL:

A well-thought-out and capable tourer that requires little, if any, aftermarket attention.

ROADRUNNER Express

What more can be said about a car that won the '96 ROAR On-Road Nats its first time out? The Express is made by a small Japanese company called GTO, and it's imported by GHI* in California. Out of the box, the Express is one of the best equipped of the bunch; and also the lightest. Features include a carbon-fiber chassis and shock towers, aluminum/carbon-fiber rear hubs, front and rear ball diffs that have weight-saving Delrin diff halves, ball bearings and an aluminum heat-sink motor mount to keep things cool.

Additional Express perks include aluminum/plastic micro-shocks (similar to those of the YR-4 'M'), a direct-drive steering system in which the tie rods are connected directly to the servo-saver, and a front suspension that provides a rising-rate caster angle as it's compressed (similar to Trinity's Reactive Caster front end). The Express is also the only car beside the Kyosho that allows the use of both saddle and stick packs. A full set of belted radial tires—super-narrow fronts and medium-narrow rears—is included.

So why aren't we doing cartwheels over the Express? It's an excellent car, but its biggest drawback is its instructions, or lack thereof. You're basically on your own trying to figure out how to build this car; the instructions contain several diagrams, but they leave out many of the assembly steps. Parts are available only through GHI (which carries a full stock of kits and parts), so it will take longer to get a part if you break something than with other cars that are carried by one or more of the larger hobby distributors. Graphite-composite suspension components are available as optional hop-ups.

HIGHS:

Lightweight, carbon-fiber parts; unique front suspension; awesome tires.

LOWS:

Instructions; body mounts; parts availability.

OVERALL:

It's the ROAR Nats champ, but it needs better instructions.

SCHUMACHER S.S.T.

Two things set Schumacher's entry apart from the rest: it's the only car in this group that comes assembled, and it has the lowest price. Did we mention that it comes with a full set of bearings and that it's also the most adjustable of this test group? Are you beginning to see why we like this car?

The S.S.T. shares its efficient and durable twin-belt drive system with Schumacher's off-road 4WD buggies. The system also places the pulleys, shaft and motor very low on the chassis, which results in a low CG. The car's independent, double-wishbone suspension is a very durable, nylon-composite material, and tuning adjustments ranging from rear toe-in to front caster can be made easily. The kit also includes a Parma BMW body (although we disagreed on its attractiveness) and Schumacher's super-low-profile wheels and tires. As one editor put it, "These tires have almost no sidewalls! It's like they were painted onto the wheels."

If there are any negatives about the S.S.T. (and these seem almost too trivial to mention in light of the car's bargain price), it's that it is held together with Torx-head screws, which means that you must buy a special screwdriver. Editor John Howell, who has the most experience with this car, claims that a Phillips screwdriver will work in a pinch. Also, we all agreed that the S.S.T.'s instructions, though far from poor, would benefit from additional text. The exploded views and tuning tips were much appreciated, however.

The Schumacher also won the competition for having the most available factory options. At last count, you could feasibly own a $1,000 S.S.T.! But we believe that the S.S.T. will work fine as it comes from the box, although we would probably opt for the aluminum shocks.

HIGHS:

Low price; pre-assembled; most tunable of the touring cars.

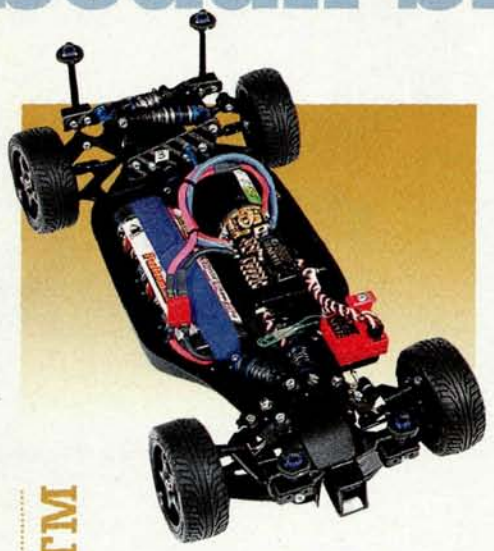
LOWS:

Torx-head screws instead of the more common Phillips; instructions could benefit from additional clarity and detail.

OVERALL:

It's hard to beat this car's combination of features: high quality and low price.

TENTH TECHNOLOGY Predator DTM



If this were a design contest and not a comparison of features and value, the Predator would win hands-down. From its radical in-board shocks (à la F1 technology) to its incredibly efficient, centrally positioned carbon-fiber drive shaft, the Predator is the perfect choice for those who prefer something a little different.

The Predator was the most expensive of the group, but what you get for your money is plenty of top-line hardware and materials. For example, all of the shock bodies, shafts and ball studs are Teflon-coated for smooth operation. The shock towers are carbon fiber, and most of the aluminum pieces are blue-anodized and look great. What seems almost out of line for such an expensive car is a lack of ball bearings. Although the center prop shaft is supported by shielded bearings, the rest of the rotating parts must make do with plastic bushings.

As high-tech as the Predator is, it's not extremely difficult to build, although one editor with plenty of Predator experience said that some degree of hand-fitting was required. He also said that the instructions often left him in the dark during certain crucial assembly steps. And as of this writing, kits and parts are only available through Maxtec*, the car's U.S. distributor, so it will be more difficult to obtain parts and support than with some of the other cars.

Those who delight in high tech will no doubt love the Predator. Its high-pitched, whining sound alone is enough to draw crowds of gawking onlookers whenever it hits the track.

HIGHS:

Unique design; top-line parts included.

LOWS:

Instructions and maintenance; parts availability.

OVERALL:

A high-performance tourer for those who like to be different.

Editors' Picks

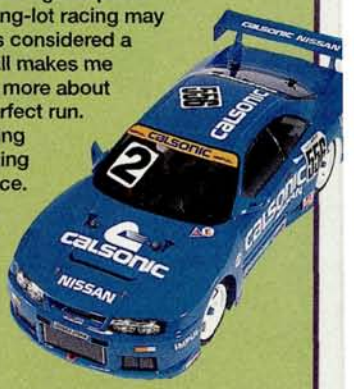
Frank

Seven cars and seven companies. Each of these top-line touring cars is capable of winning races (you're probably tired of reading this by now) but which one would I pick if I were coughing up my hard-earned dollars? Tough question! Every one of these cars has something to offer. And they each seem to do pretty much the same job, all the while going about their business in slightly different ways.

Out of these seven, the Tamiya is my favorite. It's not the most expensive or the cheapest, but to me, it's the best blend of touring-car performance and parking-lot-racing fun. You see, I worry that parking-lot racing may become too serious, and, therefore, less fun. Even though it's considered a high-performance racing car, the TA03 is the only one that still makes me recall the "early days" of parking-lot racing when we worried more about punting each other into the woods than about turning in a perfect run.

Also, I really enjoyed building this car; there's just something about putting together a Tamiya kit. The instructions, packaging and high-quality parts make assembly an enjoyable experience.

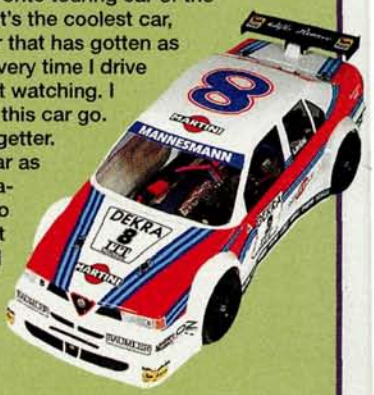
Another car that, if not for a few parts and assembly glitches, would also have been my top choice, is the Kyosho TF-2 Type R. In my opinion, it's by far the "trickest" car of the bunch, and it's a great value when you add the cost of purchasing its hop-ups separately.



George

I'm going to go out on a limb here, folks. I realize that the Tenth Technology Predator DTM scored the fewest points overall, but it just happens to be my favorite touring car of the bunch. Why is that, you say? Because it's the coolest car, that's why. I've never owned an R/C car that has gotten as much attention as my Predator DTM. Every time I drive the car, racers stop wrenching and start watching. I kid you not; I've seen racers run from their pit area to see this car go. Then again, the car's distinctive sound is a real attention-getter.

I realize that the Predator is at the top of the heap as far as price is concerned, but when you factor in all of its hot features, you'll realize that it is actually a bargain! I do have to admit, however, that I wouldn't recommend this car to just anyone. Because the Predator is difficult to assemble and tune, only experienced racers need apply. There is no doubt in my mind that the Predator will appeal to those with a flair for the unusual and a need to be different. And you thought Chris Chianelli was the oddball at *R/C Car Action*—guess again.



John

I know that the big question on the readers' minds is, "If I had to buy one and only one of these cars, which should it be?" After careful consideration, I came to this conclusion: I would buy the Schumacher S.S.T. 2000, and here's why it's my number-one choice.

I feel that the S.S.T. is the best "bang for the buck." It's the least expensive, yet it still comes with a full set of ball bearings. Also, the S.S.T. is completely raceworthy out of the box. The only thing that a hardcore racer might want to do is to switch from plastic to aluminum shocks. In all fairness though, the stock plastic shocks work very well.

Speaking of hop-ups, the car can quickly go from mild to wild, depending on your budget, which is another plus. There are too many factory hop-up items to list here.

Another major reason why I picked this car is that it is completely adjustable. As a matter of fact, it's the most adjustable of the group. Front and rear toe, front and rear camber, front caster and rear anti-squat are all adjustable and offer the racer more tuning options.

The wheels and tires that come with it are also noteworthy. The five-spoke white wheels are pretty sharp, but it's the included sticky slicks that really got my attention. They have almost no sidewall, and that's beneficial when going through sharp turns or turns on power; tire roll is almost nonexistent.

Finally, as an overall package, the S.S.T. 2000 is very complete. It also comes assembled, and you'll either love that or hate it. For people who want to get out on the track quickly, it's beneficial. For those who want to take their time going through the entire car completely, it's a negative. At least you have the option of disassembling it, though.

As for the other contestants, I place the Tamiya TA03 in second (actually, not too far from the S.S.T. 2000) and the HPI RS4 a close third.

Sedan Shootout

Tamiya TA03

Editors' Ratings CATEGORY	Roadrunner Express	HPI RS4	Kyosho TF-2 Type R	Scumacher SST	Tamiya TA03	Tenth Tech. Predator DTM	Yokomo YR-4 M	COMMENTS
Quality	8	9	7	8	**10**	7	7	The Tamiya's parts fit and finish is second to none. The Predator's plastic arms were brittle and snapped easily.
Parts availability	6	**9**	**9**	6	**9**	4	6	Tamiya and HPI are carried by most major hobby distributors, and Kyosho is supported by Great Planes/Tower Hobbies.
Completeness	7	8	**9**	**9**	**9**	6	7	The Kyosho and Tamiya come with everything needed, i.e., servo arm, shock oil and diff lube. The Schumacher comes pre-assembled.
Instructions	2	**10**	7	8	**10**	5	5	HPI's excellent instructions, plus its thorough tuning section, make it equal to those from Tamiya.
Ease of assembly	6	8	7	9	**10**	4	8	Building a Tamiya car is always fun. The Predator required some hand-fitting.
Dollar value	8	7	8	**9**	8	4	8	The Schumacher offered the most features for the least money. The Predator was the most expensive of this group.
Hop-up potential	5	9	9	**10**	**10**	5	7	Schumacher's list of hop-ups is impressive. Many aftermarket companies have already targeted the Tamiya.
Maintenance	**9**	7	8	**9**	**9**	6	8	The Roadrunner, Schumacher and Tamiya provide the easiest access to the mechanicals.
Tunability	7	8	8	**10**	4	9	6	The Schumacher offers the most adjustable suspension settings. The Tamiya allows few adjustments.
TOTAL SCORE	58	75	72	78	79	50	62	
VALUE AVERAGE	6.4	8.3	8	8.7	8.8	5.6	6.8	
RANKING*	6	3	4	2	1	7	5	

***Warning!** This chart reflects the editors' opinions only. It does not mean that if you buy a car that is rated higher than the one your friend owns, you'll beat him. If he's a better driver than you, you'll get whupped no matter which car you own. The reality is that none of these seven cars holds a distinct performance advantage over the others. In other words, each is capable of winning provided it has been well set up, is equipped with the correct tires and body for track conditions and is driven properly.

"Best of" Awards

During our testing, discussions always seemed to bring out superlatives such as, "Which car's shocks were the best?," or "Which tires worked best?" Here's a short list of the "bests" that we could actually agree upon.

- **Best battery hold-down**—RS4.
- **Best motor adjustment**—Predator DTM.
- **Best access to diffs—**YR-4 'M' and SST (tie).
- **Best kit tires—**YR-4 'M' and Roadrunner Express (tie).
- **Best shocks**—Kyosho TF-2 Type R and RS4 (tie).
- **Best steering system**—RS4 and Roadrunner Express (tie).
- **Best tie rods**—RS4.
- **Best body mounts**—RS4.

EXPLANATION TO CHART CATEGORIES:
the categories included in this chart are those we felt were the most important to potential touring-car owners. Ratings are from 1 through 10, with 10 being the best possible score. Here are detailed descriptions of each category:

Quality: describes the overall quality of the kit, including all the parts and hardware. This also reflects the material used to make the kit.

Parts availability: cars that are distributed by one or more of the larger hobby distributors, e.g., Horizon and Great Planes, received higher marks here. Cars sold by smaller companies acting as importers/distributors generally received lower scores because their cars and parts are less likely to be stocked and sold by retail hobby shops, i.e., it usually takes longer to mail-order these items.

Completeness: after purchasing one of these cars, how much more must be spent in addition to buying the usual running gear, e.g., radio, battery, speed control, to run? Kits that include miscellaneous items such as servo arms, shock oil (good shock oil!) and diff lube received higher scores.

Instructions: this rating covers the quality of the text, illustrations and presentation. Tuning tips and parts legends are a plus.

Ease of assembly: how well does the car go together? Cars that required hand-fitting, had excessive flashing on molded parts, or suffered from instruction glitches rated lower.

Dollar value: compares each kit's features and quality against others in the same category. Basically, how much bang per buck.

Hop-up potential: most of these kits are ready to conquer the track straight out of the box. However, we realize that many racers thrive on making their cars a statement of their individuality. This category describes the availablility of hop-up parts and accessories from both the kit's manufacturer as well as from aftermarket sources.

Maintenance: all machines need maintenance—it's a neccessary evil—but some are just plain easier to work on than others.

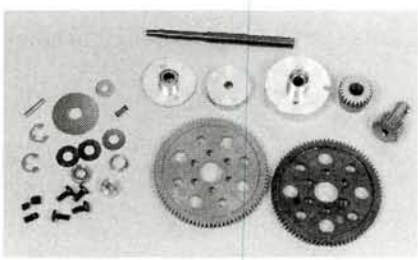
Tunability: the number of tuning options available to the racer. For some, simpler designs with fewer options are better, but most serious racers know how to set their cars and can benefit from having a car that's highly tunable.

