ROAR MONSTER TRUCK CHAMPIONSHIPS!

FEBRUARY 1992

RADIO CONTROL MODEL CARS AND TRUCKS

VOL. 7, NO. 73

C&M Left Turn Only/On Road COBRA LTOOR



KYOSHO'S HEAVY METAL MONSTER!

QUARTER SCALE SPECIAL!



- VEGAS SUPERNATIONALS
- KNOXVILLE '91
- STEERING SECRETS

COBRA THE RACERS CHOICE

52

C&M MFG.

Double-Duty 1/12 ROCKET!

USA $2.95
Canada $3.95
46823

02
0 71896 46823 6

FUN IN REVERSE!

FASTER IN BOTH DIRECTIONS!

- Proportional Forward & Reverse
- Adjustable Reverse Delay
- Wired with Tamiya Battery Plugs and Bullet Motor Plugs
- Thermal Overload Protection
- Plug-Compatible with all Popular Radio Systems
- For use in any Monster Truck (dual motor models included) Clod Busters, JR-XTs, RC-10s, ETC.



2 X Actual Size

Team Novak's new high frequency speed controls are hot. World Champions in their first year. And now you can get all the speed, power and run time advantages of Novak's state-of-the-art technology in a reversible speed control.

Introducing the Novak 610-RV.

The 610-RV's high frequency operation delivers smooth, linear power for the ultimate in control and run time. Its super low voltage drop means instant response for that extra burst of power when you need it. And the built-in reversing circuit lets you back out of trouble without the wiring hassles and weight of separate reverse modules.

In a Jam? With the 610-RV's reverse drive you can power out easily. And since it's a proportional reverse, you can ease it out or blast it because you've got as much throttle control going backward as forward. Plus, there's an adjustable 0-3 second reverse time delay so you can use your brakes while racing around and not worry about reverse kicking in too soon. All this and Team Novak's reputation for quality and reliability.

For a high-performance, high frequency speed control that can help you get out of as much trouble as you get into, there's only one answer. The Team Novak 610-RV. Faster in both directions.

OFTEN COPIED, NEVER DUPLICATED.

Team NOVAK

NOVAK ELECTRONICS, INC. 128-C East Dyer Rd., Santa Ana, CA 92707 • (714) 549-3741

©1991 Novak Electronics, Inc.

Andy's

R/C PRODUCTS AND PAINT



*3149 AUDI QUARTO GTO
1/10 BODY



*3153 NPT-91
NISSAN GTP, 1/10

LOOKIN' GOOD!



*3019 PRO ARROW "OFF-ROAD", 1/10



*3152 LOTEC GTP, 1/10
Winner of '91 ROAR NATS A 1-2-3 Victory



*3032 CHEVY EXTENDED CAB
OFF-ROAD "RACE TRUCK"



*3160 PONTIAC GRAND PRIX
NASCAR 1/10

*3170 PONTIAC GRAND PRIX
NASCAR SUPER SPEEDWAY 1/10

Andy's

**Bodies Available in Paint*

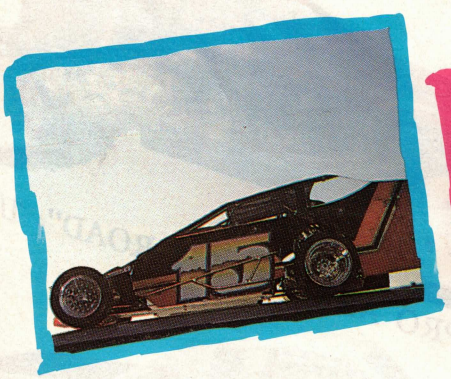
1710 Grevillea Court · Ontario, CA 91761
(714) 923-6155 · FAX (714) 923-6156

RADIO CONTROL MODEL CARS AND TRUCKS

FEBRUARY 1992

FEATURES

SEEN IN CHICAGO 18
SOUTHEASTERN PULLING CHAMPS / *Jack Wright* 26
MONSTER TRUCK CHAMPIONSHIPS / *Gene Husting* .. 30
Q-SCALE SUPERNATIONALS / *Tom Nusbickel* 42
KNOXVILLE NATIONALS 47
KYOSHO'S HEAVY METAL / *R.C. Canon* 48
BOLINK'S LTO SS / *Jack Wright* 52
FRANKENSTEIN DIRT OVAL CAR / *Rick Eyrich* 58
RCHTA'S SCENE IN CHICAGO / *Gene Husting* 60
C&M'S 1/12TH LTOOR / *Derek Arita* 66
KENDRICK'S SUPER MODIFIED 82
HOLLY FARMS 400 / *Jack Wright* 90
LAGUNA SECA '91 / *Richard Dowdy* 92





DEPARTMENTS

Letters 8
Answerman 10
All About Batteries 12
Readers' Pages 14
Big Tips 20
Trackside 22, 38
Racing in Australia 24
Art of Quarter Scale 34
Truckin' 36
Scene in the Pits 70
Track of the Month 88

R/C MODEL CARS
898 W. 16th St.
Newport Beach, California 92663
Phone: (714) 645-8830

STAFF
PUBLISHER
Mark Thiffault
EDITOR
Richard Dowdy
DESIGN DIRECTOR
Mike Ogle
ADVERTISING DIRECTOR
Don Kremers
ACCOUNTING MANAGER
Robert Ruiz
OFFICE STAFF
Edna Clark
Luis Garcia
Heidi Johnson
Betty Simpson

CONTRIBUTING EDITORS
Derek Arita
Tony Burlison
Reed Deanfield
Rick Eyrich
Gene Husting
Vernon Lewis
Mike Liem
Eloy Marez
Norb Meyer
Tom Nusbickel
Snuffy Smith
Stan Smith
Bill Strauss
Jack Wright

R/C MODEL CARS MAGAZINE (ISSN088774689) is published monthly at the editorial offices, located at 898 W. 16th Street, Newport Beach, California 92663. Phone (714) 645-8830. **CONTRIBUTIONS:** All contributions are welcome. Address your submission to Editor, R/C Model Cars, 898 W. 16th St., Newport Beach, California 92663. Please enclose postage with manuscripts, photographs and illustrations if material is to be returned. R/C Model Cars accepts no responsibility for unsolicited material. All photos should be packed carefully and marked PRESS PHOTOS—DO NOT BEND. All materials published in R/C Model Cars become the exclusive property of Gallant Models, Inc., unless prior arrangements have been made in writing with the publisher. Gallant Models, Inc. assumes no responsibility for unsolicited material. Manuscripts and photographs accompanied by an SASE will be returned. **SUBSCRIPTIONS:** One year (12 issues) $25.00 per year. $47.00 for two years. Single copies $3.25. Subscriptions outside the US (except APO & FPO) $38.00 for one year, two years $68.00. All payments must be in U.S. funds drawn on a U.S. bank. Copyright 1992 by Gallant Models, Inc. All rights reserved. Reproduction without permission prohibited. **CHANGE OF ADDRESS:** Six weeks are required to change your address. In the meantime, forwarding postage is paid by you, and lost copies cannot be replaced. Send old address at least six weeks before you move, and include new address. **POSTMASTER:** Send address changes to R/C Model Cars, 898 W. 16th St., Newport Beach, California 92663. **ADVERTISING RATES:** Rate card is available on request. Contact the advertising manager at the editorial address, or call (800) 243-9593, or in California, (714) 645-8830. **HOBBY SHOP ORDERS:** Contact R/C Model Cars, at 898 W. 16th St., Newport Beach, California 92663 for details. **BACK ISSUES:** Most are available. Send the month/ year for issue(s) desired, along with $4.00 per copy. Magazines will be mailed second class, postpaid. Foreign orders, write for details. SECOND CLASS POSTAGE is paid at Newport Beach, California, and at additional mailing offices.



RED TIRES ARE TURNING HEADS

STADIUM TRUCK

Fits any 2.2" wheel

At **PRO-LINE**® U.S.A. our **RED** racing tires were developed to win races. To accomplish this goal, our engineers have combined high performance rubber with treads designed for the most specific track conditions. This superior performance brought the #7065 & #7090 combination a First, Second & Third place sweep at the 1991 NORRCA TRUCK NATIONALS. At the Florida Winter National's, **PRO-LINE'S** #7080 & #7090 REAR TIRES gave the winning drivers an unfair advantage, allowing them to dominate the truck & car classes. If your local dealer doesn't carry **RED** Tires, give us a call! We'll help you track some down.

OFF-ROAD

Front fit 2.1" and Rear fit 2.0" wheel. #7022, #7081 & #7101 Rear fit 2.150" "ROAR LEGAL" PRO-LINE® or 2.2" wheel.

PRO-90
#7090
2WD/4WD
Front or Rear
Mini-Pin
Medium to
Hard Packed
Conditions
1991 NATIONAL CHAMPION

PRO-80
#7080
2WD/4WD
Front or Rear
Mini-Pin
Medium to
Hard Packed
#7081
"ROAR LEGAL"
2.150" Tires

PRO-25
#7025
2WD
Front Only
Multi-Rib with
Staggered Bars
Loose to
Medium Packed
Conditions

PRO-75
#7075
2WD
Front Only
Spike
Loose to
Medium Packed
Conditions

PRO-65
#7065
2WD/4WD
Front only
Multi-Rib
w/ Mini
Staggered bars
All Conditionds
1991 NATIONAL CHAMPION

PRO-100
#7100
2WD/4WD
Front or Rear
Stepped Spike
Loose to
Medium Packed
#7101
"ROAR LEGAL"
2.150" Tires
WORLDS SPECIAL EDITION

PRO-21
#7021
2WD/4WD
Front or Rear
Course Pin
Loose to
Medium Packed
#7022
"ROAR LEGAL"
2.150" Tires
WORLDS SPECIAL EDITION

PRO-85
#7085
2WD
Front Only
Medium Pin
Loose to
Medium Packed
Conditions

PRO-50
#7050
2WD/4WD
Front or Rear
Medium to
Hard Packed
Conditions

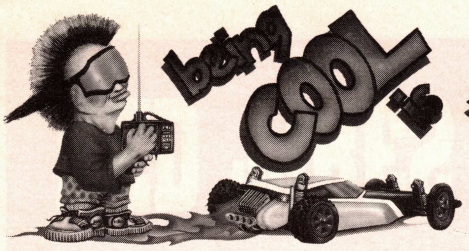
RACING TO BRING YOU THE BEST.

PRO-LINE®

Track facilities featured in ad courtesy of Outlaw RC Hobbies and Raceway, Highland, California.

Pictured above:
Left, RC10T with Chevy Stadium body (3013), front tires (7045) and rear tires (7050).
Right, RC10 with Magnum Racing body (3019), front tires (7025) and rear tires (7060).

P.O. BOX 456, BEAUMONT, CALIFORNIA 92223 • 714.849.9781 / SEND $2.00 FOR OUR 1992 FULL LINE CATALOG

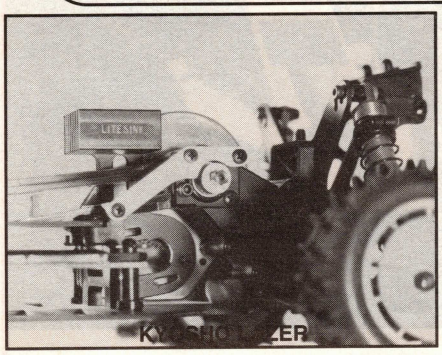


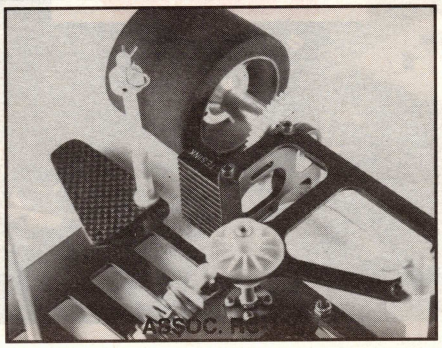
MORE TORQUE
HIGHER SPEED
LONGER RUN TIMES
EXTENDED MOTOR LIFE

LITESINK®

LITESINKS ARE THE PERFORMANCE MOTOR COOLING HEATSINKS FROM LITESPEED, AND A LITESINK COOLED MOTOR IS THE HOT SET-UP TO GET MAXIMUM POWER AND PERFORMANCE FROM YOUR R/C CAR.

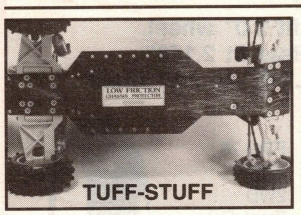
NEW • LIGHTER WEIGHT • MORE COOLING





HEAT drains motors of power. HEAT is not cool, but a LiteSpeed LiteSink is! NOTHING beats a LiteSink for removing unwanted motor heat! The race proven LiteSink design can lengthen run times by 20-40% and provide the option of gearing for higher top speed. A LiteSink will increase your motor's torque and speed. Experience the increased power of running a LiteSink and burn up the track, not your motor.

AVAILABLE FOR MOST POPULAR CARS AND TRUCKS



TUFF-STUFF

Low friction covering reduces drag & stops costly chassis wear.



SUPER-CONS

The lowest resistance highest performance connectors available.



HEAT-FLO GASKETS

Special heat transfer gaskets seal out dirt and aid motor cooling.



TO RECEIVE OUR **NEW CATALOG** WITH MORE INFORMATION ABOUT THESE AND OTHER QUALITY LITESPEED PRODUCTS, SEND YOUR NAME, ADDRESS, AND (2) STAMPS TO:

LITESPEED® INC.
P.O. BOX 4765
SPOKANE, WA 99202
(509) 535-2717



Track Time

Traveling from sunny California to Chicago, one conjures up some expectations, but nothing can get you ready for the shock of stepping into an airliner from an 80-degree, sunny morning and stepping out four hours later into a 20-degree afternoon! Man may not have been meant to fly, but he definitely wasn't meant to endure such swift and diabolical climatic changes!

All that aside, the warm welcome received once we stepped into the exhibition hall thawed our chilled bones in short order. The Seventh Annual RCHTA Hobby Show was a grand affair, with wall-to-wall exhibitors offering up a cornucopia of bright, shiny new products to drool over, and drool we did! Thursday and Friday were dealer days—a chance for hobby shop owners to tour the show and place orders for the coming year. This was when we did most of our own sightseeing and handshaking, before the general public poured in Friday evening, when there was still room to move and talk with exhibitors who could devote some of their attention to the press. So, what'd we see? In a word, lots! In this brief overview we'll hit some of the highlights, then in coming issues we'll bore down on noteworthy items for R/C car enthusiasts in more detail. But for now. . .let's browse!

Great Planes/Kyosho was exhibiting a four-wheel drive Toyota 4Runner with a remarkably realistic body and undercarriage, and it should be reaching dealers' shelves by the time you read this, if not already there. **Tamiya** showed its limited-edition Astute, surely a winner with racing enthusiasts. **Custom Works R/C's** new Enforcer 1/10th-scale electric sprint car was making impressive laps on the carpet track; it comes with a graphite chassis, a ball differential, and adjustable independent suspension. A purpose-built racer (rather than a conversion kit), the Enforcer should be a popular addition to oval track racing. **TRC** had their good-looking Python 1/10th-scale gas on-road racer on display, and it was getting a lot of attention from the crowd, indicating the continued interest and popularity of 1/10th gas cars. One of those companies that has long been involved in gas racing, **Serpent,** was represented in Chicago by **RCM (Radio-Controlled Motorsports),** with the Impact onroad racer, available in a .10 and .12 engine configuration. Also shown by RCM was the Tenforce 1/10th electric racer (reviewed here in next month's issue). This is an exceptional onroad racer, with an extremely narrow chassis and full suspension. Just the chassis for Indycar or F1 bodies! RCM was very secretive about their two-speed 1/10th-scale gas car, keeping it under the counter and out of the range of photographers' lenses. Too bad; it is a beau-

Continued on page 18

4 ways to be #1

KYOSHO®



Ultima II



Turbo Ultima II



Ultima Pro XL



Outlaw Ultima Racing Truck

© 1991, Hobbico, Inc.

Whether you're just starting out in R/C or you're a veteran racer, the Kyosho Ultima series, based on its World Championship design, offers a model that's just right for you. A lightweight, space-age Kelron™ composite chassis throughout the line (graphite chassis included in Pro XL) is just one feature that makes these models standouts in the 1/10 scale, 2WD off-road category.

Affordable performance for the first-time racer

The Kyosho Ultima II, perfect for the first-time racer, includes adjustable front and rear upper suspension links for easier trackside adjustments, oil-filled, coil-over shocks mounted on duraluminum shock towers for improved handling over rough terrain, a LeMans Stock 05 motor, and a heavy-duty rotary speed control. Affordably priced, it can be hopped-up when you're ready for more action.

The Turbo Ultima II gives value-conscious racers the competitive edge with ball bearings, Kyosho gold shocks, ball differential, fiberglass shock towers, a 22 x 1 Mega Outlaw Stock motor, and fully-adjustable front and rear upper camber rods.

The advanced racer's choice for the '90s

The Ultima Pro XL offers advanced racers the winning combination of power and performance with a longer wheelbase graphite chassis with 30 degree kickup and wider front end for improved handling and stability. Long rear suspension arms for a smoother ride, gold shocks, front and rear anti-roll bars, and rear "A" arms which feature unique, adjustable toe-in complete the package. Motor, battery and speed control not included.

Introducing the Ultima racing truck

The Outlaw Ultima brings proven Ultima technology to truck racing with new, lightweight racing wheels, chassis side guards, pin-spike tires for superior speed and handling, four long shocks—front and rear, duraluminum shock towers, a Super Stock 34 motor (ROAR legal), and a heavy-duty rotary speed control.

From beginner to expert racer, you'll find a Kyosho Ultima to fit your needs. See your local hobby dealer for the complete Ultima line.

For more information, please write for information packet No. 919.

DISTRIBUTED TO LEADING RETAILERS
NATIONWIDE EXCLUSIVELY THROUGH

GREAT PLANES™

MODEL DISTRIBUTORS COMPANY
P.O. BOX 4021, CHAMPAIGN, IL 61824-4021



"Kyosho has produced a car with real potential at an affordable price...this car can race with the best of them!" – *Radio Control Car Action*

Letters

COMING TO AMERICA

Dear *RCMC,*

I am in the process of getting a Clodbuster and I would like to know of some hop ups for it. I keep saying to my Mum that I will move to America as soon as I can so I can race R/C cars all I want to. Also, if it's not too much trouble, could you send some info on that hot Dick Tracy car for my brother? Thanks. By the way, your mag rules.

Michael Chrichton
Toorak Gardens
South Australia

Mike: Howzit, mate! Our December, 1990 issue has a feature by Jack Wright called "Chrome Clod" that shows some killer modifications for your Clodbuster. Come on over and race anytime, okay? —Ed.

Dear *RCMC,*

A friend said you all had a story in your magazine about turning a Team Losi JR-X2 into an oval racer. I have some issues, but I can't find that article. Do you know where it is?

Jere Bettels
Ft. Worth, Texas

Jere: Rick Eyrich wrote a feature on turning a JR-X2 offroad car into an asphalt oval racer in our September, 1991 issue. Copies are still available from our back issue department.—Ed.

NUTS ABOUT CARS

Dear *RCMC,*

Hve you seen the new magazine on real car racing? It's called *Racing For Kids.* Anyway, I saw an article on Kyle Petty. The article wasn't the best, but it had radical pictures. I decided to make a lookalike of his Mello Yello -sponsored car. What company makes the best Lumina? What company makes Mello Yello Decals?

I also saw an article on my absolute favorite driver, Rick Mears. I would like to do a lookalike of his Marlboro-sponsored Indycar. What company makes the best moderately priced Indycar replica (1/10th scale or 1/4-scale)? What company makes Marlboro decals with car #3? Your mag is great!

Joel Wolpert
Weatogue, Connecticut

Joel: Parma International makes a fine Chevy Lumina/Mello Yellow car kit, complete with decals. If you want Kyle's #42 decals, check with Autographics (805) 836-2886. Great Planes/Kyosho make an excellent 1/10th scale Indycar kit that comes with Rick Mears old Pennzoil decals. This can be changed to his current Penske Marlboro team colors by using Autographics decals. In quarter-scale, RACO makes a beautiful Indycar that can be decorated as you wish. You can contact RACO at (714) 546-3045.—Ed.

OUT OF THE PAST

Dear *RCMC,*

As a frequent reader of your letters column, I thought you might be able to assist me. Recently, while rummaging through my old R/C equipment, I came across the RA/CAR Sonic R/C Formula 1 car that I ran in 1968. It is a neat old piece with a McCoy .19, shiftable two-speed transaxle, real magnesium wheels, and piano wire independent suspension. I would like to contact anyone out there in R/C land who also has one of these machines and/or parts. Maybe we can start a vintage R/C car group. Thank you for your time and attention.

Jon Schwartz
Box 73
Mercer Island, Washington 98040

Dear *RCMC,*

I have been looking for some replacement parts for converting my Tamiya Hornet into a truck. I have had no luck at my hobby shop and I'm hoping that you can give me some direction. Thanks in advance for your help.

Cory Fenton
Columbia, South Carolina

Cory: Custom Racing Products (CRP) in Atascadero, California has some vintage R/C car parts in stock, including a basic truck conversion kit for the Hornet, and front and rear body mounts and front wheel adapter nuts for truck wheels. One caution: they are noting that quantities are limited, so you had better act fast. Give them a call: (805) 466-6974.—Ed.

GTO CRAZY

Dear *RCMC,*

After seeing the January issue with the Tamiya Nissan GTO racer I had to write to tell you that it was my favorite GTO racer on the IMSA racing circuit last year. Your photos of the car model and the real car were an inspiration to me to get a new body and paint mine over again. It has suffered some wall damage and road rash from a lot of heated competition this past summer. I think your continuing features on full-size cars with the model counterparts are excellent and really help modelers in detailing their cars. Steve Millen's a hot truck racer, too. I saw him at the Mickey Thompson race at the Rose Bowl last year. He stomped!

Terry McGraw
Rosemead, California

LADIES IN DRAG

Dear *RCMC,*

My name is LoLo Mason and I am an R/C drag racer. I have been racing in the Top Fuel class for over a year. I have a Fine Design Streamliner Rail which I have raced at over 84 mph with my lowest ET being 1.86 seconds (please make no mistake—I wrench this car myself). I have had great teachers: my son David Williams, my husband Ken Mason and Fine Design's Chris Fine and Rich Roth.



Lolo on the line

Last June I participated in my first IEDA East Coast Nationals. I didn't win but I feel I accomplished something because I did do well in the B-main. While at the Nationals I noted that I was the only woman racer. This surprised me because I know there are other women racing competitively. I remember reading about Christine Gabriel when she won Pro Stock at the IEDA Worlds in 1991 in your magazine. I thought she should have received more recognition just as the male racers. You had pictures of the male racers, a variety of cars and even Miss Drag World. Is it possible for you to devote more articles and recognition to the women who actually race? Or better yet, how about an article on the women racers in R/C racing?

LoLo Mason
Washington, DC

SUPER MODIFIED

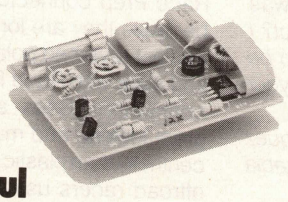
Dear *RCMC,*

I saw your photos of the Kendrick sprint and super modified cars in the January issue, and I was wondering if you were going to feature more of these cars. They look really good. I was very impressed with the Coyote 1/10th sprint car shown in your October issue as well, and I am hoping that we can see more of these cars.

Dawson Felder
Grand Pass, Missouri

Dawson: This month we feature Gary Kendrick's East Coast Super Modified 1/10th racer (electric) on pages 82-83. For more information on the Coyote sprint car, contact B-B Models, (505) 883-4561.—Ed.

SIX REASONS THE SUPER RACE STATION IS THE #1 CHOICE IN SOLDERING.



1. Powerful

A sophisticated "power–brain" actually senses tip temperature and adjusts the output to hold whatever temperature you've chosen. There's so much power available with the Ungar Super Race Station, soldering will be a joy...not a headache.

4. Safe

The handy stand keeps the iron safely out of the way of car components in your pit area.





5. Adjustable

Select any temperature between a mild 400° for detail work to a blistering 800° that's more than enough for batteries, motors and field work.

2. Cool

Cool–grip handle makes sure the heat goes to your work, not to your hand.

6. Handy

The clean–up sponge helps keep a clear tip for clean, strong solder joints.

3. Heavy Duty

Unlike any other iron, this one has a special high mass thermal thrust tip that's perfect for high–powered R/C use. Interchangeable tips expand the iron's uses, too.

For less than you'd spend on a good speed control, you can have the best soldering station money can buy. The one found in the pits of more champions than any other brand. See your neighborhood dealer and ask for the Ungar Super Race Station (UNG300S), and experience the best there is.

ungar®

Exclusively distributed by Horizon Hobby Distributors, Inc.

Answerman

Dear Answerman,

I love the Coyote Sprint car that Richard Dowdy wrote about in your magazine. I have been thinking about building and racing a sprint car, and I was going to buy a Big Boy Toy Desperado until I read about the Coyote. It just seems like the Coyote is quite expensive. Do you think the Desperado is a better buy? Thanks.

Thomas Koert
Goshen, Indiana

A. Thomas, as Richard points out in his review, the Coyote is a limited production car. Given the fine craftsmanship and all the engineering that went into the design of the Coyote, the cost is more than justified. What you have to keep in mind with conversion kits like those from Big Boy Toy is that the cost of the conversion kit does not include that of the base car. The Coyote is a complete car. It's also much more realistic in appearance than the typical conversion sprinter.

Dear Answerman,

I've been interested in R/C for a long time. I just recently purchased two cars, a Cox .049 Nissan and a Traxxas Fiero. That brings me to two questions. Can I put holes in the Nissan where the real Nissan has for cooling? Also, what can I do to upgrade my cars?

Dewayne Cox
Columbus, Ohio

A. Dewayne, I don't think cutting out the molded radiator and brake ducts on your Nissan GTP body would be a good idea, as this would weaken the front area (where you're most likely to crash!) of the body considerably. The Nissan GTP uses standard running gear and hardware instead of metric so you should be able to adapt readily available American-made 1/12-scale parts to your car. I would start with a set of wheel bearings.

Dear Answerman,

You have a great section in the magazine. My question is, does the OS CZ-R engine have reverse and what's the maximum speed? And if the engine has a zip starter, do you also need an electric starter and a glow plug starter?

Jaime Ramos
Dorado, Puerto Rico

A. Jaime, glow engines like the CZ-R were not intended to be run in "reverse." You would have to devise a special transmission that incorporates a reverse gear to allow the car to be run in reverse. With a zip starter, you don't need an electric starter, but you do need a glow plug battery to start the engine

Dear Answerman,

I read in your magazine that the Novak T-4, according to Tyree Phillips from Novak, can be used with modified motors with no problems. I have an Associated RC10 that I bought with the T-4. When the motor wore out, I bought a Trinity Triad, but the speed control got so hot after running the car that I couldn't touch it. I then bought a Dialed speed control and I don't have the overheating anymore. Do you think my T-4 was defective? Is it normal for it to get so hot? I have told my wife to send it to Novak to be repaired, if necessary. Thank you for your time.

PFC Carlos Vasquez
Khobar, Saudi Arabia

A. Carlos, although I recommend the reliable T-4 for stock and mild modified motor applications, the speed control is capable of heavier-duty use. I recommend use of high-performance speed controls with hot modified motors because of the "on" resistance and voltage drop rating of such units, which allows you to take full advantage of the motors.

You did the right thing by having the experts at Novak check your T-4. The T-4 is equipped with heat-sensing Tempfet circuitry, which protects the unit against excessive thermal build-up, so I doubt seriously if any permanent damage has been incurred.

Dear Answerman,

I recently put Clodbuster tires on my Blackfoot and the leads on my speed control keep unsoldering themselves. What will I have to do? If the answer is an electronic speed control, which would be the one to use that would cost the least? I am on a limited budget.

Steven D. Joyce
Mayodan, North Carolina

A. Steven, your stock mechanical speed control may be "overheating" from poor wiper contact, which causes arcing. Try cleaning the contact points with a pencil eraser. If that fails to remedy the problem, the contact points may be worn. I'm a great believer in electronic speed controls, but a manual unit, preferably a sealed speed control like Kyosho's, should do the job for you. An ESC like Novak's T-4 would be a good low-cost alternative to the manual unit.

Dear Answerman,

I recently bought a used Tamiya King Cab. It has a LeMans 360ST motor, an AristoCraft Hitec speed control with reverse, Futaba Magnum Jr. radio and Race Prep connectors. I'd like to get a new motor and connectors and a set of Sees aluminum wheels. I'd like your advice on these decisions. I'm new to this hobby and am going to race my truck at the local dirt track. Thanks!

Ryan Evans
Trenton, Illinois

A. Welcome to the sport, Ryan! For a new motor, get a stock-type motor from a reputable manufacturer, such as Reedy or Trinity. Race Prep connectors are a good choice because they are long lasting and oriented against reversed polarity, so I'd suggest that you stick with Race Prep when buying new connectors. Sees aluminum wheels are great looking and much closer to true concentricity than plastic wheels. However, most offroad racers use the plastic wheels because they're lighter and much cheaper to replace in the event of damage.

Dear Answerman,

I know you don't want anymore "which car" questions, but I really need your help. I am a big fan of Ferrari and I'd really like to get a radio-controlled Ferrari F1 car. I want a car that looks good but can be raced also. Should I get the Kyosho Ferrari or the Tamiya one? Your advice would be greatly appreciated.

Edward Ingold III
Brooklyn, New York

A. That's a tough choice, Edward. Kyosho's Ferrari F1 car, with its pull-rod front suspension and scale details, is easily the better looking of the two. On the other hand, Tamiya's Ferrari has the features you want for racing, features like a full-floating rear pod and a ball-type differential. If what you want is a scale model that can be displayed in your living room, the Kyosho Ferrari F1 would be the obvious choice. But if you're going to race, you should get the Tamiya Ferrari F1.

Dear Answerman,

I need advice on setting up the 10L-SS for concrete oval racing. Should the front and rear ends be tweaked? Should all six batteries be on the left? What's the best way to add camber? Should the left side and the right side be fixed differently? Should the springs on the front suspension be the same on each side? When should you use soft, medium, or heavy springs? How do you set up the rear dampener? What difference will it make if it's loose or tight? How do you set up the shock for smooth or bumpy tracks? Let's say you have the car set up with TRC Golds on all corners and the car either pushes or oversteers. You've adjusted the wing either backwards or forwards and the car still

Continued on page 37

PARAGON
RACING PRODUCTS

Superior Performance Products for the Serious RC Enthusiast . . .