Features	Roadrunner Express	HPI RS4	Kyosho TF-2 Type R	Scumacher SST	Tamiya TA03	Tenth Tech. Predator DTM	Yokomo YR-4 M
Price	$385	$288	$399.99	$319.50	$356	$479	$425
Available at	$225	$199.99	$299.99	$190	$204.99	$320	$319.95
Length (in.)	13.94	13.5	14.19	12.56	15.19	13.75	13.74
Wheelbase (in.)	10.3	10	10.19	10	10.1	10	10.16
Max. width (in.)	7.8	7.63	7.38	7.13	7.19	7.25	7.44
Weight (oz., chassis only, RTR)	46	49	47.8	50.9	52	50.6	46.5
Chassis type	Double-deck	Double-deck	Double-deck	Double-deck	Double-deck	Molded tub	Double-deck
Material	Carbon-fiber	Fiberglass	Carbon-fiber	Fiberglass	Fiberglas	Nylon comp.	Carbon-fiber
Battery configuration	Stick/saddle	Stick	Stick/saddle	Stick	Stick	Stick	Saddle
Suspension (F/R)	Ind. A-arm, adj. upper link	Ind. A-arm, adj. upper wishbone	Ind. A-arm, adj. upper link	Ind. A-arm, adj. upper link	Ind. H-arm, fixed upper link	Ind. double-wishbone	Ind. A-arm, adj. upper link
Shocks	Plastic/alum.	Alum.	Alum.	Plastic	Plastic	Alum.	Alum. micro
Shock towers	Carbon-fiber	Molded	Carbon-fiber	Fiberglass	Molded	Carbon-fiber	Carbon-fiber
Tie rods	Steel turnbuckle	Steel turnbuckle	Steel turnbuckle	Alum. turnbuckle	Steel rod (threaded)	Steel rod (threaded)	Steel turnbuckle
Drive system	Mid-motor, dual-belt	Mid-motor, rear gearbox, front-belt	Mid-motor, dual-belt	Mid-motor, dual-belt	Front-motor, f/r gearboxes, center-belt	Mid-motor, shaft-drive	Mid-motor, dual-belt
Front ball diff	Yes	Yes	No	Yes	Yes	Yes	Yes
Rear ball diff	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Front one-way bearing	No	No	Yes	No	No	No	Yes
Drive shafts	Steel universals	Steel/plastic universals	Steel universals	Plastic universals	Stainless-steel dogbone	Steel universals	Steel universals

Tuning Adjustments	Roadrunner Express	HPI RS4	Kyosho TF-2 Type R	Scumacher SST	Tamiya TA03	Tenth Tech. Predator DTM	Yokomo YR-4 M
Adj. front toe	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. rear toe	No	No	No	Yes	No	Yes	No
Adj. camber (F/R)	Yes/yes	Yes/yes	Yes/yes	Yes/yes	No/no	Yes/yes	Yes/yes
No. of inner camber-rod positions (F/R)	2/1	1/1	3/3	1/1	1/1	1/1	1/1
No. of outer camber-rod positions (F/R)	1/3	1/1	1/1	1/1	1/2	1/1	1/1
Adj. caster	Yes*	Yes	No	Yes	No	Yes	No
Adj. anti-squat	No	Yes**	Yes**	Yes	No	No	No
No. of upper shock-mount positions (F/R)	1/4	2/3	1/1	4/4	1/1	1/1	1/1
No. of lower shockmount positions (F/R)	1/1	2/2	2/3	1/1	1/1	3/3	1/1
Swaybar(s)	No	Optional F/R	Optional F/R	Optional F/R	F/R	Optional R	No
Adj. wheelbase	No	No	Yes	No	No	No	No
Adj. steering Ackerman	NA	Yes	No	Yes	No	No	No
No. of battery-mounting positions	1	2	1	1	2	1	1***

* The Express uses a rising-rate caster design; as the suspension compresses, caster angle is increased.
** Anti-squat is adjustable by installing optional rear-arm mount pieces.
*** An optional chassis set allows the cells' position to be adjusted.

Shiftin' Gears



First pioneered by gas-powered on-road racers, 2-speed transmissions have now found their way into electric-powered touring cars. Though seemingly complex devices, most 2-speeds consist of a special pinion gear that looks like two gears stacked on top of each other. They also have a similar spur-gear arrangement and a centrifugal clutch much like those used on gas engines. In essence, having a 2-speed mounted on your car is like having two pinion and spur gears—two drive ratios.

Initially, the larger of the two spur gears is driven to provide low-ratio acceleration—just like running a really small pinion for added punch. When the transmission reaches a certain rpm (adjustable on most units), the centrifugal clutch "locks in" the second, smaller spur gear so that a higher drive ratio is attained—like running a big pinion gear. As a result, a 2-speed can provide the best of both worlds: rocket-like acceleration and blinding top speed.

Currently, 2-speed trannies aren't legal for sanctioned competition, but if you race for fun, they provide an awesome speed advantage; even stock motors seem to perform like modifieds. Not all of our touring car group will accept 2-speeds. As of now, only Kyosho, Yokomo and HPI offer 2-speed trannies.

IFMAR International Scale Touring Car (ISTC) Guidelines

Construction and Race Rules

- **Purpose.** The essence of the ISTC class is competition between realistic models of saloon/sedan cars raced in the Touring Car Series for Class One and Class Two FIA touring cars.

Appearance

- Cars entered for the ISTC class shall be scale representations of full-size touring cars that currently race in the International Touring Car Series, e.g., DTM, ITC, BTCC, NATC, Japan Touring Cars, held from time to time.
- An approved list of bodies may be provided for each event (see body shells). Cars shall be neatly finished in the style paintwork used on the original full-size car. All details of front and rear lights, air intakes and windows must be clearly visible from the surrounding paintwork. Any decals must be carried on the car and wing. Space for event-sponsors' decals may be required on the wing and roof, with the details to be sent out with entries.

Chassis and Drive Train

- Two-wheel drive to front or rear wheels or 4WD is allowed.
- Aerodynamic parts, e.g., splitters and diffusers, may not be fitted to the underside of the chassis. The chassis may not be shaped to gain an aerodynamic advantage.
- Materials used in the chassis and drive train are not restricted, although, to reduce costs, the use of special metal alloys (titanium, magnesium, etc.) in parts is discouraged.
- "Flat pan" (1/12-scale and 1/10-scale track style) chassis are not allowed. Chassis must have independent suspension to all four wheels. Each driven wheel must have a flexible joint, e.g., dogbone(s) or universal joint(s) in its drive shaft. The drive train and suspension design should be free from restriction.
- When viewed from above, no part of the chassis, including wheels, tires and axles, may protrude outside the bodyshell. No part of the motor, batteries or electronic equipment may protrude outside of the bodyshell. Rollover masts may not be fitted.
- Materials used in the chassis and drive train are not restricted, although, to reduce costs, the use of special metal alloys (titanium, magnesium, etc.) in parts is discouraged.
- When viewed from above, wheel nuts and axles must not extend beyond the wheels.

Wings

- Only one wing is allowed, and it must be fitted in the same place as the wing on the original car.
- The rear edge of the wing may not overhang the rear of the body by more than 10mm at any point along the length of the wing.
- The wing must not extend higher than the top of the roof.
- Front wings, splitters and spoilers must be molded into the body shell in the same position as on the original car.
- Only one tab or gurney flap is allowed. They must be fitted to the rear wing securely and be contained within the wing dimensions.
- Wings, splitters, spoilers, tabs and gurney flaps must be fixed rigidly to the body and/or wing, and they may not be moved while the car is in motion.

Tires

- Only molded rubber tires are allowed. No sponge or closed-cell foam tires are permitted.
- Tire material must not damage the racing surface.
- The tire must be black, except for the sidewalk detail.
- Foam inserts may be fitted inside the tire.
- Pneumatic tires are allowed.
- Tire additives and/or conditioners are not allowed.

Numbers

- Cars will carry three numbers; one number on each door, and one number on the bonnet/hood or roof. Numbers must be at least 25mm high, with a minimum stroke of 3mm.

Bumpers

- Foam bumpers may be fitted. When viewed from any direction, no part of the bumper may extend outside the body shell, or be lower than the chassis.

Speed Controls

- ESCs may have forward control only.
- Mechanical speed controls may have forward and reverse control.

Motors

- Motors from the IFMAR-approved list are to be used.
- One drive motor only is allowed.

Batteries

- A maximum of six cells are allowed in the car, in stick (6) or saddle pack (3+3) configuration.
- No separate batteries for powering the radio-control equipment are allowed, unless a mechanical speed control is used.
- Drive batteries from the IFMAR-approved list are required.

Body Shells

- Body must be a scale replica of the original car used in the relevant FIA or Nationals class.
- Body may not be cut above the lower door line nor above the rear bumper line.
- Body must be securely fixed to the chassis at all times during a race.
- Only one cutout—maximum 10mm diameter—may be made in the body, except for clearance for the wheels (wheel arches), body mounting holes and lap-timing equipment.
- All wheel arches must be cut out as on the original car. No more than a 10mm clearance between the wheels and the wheel arches is allowed.
- Cars shall be neatly finished in the style of paintwork used on the original full-size car.
- Details of all front and rear lights, air intakes and windows must be clearly contrasted from the surrounding paintwork.
- All windows must be clear. Windows may not be cut out.

Driver Aids

- Traction control, including slipper clutches and fluid clutches, active suspension and steering control by gyroscopes is not allowed. Sensors fitted to the car for the purpose of measuring suspension movement, wheel speed or tire slip are not permitted. In the receiver, only two channels may be used.

Races

- Starts will be in a grid formation, with all cars starting together. The grid will be staggered, with 1 meter between each car. Grid positions will be determined by qualifying results. Races will be 5 minutes, plus time to complete the last lap.

SPECIFICATIONS

Dimensions	Minimum (mm/in.)	Maximum (mm/in.)
Wheelbase	250/9.8	270/10.6
Width (without body shell)	170/6.7	190/7.48
Width (with body shell)	175/6.9	195/7.68
Length overall	360/14.2	460/18.1
Height (to top of roof, RTR)	125/4.9	175/6.9
WING		
Width (w/endplates)	125/4.9	190/7.48
Chord	20/0.79	32/1.26
Endplate	NA	35x15/1.4x0.6
Overhang (rear of wing to rear of body)	NA	10/3.9
Flap or gurney tab extension (above plane of wing)	NA	3/0.12
WHEELS		
Diameter (excluding tire bead)	48/1.9	60/2.36
Width (including tire bead)	22/0.87	26/1.0
TIRES		
Width (across sidewalls when fitted to wheel)	22/0.87	27/1.06
Diameter (when mounted on wheels)	55/2.17	67/2.64
Ground clearance* (RTR)	5/0.2	NA

**For use on carpet and other surfaces that could be damaged.*

WEIGHT (gm)		
RTR, excluding timing equipment, at all times during the race	4WD—1,500 /2WD—1,400	NA

Team Losi's Scott Brown shows us the proper way to be a big geek.

ROAR

by John Howell

Battling in Butler

off-

You go to the ROAR Nats and you never know what you'll see. These two were almost as much of a distraction as the XX-4.

It's interesting that all three TQ'ers also won overall national championships. Left to right: new national champs Chris Bing (2WD), Greg Hodapp (Truck) and Brian Kinwald (4WD).

What an interesting race!

Don't get me wrong, most races are, but for some reason, this one particularly interested me. I can't nail down a specific reason why, though. Maybe it was the close competition. Maybe it was seeing the fervor the Losi* 4WD prototype created in the pits. Maybe it was witnessing a local guy have the ride of his life, catch all the top factory guys off-guard and TQ in 2WD. Or maybe it was the fact that it was the ROAR Modified Nationals, and as I've found out over the years, almost anything can happen.

Road Nats

So what was the hottest topic at the ROAR Nats? Did you even need to ask?

BATTLING IN BUTLER

Most astute racers (or race groupies, for that matter) should know that the ROAR Nats have been split into two divisions—Stock and Modified. This year, the Mod Nats were held in Butler, PA. To cover the event, I made the eight-hour trek by car to western Pennsylvania with our assistant editor Stacey Granelli. While there, we also planned to try to get the scoop on the prototype Losi 4WD car that was rumored to be making its debut at the event. While driving into Butler on Thursday night, it was pouring rain, and it had been raining most of the week. Friday was a different story, though; the sun was out and the stage was set for ideal race conditions. After four rounds of Qualifying, the TQ's were set and everyone was ready to race. Let's look at the fastest of the fast in every class.

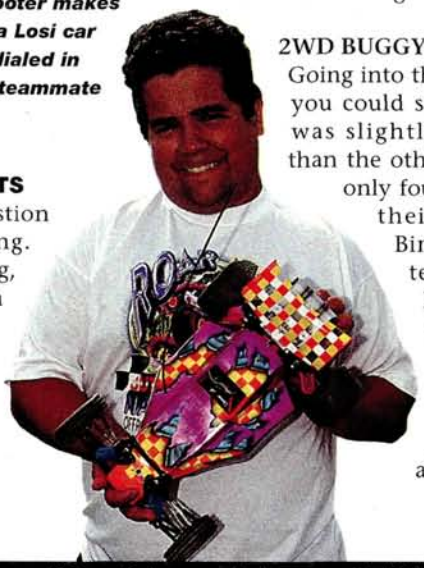
Above, left to right: Jack Johnson readies Greg Hodapp's new XX-4 for an upcoming Qualifier. Do you know this man? For those of you who don't, this is Scooter. Scooter makes motors. Scooter is Chris Bing's sponsor ... OK, Chris Bing is a racer ... he races a Losi car ... he TQ'ed the 2WD class ... OK, stop scratching your head now. Brian was so dialed in that he could even relax between 4WD heats ..... while, on the other hand, his teammate Hodapp didn't just relax between heats; he plain passed out.

QUALIFYING HIGHLIGHTS

• **2WD.** Chris *who*? This question best sums up 2WD qualifying. Relatively unknown Chris Bing, took command of the field with his Team Losi Double-X 'CR'.

• **Truck.** Team Trinity*/Team Losi driver Greg Hodapp piloted his new Double-XT 'CR' to the top spot.

• **4WD.** Team Trinity/Team Losi driver Brian Kinwald put Team Losi's newest endeavor, the XX-4, into the pole position.



Concours winner Paulo Aguiar proudly displays his car.

MAINS

Because every class featured a triple A-Main format, I won't give a blow-by-blow narrative of what happened. Instead, I'll focus on the highlights of each race.

2WD BUGGY

Going into the buggy A-Mains, you could see that one team was slightly more nervous than the other. Team Losi had only four cars and one of their drivers, Chris Bing, wasn't even a team driver. Losi's hopes for victory rested on Brian Kinwald and Greg Hodapp, with Bing and Jimmy Babcock as longshots. Team

WINNERS

2WD

Fin.	Qual.	Driver	Chassis	Motor	Battery	ESC	Radio	Body	Tires(F/R)	Traction Additive	Pinion/ Spur
1	1	Chris Bing	Losi	Scooters	Trinity	Novak	Airtronics	Losi	Losi	Scooters	20/86
2	2	Scott Hughes	Associated	Reedy	Reedy/Orion	LRP	Futaba	Associated	Losi	-	19/84
3	3	Mike Weed	Associated	Reedy	Reedy	LRP	KO Propo	Associated	Losi	-	19/81
4	10	Greg Hodapp	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi	Trinity	21/84
5	5	Brian Kinwald	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi	-	20/84
6	4	Mark Pavidis	Associated	Reedy	Reedy	LRP	Airtronics	Associated	Losi	-	19/84
7	6	Gabe Boudreau	Associated	Reedy	Reedy	LRP	Airtronics	Associated	Losi	-	19/84
8	7	Jimmy Babcock	Losi	Maxtec	Trinity	Novak	Airtronics	Losi	Losi	-	19/84
9	9	Jimmy Jacobson	Associated	Reedy	Reedy	LRP	Airtronics	Associated	Losi/Pro-Line	-	19/84
10	8	Rhett McNair	Associated	Fantom	Badd Boyz	LRP	Airtronics	Associated	Losi/Pro-Line	-	21/81

Truck

Fin.	Qual.	Driver	Chassis	Motor	Battery	ESC	Radio	Body	Tires(F/R)	Traction Additive	Pinion/ Spur
1	1	Greg Hodapp	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi	Trinity	19/88
2	4	Brian Kinwald	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi	-	19/88
3	8	Mark Francis	Associated	Reedy	Reedy	LRP	Airtronics	Associated	Pro-Line	-	19/87
4	3	Todd Hodge	Losi	Scooters	Perfect Match	Novak	Airtronics	Losi	Losi	Scooters	18/88
5	6	Brian Dunbar	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi	-	20/88
6	5	Mark Pavidis	Associated	Reedy	Reedy	LRP	Airtronics	Associated	Pro-Line	-	19/87
7	9	Scott Brown	Losi	Trinity	Trinity	Novak	JR	Losi	Losi	-	23/88
8	2	J.R. Mitch	Losi	Maxtec	Maxtec	Novak	Airtronics	Losi	Losi	-	18/88
9	7	Jason Schweitzer	Losi	Fantom	Fantom	Novak	Airtronics	Losi	Losi	-	17/88
10	10	Sohrab Tavakoli	Losi	Peak	Orion	Novak	Airtronics	Losi	Losi	-	18/88

4WD

Fin.	Qual.	Driver	Chassis	Motor	Battery	ESC	Radio	Body	Tires(F/R)	Traction Additive	Pinion/ Spur
1	1	Brian Kinwald	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi	-	-
2	7	Jason Ruona	Yokomo	Reedy	Reedy	LRP	Airtronics	Yokomo	Pro-Line	-	17/87
3	9	Jason Babcock	Yokomo	Maxtec	Trinity	Novak	Airtronics	Yokomo	Losi	-	17/87
4	10	Brent White	Schumacher	Trinity	Trinity	LRP	Airtronics	Schumacher	Losi	-	18/95
5	4	Greg Dennett	Kyosho	Peak	Orion	LRP	Futaba	Kyosho	Losi	-	18/87
6	6	Billy Easton	Yokomo	Reedy	Reedy/Orion	LRP	Futaba	Yokomo	Pro-Line	-	17/87
7	2	Scott Hughes	Yokomo	Reedy	Reedy/Orion	LRP	Futaba	Yokomo	Pro-Line	-	18/87
8	5	Derek Furutani	Tenth Tech.	Maxtec	Orion	LRP	Airtronics	Tenth Tech.	Losi	-	20/70
9	3	Greg Hodapp	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi/Trinity	-	19/88
10	8	Jon Andersen	Losi	Trinity	Trinity	Novak	Futaba	Losi	Losi	-	19/84

Associated had three of their biggest guns, Scott Hughes, Mike Weed and Mark Pavidis, in the running. All were eager to take home the title.

• A1. TQ'er Chris Bing took an early lead, but he quickly relented under the pressure of Team Associated's Hughes, who then took over. Weed took command of second place, while Kinwald followed in third. Hodapp had an incredible drive; he came from the back of the pack a few times and by the race's end, had charged up to fourth overall. In the end, it was Hughes, followed by Weed, Kinwald, Hodapp and Gabe Boudreau. Bing finished ninth.

• A2. Bing shocked everyone and proved that he undoubtedly deserved to be in with the "big boys." He held the lead from start to finish, but early on, he was pressured by Hughes. Hughes stuffed it into a pipe, and this allowed teammate Weed to slip into second. After battling with Hodapp for second, Weed held on to the position, followed by Hodapp, Kinwald and Babcock.

As the field prepared, I noticed that Bing's tranny made some pretty nasty grinding noises as he practiced his starts. It sounded as if his idler gear was starting to let go. Would his tranny hold up? I wasn't too sure—nor was his sponsor.

At this point, the championship was still up for grabs. Weed and Bing were the top two contenders going into the third and final Main.

• A3. As the field prepared, I noticed that Bing's tranny made some pretty nasty grinding noises as he practiced his starts. It sounded as if his idler gear was starting to let go. Would his tranny hold up? I wasn't too sure—nor was his sponsor, Scooter. I looked at him as he placed Bing's car on the grid, and he gave me a "We'll see" look.

At the start, Bing pulled out in front, followed by Pavidis, Hodapp and Hughes. As Hodapp and Hughes battled for third, Bing and Pavidis pulled away slightly and engaged in their own battle. Shortly afterward, Bing stuffed it into a pipe, allowed Pavidis by, and dropped back to fourth. Eventually, Bing worked his way back up

Nineteen-year-old Chris Bing is every privateer's hero. If he isn't, he should be. At the Mod Nats, the relatively unknown Bing went out and not only TQ'd the 2WD class but also took the big win away from some of the finest and fastest off-road racers in the world—racers whose careers he had followed since he began racing regularly back in 1993. And not only did he beat them, but he beat them with parts that you and I can buy over the counter. There wasn't a single prototype part on his car. As a matter of fact, Chris's car could be considered a "plain Jane" on the R/C racing circuit (the only graphite parts he had were a pair of front-suspension arms; the rest were made out of standard Stiffezell).

Chris didn't have much time with his somewhat "new" Losi ride. He had his Double-X 'CR' together roughly a month or so before the race, and he had only a dozen club races with it under his belt before he took off for the Nats. After the race, I caught up with Chris and asked him a few questions about his wild ride.

Doogie: ***During the Main, how did it feel to line up on the pole with all those guys behind you?***

Chris: I felt kinda numb, actually. But I just put it out of my head and put them out of my mind. It was weird; I've followed or read about these guys for years, so it was a pretty big deal to me. I tried to concentrate and I didn't think about it as much.

D: ***What was it like lining up against all those guys knowing that you were an underdog?***

C: Well, it was an honor. I was happy to be with them and race in the A-Main. As for being an underdog, I just went out there, concentrated and did my best. It would have been easy to get myself psyched out in an event like that, but I tried to treat it as though it were any other race.

D: ***At the beginning of the third and final A-Main, I noticed that when Scooter put your car down to test the slipper, a horrible noise came from your gearbox when you nailed the throttle. I remember looking at Scooter and he kind of gave me a "We'll see" look. I didn't think you'd make it through the race without munching something in your tranny. What was the deal?***

C: I have no idea. Scooter told me later that it was making that noise; I think my gear mesh was a little off. I don't know what it was. I took apart the tranny after the race, and the top gear looked a little worn, but I thought it was normal enough. I was lucky that I didn't hear it; it would definitely have broken my concentration. During the race, I would have worried about whether or not the car would finish.

D: ***What are your plans now?***

C: Well, I'm going to keep busy with racing. As for major events, I'll be going to the Reedy race, and after that, I'll start preparing for the Worlds in California. Also, I'm looking at going to school—possibly for engineering. I'm undecided on what to study at the moment.

D: ***What does this win mean to you?***

C: I'm really glad I won because people always told me that without a factory ride, I couldn't compete with those guys. They always said that I might be able to make a Main with them, but without the ride and the trick parts, there was no way that I could win. I'm really glad I could prove them wrong. When it comes to winning, it's not always the parts. The more you run, the better you get. I'm glad I could prove that.

D: ***Congratulations, champ! Good luck in the future.***

QUALIFYING QUANDARY Take steps toward eliminating the "rocket round."

If you've ever been to a major off-road race or raced in one, then you must be familiar with the term "rocket round." In case you aren't, I'll explain briefly. Rocket rounds have come to be racers' nightmares. Going into the fourth and final round of qualifying, a racer may be comfortably holding down the top-qualifying position, and then the infamous rocket round comes around. It kicks out really fast times that could bump him down to somewhere in the B-Main or even the C-Main! How can that happen? At an off-road race, track conditions often change. The first few rounds might have been in the morning before the track had a chance to dry out, and maybe the later rounds see a more "blue-grooved" surface. Anything is possible. It's even more frustrating when you've raced and wrenched hard on Friday and Saturday only to have all that hard work go out the window because the track got fast in the fourth and final qualifier and you had a bad race.

So how do you compensate for the rocket round? A consistently fast racer can get the shaft while an otherwise slow racer can get lucky and take advantage of the rocket round, do great and get into the A-Main. The trick is to make qualifying more consistent across the board. ROAR is currently working on an entirely new qualifying system. This is how it would work: there would still be four rounds of qualifying, but each time around, the racers would be awarded points, e.g., the TQ'er of a round would receive one point, second place would get two and so on. After the rounds are completed, a racer's worst round would be thrown out. In the event of a tie, the tiebreaker would be the total number of laps and times for the three rounds used.

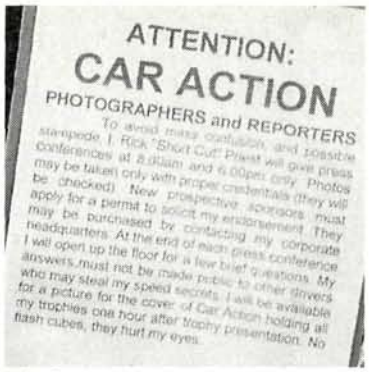
Use of this system should weed out the possibility of getting into the A-Main by luck only. The consistently fastest 10 racers will fill up the race, and that's the way it should be. For more info on the new qualifying system, contact ROAR president Phil Hurd at (912) 355-7406; fax (912) 355-7406.

to third and found himself behind Hughes, who had inherited second. With time running out, Bing passed Hughes and set his sights on race leader Pavidis. Bing got close to Pavidis, but he was unable to get around him and had to settle for second, which was good enough to capture the championship—tranny noise and all. Hughes took third, followed by Hodapp and Kinwald.

TRUCK

Team Trinity/Team Losi's Greg Hodapp hoped to prove to everyone that his mediocre showing in 2WD was a fluke and that he was "the man" in Truck. Most of the Team Losi drivers commented all weekend on how dialed Greg's truck was. Also, the tables were slightly turned in this class; Team Associated now had cause for concern. They had only two drivers going into this race—Mark Pavidis and Mark Francis.

• **A1**. Hodapp jumped out to an early lead, followed by J.R. Mitch, Kinwald and Pavidis. Hodapp looked smooth out in front, while farther back a bit, Kinwald pushed Mitch to the limit. After a while, Mitch could no longer stand his ground and Kinwald slipped past him and into second. Pavidis and Mitch battled intensely for third; we could see that Mitch was doing everything he could to stay ahead, but it wasn't long before Pavidis got by him, but found it was too late to go after the leaders. Hodapp and Kinwald finished one-two, followed by Pavidis, Brian Dunbar and Scott Brown.


ATTENTION:
CAR ACTION
PHOTOGRAPHERS and REPORTERS
To avoid mass confusion, and possible stampede, I, Rick "Short Cut" Priest, will give press conferences at a dozen and a dooen only. Photos may be taken only with proper credentials (they will be checked). New prospective sponsors must apply for a permit to solicit my endorsement. They may be purchased by contacting my corporate headquarters. At the end of each press conference I will open up the floor for a few brief questions. My answers must not be made public to other drivers who may steal my speed secrets. I will be available for a picture for the cover of Car Action holding all my trophies one hour after trophy presentation. No flash cubes, they hurt my eyes.

Who?

• **A2**. Again, Hodapp jumped to the lead, Kinwald was second, and Brown pursued in third. Midway through the race, Brown got onto his lid and dropped back to sixth. Mark Francis charged from the back of the pack and jumped up a few places to third. Hodapp—a straightaway ahead of Kinwald—easily cruised toward the national championship. At the buzzer, Hodapp was first, with Kinwald again second overall, Francis third, Todd Hodge fourth and Dunbar fifth.

• **A3**. Hodge grabbed an early lead, followed by Kinwald and Pavidis (Hodapp sat out the third Main because the championship had already been decided). Not long into the race, Kinwald took command, followed by Hodge, Brown and Francis; Pavidis had a few problems, was bumped around and settled in last place. Kinwald had a commanding lead over Hodge and won easily. Francis moved up to third, with Dunbar fourth and Brown fifth.

4WD

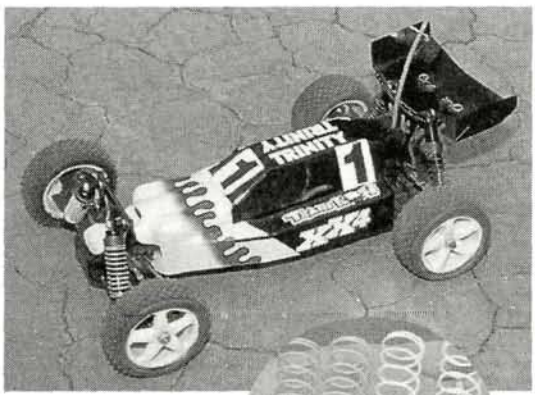
It seemed as though whenever the Losi 4WD prototype hit the track, the pits cleared out and everyone ran to watch it go. Kinwald seemed to have all the luck with the new car, because both Hodapp and Jon Andersen either had radio problems or were still sorting out tuning them. Could Kinwald take the car to victory lane on its first time out?

• **A1**. TQ'er Kinwald had a bad start and found himself in dead last. Greg Dennet piloted his Kyosho into the lead and was

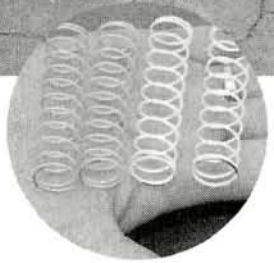
(Continued on page 279)

New in the Pits

TEAM LOSI
XX-4



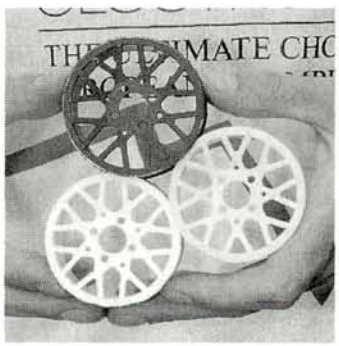
This vehicle caused quite an uproar at the Nats. Team drivers Brian Kinwald, Greg Hodapp and Jon Anderson all qualified for the A-Main with this four-wheeler—not bad for its first outing. Kinwald grabbed the win with it. Look for its release sometime in late winter/early spring. For an in-depth look at this wild-looking vehicle, check out Frank Masi's "Inside the XX-4" article in this issue.



Gray and White Rear Springs

These were designed to be used with soft-compound tires and the newly revised suspension geometry found on the new 'CR' cars and trucks. The White spring (part no. A-5147) has a 1.8 rate, which is a bit softer than the previously softest Yellow spring. The Gray spring (part no. A-5146) has a 1.6 rate, which is one step softer. For more information, contact Team Losi at 13848 Magnolia Ave., Chino, CA 91710; (909) 465-9728; fax (909) 590-1496.

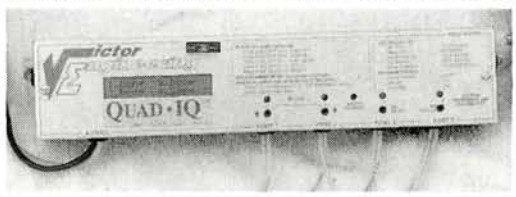
LRP · **BBS Wheels**

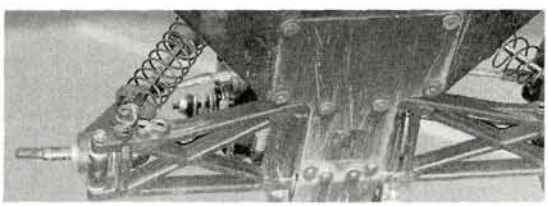


These hot wheels are available for Yokomo YZ-10 4WD buggies. They are lightweight, yet rigid, and according to LRP's Jurgen Lautenbach, that helps provide the best acceleration and handling. They are pre-balanced and easy to glue, thanks to a new special surface that bonds well with CA. They are available in black, white and yellow, and they come in 2.2- and 2.15-inch sizes. For more information on LRP products, contact Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342; fax (714) 850-1744.

VICTOR ENGINEERING · **Quad IQ Charger**

Its main feature is its ability to charge four packs at one time—a great feature for racers running in more than one class! Controlled by a single micro-computer, the Quad IQ 4-channel Comp-U-Flex Super-Conditioning charger is four independent IQ-type chargers in one. For more information, contact Victor Engineering at (714) 830-8483; fax (714) 830-2787.





TEAM ASSOCIATED · **RC10B2 Suspension Arms**

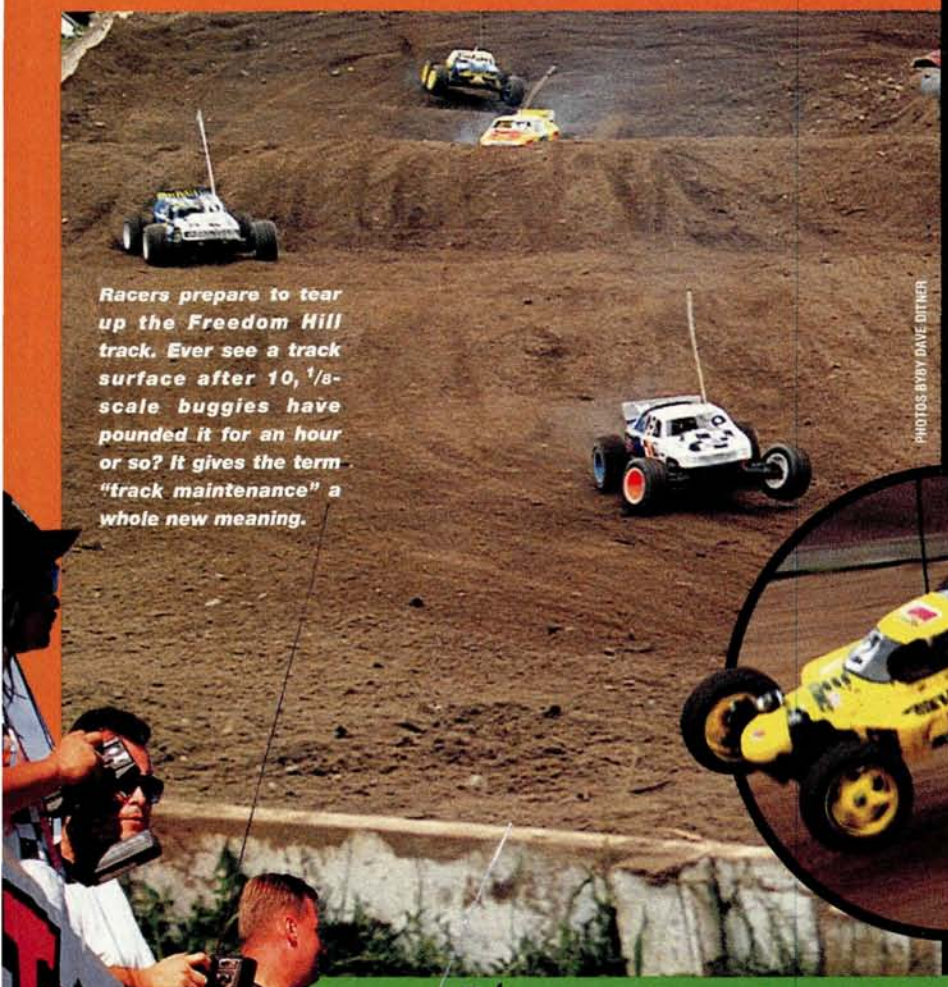
These feature an additional shock-mounting hole farther out on the arm. Having the shock bottoms farther out makes the car more stable from side to side and allows you to run lighter oil and softer spring rates. It also seems to help the car handle better on bumpy tracks. Part nos.—9255 (standard), 9256 (carbon fiber). For more information, contact Team Associated at 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342; fax (714) 850-1744.