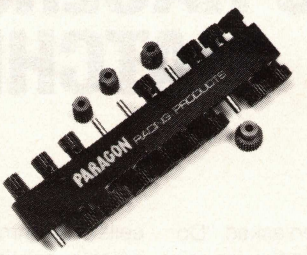
Eclipse™ Series Motors (ECO 13, 15, 17, 19, 20, 23)



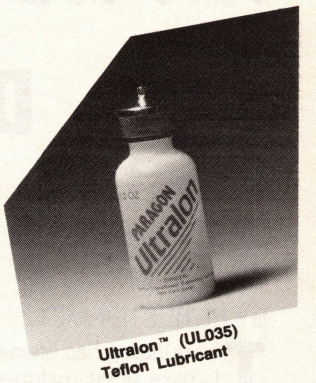
Ground Effects™ Traction Compound (GE013)



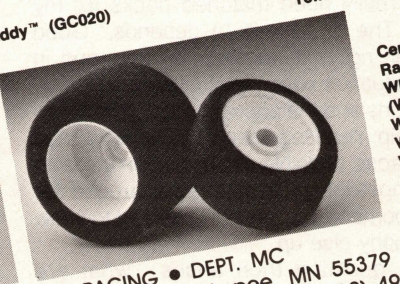
Liquid Bearings™ (LB025) Moly/Graph Lubricant

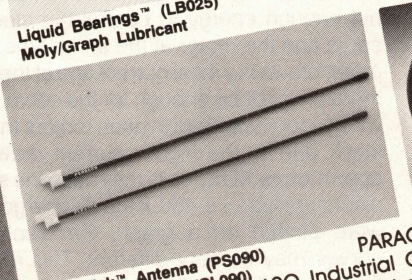


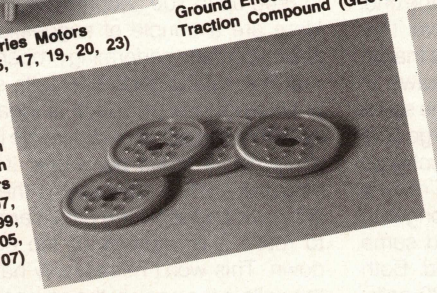
Gear Caddy™ (GC020)



Ultralon™ (UL035) Teflon Lubricant


Centerline Racing Wheels (WF012, WR012, WMF12, WMR12)


Pro Stick™ Antenna (PS090)
Classic™ Antenna (CL090)


ProLite™ Odd Tooth 64 Pitch "Cut" Gears (PL097, PL099, PL105, PL107)

PARAGON RACING • DEPT. MC
690 Industrial Circle South • Shakopee, MN 55379
Send $2 for Catalog • Phone: (612) 496-0091 • Fax: (612) 496-0191

The Choice of World Champions

TEAM COBRA SMOKES 'EM AT THE WHIP!!!!!
1991 LAKE WHIPPOORWILL U.S. OVAL MASTERS



John Broesler, TQ/Wins the A MAIN MODIFIED, wins the A MAIN STOCK!
After driving his COBRAS for only 3 weeks!

"After having owned and raced all other competitive 1/10th scale cars, I can say that nothing compares to a Cobra. It was so much smoother, faster, and easier to get dialed in, that I was immediately turning more laps than I had ever turned before."

COBRA LTOOR
TQ/WINNER A MAIN MODIFIED

COBRA SS
WINNER A MAIN STOCK

TEAM COBRA
THE RACERS CHOICE

C & M Team Cobra • P.O. Box 701353 • West Valley City, UT 84170 • (801) 250-9747 • Fax (801) 250-9792
For Catalog & Free Sticker Pack, send $2.00

DO RACERS REALLY NEED MATCHED PACKS?

BY PETE STEINMETZ

The question has often been asked, "Do I really need matched packs for my car?" The answer is "it depends," Good answer, right? It depends on how and in what situation you drive. Let's look at a few situations and the answers: National championship; Yes. Regional championship; Yes. Club races; possibly, depending on the level of competition. Running the car around the neighborhood: No, unless you want to show somebody else up.

The question then arises, "what are matched packs?" The easiest definition is, "Packs are matched when all the cells in the pack charge and discharge at approximately the same rate over the same period of time."

For comparison purposes, let's consider a pack of Sanyo N-1200-SCRs in which all the cells have a discharge time of 480 seconds at the 10-amp rate. If the motor draws exactly 10 amps continuously, at the end of 480 seconds, or 8 minutes, the car will stop. It will not coast, or slow down, it will stop. This is a very tight match, almost the best you can find. The best is when all the cells discharge at the same rate and have the highest voltage possible. (A future article will be written on what the numbers mean.) Most of the packs currently available are done at the 20 amp rate, not the 10-amp rate. Stock motors don't draw exactly 10 amps continuously; slowing down, rapid acceleration, crashes, variations in speed controls, and other factors vary the discharge rate. Most people do not have packs matched this tightly. An average pack, done at the 10-amp rate, might contain cells with the following discharge times: 460-452-471-472-462-459. This pack is matched within 20 seconds of run time. This is not bad, but certainly not the same as having all the cells with the same discharge number. Always remember battery Rule Number 1: "A pack is only as good as its weakest cell." The above pack is considered a "452" pack because 452 is the lowest numbered cell. You might as well hae all the cells matched closer to 452 as opposed to wasting the higher numbered cells. Unfortunately, this requires having many batteries to choose from and having the ability to test them properly. (The subject of another future article.) At the end of the race, the 452 pack will slow the car down gradually. The driver will notice the car beginning to slow down or "dump." Due to the different capacity of the cells of an unmatched pack, where there is a greater variation in the discharge time and rate of the cells, the car will slow down and possibly will start going in circles as there is not enough energy to control the steering servo and the motor at the same time. The motor draws the most current and at the end, there may not be enough for the servo. This will be more apparent in open motors than in stock due to the higher current draws of open motors. Many cells may have the same discharge time, i.e. 480. If the discharge time were plotted on a graph, the discharge curves may be very different. This means that some of the cells would be stronger at the beginning of the discharge and some cells would be stronger at the end. Both would be technically considered 480 cells, even with the different characteristics. This is very difficult and time consuming to calculate. Voltage readings would have to be taken every few seconds until the cell reaches the cutoff voltage specified.

"An average pack in the hands of a good driver will beat a good pack in the hands of an average drive, so practice!"

There are two other important pieces of data in a matched pack, *voltage* and *impedance*. The higher the voltage the stronger the pack. Look for the highest voltage pack available. Impedance is the internal resistance in the cell. This translates to how fast the power will come out of the cell. The lower the impedance, the faster the juice will come out and the more "punch" you will have. Impedance, voltage and run time will be covered at length in a future article.

We have been discussing Sanyo N-1200 SCR cells. Let's move on to the Sanyo KR-1700 SCE. This is a different animal altogether. While the SCR cell is more rugged and can be run more often, it will last quite a while with normal care. The SCE cell is much more fragile and requires special care. First off, it's more expensive. Secondly, it was never designed to accept a fast charge or be used at a high discharge rate. Many racers notice that their packs lose performance after a few runs. If the cells are checked on a regular basis, the capacity has been known to drop up to 100 seconds after a few runs. Here are a couple of suggestions to help keep your cells performing properly. Let them rest after racing. With SCE cells, seven days between races per pack is ideal. For SCE cells this can get very expensive if one races a couple of times per week. If this is not possible, then 3 days rest is the minimum. What will happen if the packs aren't allowed to rest? The capacity of the cells will go down. This won't necessarily happen to all the cells in the pack at the same time. Even if one cell goes down, the rating of the pack goes down. Remember, a pack is only as good as its weakest cell. This will require periodic rematching. At big races, it's not uncommon for racers to rematch their cells after every run. The second hint is that SCE cells do not like to be pulse-charged. A constant current charge will yield higher numbers or longer run time. Keep this in mind before your next charger purchase. (SCR cells will accept both a pulse charge or a constant current charge and perform about the same.)

I have not discussed the Sanyo KR 1300 SC cell in this article. This cell is primarily an entry-level or sport cell. It is constructed differently than either the SCR or SCE cell. Testing has shown that it does not match well and will not hold a match. It is not used much in competition in the USA.

There is a new cell from Panasonic, available in limited quantities, that needs mentioning. It is the P-170-SCR. This cell combines the best of the SCR characteristics with the extra run time of the 1700 ma SCE cell. It has the high discharge rate of the SCR and can also be used with the frequency of the SCR cell. Sanyo is rumored to have a 1700 SCR cell in the works, with a release date in 1992. I imagine it will be of the same quality as all Sanyo battery products, meaning it will work very well.

Keep in mind that as the cell capacity increases, and the size of the cell remains the same, something has to give. What gives

Continued on page 62

TEAR OUT OF THE PACK-JOIN Team SHREDDER®



Team Shredder® takes TQ and Wins A-Main In 2 WD Stock at the 1991 ROAR DIRT OVAL NATS!

TEAM SHREDDER® WINS MORE RACES!

With Price/ Performance That "TEARS UP" The Competition

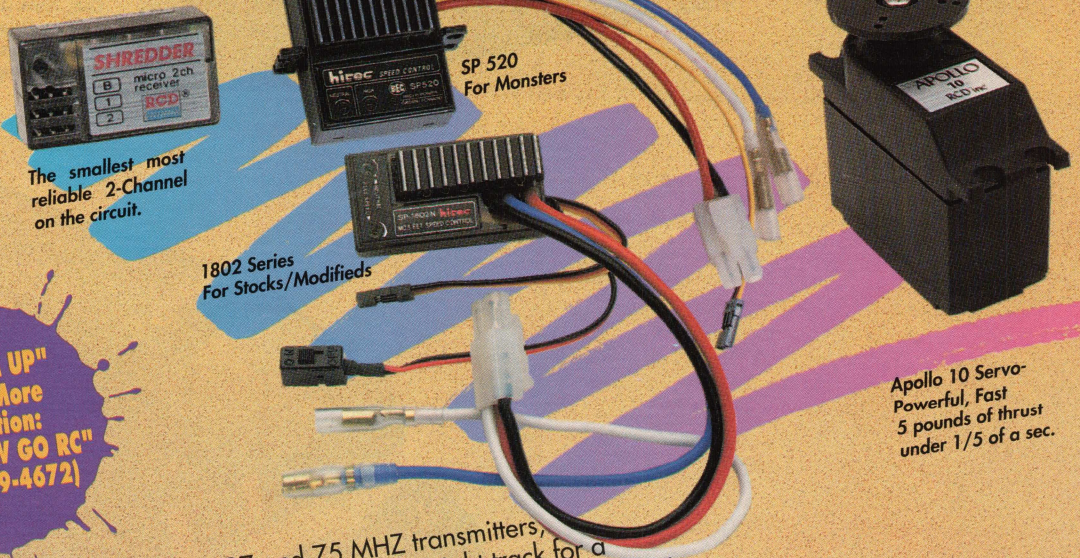
RCD Team Shredder Packs— The only COMPLETE "Road Packs" out there! Every pack features RCD/Hitec's winning combination of Team Players:

■ **RCD SHREDDER RECEIVER** ■ **HITEC SPEED CONTROLS** ■ **RCD APOLLO 10 SERVO**

MONSTER PACK
- SP-520 Speed Control
- Shredder Receiver
- Apollo 10 Servo

PRO- STOCK PACK
- 1802N Speed Control
- Shredder Receiver
- Apollo 10 Servo

PRO- COMP PACK
- 1802DL Speed Control
- Shredder Receiver
- Apollo 10 Servo



The smallest most reliable 2-Channel on the circuit.

SP 520 For Monsters

1802 Series For Stocks/Modifieds

Apollo 10 Servo- Powerful, Fast 5 pounds of thrust under 1/5 of a sec.

To "TEAR 'EM UP" Call For More Information: 1 800 "NOW GO RC" (1-800-669-4672)

Runs with most 2-Channel AM 27 and 75 MHZ transmitters, RCD "Team Shredder" Race Packs get you on the right track for a winning price. So, whether you're out to "Shred the Competition" or just "Cruising for Fun", we have the performance pack for you!

Radio Control Development, Inc.
9419 Abraham Way • Santee, CA 92071
Ph: (619) 449-1112 • FAX: 449-1002

RCD™

© RCD 1991

Readers' Pages



Here's Adam Stark's nifty Ninja Party Wagon, after his dad got through modifying it for R/C. Dad Greg took a Traxxas Cat and cut out some of the chassis, cut off the wheels, made velcro body mounts, put on some Pumpkin wheels and tires, and a Kyosho Super Stock motor. It really moves, says Greg.

Race cats: here we come again with a new batch of your very own photos! Every day I'm amazed at the number and quality of your photos and cars! Keep them coming, I can't get enough!! If you send your car or truck photos to me you'll have a chance to win a free six-month subscription to the only R/C car magazine you'll ever need. Send your pictures, along with a short description to: Del Bagshaw, Readers' Photos, 898 W. 16th St., Newport Beach, California 92663. I'll pull out the best, and you'll see them here, every month. It's easy; do it today! See you next month.

Del



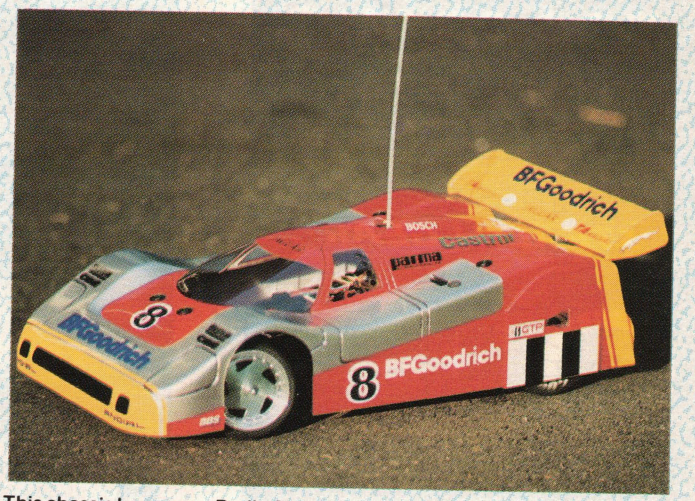
This hot Ford T-bird with a BoLink Eliminator 10 chassis underneath is from Tim Russo, from Ft. Dix, New Jersey. Tim says it's his second R/C car, and his wife got it for him for Christmas, and his son was born on the same day! The whels are TM Radials, and the motor is a Torkzilla 13-turn.



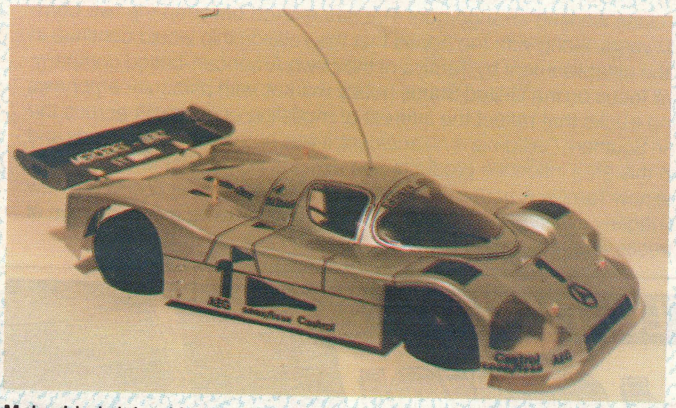
Dennis Semanik II, of Broadview Heights, Ohio, says his 12-inch high, four-wheel drive and four-wheel steering twin-motor monster was custom painted and designed by him. A free, six-month subscription is on its way to Denny.



David Hunyh, of New York, says he finally finished the second body for his Clodbuster, and he calls it the Wolverine. He hopped it up with bearings, an Attack 4 radio, Trinity's Monster Mash motors, and ESP lift kit, chrome wheels, Parma motor guards, a working stereo radio(!), and a Parma Ford Ranger body.



This chassis began as a Radio Shack Golden Arrow, but when its electronics went, David Schleinkofer, of Morrisville, Pennsylvania, mounted the rear axle-gearbox to an aluminum plate and mounted another trailer hitch-type plate to the rear bulkhead. He installed Trinity shocks, extended the front axles, added a Speedworks 350 motor, Novak ESC, and a Futaba radio. What a deal!



Myles Limbrick, of London, Ontario, says he took one of Andy's Sauber Mercedes Group C bodies and put it on a fiberglass 10L chassis, added a Novak ESC, and a RevTech motor. He uses Magic 48-pitch gears and stock tires. It's a clean car, Myles.



Team Tewes (pronounced 'twos') is responsible for these father/son cars. Mike (the son) owns the number 75 Valvoline car, that has a 10L chassis, Trinity monster stock motor, Tekin FSC, and MRP's Pontiac body. Tom (the dad) runs the Havoline car with a McAllister chassis, Twister Pocket Rocket stock motor, a Tekin ESC, MRP's T'bird body, and a Futaba radio.