Kyosho Off-Road GAS CHALLENGE

Nitro nuts attack Freedom Hill

by Dave Ditner

AT THE Top of the Hill Club's off-road track at Freedom Hill Park in Sterling Heights, MI, 187 racers gathered to participate in one of the premier gas racing events in the U.S. People came from all over the country, and the field included three racers from Team Hawaii! Canada also made a strong showing with nine racers, most of whom were Team Kyosho* guys. Kyosho even brought a racer from England!! I hadn't been to this race before, and I didn't know how the racers would handle the stress of competition and still manage to enjoy themselves. Let me tell you, although the competition was indeed intense, these folks were having fun! As I made my way through the pit tents, I was pleasantly surprised to see people helping their fellow racers and sharing tips and even parts when needed!



Racers prepare to tear up the Freedom Hill track. Ever see a track surface after 10, 1/8-scale buggies have pounded it for an hour or so? It gives the term "track maintenance" a whole new meaning.

PHOTOS BY DAVE DITNER

Top three in 1/8-scale Buggy (left to right): Peter Head (third), Kris Moore (first), Eustace Moore (second).

Top three in 1/10-scale Stadium Truck (left to right): Michael Mattis (third), Jon Andersen (first), Roadbeast Bruns (second).

KYOSHO GAS CHALLENGE

The Freedom Hill track had been reworked with flexible tubing as the track borders. In addition to the doubles and triples, this track had a 3-foot tabletop jump! There were plenty of tight berms in the corners, and this forced drivers to take tight lines. The two straightaways provided good speed thrills (speed = joy), and the rough track made for some awesome wheel-standing action!

The track surface proved to be challenging. During Friday's practice, the sun was out in full force, and despite excellent efforts by the track maintenance crew, the track quickly became dry and rut-filled. No whiners (the motto of the Top of the Hill Club) here, though; racers tuned their suspensions accordingly. Everyone had the same conditions to contend with, so suspension setup was key. Driving skills were a help, too (you think?). As one racer put it, "If you can't handle rough track surfaces, you don't belong in off-road racing!"

OFF TO THE RACES

• **1/10-scale 4WD Buggy.** This class belonged to Kyosho. Everyone ran the well-respected Inferno 10, with O.S.* engines for power. These cars had the least ground clearance of the day, so they ran first. Jim Williams led the race right from the gun. Frank Tanaka was second, followed by Dave Henry. A little past the halfway point in the 20-minute Main, Tanaka flamed out, allowing Henry to take second. Tanaka's pit team had him fired up and back on track quickly enough for him to maintain third. Way to go Team Hawaii! With two minutes left in the race, Williams broke, giving Henry first, followed by Tanaka in second. When the dust cleared, Henry won, Tanaka took second, and Williams had racked up so many

Splash 'n' dash! To be successful in gas racing, you must have a pit crew who can fill your car and get you back on the track in seconds.

laps before breaking that he took third only one lap behind Tanaka!

Top three in 1/10-scale Buggy (left to right): Frank Tanaka (second), Dave Henry (first), Jim Williams (third).

Pretty funny-looking trophy girl! Kris Moore accepts his first-place trophy and gets the "gimme five" from the trophy lad.

• **1/8-scale 4WD Truck.** This was the class for wolves in sheep's clothing. Most of these "trucks" were evil, tricked-out buggies wearing truck disguises (wheels, tires and bodies). In fact, Brian Turner of Grand Rapids, MI, was the only one running a vehicle that began life as a truck. Chris Walrod took the win over David Leavitt. Following in third place was Jim Williams.

• **1/8-scale 4WD Buggy.** This was the rowdiest class at the event. At the start of each race, the butt-grinding, screaming, 32hp nitromethane engines bullied dirt and smoke into the air. A racer told me, "Keeping these cars on the track is like trying to walk a rabid dog on a leash." Paints a nice picture, doesn't it? The simple fact is that these cars had far more power than was usable for this track. Throttle-finger finesse would be very important to maintain lines. Sixty-eight racers participated in this event, and everyone raced in a Main, from A through G. The action was fast and furious, to say the least.

During qualifying heats, Team Kyosho members traded the lead. Man, these guys are good! Kris Moore, Mike Craddock, Dave Henry, Chris Walrod and Brian Lavigne of Team Kyosho were all at the top of the qualifiers. Eustace Moore, owner of MIP*, was the only mixer in an otherwise Team Kyosho-dominated event. Throughout the event, he was very fast and consistent.

Defending champion Kris Moore dominated the A-Main with authority. Eustace Moore's neon yellow, CVD-equipped MP-5 was his only challenger. In fact, Eustace, after falling back some in the beginning, came within a lap of Kris by the finish. Now that's hard charging!

• **1/10-scale 2WD Truck.** The largest class of the event was the 1/10-scale truck class with 83 racers entered. Richard Saxton of

1/8-SCALE WINNERS

Stadium Truck

Final	Qual.	Driver	Chassis	Engine	Pipe	Fuel	Radio	Tires (F/R)
1	1	Chris Walrod	Kyosho	O.S.	Paris	O'Donnell	Airtronics	Kyosho
2	6	David Leavitt	Mugen	Rex	Rex	Mu-Juice	KO	Kyosho
3	3	Jim Williams	Kyosho	O.S.	Paris	O'Donnell	Airtronics	Kyosho
4	4	Rob Brown	Kyosho	Paris	O.S.	Byron	JR	Kyosho
5	8	Brian Harper	Kyosho	O.S.	Paris	Blue Thunder	Airtronics	Kyosho
6	7	Brian Turner	Kyosho	O.S.	O.S.	O'Donnell	KO	Kyosho
7	2	Caillen Kanekoa	NA	NA	NA	NA	NA	NA
8	5	Dominick Sansone	Kyosho	O.S.	O.S.	O'Donnell	KO	Kyosho

Buggy

Final	Qual.	Driver	Chassis	Engine	Pipe	Fuel	Radio	Tires (F/R)
1	1	Kris Moore	Kyosho	O.S.	Paris	O'Donnell	KO	Pro-Line
2	2	Eustace Moore	Kyosho	Rex	Rex	O'Donnell	Airtronics	Mugen
3	8	Peter Head	Kyosho	Paris	Paris	O'Donnell	KO	Kyosho
4	5	Dave Henry	Kyosho	O.S.	Paris	O'Donnell	Futaba	Kyosho
5	4	Chris Walrod	Kyosho	O.S.	Paris	O'Donnell	Airtronics	Pro-Line
6	6	Brian Lavigne	Kyosho	O.S.	Paris	O'Donnell	KO	Pro-Line
7	7	Tom Maffer	Kyosho	Paris	Paris	O'Donnell	Futaba	Kyosho
8	3	Mike Cradock	Kyosho	O.S.	Kyosho	O'Donnell	Sanwa	Kyosho
9	10	Felix Racoma	Kyosho	Picco	Picco	O'Donnell	JR	Pro-Line
10	9	Steve Hale	Kyosho	O.S.	O.S.	O'Donnell	JR	Kyosho

1/10-SCALE WINNERS

Stadium Truck

Final	Qual.	Driver	Chassis	Engine	Pipe	Fuel	Radio	Tires (F/R)
1	4	Jon Andersen	Losi	O.S.	Losi	O'Donnell	Futaba	Losi/IFMAR
2	10	Roadbeast Bruns	Losi	O.S.	Associated	Blue Thunder	Futaba	Losi
3	9	Michael Mattis	Losi	O.S.	Associated	Blue Thunder	JR	Losi
4	6	Russ Williamson	Losi	Dynamite	Losi	Blue Thunder	JR	Losi
5	2	Sohrab Tavakoli	Losi	O.S.	Losi	O'Donnell	Airtronics	Losi
6	7	Kris Moore	Kyosho	O.S.	Paris	O'Donnell	KO	Losi
7	3	Darrin Leist	Losi	Thunder Tiger	Associated	O'Donnell	Airtronics	Losi
8	8	Jim Molnar	Associated	O.S.	Associated	O'Donnell	Airtronics	Pro-Line
9	1	Richard Saxton	Associated	O.S.	Associated	O'Donnell	Airtronics	Pro-Line
10	5	Carl Giordano	Associated	O.S.	Associated	O'Donnell	Airtronics	Pro-Line

Buggy

Final	Qual.	Driver	Chassis	Engine	Pipe	Fuel	Radio	Tires (F/R)
1	1	Dave Henry	Kyosho	O.S.	DuraTrax	O'Donnell	Futaba	Losi
2	4	Frank Tanaka	Kyosho	O.S.	O.S.	O'Donnell	JR	Pro-Line
3	5	Jim Williams	Kyosho	O.S.	Associated	O'Donnell	Airtronics	Losi
4	2	Dominick Sansone	Kyosho	O.S.	DuraTrax	O'Donnell	KO	Pro-Line
5	6	Fran Boersma	Kyosho	O.S.	O.S.	Byron	Futaba	Pro-Line
6	3	Peter Head	Kyohso	O.S.	DuraTrax	O'Donnell	KO	Losi
7	7	Adam Hatzell	Kyosho	O.S.	Kyosho	O'Donnell	Futaba	Kyosho
8	8	Bill Jeric	NA	NA	NA	NA	NA	NA

Team Associated* set the pace in the first round of qualifying and seemed to be the man to beat. Following him were Team Losi's* Sohrab Tavakoli and Darrin Leist, Carl Giordino and Jim Molnar. As qualifying progressed, few changes occurred; Jon Andersen moved into fourth and Carl Giordino into fifth.

Top three in 1/8-scale Stadium Truck (left to right): David Leavitt (second), Chris Walrod (first), Jim Williams (third).

The A-Main was 45 minutes long! Quick pitting, proper truck setup, durability and driver stamina were needed to win (not to mention a fast trigger finger). When I say "driver stamina," understand that these guys had to maintain serious concentration and stay alert for the entire race, and that's not easy under any circumstance, especially at this level of competition.

Unlike the very sunny qualifying days, race day was overcast. This kept the track moist and smooth, allowing racers to attain higher speeds. The start of the A-Main saw Richard Saxton easily leading the pack, followed by Jon Andersen and Carl Giordino.

At the 10-minute mark, Sohrab Tavakoli took second place from Jon Andersen, while Saxton was still in the lead. At the 20-minute mark, the race became a war of attrition. Carl Giordino had gone, and top qualifier and leader Saxton blew his tranny and was down for the count. Sohrab took over the lead and pulled away from the second place Andersen and third place Jim Molnar.

Andersen flamed out around the 30-minute mark, giving Molnar second, and "Roadbeast" Bruns took third. An excellent pit stop had Andersen back on the track and quickly regaining position. A few laps later, Molnar's tranny gave out,

(Continued on page 254)

Inside Team Losi's XX-4

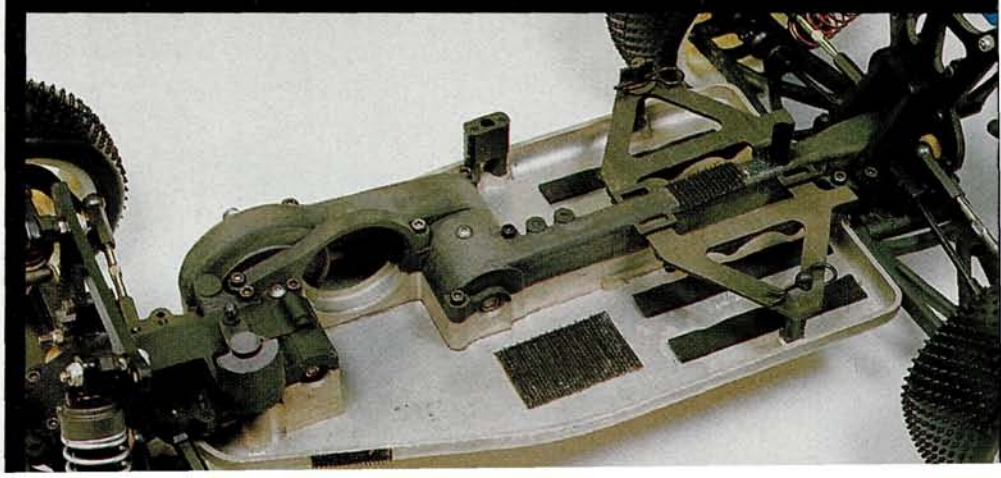
The savior of the 4WD class

by Frank Masi

FOUR-WHEEL DRIVE is back in the U.S., and Team Losi* can be credited for its return. Since the decline of 4WD during the late eighties, people have been saying, "If only an American company would make an affordable and competitive 4WD buggy, the class would become big again." Well, one company has, and once you've scanned these photos, you'll agree that the new Losi XX-4 is one helluva cool ride.

Three, hand-built prototypes of the XX-4 were taken to the '96 ROAR Off-Road Nats in Butler, PA.

PHOTOS BY WALTER SCOTT



The XX-4 has an adjustable slipper clutch that can be set easily, even when the body is on the car. A unique, adjustable, overriding "freewheel" system (not to be confused with a one-way bearing) allows the front wheels to freewheel to a certain extent, yet can be set tightly enough to allow for a slight degree of four-wheel braking (unlike cars that have one-way front wheel bearings and brake with their rear wheels only).

Losi's triple-belt drive system allows the use of larger-diameter belt pulleys to drive the rear diff, which is subjected to the highest loads. The larger pulleys ensure more "belt-wrap," i.e., how much of the belt actually touches the pulley. This also makes any sort of belt-tensioning device unnecessary. Despite the differing sizes of the pulleys, the front and rear diffs are driven with the same final ratio.

Because of the forward motor placement, the steering servo is mounted behind the drive enclosure at about mid-chassis. A long tie rod runs from the servo to a dual-bellcrank steering system similar to that of the Double-X buggy. To allow adjustment of steering Ackerman, the bellcranks offer a choice of two positions for the center drag-link.

And in the talented hands of drivers Brian Kinwald, Greg Hodapp and Jon Andersen, they made an impressive showing, with Kinwald effortlessly taking the TQ position and the win.

At the Nats, no one outside of a few key Losi personnel was allowed to glimpse the XX-4 sans body; we were, however, able to coax Losi's Jack Johnson to fly from sunny California to wet and rainy Connecticut—XX-4 prototype in hand—for a sneak-peek photo session. So thanks to Jack and Team Losi, we're pleased to show you, for the first time anywhere, detailed photos of what is perhaps the most significant new car of the '90s.

Although the early prototype shown here features a machined-magnesium chassis (magnesium is light, strong and easy to machine), production XX-4s will employ chassis molded from Losi's Stiffezell composite. The chassis, which is slightly narrower than that of Losi's Double-X buggy, not only serves as the backbone of the XX-4, but it also forms the lower half of the drive train's enclosure (the XX-4's drive system is completely sealed against dirt).

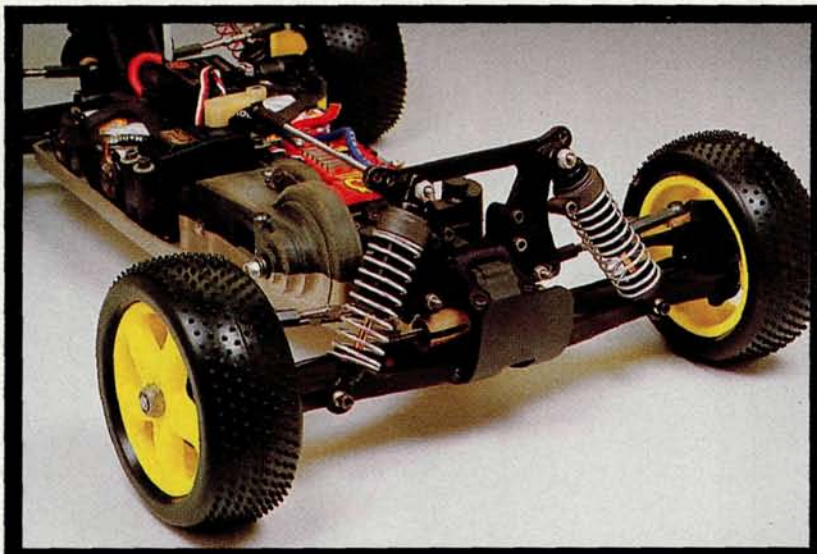
The layout of the XX-4's chassis distributes the weight of the motor and battery to provide better traction, both front and rear, and to minimize "hobby-horsing," i.e., the tendency of an improperly balanced chassis to transfer its weight rapidly from front to rear—kinda like those spring-loaded, brain hemorrhaging, ride-on plastic horses we all had as kids. The motor is placed far forward on the chassis, while the battery pack (a 6-cell saddle-pack toward the rear of the chassis) straddles the main drive enclosure.

The motor is attached to the drive enclosure in similar fashion to that of the Predator buggy; an aluminum disk is bolted to the motor, then the disk is held to the enclosure by a clamping device. Because the motor disk's holes are offset, fine gear-mesh adjustments can be made simply by loosening the clamp and rotating the motor. A tiny window on the opposite side of the enclosure allows you to observe gear mesh. A small rib on the motor-mount disk keys to the clamp to provide additional security.

The XX-4's drive system comprises two pulley shafts, three belts and two ball differentials. The forward pulley shaft is located directly in front of the motor; the rearward shaft is just behind the motor. The motor drives a spur gear that's connected to the forward pulley shaft. On this shaft are two pulleys; one drives a belt to the front diff, while the other drives a second belt back to the rear pulley shaft. A third belt, running from the rear pulley shaft, drives the rear diff.

The XX-4's rear ball diff is almost identical to that of the 2WD Double-X buggy, but it has a diff pulley instead of a diff gear. The front ball diff has new plastic outdrives that significantly reduce the weight over the front wheels. Losi's standard universal-joint drive shafts are used for the rear, while a pair of new, smaller-diameter drive shafts (necessary for front spindle clearance) can be found up front.

Once the drive train is in place on the main chassis, a molded enclosure/stiffener—which runs all the way from the rear diff to the slipper assembly—seals the drive train and adds to the chassis' rigidity. A smaller piece covers the forward section of the belt-drive system and the front diff. According to Losi, the XX-4's drive system is so well sealed that they've yet to encounter any dirt penetration despite many hours of rigorous testing in punishing off-road environments.



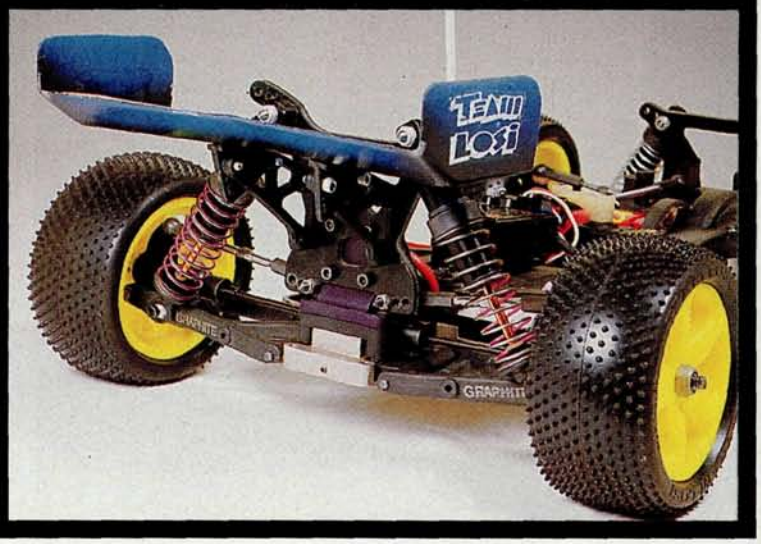
A molded bulkhead is attached to the front of the main chassis, and it supports the front suspension arms, the shock tower and the forward portion of the front differential (the rest of the diff is supported by the main chassis). The bulkhead provides the XX-4 with 10 degrees of front kick-up for improved handling on bumpy tracks. The front suspension arms are made of Stiffezell, sweep forward slightly and are a little longer than those found on the Double-X 2WD buggy.

To provide clearance for the drive shafts, the XX-4's front spindle carriers are attached to the suspension arms using a pair of unique pins that resemble screws but are threaded only near their "heads." Similar pins secure the spindles to the carriers.

New, narrow versions of Losi's five-spoke rear wheels are attached to hex-shaped, aluminum wheel adapters (similar to those found on 4WD touring cars, hmmm). Losi's standard-length front "hard-body" shocks complete the front end.

Although it uses the same rear A-arms as the Double-X 'CR,' the XX-4's rear suspension shares little else with its 2WD sibling. For example, the arm mounts (which provide 2 degrees of anti-squat) had to be made in two pieces to give enough clearance for the rear drive belt. It's also likely that rear toe-in will be placed at the hub carrier and not at the arm mount, as it is on the 'CR.' This being the case (Losi's early testing leans in this direction), the original Double-X buggy's rear hubs will be used on the XX-4, because, as you'll remember, the Double-X had its rear toe-in at the hub, not at the arm mount.

The tops of Losi's standard-issue "long" rear shocks are attached to a molded shock tower, while the bottoms are attached to the back of the suspension arms. A neat-looking, molded wing mount (hooray! no more wire to bend!) keeps the wing at the proper angle—and we all know how wing wire bends during horrific crashes. Body clips hold the wing on the mount for lickety-split removal and installation.



Second Opinion

There's no doubt in my mind that because of the XX-4, you're going to see a lot of 4WD racers at your local track this summer. There's a lot of excitement in the pits about this car! Since 4WD is all but extinct in the U.S., any participation is going to be an improvement. How popular the class will become as a result of Losi's effort will depend on two issues: the XX-4's cost, and which other class (truck or buggy) racers will give up to go four-wheelin'.

If Losi can keep the "street price" at around $250, they'll sell millions of these things, but I remember how the introduction of racing trucks caused interest in the 4WD class to diminish. I don't think that most racers will have the time or the funds to run three classes. Something's going to suffer if 4WD makes a big comeback, but if the XX-4 works as well as I've heard, I won't mind making a few sacrifices to race one. *—George M. Gonzalez*

Four-wheel-drive is alive and well—at least it will be when Team Losi releases their XX-4! I witnessed the car tear up the track at the ROAR Mod Nats in Butler, PA, and let me tell you, it's one cool machine. When Kinwald, Hodapp, or Andersen hit the track with their cars, almost everyone lined the track to watch it go. The car was so dialed it was amazing—especially considering that it was a rough track surface. Most 4WD cars don't seem to fare well on rough, bumpy tracks, but the XX-4 handled it with ease. It also jumps well—unlike most other 4WD cars. I was very surprised to see it handle jumps as though it were a 2WD buggy. Equally impressive was the car's overall design, and its easy layout should help make any maintainance chore a very painless task to complete—a definite plus.

The future of four-wheel looks very interesting. I guarantee that once this car is released, there will be a resurgence of four-wheel racing. If your local track doesn't have a 4WD class, it will quickly need to add one to the race program. *—John "Doogie" Howell*

We can't yet comment on the XX-4's performance beyond citing its impressive debut. Here's a story that Jack told us, however: during testing at the bumpy Ranch Pit Shop track in Pomona, CA, through some of the rougher sections, the XX-4 actually worked better than even the stadium trucks with their long arms and cushy tires. Jack attributes this to the XX-4's weight distribution and long-travel suspension.

Look for a full test of the XX-4 as soon as we receive a production sample (kits should be available early in '97). In the meantime, feel free to drool on this issue and to start saving your money, because we predict that 4WD is going to become popular once again.

**Addresses are listed alphabetically in the Index of Manufacturers on page 288.* ■

Extend Your Run Time

by Peter Vieira

EVERYBODY WANTS to run longer. The only time I like to see my batteries dump at 4 minutes and 5 seconds is on a race day; otherwise, I want as much track time as I can get. Who wants to be changing packs when you could be out stuffing your buddies into the weeds?

So how do you increase run time? Fortunately, you can make pretty impressive gains without spending all your money on a HAL9000 WonderFet speed control or megadollar matched packs. The answer is friction—not getting it, but getting rid of it. The less force your car must overcome to move, the less work it has to do, and the longer it will run. It's that simple. Here's how to make it happen.

At this point, it would be easy to just say "Buy bearings!" Actually, I will say that. Buy 'em. Ball bearings spin longer, offer more precision and outlast bushings. But you might not have the dough for a set, especially if the vehicle in question is, say, a Clod Buster, which requires a lot of bearings. Or you may not want bearings because this would violate your track's spec rules. If you race Bolink's* Legends class, it certainly would. But even if you can't run bearings, there are other ways to reduce friction.

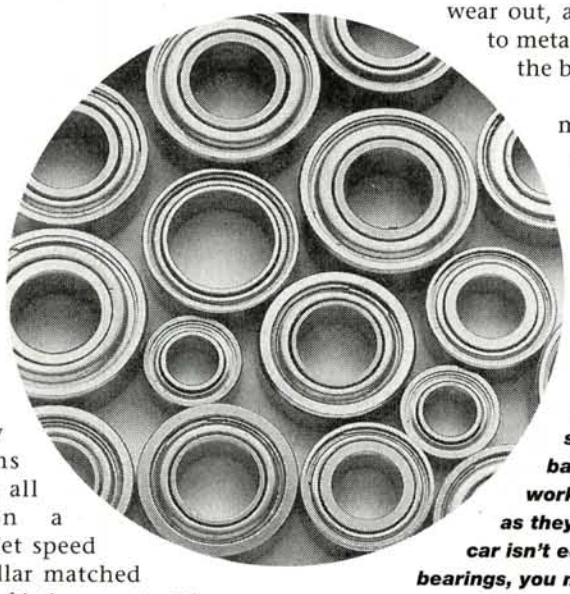
Aerocar's Super Speed Gear lube can be brushed on your gear's teeth to reduce friction in your gearbox.

BUSHING BASICS

Bushings come in two flavors, plastic and metal. Plastic bushings are oft maligned, but they aren't bad spinners when properly lubed. The trouble is that the lube attracts a lot of crud, which soon wears the bushing into uselessness. Unfortunately, the dry lubes meant to eliminate this problem are not the hot setup for plastic. The kit grease your car came with is usually the best stuff to use; just try not to use a ton of it.

When the plastic bushings do wear out, at least upgrade to metal if you can't go the bearing route.

If you have metal bushings, the "lube sparingly" advice also applies. But to get the most from metal bushings, use Paragon's* Liquid Bearings (part no. LB025). This liquid (duh) goes on with a brush and quickly evaporates, leaving a tough film of lubricant that "absolutely will not attract dust." This was proven to me after I dropped a Paragon-treated bushing and watched it roll through Dust City, USA—the part-swallowing void beneath my workbench. Dust repulsion aside, Liquid Bearings' real benefit is friction reduction. Compared with a kit-lubed bushing, one coated with Liquid Bearings had nearly twice the spin-down time! That's a real benefit for any bushing-equipped car, especially those with bushings in their gearboxes.



The key to extending run time is to make sure that all the ball bearings work as efficiently as they can. If your car isn't equipped with bearings, you might want to consider getting a set because this will help maximize your run time.

BALL BEARINGS—THE BEST

If you saved your pennies as you wore out your bushings, it's time to go for the real deal: ball bearings. Most kits list a part number for a complete bearing set, but it's usually less expensive to buy an aftermarket kit or individual bearings. This will also allow you to replace bearings piece by piece if funds don't allow a wholesale conversion. If you do opt for piecemeal replacement, equip the transmission of your car first, starting with the top shaft. Then move to the rear hubs and finally the front wheels.

I've had good luck with DuraTrax* bear-

ings, and they have recently expanded their line, so finding bearings for your car shouldn't be a problem. If you do have an unusual size bearing, give the folks at Boca Bearing* a call; not only do they have every size you could need, but they also offer different bearing grades, from plain steel to stainless to Teflon™-sealed. Generally, I stick with the less expensive shielded bearings because they create the least friction, and I'm good about keeping my car clean. If you want to reduce maintenance or run in especially dusty conditions, sealed bearings are the hot setup. Generally, you just wipe them off and go. They create a little more friction than shielded bearings, but they are still light-years ahead of any bushing setup.

If you have metal bushings and either can't afford bearings or are restricted to running only bushings (for instance, if you run in a cost-controlled race), fret not. Try Paragon's Liquid Bearings; it cuts down friction considerably.

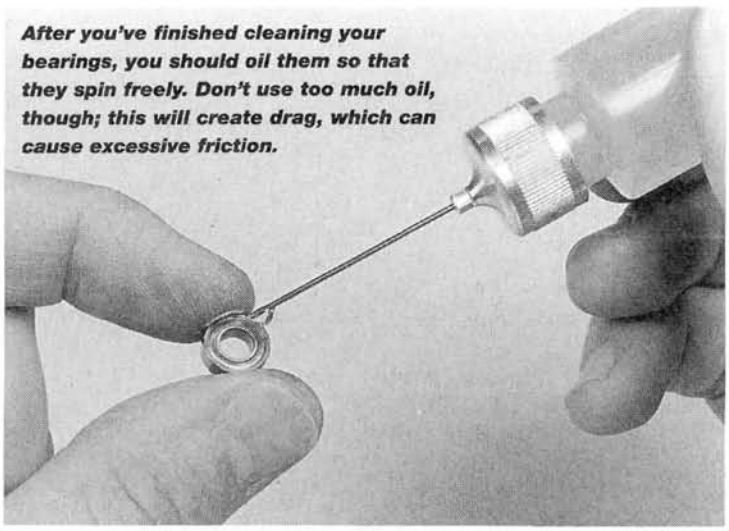
The key to bearing maintenance is cleanliness; ball bearings in R/C rely on very tiny balls traveling at incredible speeds, so any grit in the bearings can quickly spell disaster. I like to use motor spray to blast out the crud; alternatively, I agitate the bearings in a jar of denatured alcohol or paint thinner. Always allow complete air drying before relubing, or trapped cleaner will thin the lube. As with bushings, less is more in the lube department. Just a drop or two does the job. Any more will only attract dirt. I'm big on Aero-Car Technology* products, and their aptly named Bearing Lubricant (AC2002) has never let me down. I've also had good luck with Dan's* Banana Lube (10019), which, in addition to being a fine lubricant, is also an intoxicating cologne for that special monkey in your life.

Thoroughly clean your shielded bearings periodically. A short blast of motor spray helps remove crud.

MORE WAYS TO REDUCE FRICTION

Now that we know how to get the most out of our bearings and bushings, let's look at the rest of the car. The best place to start a friction-reduction plan is the transmission. This is where the highest concentration of moving parts is, and therefore, it's the place where you stand to gain the most. First remove and disassemble the transmission. How do the internal gears look? If the teeth are pointed or have a shark-fin profile, replace the entire gear set. Don't re-place individual gears inside the transmission because the new gears will not mesh properly with the old ones. If the gears appear to be in good shape,

(Continued on page 274)



After you've finished cleaning your bearings, you should oil them so that they spin freely. Don't use too much oil, though; this will create drag, which can cause excessive friction.

ROLLING RESISTANCE

I was curious to see just how much difference there was between the rolling resistance of various bushing setups, so I devised a rough test rig. I used a Tamiya truck wheel and tire as a flywheel to spin a Tamiya axle on 5x11 bushings and bearings with different lubes. To gauge performance, I brought the wheel up to speed with my Dremel* tool, then I timed how long it took to stop. I took the average of three test cycles to come up with a final figure. Although this doesn't reveal actual resistance, it does provide a good yardstick for performance.

TEST 1: Tamiya plastic bushing with kit lube: 15.2 seconds. I thought this would be the low-performance benchmark; guess again!

TEST 2: Traxxas* Oilite-type bushing with kit lube: 10.5 seconds. Hmm ... 31 percent slower! The Tamiya bushing is just a little more free when dry-fitted on the axle; I would expect the metal bushing to get better after a few runs.

TEST 3: Traxxas Oilite-type bushing with Liquid Bearings: 17.9 seconds. Pow! Instant 42-percent gain in spin time! Make sure you thoroughly clean the bushing before you apply the Liquid Bearings.