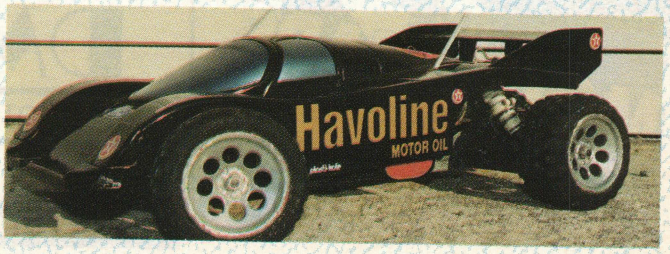


"This is a picture of my '91 Xoom Q-scale sprinter. IT has a Zenoah engine, Zoom Foam tires, Skellenger quick-change rear end, and the paint job was by Ken Lesley, of Little Rock, Arkansas. I placed seventh at the '91 Supernationals and I'm second in QSAC Mid-States points." Vicki Woods, Livingston, Texas.



From faraway France comes this fine Tamiya Wizard that finished sixth in the French National Championships. Eric Ferrboeuf, from Montigny, says he also has an RC10, and would like to buy a quarter-scale car. Eric, here comes a subscription for you! Hope you enjoy it, mon ami.

Douglas Waller, from Prince George, Canada, says he took a Radio Shack Porsche 962 GTP and painted it up in Havoline colors, then mounted it on a Kyosho 4WD Optima chassis, powered by a Trinity 427 Speedworks motor. Doug offers a limerick: "An avid RC'er named Doug, drove a car, slow as a slug. To dust all the jerks, he bought a Speedworks, Trophy girls now give Doug the hug!"



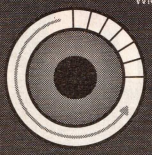
TOP RACING PRODUCTS™

The Optimal Solution In Racing

PRECISION CRAFTED

STEALTH GEAR™
& PRECISION STEEL

Precision Aluminum & Steel Machined Pinions
Widest Range Of Selection On The Market
Averaging 40% Lower Rotating Mass
Lightest Pinions Available Today

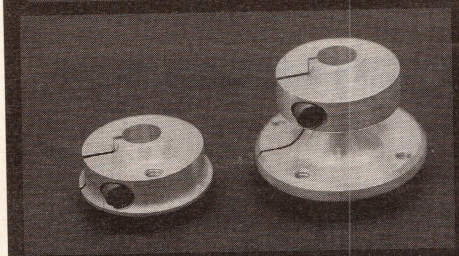


Available On January 1992

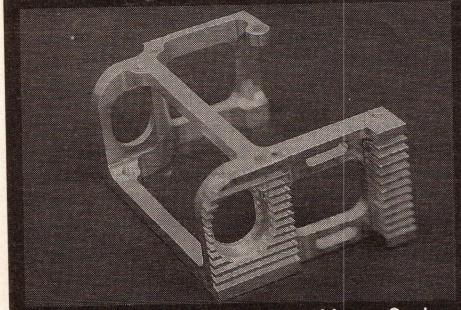
32 PITCH - 8T TO 24T
48 PITCH - 10T TO 45T
64 PITCH - 14T TO 48T

32, 48 & 64 Pitch Racing Pinion Gear:

STEALTH GEAR Use A Metal Impregnation Process Designed To Reduce Friction, Increase Surface Life, Resist Corrosion And Run Stealth-like Quietness.
32, 48 & 64 Pitch Precision Steel, $3.95
32, 48 & 64 Pitch Stealth Gear, $4.95



On-Road Clamp Type Left Wheel Hub:
12LW #T1005, $8.95 10L #T1006, $13.95



PA1 One-Piece Aluminum Motor Pod:
12LW #T1007, $69.95 10L SS #T1008, $69.95

Dealer And Distributor Inquires Invited
Send $1 For Our Catalogue And Decal
See Your Local Hobby Dealer Or Contact:

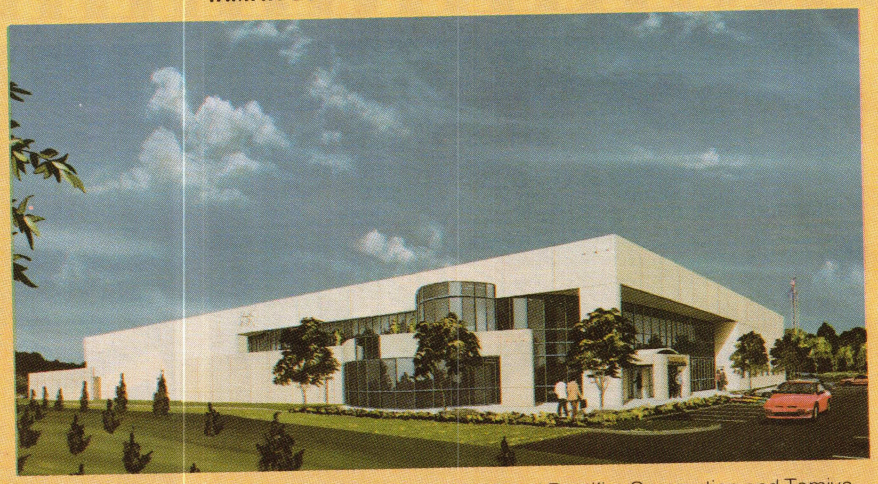
TOP RACING PRODUCTS
P.O. Box 86424 - Los Angeles, CA 90086
Tel (213) 617-0791 Fax (213) 621-2177

A Division of PROMPTON DESIGN INC.

© 1991, PROMPTON DESIGN INC. - All right reserved

SUBSCRIBE
RADIO CONTROL MODEL CARS

TAMIYA COMES TO SOUTHERN CALIFORNIA



At a recent press conference in Los Angeles, Model Rectifier Corporation and Tamiya Incorporated of Japan announced that on July 1, 1992, Tamiya America will be established in Aliso Viejo, California, to import, distribute and market all Tamiya products. The new, 74,000 square foot facility now being constructed in Orange County will house executive and research & development offices as well as shipping and distribution headquarters for Tamiya products destined for American hobby shops and other sales outlets.

The announcement, made by MRC President Roy Gelber and Tamiya President Masayuki Tamiya, detailed the close working arrangement that has existed between the two companies for the past 30 years, along with the hopes that this relationship would continue in some form following the establishment by Tamiya of their own American-based company.

Tamiya America will focus on the United States hobby market, with particular emphasis on producing cars and trucks that reflect the interest of modeling enthusiasts across the country. The location in Southern California is no accident; it was noted that many trends and styles that originate in this area influence products and designs from coast to coast.

For the modeler, the new Tamiya America promises to be a treasure trove of enticing new RC vehicles; we'll be eagerly awaiting the release of what promises to be a continuation of well-designed cars, trucks and accessories.

NO MORE LOST WINGS!

WingLOCKS!


NEW!

It's the fastest and easiest way to mount your car's wing ever devised! *Just set-screw your wing wire into the top part of the WingLock, and mount the base to your car as you would with a regular wing wire mount. The two pieces lock securely together with a click, and with an easy move of the spring lever, your wing pulls off instantly! You can even change wings during a quick pit stop!*

WingLocks #DMS 2025

DMS
DAVIS MOTOR SPORTS

750 Mobil Ave., #16
Camarillo, CA 93010
(805) 389-1306

ALSO AVAILABLE FROM DMS:



BATTERY TAKEDOWN DISCHARGE TRAYS
Discharges your batteries individually- the safest and most effective way!



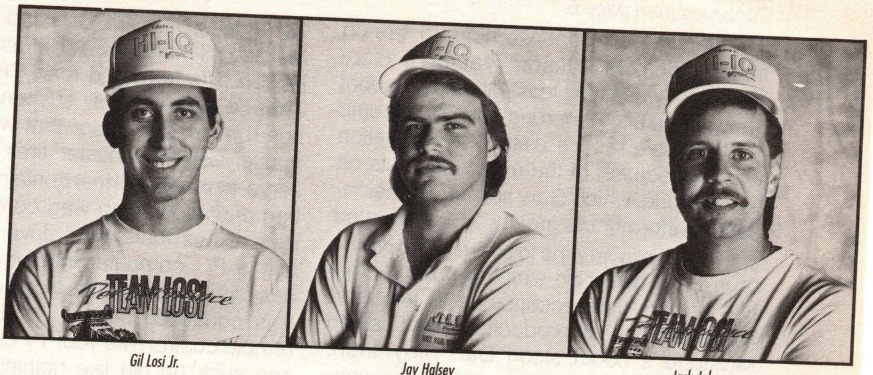
SUPER CELL ASSEMBLY SYSTEM
Enough insulators, wire, connectors and shrink-wrap to do two 7-cell packs!

DEALER AND DISTRIBUTOR INQUIRIES INVITED

ONLY HI-IQ CAN *Release the BEAST*

from your racing batteries and motors by 6 types of **LINEAR CHARGE, HI-RATE DISCHARGE,** Cycling, Grading / Matching, Motor Conditioning / Analysis and much more...

HI-IQed VICTORS...



Gil Losi Jr. — Jay Halsey — Jack Johnson

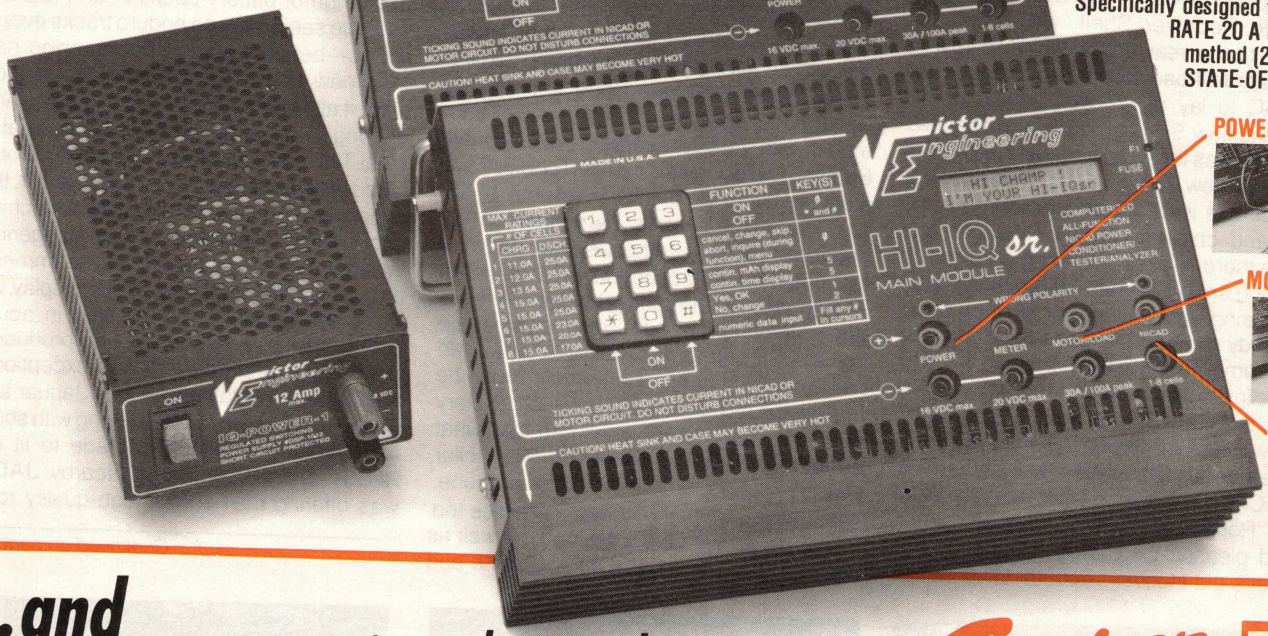
...if you can't beat 'em, join 'em!

Use your own IQ...

Made in U.S.A.

IQ-POWER-1

Sub-compact, feather-weight, switching POWER SUPPLY delivers up to 12 Amps of clean regulated 14VDC power. Great for ANY CHARGER. Can mount piggy-back on HI-IQ (optional hardware is needed).



HI-IQ STANDARD

9 std. functions. Charge up to 15 A. Discharge in excess of 15 A (20 A max.). Ideal for std. 10 A Discharge method.

HI-IQ "SENIOR"

16 functions + carrying case. Specifically designed for HI-RATE 20 A DISCHARGE method (25 A max.) STATE-OF-THE-ART

POWER HOOKUP



MOTOR HOOKUP



NI-CAD HOOKUP



...and now... introducing the NEW Super IQ

to give you the EXTRA COMPETITIVE EDGE you need today by adding the following NEW RADICAL FEATURES above existing legendary HI-IQsr capabilities:

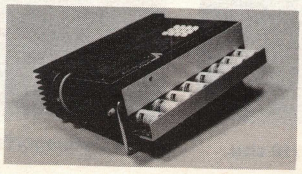
• designed for **30 Amp Discharge** Method (**40 Amp max.**) not only for **SINGLE CELLS** but **ALSO PACKS(!)** down to .7v cut-off • **INTERNAL RESISTANCE** reading in mOHMs • **6 CHARGE METHODS** including VICTOR EXCLUSIVE **LIN-R-FLEX** [1] • **POWER-DOWN MEMORY** for factory and your own default parameters. **STORE, EDIT** and reuse up to **5 CUSTOM SEQUENCES/CYCLES**. Run any of them by **SINGLE KEY STROKE**. All data retained. • **GRAPH or LABEL** printing with any serial printer [2] or hook up PC with optional **PC SOFTWARE "TracPac"** with powerful **DATA-BASE** [2] for **AUTOMATIC CELL MATCHING** • **EXPANDED MEMORY** ready for more features • **SOFTWARE SUPERVISED THERMAL MONITOR** - no overheating • **40 AMP CELL HOLDER** and more... NEW SHARP LOOKS. WELL PROVEN and REFINED PRODUCT LINE - NEVER OBSOLETE. **ANY EXISTING HI-IQ** can be easily **UPGRADED** - call for info.