TEST 4: Tamiya plastic bushing with Liquid Bearings: 5.3 seconds. Yikes! That's a lot worse. I think the problem is that plastic isn't porous, so the Liquid Bearings solution can't penetrate and bond to the surface. Either that or the 111 trichloroethane carrier etches the plastic. Either way, stick to kit lube or silicone grease on plastic bushings.

TEST 5: Fresh DuraTrax bearings: 42.6 seconds. Now you're talking! Imagine every rotating part on your car with 75 percent less work to do. That's a lot more punch and run time. And that's more fun!

From the track to the parking lot.
This is the R/C action as **you** see it.

Grassroots RACING

This is YOUR PAGE! That's what "Grassroots" means—from the roots—the ground up; and that means YOU!—real, live R/C'in' readers—an entire page of your stuff! Show the world—yes, everywhere from here to there—what you and your R/C friends are doing. Wanna brag? Here's the spot. Go on; show us! Send photos with captions to "Grassroots Racing," *Radio Control Car Action,* 100 East Ridge, Ridgefield, CT 06877-4606.

TCS Hits Washington

Those fine people at Tamiya did it again, this summer with TCS Race #29 run by Galaxy Hobby in Lynwood, WA. With a total of 77 entries and 60 racers, prizes were awarded to 24 different individuals. Nine awards were given out for a variety of classes and categories including F-1, FWD Sedan, 4WD Sedan, 4x4 Truck, M-Chassis, GTP & GTO, Top Rookie, Best of Show and Top Qualifier.

WINNERS

F1

1 Bob Soppeland	Best of Show .....Nick Long
2 Brett Sisley	TQ .....Brett Sisley
3 Don Nimi	

FWD SEDAN

1 Dale Van Wyk	Best of Show .....Andrew Balatico
2 Ed Eamllumnow	TQ.....Dale Van Wyk
3 Leslie Smith	Top Rookie .....Josh Young

4WD SEDAN

1 Andy Sharples	Best of Show .....Scott Norton
2 Robert Shaw	TQ .....Ty Follis
3 Ty Follis	

4X4 TRUCK

1 Ray Meek	Best of Show .....Andy Meek
2 John McLean	TQ .....Ray Meek
3 Sean McInnes	Top Rookie .....Craig Peterson

M-CHASSIS

1 Brian Krezeszowski	Best of Show .....Nancy Winkleyl
2 Dale Van Wyk	Top Rookie.....Richard Shaw
3 Jose Morales	

GTP & GTO

1 Jeffrey Murrell	Best of Show GTP .....Jeff Murrell
2 Ray Meek	TQ GTP .....Jeff Murrell
3 Rick Ramus	

Above: When all the races had been won, and awards given out, these winners remained, also shown with their cars. Right: All the entrants for TCS Race #29 gathered for this photo opportunity with their cars.

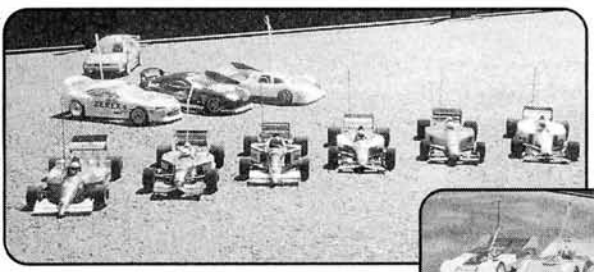
Easy Street

During the summer, Clark Freeman, of Dynamic Hobbies in Ottawa, Canada, gathers a group of local on-road racers together for the Easy Street series.

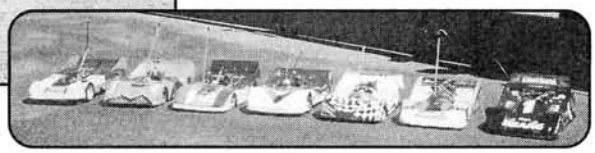
It consists of three classes, F1 stock, 1/10-scale open and 1/10-scale gas all of which maintain competitive fields. The open class pits sedans such as the Predator DTM and the TF-2 against the best of the pan cars and the gas field includes both the 1995 and 1996 Canadian Gas Champs. Whatever the racers are driving, racing within the 30 minute mains is tough and close.

The First Annual Sunoco Grand Prix, shown here, was run at a local gas station as part of a customer appreciation day. Between heats, members of the public were able to give the track a test run. Once winter hits, though, these on-road racers move on to the carpet with the Ottawa Valley Racers.

If you're in the Ottawa area this winter, and interested in some indoor carpet racing, look up Matthew Eglin and the Easy Street crew on the World Wide Web: www.magi.com/~eglin/ncrr



Above: The "Easy Street" group of entrants pose with their cars in front of their host parking lot.



Above: angled in the background are the open stock class cars. Shown in the foreground the F1 class cars are lined up.

Above: the seven speedsters are lined up in a row after their runs around the lot.

call now!

Whether you're a dealer or just a bunch of fun-lovers in search of a race program, call now! Here are a few hotline numbers to call if you have any questions, or if you'd like to start a program in your area.

Bolink Legend Series
(404) 963-0252

Tamiya R/C Championship Series
(800) TAMIYA-A

Kyosho R/C Sport Racing
(800) 682-8948
ext. 085F

Hobby Shack Parking Lot
(714) 964-8846

Hobby Town USA Parking Lot
(402) 434-5050

Trinity's Street Spec Series
(908) 862-1705

(Continued from page 68)

tires scuff and heat up. After a few stock-car pace laps to wear in the tires, I yanked the throttle again and set out for the corners. This time, I was more than pleasantly surprised. The car stuck like glue not only to the straights, but to the corners as well.

I ran the car for about 40 minutes, pulled it in and pushed the red engine-kill button. The tank—to my surprise—still had fuel in it. Now it was time for another track test. I bolted over to a local go-kart track to run it on the most scale track conditions I could find. Talking with CEC, I was told that this car is doing some major cleanup on the racetracks in Europe. I wanted to see how it handled when taking tight turns and long straights. Because the first test went so well, I should have guessed that the car would work well even in tight-turn situations. The Turn Force servo allowed the car to dart through the turns while keeping it at a decent speed. OK. OK. I know you're saying, with a big 1/5-scale car, you must have hit something. Yes, I did! I hit a couple of curbs and a 1/2-inch raised crack in the asphalt, and I sent the car off-roading. Here's the damage report: a scratch on the body and bumper and a couple of scrapes on the chassis—nothing broken! Even if something had broken, CEC offers a 90-day guarantee on everything (except tires and the body).

FINAL THOUGHTS

When 1/4-, 1/5- and even 1/8-scale cars are mentioned, the first thing that comes to mind is, "It costs too much." I need you to help me with my response to this: go to your hobby room or garage or wherever you keep your R/C vehicles, and quickly add up all of the money you've invested in the hobby. Many of you possibly have over $1,000 worth of cars, especially if you have more than one. Now, look at the price listed on the Specs. chart for the CEC Calibra. Not bad, huh? This 1/5-scale has everything you could ask for. It's preassembled, it's equipped with a fast engine with tuned pipe, it has long-lasting tires, it's durable and it looks cool! Most important, CEC offers great support. They are the exclusive importers of Yankee, which is manufactured in Europe. CEC offers the guarantee, it stocks all the parts for the car, and right now, it's working with Goodyear to produce longer-lasting tires specifically designed to meet the needs of each of their cars. With all these factors added in, don't you think bigger is better?

**Addresses are listed alphabetically in the Index of Manufacturers on page 288.* ■

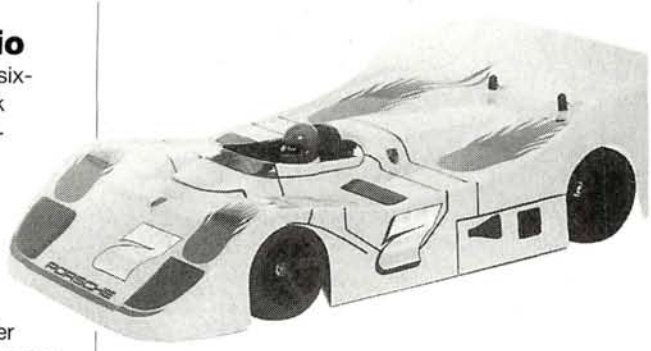
KO PROPO

Precious EX-1 Radio

This radio features a redesigned six-button touchpad that offers quick access to all the radio's programming and is more durable because it has fewer moving parts. A digital readout LCD screen provides constant monitoring of battery voltage, model selection and many timer functions. Its trim levers offer more precise control settings. Because its center of gravity is behind the trigger, it provides balance and comfort when you drive and handle the radio. The built-in rubber pads on the handle and trigger are replaceable and available in black and four bright colors.

Part no.—KOPK20; price—$379.99.

KO Propo; distributed by Great Planes Model Distributors, 2904 Research Rd., Champaign, IL 61826-9021; (217) 398-6300; fax (217) 398-0008.



PARMA

Gas K-8 Porsche 1/10-Scale .040 Clear Body

Made to fit BMT, Serpent, Delta and similar 1/10-scale road gas cars, this body has built-in reinforcing ribs in the tail end for added strength. An adjustable rear spoiler for increased downforce on low-traction tracks is included.

Part no.—99035; price—$19.

Parma Intl./PSE, 13927 Progress Pky., North Royalton, OH 44133; (216) 237-8650; fax (216) 237-6333.

TEAM ORION

Delta Peak Charger

This was designed for 6- to 7-cell packs and features a 4A charge rate, Delta Peak detection, 12V input and LED charge indicator.

Part no.—AT3300; price—$60.

Team Orion; distributed by Peak Performance, 23352-J Madero Rd., Mission Viejo, CA 92691; (714) 707-4683; fax (714) 707-4684.

TRINITY

VIS-Matched Battery Packs

These cells feature more voltage than typical SCRC cells and noticeably improve performance in all types of racing, especially stock-class racing. These battery packs are available in 4-cell versions and are assembled with either Sanyo 1700 SCRC or Panasonic EX 1800 SCR cells.

Part nos. and prices—VIS1704 (Sanyo), $89; VIS1804 (Panasonic), $99.

Trinity Products Inc., 1901 E. Linden Ave #8, Linden, NJ 07036; (908) 862-1705; fax (908) 862-6875.

ASSOCIATED

Reedy's Car Wash

This biodegradable wash was created to clean and polish chassis and plastic components. It safely removes fuel residue, tire scuff marks and decal adhesives from a Lexan body without damaging its plastic surface.

Part no.—711 (4oz. spray bottle); price—$6.

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

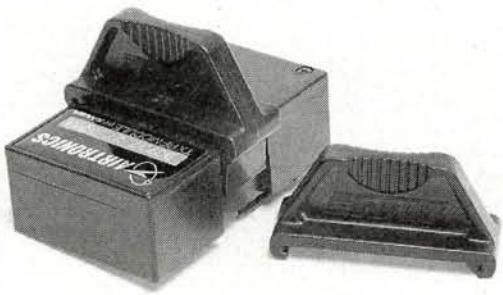
RPM

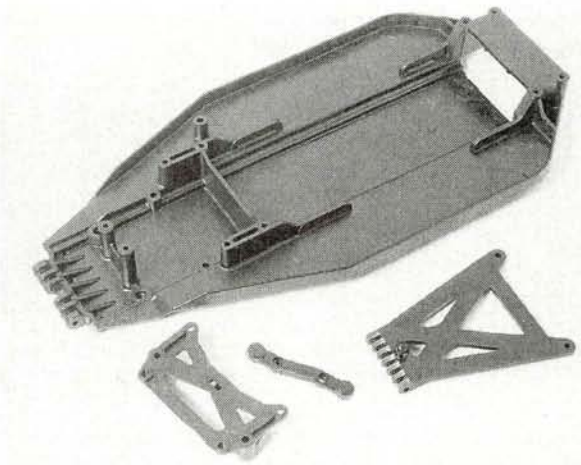
Module Removal Clip for Airtronics CS2P and XL2P

To help make changing crystals easier, this ABS plastic clip, which slides over the small tabs on the module, acts as a handle for lifting the module from these two radios.

Part no.—8050; price—$2.95.

RPM, 14978 Sierra Bonita Lane, Chino, CA 91710; (909) 393-0366; fax (909) 393-0465.





TEAM LOSI

X-long Chassis for Double-XT

This chassis, which is .3 inch longer than that of the original Double-XT, extends a truck's wheelbase to the maximum allowable length for racing. The extended wheelbase increases high-speed stability while improving handling on rough sections of track. The chassis is made of Losi's exclusive Stiffezel material for increased stiffness and reduced weight and is also available in graphite Stiffezel. This chassis is included in all the Double-XT 'CR' kits.

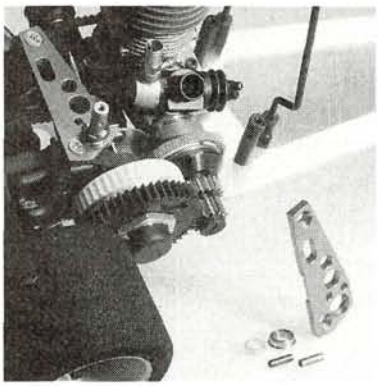
Part nos. and prices—A-4103 (main chassis), $25.95; A-9904 (graphite/composite chassis), $49.95.

Team Losi Inc., 13848 Magnolia, Chino, CA 91710; (909) 465-9400; fax (909) 590-1496.

SERPENT

Impact 2 Aluminum Brake Bracket

Designed to stiffen the rear end of the car for better suspension and transmission performance, the bracket has a ball bearing that is inserted into it to provide better support for the brake cam. It is a direct replacement for the existing nylon brake bracket and is anodized in Serpent purple.



Part no.—88304; price—$22.25

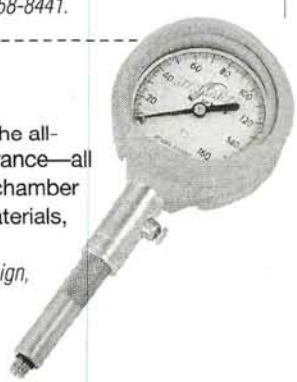
Serpent USA Inc., 2832 NW 79th Ave., Miami, FL 33122; (305) 639-9665; fax (305) 639-9658.

DYNAMITE

Engine Compression Gauge

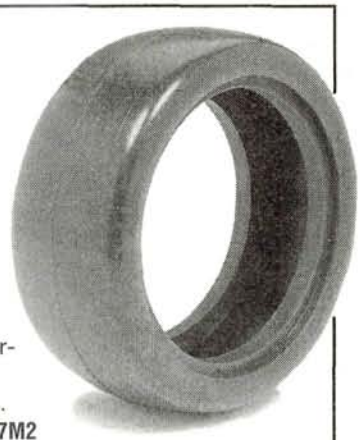
Compression-chamber readings can give valuable information on the all-important piston-to-cylinder fit, atmospheric effects and deck clearance—all contributing factors to a model engine's power. This compression chamber has all these benefits, and it's easy to use. Made of high-quality materials, it was designed to give readings with an accuracy within 1psi.

Dynamite; distributed by Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-9511; fax (217) 352-0355.



PRO-LINE

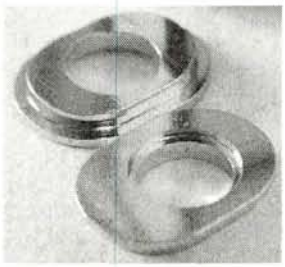
Sedan Slicks



The new XTM and M2 sedan tires are available in standard and wide widths. These longer-wearing tires provide more aggressive traction for unprepared asphalt or concrete surfaces. They are a perfect fit for Tamiya, HPI, Yokomo and Kyosho 1/10-scale touring sedans.

Part nos.—1067 (XTM standard front or rear); 1067M2 (M2 standard front and rear); 1088 (XTM wide rear); 1088M2 (M2 wide rear); price—$12.50

Pro-Line, P.O. Box 456, Beaumont, CA 92223; (909) 849-9781; fax (909) 849-2968.



HAMMAD GHUMAN

Aluminum Ride-Height Adjusters

These aluminum ride-height adjusters have been created to replace the more common plastic adjusters that can be too flexible and ultimately cause a loss of speed and increased wear on the bearings, gears and axle. Aluminum adjusters provide solid alignment and are strong enough to withstand even the most extreme road and racing conditions. The adjusters are available in three offsets.

Part nos. and prices—RH 1000 (low), $9.95; RH 2000 (medium), $9.95; RH 3000 (centered bearing hole), $9.95; RH1230 (set of all three offsets), $25.

Hammad Ghuman, 6 Tower Heights, Albany, NY 12211; (518) 458-8441.