[1] this feature requires optional Thermal Probe # VE-TAC1K

[2] this feature requires optional RS-232 connector #VE-IQSP-1

— see your HOBBY DEALER —

Victor Engineering
380 Camino de Estrella, Suite 170
San Clemente, CA 92672
ph.# (714)496-9701 Mon.-Fri. 9 a.m.-5 p.m. PST



also *NEW* - 8 channel MULTIPLEXER "IQ x 8"

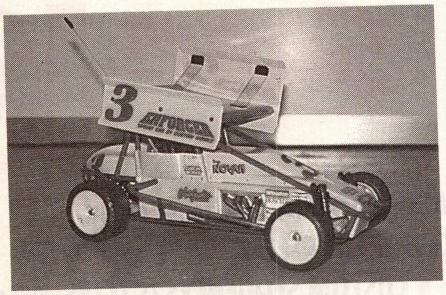
8 CHANNEL MULTIPLEXER! Piggy-Back option performs NI-CAD functions for up to 8 single cells simultaneously or up to 8 packs sequentially. Allows direct printer hook-up for labels or PC hook-up for data-basing or both. Superior to other Multiplexers yet more cost effective.

compatible with any HI-IQ or SUPER-IQ

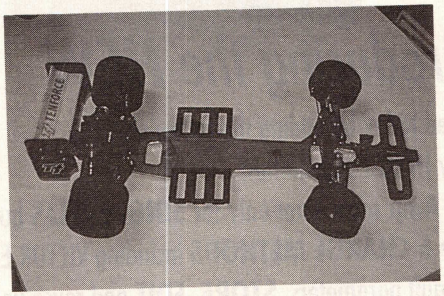
Continued from page 6

tiful machine, and one we hope to see on tracks soon. **McAllister Racing's** Gary McAllister wasn't the least bit reticent about showing off his 00 onroad car. The electric 1/10th-scale racer's distinctive innovation was the location of the mounting posts on the rear pod, which Gary said improves on-track performance greatly. He recounted some recent oval wins to prove his point; the 00 is a well-designed, simple onroad car that has gained wide acceptance in the short time it has been in production. Right next to McAllister's booth stood **Dan Moynihan,** gleefully offering to show anyone who wandered by his new Battery Belts, narrow nylon straps with belt buckles to hold from four to seven cells firmly to the chassis of virtually any car. Meanwhile, **Holeshot Racing Products** was showing its Battery Heatsinks, which in a case of parallel design, accept Dan's Battery Belts as a perfect fit. The Heatsinks, made of anodized aluminum, allow batteries to run cooler, giving longer run time and extending the effective life of racing cells. Holeshot was also showing its graphite Receiver Shelf, which mounts directly to the rear shock tower of Losi or Associated offroad cars and trucks, allowing the ESC to lay down and receive direct, cooling airflow. Simple design, and effective. Simplicity was the word for **Custom Racing Products'** new Body Buttons. These deceptively simple Kydex buttons mount on the body and chassis of your R/C car and remain there; they're said to be good for up to 30,000 snap-on, snap-off functions without wearing out, and best of all, they eliminate body clips! (Who hasn't been minutes away from a heat and unable to find the #®& body clips?) CRP makes them for virtually every R/C car imaginable. R/C racers everywhere are blessing CRP for this much-needed accessory. CRP's resident genius, Gary Crawford was showing his one-of-a-kind "Robo-Vac," which was a gigantic crowd pleaser. Beginning with his grandmother's old Hoover vacuum, Gary added 14 shocks, 40 Sub-C Nicad batteries, a Makita drill motor, an AYK brass gear drive, Hirobo diffs front and rear, CRP FX-10 A-arms, a cantilever tail suspension, an on-board micro-processor that was programmable, CRP Clodbuster tires and rims, a servo-activated tail that contains the pick-up bag and allows it to wag contentedly as it runs. It has four-wheel drive and steering and a PC computer interface board! The description barely does this creature justice. It is controlled by a 15-channel, infrared remote control (like your TV changer), and it can suck up dirt like nothing you've ever seen! You had to see it to believe it. Gary has only begun to scratch the surface of the possibilities of radio control, and if the Robo-Vac is any indication, we're going to see a lot more wild creatures from Gary's fertile, twisted mind. No less interesting, though certainly not as flamboyant, was **Schumacher's** new Cougar 2, the latest refinement of the popular offroad racer from England's premier car designer. With a dirt-sealed 12 ball diff, Kevlar high-torque drive belt, anodized chassis and 2.2-inch wheels, the Cougar 2 is available in three configurations: the Cougar 2 Sport, Cougar 2 Racing, and the Cougar 2 Team model. Both the Sport and Racing versions can easily be upgraded to the Team model with readily available accessories. Bodies? Did someone mention bodies? We stopped by **Andy's R/C Products** booth and found the always personable Andy Jacobsen on hand enthusiastically showing his outstanding collection of prepainted 1/10th and 1/12th racing bodies. We were particularly taken with his 1/10th-scale LoTec GTP body, a real winner! Andy invited us up to his factory for a tour, and we'll be making the trip soon; we'll have a photo story in a future issue so you all can see what goes on behind the scenes at this stellar California company. Not to be outdone, **BoLink** was showing some hot bodies too, including a killer Chevy Nomad, as well as their narrow-bodied '92 Chevy Lumina and Buick bodies. A new Chevy Stadium truck body was also prominently displayed by designer Rick Jordan in the BoLink booth. Over at the **Protoform** display, owner Dale Epp was proudly showing his 1/10th drag racing bodies, along with the elegant Peugeot Group C body in crystal clear Lexan. This Canadian manufacturer certainly has a way with racing bodies, and his were well-received in Chicago. There was no way you could miss the **Parma** display, with its full-size Snakebite truck looming over most everything in the vicinity. Parma was also showing Jack Wright's 1/10th version of the Snakebite truck, plus their licensed Chevy Intrepid GTP car body, beautifully painted. **Traxxas** had one of their latest two-wheel drive racers here in Chicago, the TRX-1 with graphite chassis, slipper clutch, and three-gear tranny. This car looks like a winner! We'll have a track-test review coming soon, so watch for it. **C&M Cobra's** Chris Farrell pulled us aside to enthusiastically show off their Quick-Change Battery Tray for enduro racing. This ultra-simple device allows the exchange of battery packs in an instant—you'll be seeing this on enduro tracks everywhere—bet on it! **Victor Engineering** had their new HI-IQ 8-channel Multiplexer on view. It allows the charging, discharging and grading of up to seven battery packs at a time! Talk about high-tech efficiency! Combined with the proven Hi-IQ or IQ Senior, the expansion of battery charging and matching capability in a portable unit is staggering. When it comes to tires, **Pro-Line** immediately comes to mind. Over at their display, we found the famous Pro-Line tires in abundance, but did you know they also produce a line of truck and car bodies of exceptional quality? Most notable was their Jaguar and Chevy Intrepid GTP bodies, along with some fine stadium truck bodies made to fit the RC10T and JRX-T trucks. Nearby, **JACO** was offering their line of high-quality road

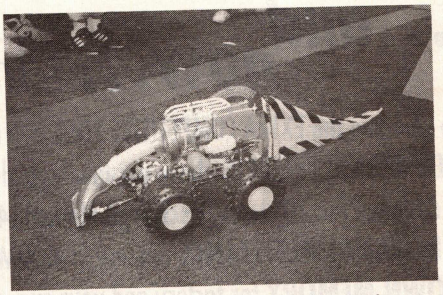
Continued on page 64



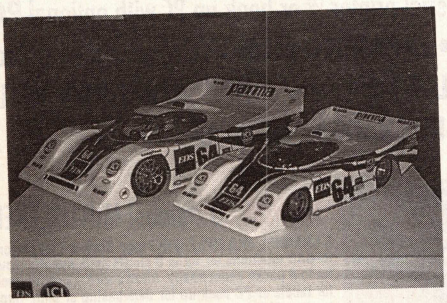
Custom Works' 1/10th Enforcer sprinter.



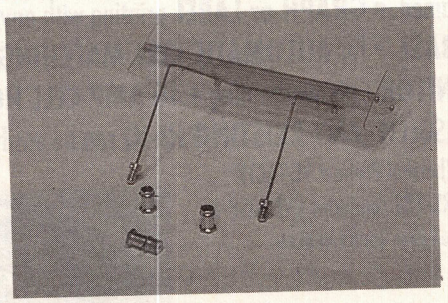
RCM's Tenforce 1/10th chassis.



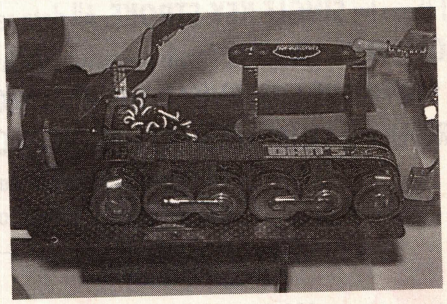
'Robo-Vac' from Custom Racing Products.



Parma's Intrepid bodies in 1/8 and 1/10 size.



Davis Motorsport's Wing Mounts.



Battery Belts from Dan's R/C Stuff.

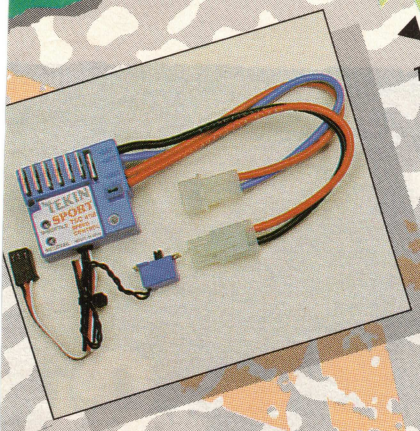
TEKIN®

COMPETITION R/C ELECTRONICS

Made in USA

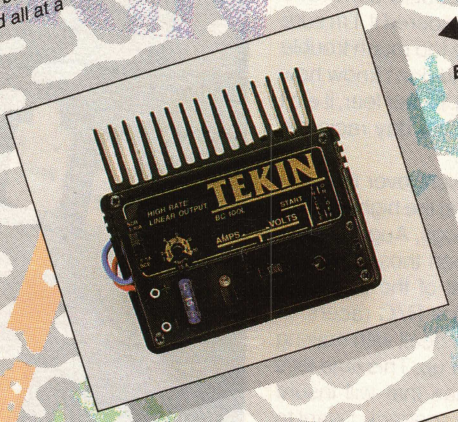


TSC 411P Speed Control
Regenerating, Recharging with Torque control. Our most popular high-performance unit, winner of thousands of races.
AVAILABLE SOON The TSC 411G GOLDFET™ Speed Control The prototype won the 1991 ROAR On-Road 1/10 Nationals. Tekin's ultimate "Goldfet" transistors deliver Glistening performance, with the drop as low as "12 FET" units, but 3/4 ounces lighter.



TSC 408S SPORT Speed Control
Replaces Servo, Wiper, Resistor, Receiver, Battery, Switch and all associated wiring with one simple, compact, and reliable unit. The TSC 408S has a smooth proportional throttle control from slow crawl to wide open, with powerful, adjustable, built-in brakes. Latest regenerating circuitry, and all at a budget price.

National Champions



BC 100L Linear Charger
A compact, dependable, automatic high-performance peak detector. Adjustable 1/2 to 10 AMPS. Linear output for SCE's, pulsed for SCR's. Nothing gives your batteries a better charge! Runs off most any 12V source.

Made In USA

World Champions

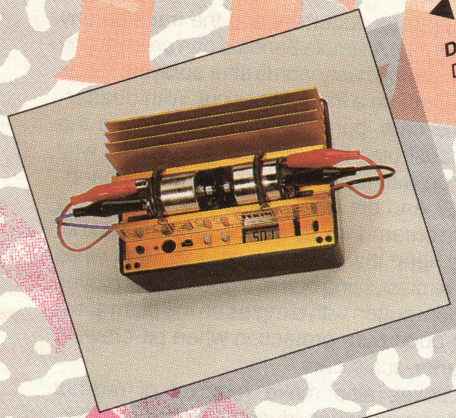


TER Micro Receiver
1.2" square, 0.4 oz. Much smaller and lighter than most stock receivers, and it works! Exclusive crystal I.F. filter makes this today's most advanced micro receiver. Available for most AM radios 27 MHz to 75 MHz. FM version due in September.

See your Hobby Dealer



TSC 410S Economy Speed Control with Torque Control.
Fuse and Thermal overload protection.

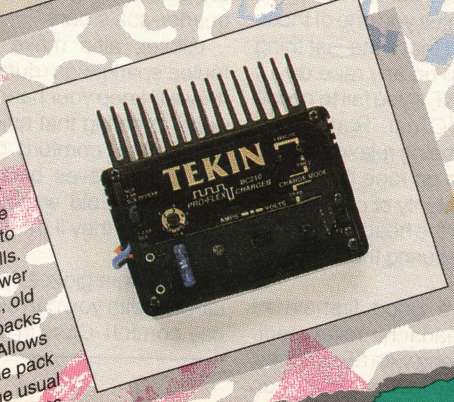


DYN 900 Digital Dyno
Dynamometer measures actual RPM, AMPS and power. Actual, real horsepower, efficiency and torque (in inch-ounces) may all be calculated. Does not depend on a calibrated or special slave motor. Will not drift on readings as slave motor becomes hotter. Electronically regulated, all Tekin Dynos read the same. Dynos will run continuously to simulate an 8 minute race.

Send $1 for Catalog and Sticker



TSC 420F Speed Control
Operates on 4 to 20 cells. High power for drag cars and twin motor trucks. Extra strong braking action. Hi-AMP B.E.C. powers 4WS truck and ERG servos.



BC 210 Pro-Flex Negative Pulse Charger
Uses advanced negative pulse technique to chemically condition cells. Restores most lost power and run time of tired, old packs. Keeps new packs running fresh. Allows recharging the same pack all day, without the usual large power loss.

TEKIN ELECTRONICS, INC.
970 Negocio • San Clemente, CA 92672 • USA
714/498-9518 FAX 714/498-6339

© 1991 Tekin Electronics, Inc.

Big Tips

MORE RACEDAY SAVVY

BY RICK EYRICH

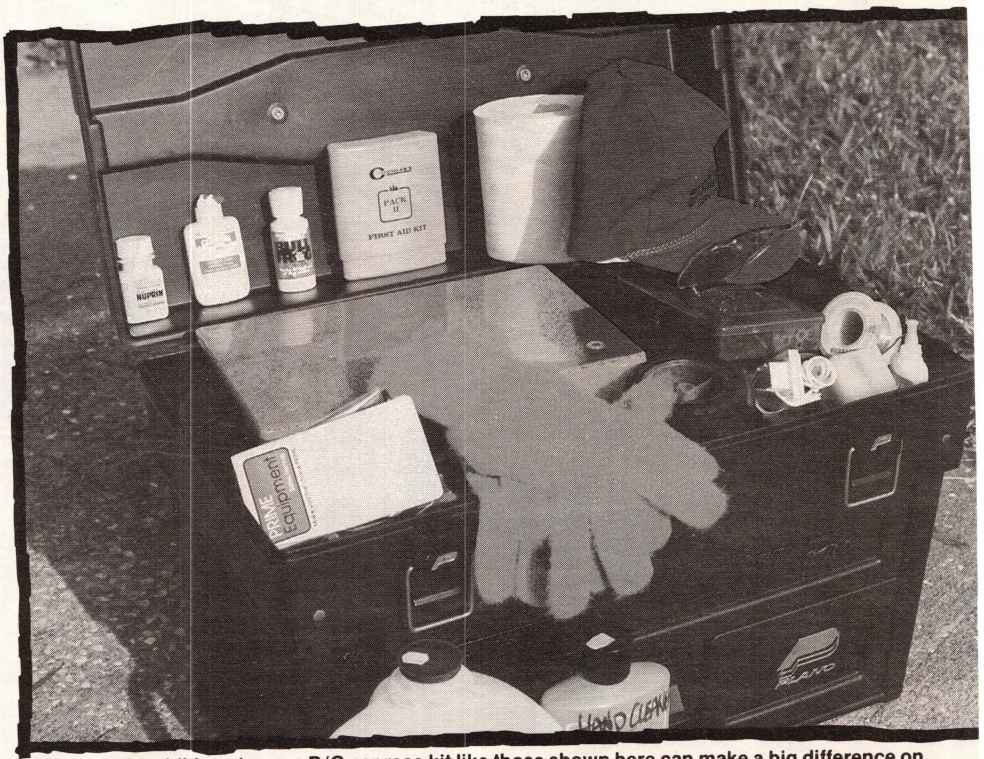
A few months back, I did an article on race day setup. While a high percentage of *R/C Model Car* readers don't race their cars, many have considered it. I'm sure that many think it could be too much trouble to get started in racing, and don't know how to go about getting started. Never fear, it ain't that tough to go and enjoy a day racing at your local R/C racetrack.

Another story I wrote went over the finer points of racing R/C cars at the higher levels (Running With The Big Dogs, August, 1991 *R/C Model Cars).* Between those two articles I tried to cover most of the important topics to help guide novice R/C racers. In the first race savvy story, I dealt with making sure your pit area was set up. This time let's go over some small areas that will insure your comfort while at the racetrack. I want to make sure you have a smooth, enjoyable day racing your R/C cars, because all this *is* supposed to be fun, right?

One big area a lot of R/C racers overlook is being comfortable while working on their cars in the pits. I'm sure many Monday morning backaches occur from bending over R/C cars on Sunday. A simple cure is to use a stool at the track. While some R/C tracks have stools (mostly the indoor ones), a lot don't. Pick up a cheapo one at a department store. Then you have to determine how much you'll need to saw off the legs to have the proper height for your work table. Remember to allow for dirt surfaces, as the legs will dig in. A stool with a swivel base will also help if you need to reach another toolbox, or for checking your batteries while under charge.

Here's a little extra tip: slap a couple of race-related decals or stickers on your stool's legs to personalize it. This way if it somehow decides to walk off by itself (or with some help) you can easily retrieve it by sight. While a simple thing like a wooden stool might seem silly, your back and legs will thank you on Monday mornings.

Another part of your body to think about on race days is your stomach. While some of you out there can snarf down nachos and chili dogs at the track without damage, a lot of us racers have B-52 butterflies on race day. But not eating can be just as bad as lunching on the toxic waste mentioned above. And least of all, you don't want to experience an "attack" just prior to your main. Try to eat light (tuna sandwiches, fruit etc.), if you're subject to a nervous stomach; and, on hot days, drink plenty of fluids (water or Gatorade over soda). Have a medium-sized cotton towel around to wipe off any excess sweat (eeiuuu!) and to wash your hands with. If you're going to a new, unknown track, include a gallon of water and some soap—just in case there's no water available at the track.



A few simple additions to your R/C car race kit like those shown here can make a big difference on race day. Some bug and sunscreen juice, a first-aid kit, gloves and a hat, will take up very little space, and can measurably increase your comfort level at the track.

And always, I repeat *always,* have a roll of toilet paper with you at all times—trust me on this!

Moving up the human body, keep a ballcap and sunglasses handy, along with a good sunscreen (like Bull Frog) to keep the sun at bay when racing outdoors. Glare from the racetrack can impair your vision on the drivers' stand, and can give you one of those mongo headaches. And that's the last thing you need to distract you on any race day. It can also lead to a big DNF if you fail to notice a problem on your R/C car. Remember, we're concentrating on being relaxed and as comfortable as possible on race day.

Of course, there are plenty of other things that can give you pain in the head (along with other parts of the body) during the course of a day at the local track.

That's why having a good first-aid kit handy (containing a headache relief medicine) is so important. Along with headaches, minor cuts, scrapes and burns are not an uncommon occurrence at the track on any given day. A simple bandaid can prevent you from saying nasty words after spraying motor cleaner into a fresh finger cut. With quarter-scale cars, burns can happen around the exhaust pipe and sparkplug areas; so why put up with using strapping tape as a bandage? And diff lube grease won't work as a burn cream. Pick up a good, small first-aid kit and keep it with your race gear. And while we're discussing burns, a good pair of gloves (nylon-cotton with dimples on the palm area) are good burn protection when pit-crewing quarter-scale cars.

Gloves also make removal of red-hot fouled sparkplugs (during a race) safe. Plus, they will keep your hands clean (for the most part) for eating that quick midday sandwich (remember, comfort) between heat races. Once the gloves become dirty just throw them in the old washing machine (in cold water) and they'll be ready 'til the next race day.

Along with gloves, having a set of backup clothes with you can also improve your race day comfort. Case in point: you show up on

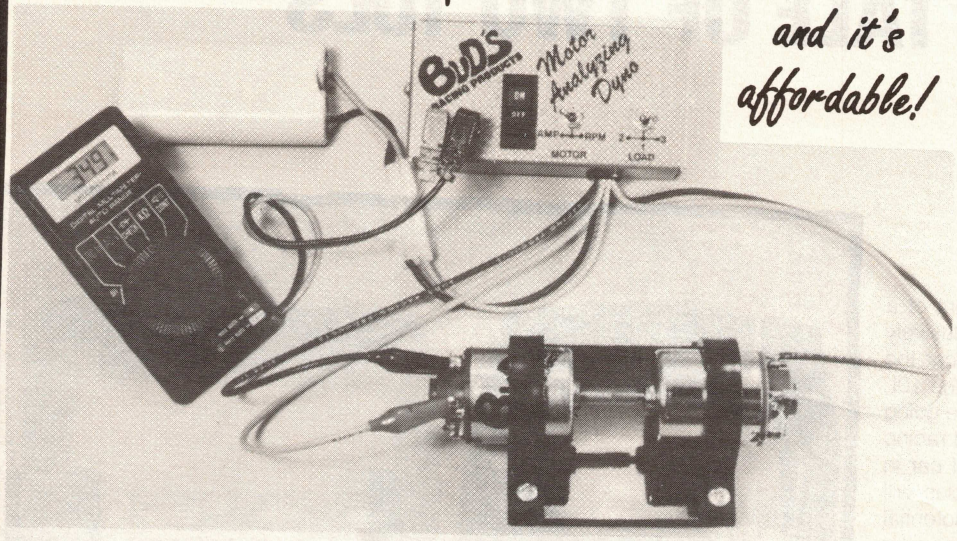
Continued on page 86

BUD'S RACING PRODUCTS

Motor Analyzing Dyno

IT DOES MAKE A DIFFERENCE!

and it's affordable!



FEATURES:
- Test Motor Amp Reading
- Load Motor Voltage Reading as R.P.M. Reference
- 3 Load Positions to Simulate Track Conditions

ALLOWS YOU TO
- Check Performance of Your Motors
- Tune Your Motor to the Track
- Check Spring and Brush Settings
- Tune Gearing to Track

P.N. 7125

D.V.M., Motors, Battery Not Included

$69.95 Retail Price

See Your Hobby Dealer

1575 Lowell St., Elyria, OH 44035 • (216) 284-0270 • FAX # (216) 284-0271

For catalog and decal send large self-addressed 52¢ stamped envelope plus $2.00

TAKE THE HOBBY SHOP HOME WITH YOU.



$9.95/#13002

***THE 15th ANNUAL RADIO CONTROL BUYERS GUIDE** is the only reference guide for all R/C hobbies. Browse through the guide, find the items you need, and you'll know just what to ask for at your favorite hobby shop.*

The RADIO CONTROL BUYERS GUIDE lets you turn your wish list into a shopping list. By knowing what's available, you can plan new projects or improve existing projects. Price information also helps you add up just what your plans will cost.

*Look for the RADIO CONTROL BUYERS GUIDE at your local hobby shop. Or call **(800) 533-6644** to order.*

To order send to: Dept. X0481, RADIO CONTROL BUYERS GUIDE, P.O. Box 1612, Waukesha, WI 53187-1612

YES! I'd like to order _____ RADIO CONTROL BUYERS GUIDE(S) (#13002) for $ _____ ❑ Payment enclosed ❑ Charge my account

Please print:

Name_____

Street_____

City, State, Zip_____

Country_____

Charge to: ❑ Mastercard ❑ Visa ❑ American Express (min. $15)

Card#_____ Exp. Date_____

Signature_____

Include for postage and handling: U.S $3.00; Canadian and foreign add 18% (minimum $4.00). Wisconsin residents add 5% sales tax. Canadian orders add 7% GST to total. Price and availability subject to change. Payable in U.S. funds.

Dept. X0481

Trackside

A TALE OF TWO 10LS

BY MIKE LIEM

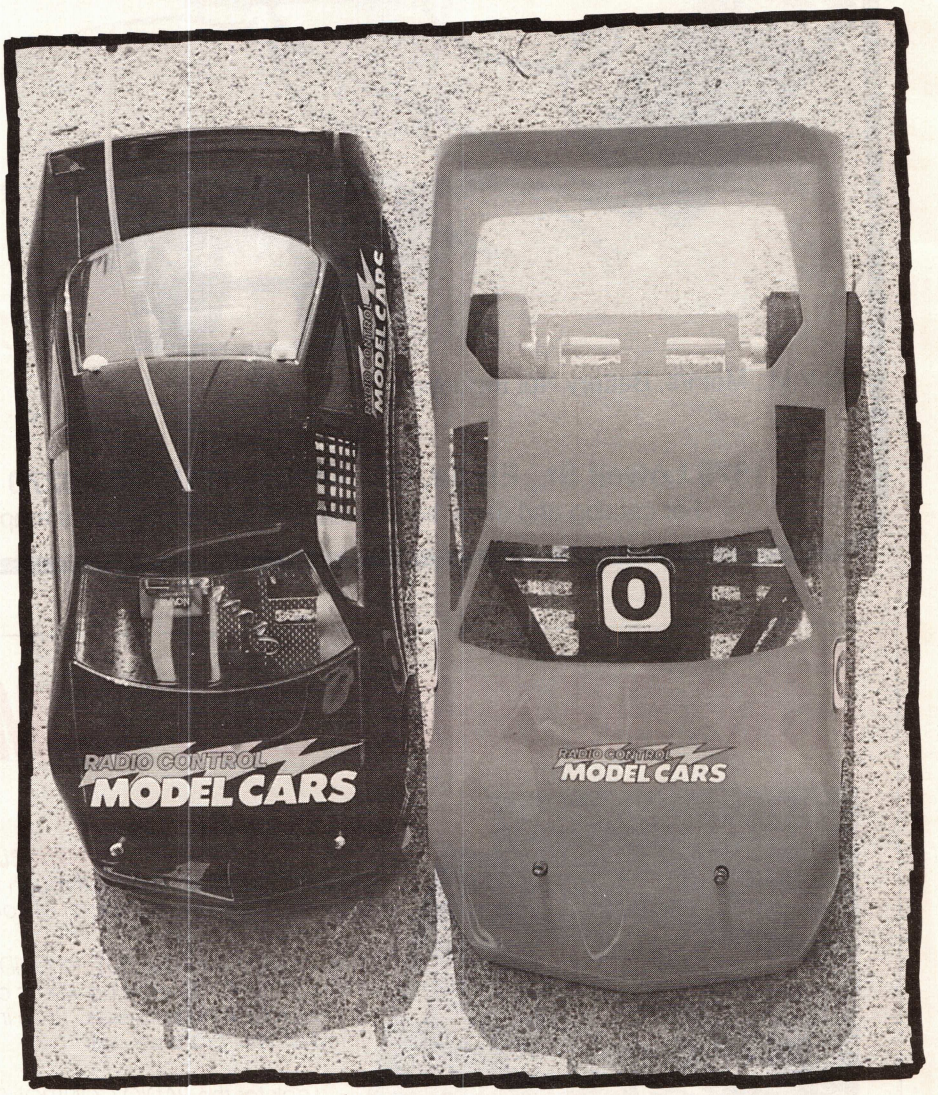
Welcome to the first installment of a series of articles devoted exclusively to Associated's electric onroad race car, the RC10L. Although both versions of the 10L have been reviewed in *RCMC*, we're going to start by looking back at the road racing and oval variants of the winningest car in electric onroad racing. Future articles will see the exploitation of the 10L's full potential through modification and the use of popular aftermarket parts.

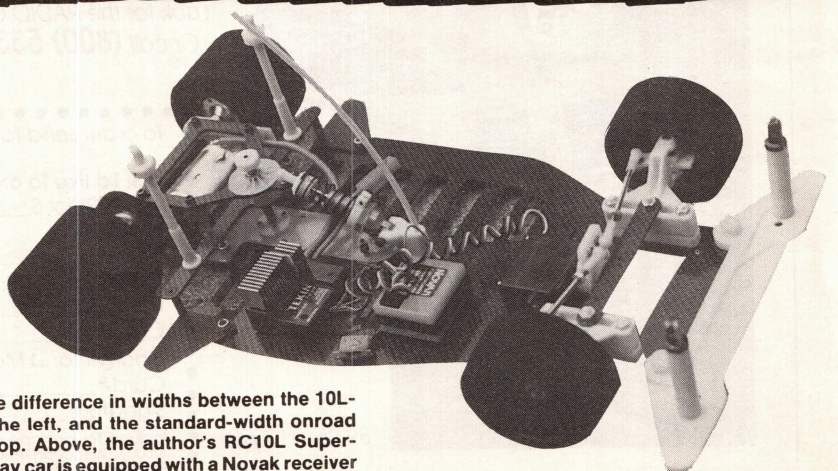
If bells and whistles and gadgets and gizmos impress you, you wouldn't think of the 10L as an exciting race car. The original 10L is essentially an enlarged derivative of Associated's World Championship-winning RC12L. In fact, the 10L shares many of the same chassis components of the 12L. But herein lies the beauty of the 10L. A simple and straightforward design lends itself to ease of setup and maintenance. Of the 1/10-scale road racers I've owned and raced, the 10L was by far the easiest to set up. I remember taking the car out for the very first time on the track and thinking, hey, this thing runs great! With few adjustments to be made on the chassis, even beginners should have no trouble figuring out the 10L.

NARROWING IT DOWN

The original 10L was joined recently by the oval version, the 10L Super Speedway. The idea behind the 10L-SS was conceived out of the need to extract as much speed as was possible on the high-banked "monster" oval tracks like the infamous Thunderdrome in Encino, California. With a boxy NASCAR stock car body, and at speeds of over 60 mph, the 10L was really pushing air. To reduce aerodynamic drag, a narrowed version of the 10L was developed. This allowed the car to have a much lower frontal area. It also gave way to stock car bodies with more realistic proportions. In fact, Associated's Lumina body is an honest 1/10 scale of the full-size Winston Cup car. Now, of course, narrow-track cars are the rage in 1/10 onroad racing. But it was the 10L-SS that started the trend in "skinny" cars.

Aside from the reduction in tracking width, the 10L-SS boasts a number of noteworthy features. The rear pod uses the 10L's left- and right-side bulkheads, but new upper and lower plates locate the motor right on the chassis's centerline. This arrangement distributes equal loading on the rear tires. The





Note the difference in widths between the 10L-SS on the left, and the standard-width onroad car at top. Above, the author's RC10L Superspeedway car is equipped with a Novak receiver and Tekin ESC. A Futaba S132 servo steers the front wheels. A democratic selection of electronics, no?

10L's thrust bearings have been replaced on the 10L-SS with a pair of aluminum spacers that ride on the inner flange of the axle ball bearings. Lateral, or side to side loading seems to be less of a concern in high-speed oval racing than in road racing, where the cars must constantly negotiate left and right turns, hence the lighter aluminum spacers.

Stock car bodies need tall rear mounting posts, and the extra height makes the posts vulnerable to breakage. The 10L-SS uses a unique standoff plate that raises the mounting point for the rear body posts so that shorter posts can be mounted. The plate also serves as a brace for the damper post, which greatly strengthens this area of the chassis. The standoff plate worked so well on the 10L-SS that I've adapted it to my regular 10L.

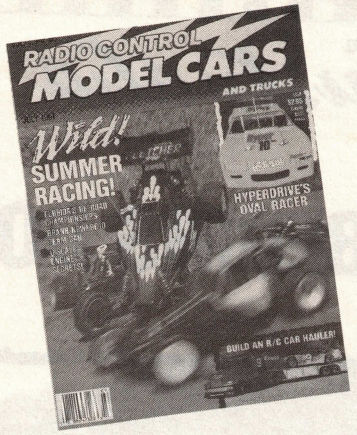
The 10L-SS chassis offers both the normal saddle-pack layout and "left-turn only" configuration. The LTO mode places all six cells of the car's battery on the left side of the chassis to reduce the tendency of the inside of the car to lift in the turns. A word about the material that Associated uses on its graphite-chassis cars. The multi-weave graphite is extremely stiff and the fibers don't separate as on the older graphite plates. I've had many an encounter with The Wall with my 10L, and I have a collection of broken A-arms and bent bumpers to prove it. But the graphite chassis and nerf plates have never been damaged. Make no mistake about it; this is tuff stuff.

Up front, heavier springs are used than on the 10L, although you could vary the springs to suit your application. The tires supplied are the standard Associated Greens mounted on lightweight wheels. Associated's wheels are not the most attractive of the lot, but they are probably the strongest. The spokes extend out to the edge of the rims, reducing flex.

The narrow track gives the 10L-SS the effect of a long-wheelbase car. As such, it is very stable in a straight line. On short ovals and with the right tires, mounting the battery on the left side of the 10L-SS produces dramatic results. The car takes even the flat turns with ease. The 10L-SS works equally well on asphalt and carpet, as my outings to the paved oval at the Firgrove International Raceway and the Tacoma R/C Raceway's banked carpet oval have shown.