NOVAK

Racer-EX Hyperfet ESC

This ESC has Hyperfet transistors that provide tougher braking power, a higher-rated current and lower resistance. Its safety features include dual-level thermal protection, digital anti-glitch circuitry and solid-state RVP. Radio priority circuitry

maintains total control of the vehicle even after the battery pack has dumped and eliminates the need for an external receiver battery pack.

Part no.—1655; price—$160.

Novak Electronics Inc., 18910 Teller Ave., Irvine, CA 92715; (714) 833-8873; fax (714) 833-1631.

Descriptions of the products shown here were taken from manufacturer and/or advertising agency press releases. The information given does not constitute an endorsement by Radio Control Car Action or guarantee product performance or safety. When contacting a manufacturer about any product described here, be sure to say you read about it in Radio Control Car Action. Manufacturers! To have your products mentioned here, send press releases to R/C Car Action, What's New, 100 East Ridge, Ridgefield, CT 06877-4606.

(Continued from page 53)

popular each year, especially among the belt-drive set. Pair up a swift Yokomo*, HPI*, Schumacher* or Kyosho* with a slipper clutch and a one-way, and you'll get to steer the car with the throttle all around a tight, twisty carpet track at high speed. Now that's fun!

SO, HOW DO THEY WORK?

A one-way is really pretty simple. The ones I've seen or used have the one-way bearing placed either in the center drive shaft, or within the front differential assembly located in the forward bulkhead. These bearings only allow the shaft or diff to turn in a single direction (it's easy to know when they're installed backwards, because the car won't move forward under power). If the bearing is located in the center shaft, such as on the Yokomo, the entire front belt-drive assembly freewheels off-power or on the straights, which many people think is a little more efficient. Tamiya* cars use one-way bearings in the front diff assembly, and this keeps the drive shaft spinning under power, but also allows the front diff, shafts and wheels to spin freely unless they're pulling you through a turn under power.

A one-way will also eliminate handling problems caused by the difference in diameter of the front and rear tires. When mounted, some are taller than others, especially rubber tires with foam inserts in them. The freewheeling action makes the tire sizes insignificant. That's one reason that gas on-road guys use one-way drive systems on cars with foam tires. As their long races progress, the fronts will often wear at a different rate than the rear tires. Rather than have to deal with the somewhat bizarre handling characteristics that this produces, a one-way allows the driver to run a car that handles pretty much the same way from start to finish.

I suggest that you ask around the pits and see who's running a one-way in your brand and model of car. If you're lucky, you might be able to get a few minutes of stick time on the car to see if you like the way it works. Another alternative is to get together with some friends who own the same type of car you do and buy a one-way that each of you in turn can try. If you like it, buy one. If not, you'll still have one available that you can slide in if you ever want to try it again. If you do like the handling characteristics of a one-way, try to keep a spare complete ball-diff setup handy to install if the surface or driving conditions change. That way, you'll be ready for anything race day throws at you!

**Addresses are listed alphabetically in the Index of Manufacturers on page 288.* ■

KYOSHO GAS CHALLENGE

(Continued from page 167)

giving Roadbeast second and Michael Mattis third. Just two minutes later, leader Tavakoli's tranny gave way, and Andersen passed him to take first, with Roadbeast in second and Mattis following in third. The top three remained the same up to the finish line.

FINAL THOUGHTS

1. Despite the cool and comfortable temperature, the sun was out in full force during most of the weekend, and I forgot my sunscreen (bright boy)!! I was having too much fun to pay attention, but at the end of qualifying, my ears looked like pork rinds, and my nose was sporting some nasty-looking blisters! I can tell you that carrying two cameras strapped to your burgundy, burnt neck is, let's say, uncomfortable. To avoid this, get yourself some waterproof 30-SPF sunscreen (the kiddie kind lasts the longest), and wear a hat.
2. You don't necessarily need the absolute leading-edge (hence, most expensive) technology to win races. Most people can't drive a competition-level vehicle to its potential out of the box. The key to winning is practice. Roadbeast Burns is an excellent example; he placed second out of 83 drivers in a world-class event driving an electric-to-gas conversion truck that isn't even manufactured anymore. In addition, his truck was powered by a CZ-R—O.S.'s first-generation .12 engine! The guy can really drive the truck! It goes to show that you don't need to remortgage the house to get into competitive R/C equipment. Bottom line: don't let what others spend on R/C equipment intimidate you into thinking you can't beat 'em. Buy the equipment you like, drive the heck out of it, and go kick some ass!
3. The great outdoors seems to bring out the best in people. The purpose of R/C is to have fun, and this weekend proved it. Even during serious competition, R/C should be a blast. People can make or break an event, and the 1996 Kyosho Off-Road Gas Challenge was a giant success because people made it so. Big Kahuna, the race announcer, did a heck of a job keeping the race orderly and on schedule. The Top of the Hill R/C Club deserves a major round of applause. The club members, especially track-maintenance guys, busted their behinds to make this race the world-level event that it was. You guys rule!
4. Remember, speed = joy!

**Addresses are listed alphabetically in the Index of Manufacturers on page 288.* ■

HOW TO

Get better grip off the line

Clean Tires

HAVE YOU EVER noticed people scrubbing, brushing and wiping their off-road tires between races? My curiosity was piqued when I first saw this R/C ritual. I had to find out exactly why people were so fanatical about tire cleanliness. I found that the purpose was much more important than preventing boredom from setting in.

by Dominic Tuso

Why clean tires? Because a clean tire gives you more traction. Tires will "load up" during a race, and on most tracks, this means less traction. I, for one, will not be stuck racing without all the traction I can get, so I always clean my tires between races.

First, let's build the tire-washing bucket. Simply secure the scrub brush to the inside bottom of the tub by drilling two pilot holes and then screwing in the two wood screws from the bottom. The brush I used was 7.5 inches long by 2.25 inches wide with a wooden base and strong 1-inch-long bristles. I also used a 6-inch-wide by 10-inch-long by 2-inch-deep Rubbermaid Serving Saver plastic tub. If you snug the wood screws up, the bucket won't leak (be careful not to strip these out by overtightening them, or the bucket may leak). You can also put Shoe-Goo or any RTV sealant on the bottom of the scrub brush where it is attached to the bucket to help prevent leakage.

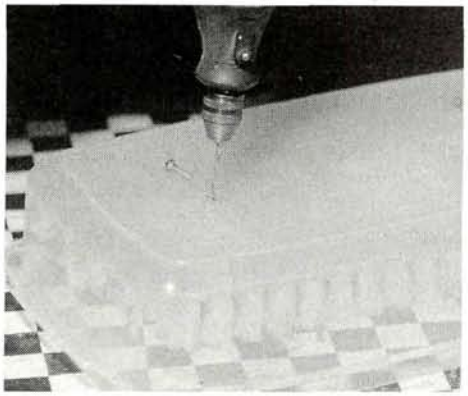
TIME TO CLEAN

Add water to just below the tops of the bristles, and spray in some Simple Green (I've found that it not only cleans extremely well, but it also conditions the tires and helps keep them very soft). If you overfill the bucket, you risk getting water inside the tires when you scrub them. With today's soft compound tires that require foam liners, water will be soaked up like a sponge and severely unbalance your tires. If this happens, you'll have to use other tires until they dry, or you'll have to take the tires apart. If you take them apart, wring the water out of the foams. You'll probably find a lot of dirt inside the tires, too. If you do, wash it out. Dry the foam liners completely with a hair dryer (not too close, or they might catch fire!) Once you're done, reinstall the liners in the tires.

I suggest using a wire brush on your normal compound

What you'll need

- A clean, dry towel
- A small plastic bucket or tub
- A scrub brush
- A fingernail cleaning brush
- A wire brush
- Baby powder
- Simple Green all-purpose cleaner
- A couple of wood screws

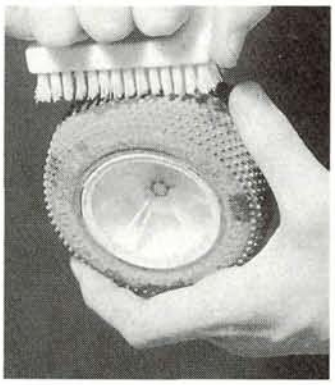


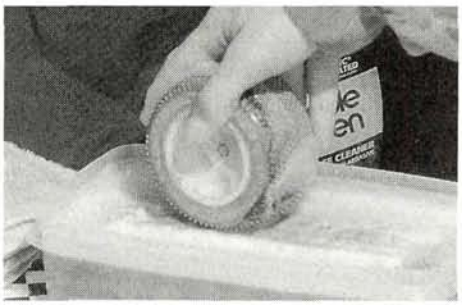
Place the brush inside the small plastic tub (wooden or plastic brush handle facing toward the bottom), and drill two holes through the tub bottom and into the brush handle.

Run two wood screws through the bottom of the tub into the brush handle until they are held together snugly.

Before you wash your hard-compound tires, to remove dirt, clean them with a wire brush.

It's best to brush dirt off soft-compound tires with a soft-bristle brush. Wire brushes can tear the compound.





Fill the small plastic tub to the top of the brush bristles with water and Simple Green, then clean away! Be careful not to get water into any vent holes in the tires or wheel.

When your tires are clean, coat them lightly with baby powder to prevent dirt from loading up.

tires to remove as much dirt as possible before washing. I've seen some racers use a wire brush on all tire compounds, but I don't recommend this because the wires can cut the softer compounds (Team Losi* Silver and Pro-Line* M2). I use a fingernail brush to remove the excess dirt from my soft compound tires.

Then I scrub my tires in the bucket, making sure that no water gets into the vent holes or through small areas of the bead where the tire meets the rim (remember, don't get those foam liners wet!). I suggest that you make sure the tires are completely glued to the rims.

Wipe off the excess water and remaining dirt with a pit towel. If your track is moist from a recent watering, you may want to sprinkle a coat of baby powder onto the tires. This will help prevent dirt from accumulating as quickly.

Even though this is not a precise science, do this on a regular basis to keep your tires sticky and clean. You should notice the difference when you pull the holeshot over your buddies who didn't clean their tires before the start of the race!

**Addresses are listed alphabetically in the Index of Manufacturers on page 288.* ■

(Continued from page 221)
give the bushings or bearings the appropriate attention described above and re-install them. For an ultra-smooth tranny, try Aero-Car Technology's Super Speed Gear and Diff Lube (AC1001). I've been using it in my Tamiya* sedans and off-road cars, and it makes for a quiet, smooth transmission. Gears last longer, too!

What you don't want to do is lather up your gears with a thick coating of heavy grease. If you do, the gears will actually require more effort to turn as they try to displace all the goo; this in turn slows the car, heats the motor and—you guessed it—decreases run time. When you reassemble the gearbox, be careful not to overtighten the screws that hold the tranny halves together, or you may cause binding. Before you re-install the motor, have a look at its bushings or bearings. Since it's the fastest spinner in the car, the motor's armature deserves the lowest possible resistance. As a final step, be sure the pinion/spur mesh is correct. A too-tight mesh is a big power waster and a surefire way to toast a spur. If you can't rock the spur on the pinion just enough to make it "tick," it's too tight.

Now that the transmission is as frictionless as the laws of physics allow, it is time to look at the wheels and hubs. Just pop out the bearings or bushings, inspect them and clean or replace as needed. Use care when mounting the wheels. If you overcrank the mounting nuts, you'll side-load the bearings/bushings, and they'll bind like a shrunken pair of Fruit Of The Looms. If you think you must apply "Hulk"-like force because the mounting nuts keep backing off the axles, the nuts should be replaced with fresh locknuts. As an additional safeguard for you Losi* drivers out there, Losi offers bearing spacers that prevent side-loading. These will allow you to crank on those wheels until your wrists swell.

That's all! Now that everything is clean 'n' smooth, keep it that way. It's much easier to spend 10 minutes on a mostly clean car after a few packs than to tear down a rolling disaster after a month of bog racing.

**Addresses are listed alphabetically in the Index of Manufacturers on page 288.* ■

ROAR OFF-ROAD NATS

(Continued from page 122)

quickly followed by Jason Ruona's Yokomo and Andersen's XX-4. At this point, Hodapp and Kinwald were in ninth and 10th. Dennet dropped back a bit and allowed Ruona into the lead while Babcock slid into third. Andersen, who was clearly having radio problems, dropped out at lap seven. Kinwald charged and made his way up to fourth. With a minute to go, it was Ruona in the lead, followed by Babcock, Hughes and Kinwald. As the clock ran down, Kinwald managed to get around Hughes and Babcock to secure second behind Ruona. Babcock finished third, followed by Hughes and Hodapp.

• A2. Kinwald jumped to an early lead and was soon long gone! Babcock was a distant second, followed by Ruona, Derek Furutani's Yokomo and Billy Easton's Yokomo. Furutani made a charge at Babcock, who managed to hold his ground. Furutani stuffed it into a pipe and let three people past, and Easton inherited third. Shortly afterward, Kinwald started to approach lappers—talk about getting around the track quickly! Kinwald took the win easily, distantly followed by Babcock, Ruona, Furutani and Dennet.

• A3. When the buzzer sounded to start the final Main, Kinwald once again shot out ahead and quickly distanced himself from the rest of the pack. Easton sat in second, while Brent White's Schumacher followed in third. At the halfway point, Kinwald had a huge lead, and it looked as though he would claim the championship if he could keep the car on its wheels. The real race was for second. White had managed to pass Easton, but Kinwald led by almost half a track, so trying to catch him was almost pointless. As everyone battled, Kinwald crossed the finish line and wrapped up the national championship, followed by White, Easton, Dennet and Babcock.

FINAL THOUGHTS

As we packed up to leave Butler, I had a chance to hang out and kick back with a lot of the racers. When the race is over, the competition between racers seems to die down a bit and they concentrate on having fun.

The race was a success, and there were no stumbling blocks along the way. Congratulations to Jeff Hyatt and the crew at Wagonhill Hobbies for running a great race as well as to Team Losi—especially their new national champs—Brian Kinwald, Greg Hodapp and Chris Bing.

**Addresses are listed alphabetically in the Index of Manufacturers on page 288.* ■

INDEX OF MANUFACTURERS

Aero-Car Technology, P.O. Box 336, Western Springs, IL 60558-0336; (708) 246-9027.

Airtronics, 15311 Barranca Pky., Irvine, CA 92718; (714) 727-1474; fax (714) 727-1962.

Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626-1403; (714) 850-9342; (714) 850-1744.

Autographics of California, 4620 New Horizon Blvd., Bakersfield, CA 93313; (805) 836-2886; fax (805) 836-0938.

Bich'n Bodies, 4903 Cloverfield Rd., Pearland, TX 77584; (713) 485-0413.

Boca Bearing Co., 7040 W. Palmetto Park Rd., Ste. 2304, Boca Raton, FL 33433; (407) 998-0004; fax (407) 998-0119.

Bolink R/C Cars Inc., 420 Hosea Rd., Lawrenceville, GA 30245; (770) 963-0252; fax (770) 963-7334.

BRP Inc., 1575 Lowell St., Elyria, OH 44035; (216) 284-0270.

BSR Enterprises, Rt. 6, P.O. Box 54, Killen, AL 35645; (205) 757-1564; fax (205) 757-1574.

Custom Electric Cars, 2 North St., Middletown, NY 10940; (914) 344-2277.

Dahm's Racing Bodies, P.O. Box 360, Cotati, CA 94931-0360; (707) 792-1316; fax (707) 792-0137.

Dan's RC Stuff, 9525-C Cozycroft Ave., Chatsworth, CA 91311.

Deans Connectors, 7628 Jackson St., Paramount, CA 90723; (310) 634-9401.

Dremel Tools, P.O. Box 1468, Racine, WI 53401-1468; (414) 554-1390; fax (414) 554-7654.

DuraTrax; distributed by Great Planes Model Distributors (see address below).

Dynamite; distributed by Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-9511.

Fantom Racing, 50201 Silver St., Vicksburg, MI 49097; (616) 649-9583; fax (616) 649-9584.

Futaba Corp. of America, P.O. Box 19767, Irvine, CA 92713-9767; (714) 455-9888.

GHI/Ultimate Hobbies, 2374 N. Orange Mall, Orange, CA 92665; (714) 921-0322; fax (714) 921-0380.

Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826-9021; (217) 398-6300; fax (217) 398-1104.

Hammad Ghuman, 6 Tower Heights, Albany, NY 12211.

Holeshot Racing Products, P.O. Box 630, Canton, MA 02021; (508) 587-0663.

HPI, 22600-C Lambert, Ste. 904, El Toro, CA 92630; (714) 837-3250; fax (714) 837-3251.