WIDE ON THE ROAD

Although the 10L-SS shines on the ovals, it can't hold a candle to its wider brethren on the road courses. Oh, I've driven the 10L-SS on a road course, and it's actually a pretty decent road handler. But you can't beat a wide track for road racing, and the original 10L is still the king of the road. Which means that if you plan to race both onroad and oval, you've gotta have two cars. It's getting to be more and more like full-scale racing! The top teams in NASCAR have a super-speedway car, a short track car, and a road racing car. With the 10L and 10L-SS, you'll have the equipment you need to win on the oval and on the road. •



RADIO CONTROL MODEL CARS AND TRUCKS

DEALERS: Sell R/C Model Cars in your shop and increase sales from walk-in traffic. R/C Model Cars is the industry leader with the potential to create positive results for you! Contact Gallant Models, 898 W. 16th St., Newport Beach, California 92663, (714) 645-8830 for complete details today!

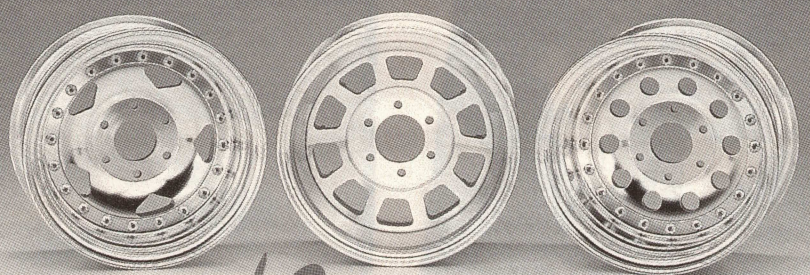
High Fashion for High Speed



Quarter Scalers, RICK'S R/C brings you a wide selection of the finest machined aluminum wheels, to dress-up your car or truck! Manufactured to extreme tolerances, both rims *and* hubs are precision cut from solid blocks of 7075 aircraft quality aluminum. This yeilds a wheel with a flawless finish that runs completely balanced and true. All RICK'S wheels feature:

- ▲ Authentic three-piece modular design allows you to choose from a variety of widths from 2" to 4" as well as several different offsets
- ▲ Versions to fit RACO*, WCM, Pacesetter, New Era, QRS and others
- ▲ "Centerline" style hub available in solid, 8, 10 or 12 hole configuration

"Drag" Style "NASCAR" Style "Centerline" Style



RICK'S 1/4 Scale Specialties

VISA & MC Accepted

13402 Hawthorne Blvd.
Hawthorne ▲ CA 90250
213▲973▲6922

*RACO wheels require new hubs, sold to you at cost.

SEASON BEGINS DOWNUNDER

BY TONY BURLISON

Well G'day again. Before I start I would like to wish everyone a very Merry Christmas and a safe and Happy New Year.

With summer right on the doorstep, the R/C cars have had the moth-balls well and truly brushed off and our summer racing season is under way with both onroad and offroad racing. The good weather that we have at this time of the year is also helping to provide some great racing as well as some great family fun.

One event that came to Adelaide just recently was the '91 Monster Truck Challenge. Now with a billing like that there was no way this little black duck was going to miss out on seeing something that I'd only read about or had seen on the TV. The trucks were here from the States and were doing the rounds of all the major cities of Australia and New Zealand.

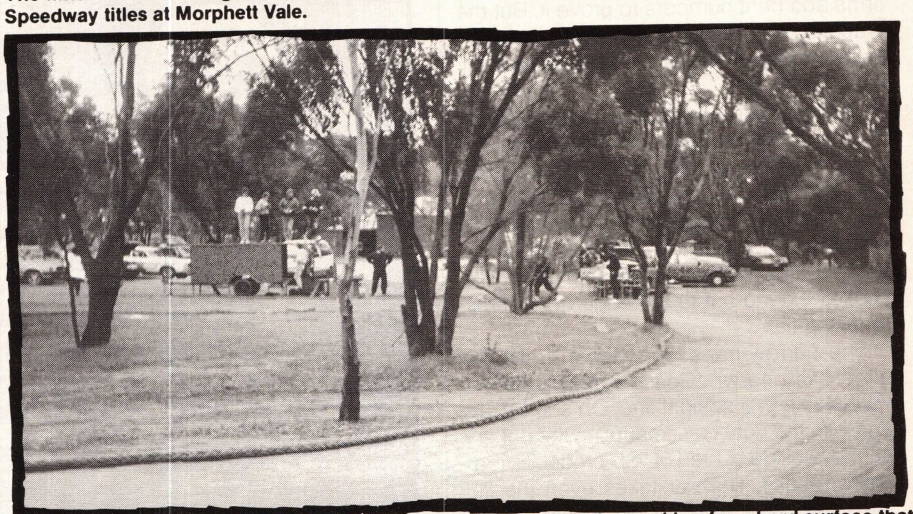
The event was held in our new indoor entertainment center and yours truly had managed to get front row seats. The show ran for a little over two hours and started with a laser light show that was something to be seen. After the light show you could hear the trucks fire up out back of the arena.

Names like Big Foot, Grave Digger, Daddy's Girl, Beastron, Kiwi Thunder and Flying Falcon were names that I'd only read about but until now had never seen in the "flesh." Being indoors, the noise from the big-block methanol motors was almost too much to handle but with fingers firmly in the ears I wasn't going to be put off by a few decibels. The racing was over an obstacle course

Continued on page 40



The Mitchell Park racing club joined their mates at the Southern District Club's South Australian Speedway titles at Morphett Vale.



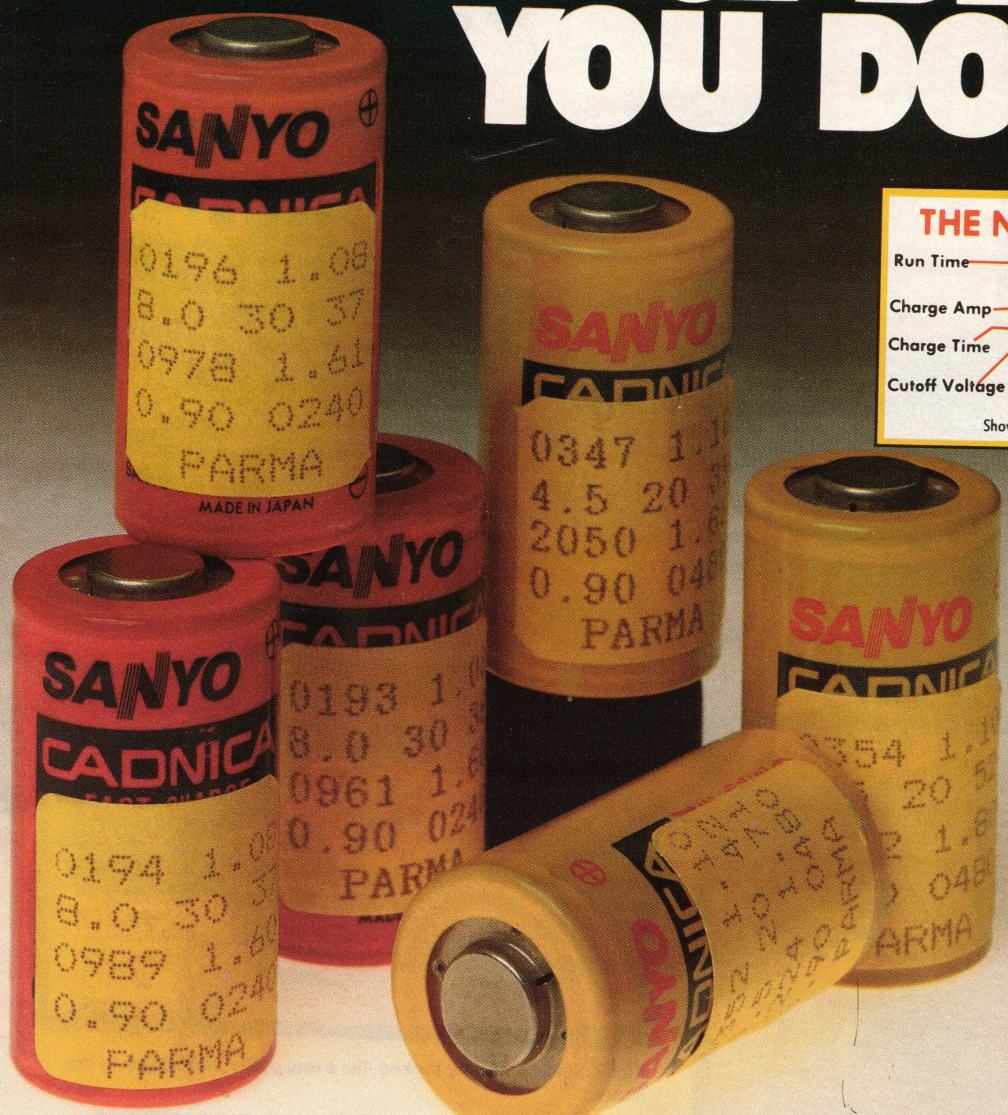
A portion of the Morphett Vale track. Surface was compacted clay, making for a hard surface that demanded a good setup on the cars to run effectively.

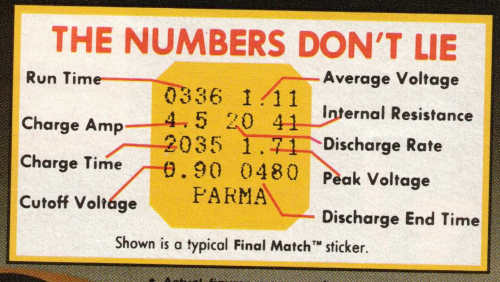




Pull trucks are just coming into view in Australia. This one, based on a Clodbuster, was shown with its homemade sled.

FINALLY, BATTERIES THAT DON'T FINISH THE RACE BEFORE YOU DO.





* Actual figures may vary from pack to pack. Most importantly is that the run time, average voltage and internal resistance are similar within each pack.

PARMA
FINAL MATCH™
SANYO SCR's & SCE's

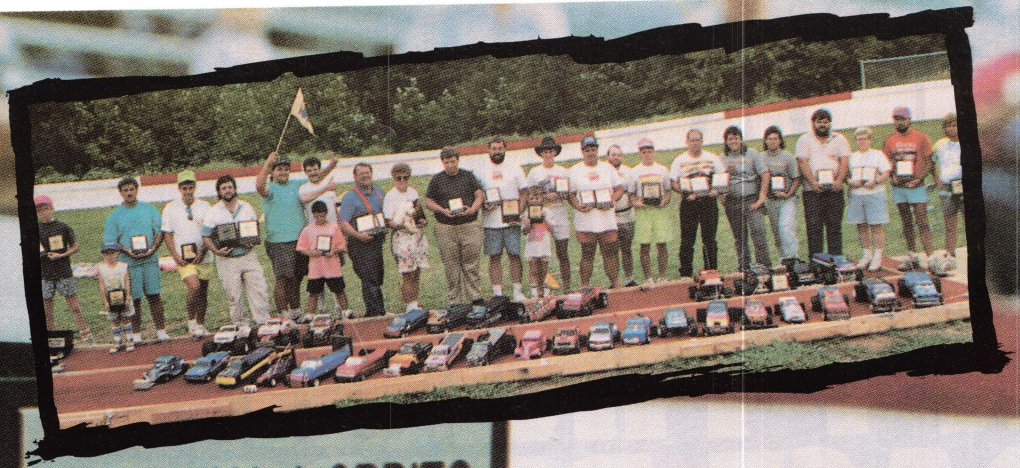
Parma's **Final Match™** Sanyo 1400 MAH SCR's and 1700 SCE's are the most accurately matched cells we have ever made.

The **Final Match™** system now matches your Sanyo's according to the run time, average voltage, and the very critical, **internal resistance factor.** Cells matched only according to run time and voltage without consideration of internal resistance may still be far from identical.

Don't be disappointed; insist on Parma's **Final Match™** Sanyo SCR's & SCE's.

parma INTERNATIONAL INC.
Established 1964 WORLD CHAMPIONS

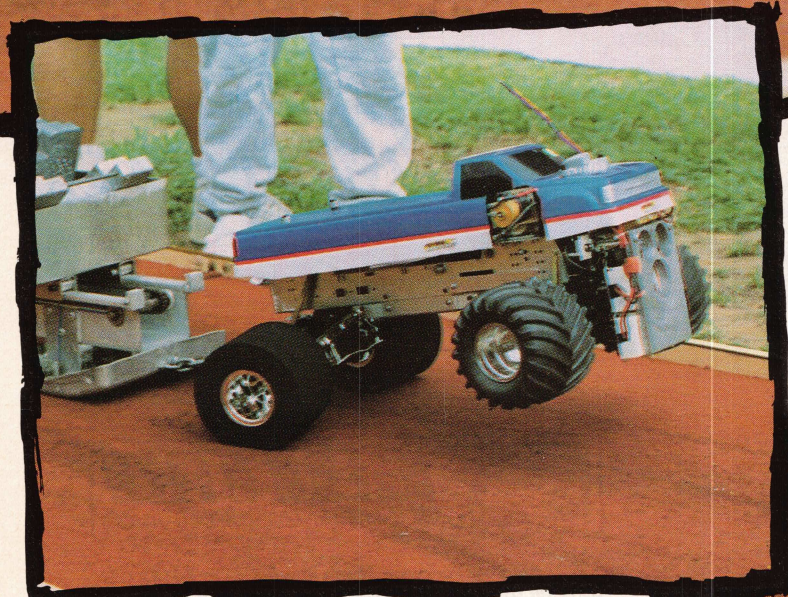
13927 Progress Parkway, North Royalton, OH 44133 USA
Sorry we cannot make retail sales. For parts and information visit your local Hobby Shop. They are listed in the Yellow Pages. Send $4.00 for a full color catalog, in the USA and $6.00 outside USA.

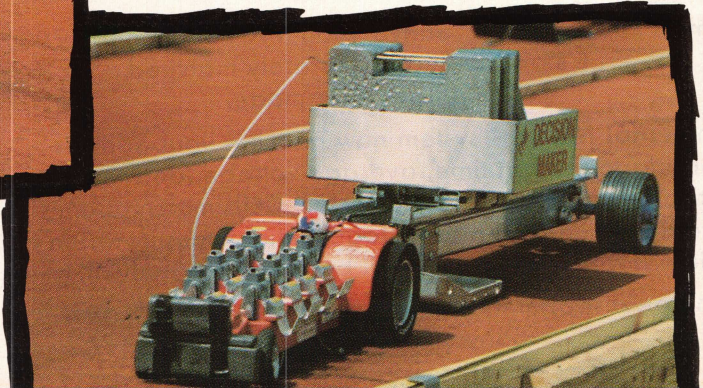






Kim Kulawik's Bruiser looked like a real puller, right down to the frame.





Above and right: hot pulling trucks included this far out multi-engine puller, typical of the weekend's competition.

SOUTHEASTERN NR/CTPA PULLING NATIONALS

BY JACK WRIGHT

On two very hot days in August, 65 drivers and their trucks converged on P.C. Hobbies in King, North Carolina to decide the best pullers in the south. The local pulling club, the Piedmont R/C Truckers Club hosted the event along with help from the folks at P.C. Hobbies and Progressive Technologies Inc. I was really surprised at the turnout—this was to be the biggest truck pull held in the Southeast, and for those of you who missed it, it was an excellent event. There were plenty of prizes and close competition to make it a great weekend. The local club worked very hard to set up the twin track system and the wild monster truck course.

On Saturday morning Paul and his crew at P.C. saw to it that registration went smoothly, followed by the traditional drivers' meeting to explain and answer any questions there might be.

With the twin track system, one class pulled on one track while another class got ready to go on the other track. This setup made things go a lot faster.

The first classes out were the 2WD Super Stock on track 1, and on track 2 was 2WD Modified. The 2WD Super Stock class had their work cut out for them after a full-pull run was made by Paul Lavecchia of the North Jersey Power pullers. A distant second was Jay Price with a 25 foot, 9-1/2 inch. David Deal edged out Billy Gabbard by only 1/4 inch for third. 2WD Modified saw a lot of trucks struggle and drop out of competition. The end of the second round found Albert Janes and Paul Lavecchia sharing the top spot with a full pull, and Dave McCarthy in second with 21 feet, 2-1/4 inch. The next up to pull was the Dual Motor Stock and Modified. In Dual Motor Stock, Ed Kramer Jr. took the early lead with a full pull in the first round but was disqualified for walking along with his truck. But he came back in the second round to pick up another full pull to share the first day top spot with Derrick Thomas.