Imex Model Co., 15392 Flight Path Dr., Brooksville, FL 34609.

Irrgang Racing Service, Cannon Range Rd., Rd. 4, Box 411, Milnay, NJ 08340.

Jaco; distributed by Pro-Line (see address below).

Kyosho/Great Planes Model Distributors, 2904 Research Rd., P.O. Box 9021, Champaign, IL 61826-9021; (217) 398-6300; fax (217) 398-0008.

Loctite, 18731 Cranwood Ct., Cleveland, OH 44128.

Lunsford Racing, 2500 Three Lakes Rd., Ste. A, Albany, OR 97321; (503) 928-0587; fax (503) 967-5917.

Mac, 7935 Carlton Rd. #A, Sacramento, CA 95826; (916) 456-6932.

MIP, 746 E. Edna Place, Covina, CA 91723; (818) 339-9008; fax (818) 966-2901.

MonoKote; distributed by Great Planes Model Distributors (see address above).

Novak Electronics Inc., 18910 Teller Ave., Irvine, CA 92612; (714) 833-8873; (714) 833-1631.

OFNA Racing, 22600 D Lambert, Ste. 1009, Lake Forest, CA 92630; (714) 586-2910; fax (714) 586-8812.

O.S.; distributed by Great Planes Model Distributors (see address above).

Pactra Inc., 620 Buckbee St., Rockford, IL 61104; (815) 962-6654.

Paragon Racing Products, 340 Industrial Blvd., Waconia, MN 55387-1738; (612) 442-6364; fax (612) 442-6368.

PC/RC Products, 13807 Amiot Dr., Ste. D, St. Louis, MO 63146; (314) 205-2450; fax (314) 878-0461.

Perfect Match, 27113 Brookpark Rd., N. Olmstead, OH 44070.

Pro-Line, P.O. Box 456, Beaumont, CA 92223; (909) 849-9781; fax (909) 849-2968.

Protoform Inc., P.O. Box 456, Beaumont, CA 92223; (909) 849-9781; fax (909) 849-2968.

Ram Radio Controlled Models, 229 E. Rollins Rd., Round Lake Beach, IL 60073; (847) 740-8726; fax (847) 740-8727.

RCPS, 18312 Gifford St., Fountain Valley, CA 92708; (714) 962-6928.

Robinson Racing Products; 4968 Meadow View Dr., Mariposa, CA 95338; (209) 966-2465; fax (209) 966-5937.

Rocket City R/C Specialties, 103 Wholesale Avenue N.E., Huntsville, AL 35811; (205) 539-8358.

RPM Inc., 14978 Sierra Bonita Ln., Chino, CA 91710; (909) 393-0366; fax (909) 393-0465.

Schumacher USA, 6302 Benjamin Rd., Ste. 404, Tampa, FL 33634; (813) 889-9691; (813) 889-9593.

Tamiya America Inc., 2 Orion, Aliso Viejo, CA 92656-4200; (800) TAMIYA-A; (714) 362-2250.

Team Losi, 13848 Magnolia Ave., Chino, CA 91710; (909) 465-9400; fax (909) 590-1496.

Tekin Electronics, 940 Calle Negocio, San Clemente, CA 92673; (714) 498-9518; fax (714) 498-6339.

Traxxas Corp., 12150 Shiloh Rd., #120, Dallas, TX 75228; (214) 613-3300; fax (214) 613-3599.

Trinity Products, 1901 E. Linden Ave. #8, Linden, NJ 07036; (908) 862-1705; fax (908) 862-6875.

Wood Racing, 37601 Dartmouth Dr., Sterling Heights, MI 48310; (810) 268-5005; fax (810) 939-6227.

World Class, 1430 Florida Ave., Ste. 217, Longmont, CO 80501; (303) 684-9450; fax (303) 684-9613.

Yokomo Ltd.; distributed by GHI/Ulimate Hobbies (see address above).

STATEMENT OF OWNERSHIP

Statement of Ownership, Management, and Circulation (Required by 39 U.S.C. 3685). 1. Title of Publication: RADIO CONTROL CAR ACTION. 2. Publication no.: 001-087. 3. Date of Filing: October 09, 1996. 4. Frequency of Issue: Monthly. 5. Number of issues Published Annually: 12. 6. Annual Subscription Price: $34.95. 7. Complete Mailing Address of Known Office of Publication: 100 East Ridge, Ridgefield, Fairfield, CT 06877-4606. 8. Complete Mailing Address of Headquarters or General Business Office of Publisher: Same. 9. Full Names and Complete Mailing Address of Publisher, Editor, and Managing Editor: Publisher: Louis V. DeFrancesco, 100 East Ridge, Ridgefield, Fairfield, CT 06877-4606. Editor: Thomas Atwood, 100 East Ridge, Ridgefield, Fairfield, CT 06877-4606. Managing Editor: Frank R. Masi. 10. Owners: Grace E. DeFrancesco, Louis V. DeFrancesco, and Yvonne M. DeFrancesco, 100 East Ridge, Ridgefield, Fairfield, CT 06877-4606. 11. Known Bondholders, Mortgages, and Other Security Holders Owning or Holding 1 Percent or more of Total Amount of Bonds, Mortgages or Other Securities: None. 12. Does not apply. 13. Publication Name: RADIO CONTROL CAR ACTION. 14. Issue Date for Circulation Data Below: December. 15. Extent and Nature of Circulation: Average Number of Copies Each Issue During Preceding 12 Months: A. Total Number of Copies (Net Press Run): 124,946. B. Paid and/or Requested Circulation. (1) Sales through dealers and carriers, street vendors and countersales: 36,020. (2) Mail Subscription (paid and/or requested): 44,500. C. Total Paid and/or Requested Circulation: 80,520. D. Free Distribution by Mail, Samples, Complimentary, and Other Free Copies: 1,196. E. Free Distribution Outside the Mail: 1,775. F. Total Free Distribution: 2,971. G. Total Distribution: 83,491. H. Copies Not Distributed (1) Office Use, left over, spoiled after printing: 107. (2) Return from News Agents: 41,348. I. Total: 124,946 Percent Paid and/or Requested Circulation: 96.4%. Actual number of copies of single issue Published Nearest to Filing Date. A. Total Number of Copies (Net Press Run): 122,254. B. Paid and/or Requested Circulation. (1) Sales through dealers and carriers, street vendors and counter sales: 36,558. (2) Mail Subscription (Paid and/or requested): 41,548. C. Total Paid and/or Requested Circulation: 78,106. D. Free Distribution by Mail, Samples, Complimentary, and Other Free Copies: 1,013. E. Free Distribution Outside the Mail: 2,040. F. Total Free Distribution: 3,053. G. Total Distribution: 81,159. H. Copies Not Distributed (1) Office Use, left over, spoiled after printing: 200. (2) Return from News Agents: 40,895. I. Total: 122,254. Percent Paid and/or Requested Circulation: 96.2%. This statement of ownership will be printed in the January issue of this publication. I certify that the statements made by me above are correct and complete.

Gary W. Dolzall
Associate Publisher

ADVERTISER INDEX

Ace Hardware Hobbies 73-77
Aero-Car Technology 263
Airtronics 9
AJ Productions 255
America's Hobby Center, Inc. 212-219
Associated Electrics 10-11,80-81,104-105,169,184-185,275,287
B&B Software 249
B&T R/C Products 255
Badd Boyz Batteries 263
Bennett Equipment 248
Boca Bearing 252
Bolink R/C Cars, Inc. 286
BRP Products 211
Bruckner Hobbies 126
BSR Enterprise 168
Burien Toyota 256
Byron Originals 252
C&M Manufacturing 170
Calandra Racing Concepts 243
Classifieds 253
Competition Electronics 194
Competition R/C Imports 243
Custom Electric Cars 276
Dahm's Racing Bodies 129
Davis Diesel Development 248
Dillion Racing 256
Dirt Bagz USA 274
Endless Horizons Inc. 170
ERI Associates, Inc. 276
ESP Hobby Manufacturing 262
ExCell Racing Products 111
Fantom Racing 269
Frewer International 124
Futaba Corp. of America 172
G. H. I. 269
Hammad Ghuman 289
Hitec/RCD, Inc. 35, 43
Hobbico 62,84,130,186-189,223,240,264-267,278
Hobby Etc., Inc. 123
Hobby Mart 128
Hobby Products International 22-23, 39
Hobby Shack 239,259-261
Hobby Tow 269
Hobby Warehouse of Sacramento 270-273
Hobbytown USA 242
Holeshot Racing Products 276
Honda House Motor Speedway 256
Horizon Hobby Distributors 54, 191-193
I. M. S. International Model Shop 254
Innoventive Technologies, Inc. 274
Japan R/C Imports 125
Kinetics 262
Kyosho Corporation 14-15
Lunsford Racing 263
M. I. P. 183, 228
Maxmod Mini Sports 262
Maxtec Development 171, 277
McAllister Racing 279
Model Rectifier Corporation C4
National R/C Truck Pull Association 248
Novak Electronics 21, 25, 53, 87-92
Parma International Inc. 19. 255
PC/RC 47
Peak Performance 127
Planet Software 27
Precision Micro Electronics 129
Pro Match 120
Pro-Line USA C3, 6-7, 195-210
Progressive Technologies 173
R/C Car Kings 244-245
Raborn Racing Originals 256
Race Prep Racing Motors 255
Ranch Pit Shop 64-65
R/C Car Action Tech Center 250-251
RCHTA 259
Realistic Racing Colors 276
Robinson Racing Products 166
RPM 54
S.E.T. Racing 252
Savon Hobbies 98-101
Schumacher, Inc. 50, 119
Serpent Model Racing Cars 164-165, 190
Sheldon's Hobbies 280-285
Sky Computers, Inc. 268
Slixx Decals 211
Southside Hobby's Inc. 262
Stormer Hobbies 56-57
Tamiya, Inc. C2, 44-45
Team Losi 16-17, 49,169,252
Team Orion 41, 241
Tekin Electronics 115, 179-182
Testor Corporation 211
Thunder Tiger 61
Tower Hobbies 230-238
Traxxas Corporation 224-227
Trinity 3,4,5,12-13,28,32-33,93,131-162
Triumph Enterprises 69
Victor Engineering 129
W. S. Deans, Inc. 229
Wood Racing 249
World Class, Inc. 97
Yokomo Ltd. 78-79

RADIO CONTROL CAR ACTION (ISSN 0886-1609, USPS 001-087) is published monthly by Air Age Inc., 100 East Ridge, Ridgefield, CT 06877-4606, USA.

Periodical postage permit paid at Ridgefield, CT, and additional mailing offices.

SUBSCRIPTION PRICES. U.S.: 1 year, $34.95; 2 years, $59.95. Canada: 1 year, $51.31; 2 years, $91.97 (Canadian prices include G.S.T.). Elsewhere: 1 year, $47.95; 2 years, $85.95. Canadian G.S.T. registration no. 13075 4872 RT.

EDITORIAL. Send correspondence to Editors, *Radio Control Car Action,* 100 East Ridge, Ridgefield, CT 06877-4606. We welcome all editorial submissions, but assume no responsibility for the loss or damage of unsolicited material. To authors, photographers and people featured in this magazine: all materials published in *Radio Control Car Action* become the exclusive property of Air Age Inc., unless prior arrangement is made in writing with the Publisher.

ADVERTISING. Send advertising materials to Advertising Department, *Radio Control Car Action,* Air Age,100 East Ridge, Ridgefield, CT 06877-4606; phone (203) 431-9000; fax (203) 431-3000.

CHANGE OF ADDRESS. To make sure you don't miss any issues, send your new address to *Radio Control Car Action,* P.O. Box 427, Mount Morris, IL 61054-9853, six weeks before you move. Please include the address label from a recent issue, or print the information exactly as shown on the label. The Post Office will not forward copies unless you provide extra postage.

POSTMASTER. Please send Form 3579 to *Radio Control Car Action,* P.O. Box 427, Mount Morris, IL 61054-9853.

Chris's Back Lot

Switzerland's Sylvie Danand is Team Orion's head maintenance mechanic and driver-support person. Reports are that she also really knows how to handle herself on a skateboard.

With a look of determination, this girl is off to an early start. I see many checkered flags in her future.

This is my page—mine!

The opinions expressed on this page do not necessarily represent the opinions of the entire *Car Action* staff. Any resemblance to reality is purely coincidental. Send your correspondence, hate mail, love letters, photographs—anything you like—to Chris's Back Lot, c/o *R/C Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606. My internet address is: chrisc@airage.com.

Racy Women

Move over boys,

here come the girls. This is for you talking nematodes who haven't yet gotten it through your thick Cro-Magnon skulls that a lot of kick-butt women out there love the heat of competitive racing: women with fight in them—the best kind, in my humble (though some would argue "whacked-out") opinion. These women are involved in all aspects of R/C racing from parking lot to world-class. By the way, boys, they are not easily impressed; so, if you happen to bump into one of them at the track, just try to be yourself.

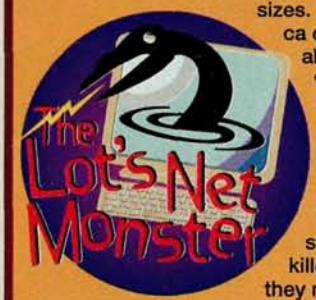
Left: California's Mandy Richter is not only an accomplished parking lot competitor, but she's also a skilled airbrush artist. The sedan body she's holding is but one example of her fine work.

Above: Katarina Cernouska, Czechoslovakian IFMAR 1/12-scale Team Manager.

Left: Vicki Carrubba is the third woman in IFMAR history to compete in the World Championship. Right: Germany's Melanie Fliessbach performs delicate tweaking and soldering operations for the Fliessbach Racing Team.

R/C V8

Chris, my experience of R/C cars is only a year old and this may sound like a stupid question, but please don't laugh too hard. Last night, out of boredom I watched the "Home Improvement" season premiere on ABC. In the beginning of the show, they did a salute to engines of all sizes. They had a replica of a V8 that actually worked and was in a body that seemed to look like a 1/10- or 1/8-scale model of a Corvette. It looked & sounded like a killer street rod. Do they make such a model for R/C; if they do, how can I get one? The engine wasn't like your standard gas engine; this thing ripped.



If you can help me out thanks in advance. By the way: I love your idea on rally racers, I just finished mine & it kicks ass!

Ruben Aranda
vtech@flash.net

Ruben, the only stupid question is the one that isn't asked. I've seen and heard that V8 run at trades shows. It sounds just like you'd imagine a miniature V8 would sound. Totally cool! It runs on alcohol glow fuel—quite powerful. They are still made, but unfortunately very expensive. Here's the address: Conley Precision Engines, 825 Duane St., Glen Ellyn, IL 60137.

Feel free to whine away

Chris, as you suggested in "your page" in November, I have taken the first step: I bought that bottle of after-run and applied it to my sacred O.S. RX-B engine in my Inferno. I want to save my investment and to use it, i.e., run the car. I am having great difficulty with this engine and am not at all coming to you to wine [sic] about how glow engines suck. My main goal is to reach someone who knows what he's talking about.

Here's my problem: I bought this engine second-hand without any instructions and, therefore, I am lost. My questions: what would be the "ideal" starting place for my stock carb? And what does each of the adjustments do?

Your help and advice will be taken into great consideration before I attempt to fire this engine up again. Also, if there are any back issues that I could look at dealing with engines and getting them up to speed, then just mention them, and I'll hit the stack of mags and/or the library. Thanks for your help,

Jeff Rodenkirch
jeff rodenkirch <jmustang@slu.edu>

Jeff, the only guys I don't want to hear any whining from are the ones who don't follow manufacturers' recommendations concerning oil content in the fuel they use. (O.S. recommends no less than 18 percent by the way). Other than that, I want you guys to whine all you want with your "gas-power" questions. That's why I'm here.

As to your questions, Jeff, I'm sure you can call customer service at Great Planes and get a new set of instructions. The only thing as important as the instructions is reading them! That being said, if you can't wait for your set of instructions to arrive, start by opening your main needle valve 3 to 3½ turns open from fully closed. That should put you in a starting place where the mixture is safely in the "rich zone" With any luck, from there, you'll be able to continue with further fine-tuning adjustments. Since all engines are a bit different, this may even be too rich for sustained running. But it's better to start off too rich than too lean. If the fuel-delivery system is in good order, the plug is good, your starter battery is fully charged and the fuel is fresh, you shouldn't have a problem—that is as long as your second-hand engine isn't worn out. If it is, well, that can be fixed, too. But that's another story and I'm out of space for this month.
Good luck. Let me know how you made out.
CC