Above & below: many pullers had their heartaches at the Nats.

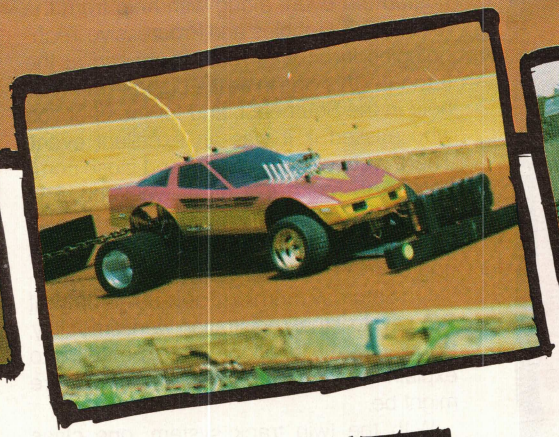




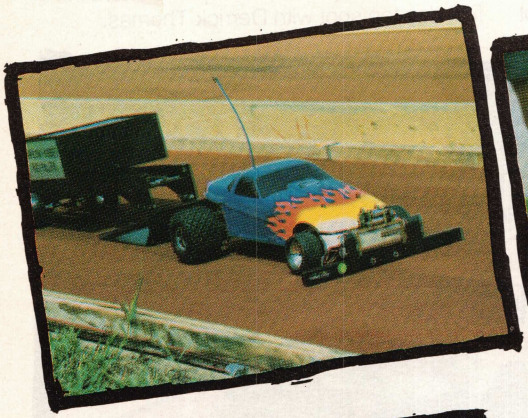
Roy Allen's Clodbuster was the truck to beat.

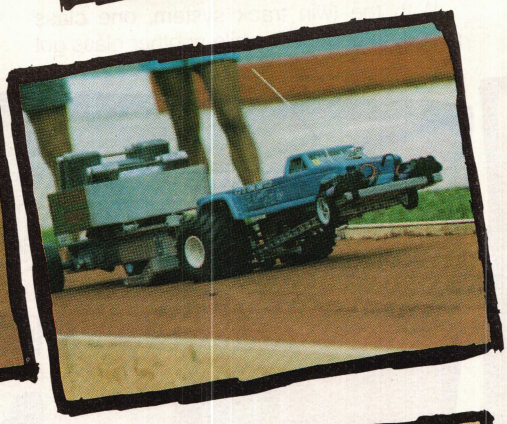


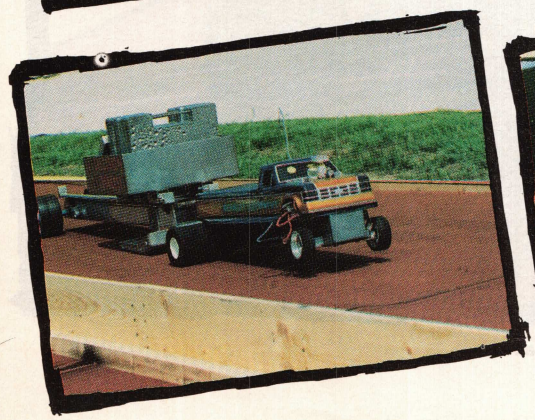


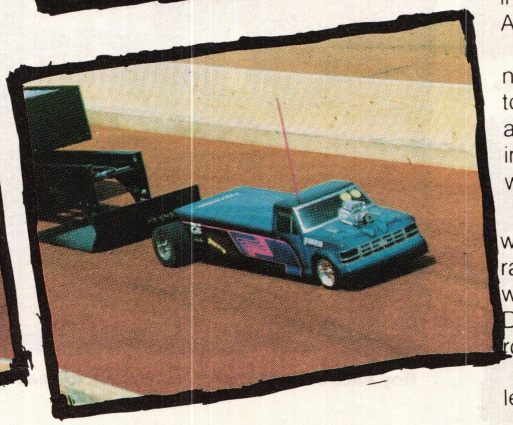












Mary Cole was 2nd with 22 feet, 1-1/4 inch and Roy Allen in third only 1-1/2 inch behind Mary. The gang in Dual Motor Modified had no trouble dragging the sled out the door. 1990 World Champ Doug Howard, Roy Allen and Paul Conte all found full pulls in the first day with Brian Gallagher in second with 27 feet, 9-1/4 inch and myself in third at 21 feet, 6-1/4 inch. The 2WD Sportsman should have been called the "close but no cigar" class. Only Glenda Bennett and James "The Mack" McMasters managed full pulls, leaving Kim Kulawik in second at 29 feet, 10-1/4 inch and myself in third just 3 inches behind. Almost everyone was separated by inches.

The Open 1 trucks hit the carpet pulling nearly 200 lbs. Once again Glenda Bennett took the top spot with a 29 foot, 9-1/2 inch, and in a close second Mark Hill only six inches behind. In third with 26 feet, 1/4 inch was Glenda Bennett with her second entry.

The 4WD Open 1 class was a short one with only two entries, and it was decided rather quickly by Sam Mitchell's best round with a 21 foot, 6 inch run. Second went to Danny Myers who dropped out after his first round pull of 8 feet, 2-1/2 inch.

As the day drew to a close the only classes left to run were 2WD Stock, 4WD Super

Stock, and the 2WD Race Trucks. As in the 2WD Super Stock class Paul Lavecchia did it again, taking the top spot in 2WD Stock with a dominating pull of 23 feet, 8 inch, with Kim Kulawik in second at 9 feet, 7-1/2 inch. Rounding the top three with 8 feet, 11-3/4 inch was Christopher Everridge.

The 4WD Super Stock class saw a couple rare trucks you just don't see very often—a pair of Tamiya Bruisers. Of course the really big deal is that it's very hard to find parts for these trucks—so parts breakage can make these guys nervous (in an upcoming issue I'll have a review of the Bruiser. For those of you who are new to the hobby, you will want to check it out). Kim Kulawik's Bruiser had been stripped down and lowered to resemble a real puller, and it runs like one too. With a full pull in the first round, Kim went on to take first, while in second with 11 feet, 6-1/2 inch was Ben Ayers with a totally stock Bruiser.

"This was the biggest truck pull held in the Southeast, and for those of you who missed it, it was an excellent event."

The 2WD Race Trucks were something to see—these trucks caught more air than I've ever seen! Some trucks were as much as six feet in the air and survived with little or no damage. This class was dominated by Blue Eagles and JRX-Ts, and in order to make good time you had to do a good bit of driving. The course consisted of a big jump at the start followed by some car bodies then a quick left-hand, 180-degree heading to the final jump. This is the place on the track that I called the "Airport" and here's where the trucks really took off for flight, literally. Jay Price's Eagle took the early lead with a 9.59-second run and in a close second was Darby Greene with a 9.63-second, and rounding out the top three only half a second behind was Danny Martin's Eagle.

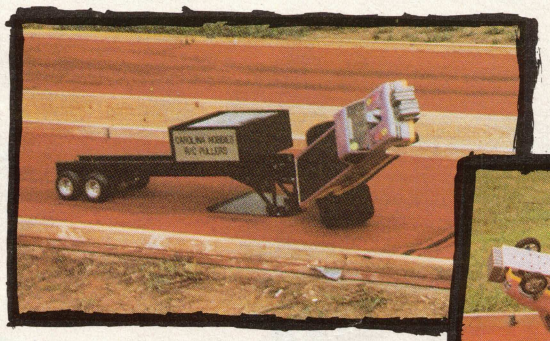
Sunday's activities started out with the concours competition and let me tell you the competition was tough. The judges had a tough time choosing the top truck for Best Paint Scratchbuilt, Best Paint Kit built, and over all concours. Brian Gallagher's six Hemi-powered puller took Best Paint Scratchbuilt, with Lenny Gumbman's 1991 Chevy truck and taking overall concours, myself with the Chrome Clod that was featured in the December '90 issue.

Once concours was out of the way, it was time for the final rounds and pull offs. In 2WD Super Stock, Paul Lavecchia with his first round full pull couldn't be beat, and he went

Continued on page 76

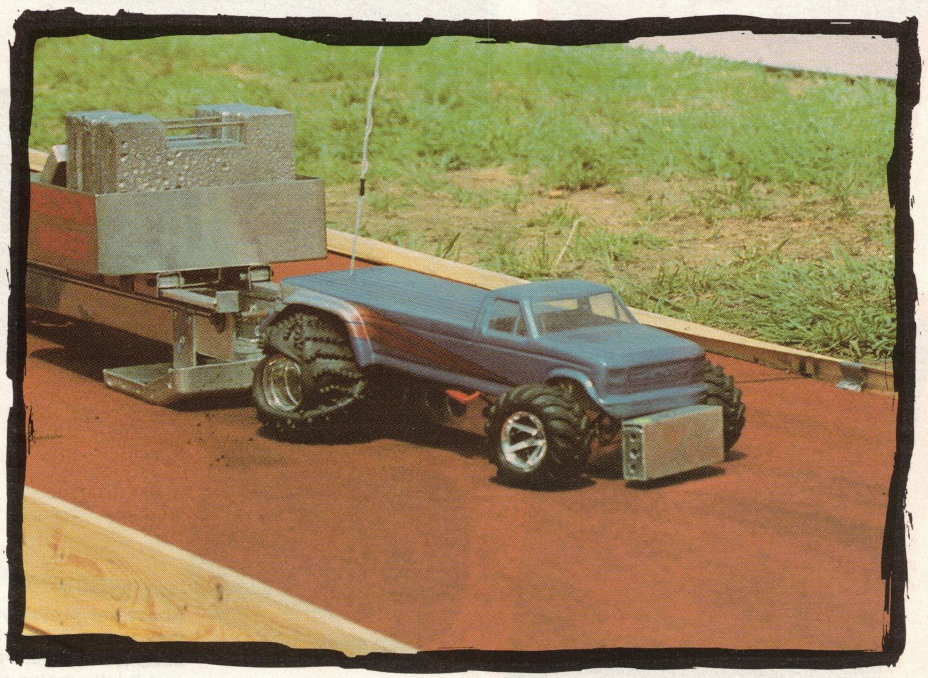


The Power Pullers have a load to haul to truck pulls. Tekin and Plano toolboxes should build a monument to these guys!



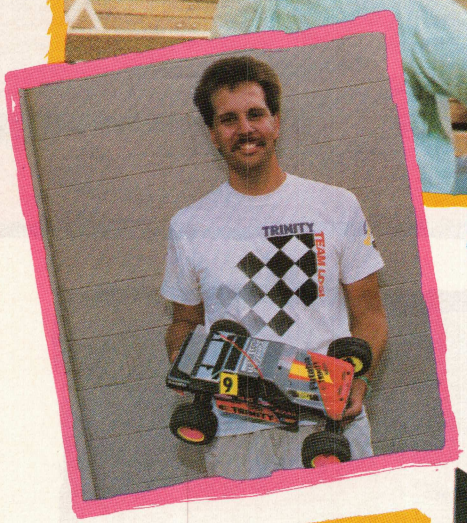


Above and left: Kim Kulawik's puller goes for a wild ride. Photos: Mike Little.



Another puller with some torquey tire problems.



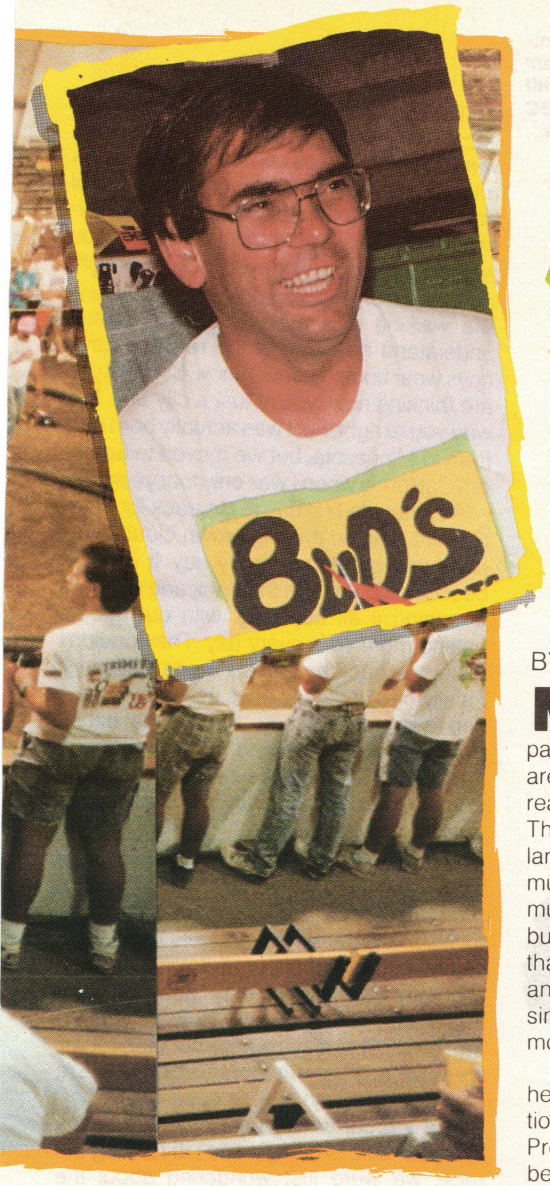






Above, the prototype truck from Team Losi, similar to the prototype car they ran at the World Championships in Detroit. Inside the white gear cover is a hydraulic drive with slipper clutch. Airtronics radio, Novak ESC and Trinity motor and batteries. Left, above: Losi driver Jack Johnson came from nowhere to win the Modified class with his Losi proto-truck. Left: Mike Dunn ran away with the Stock class with his Losi truck.

1991 ROAR MONSTER TRUCK NATIONALS



BY GENE HUSTING

Monster truck racing is growing at such a fast rate that they've long ago surpassed the 4WD class in popularity, and now are on a par with 2WD. There's a number of reasons why monster trucks are so popular. They're bigger, so they're easier to see. The larger tires and wider tread width make it much easier for the average driver to go much faster. They're a whole lot easier to build and maintain, and they cost a lot less than 4WD. All around the country now, 2WD and trucks make up 98% of the racing. You simply get the most amount of fun for your money and time with trucks.

The CORCAR club of Columbus, Ohio held the 1991 ROAR Monster Truck Nationals, with Bud Bartos, of Bud's Racing Products sponsoring the event. Bud has been an avid onroad racer for many years, is an IFMAR 1/12 Onroad World Champion and just a great credit to the sport. Being surprised at hearing that Bud was sponsoring this race, I asked him why. Bud said he started racing trucks (he was racing here too), and he just wanted to sponsor the event.

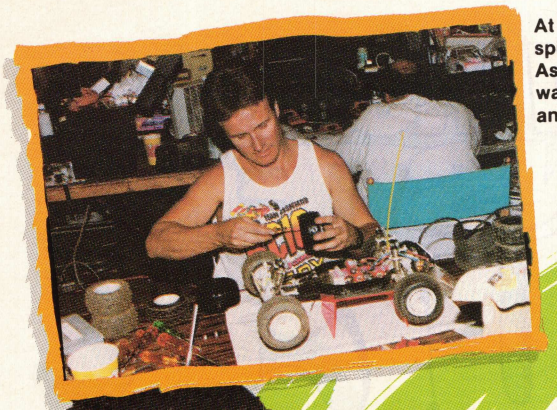
The track was located inside the Cooper Arena, at the Ohio State Fairgrounds in Columbus. This was a good-sized arena with bleachers all around the building, with a large enough floor area for a large track and ample pit area for the 320 entries. Race Director Ray Williams and the whole CORCAR club, as well as announcer Bill McCall, did a super job running the event. Everything was always right on schedule.

A lot of you have been to county or state fairs, and you know that a number of the buildings are used for livestock competition. As a matter of fact, four of the buildings here

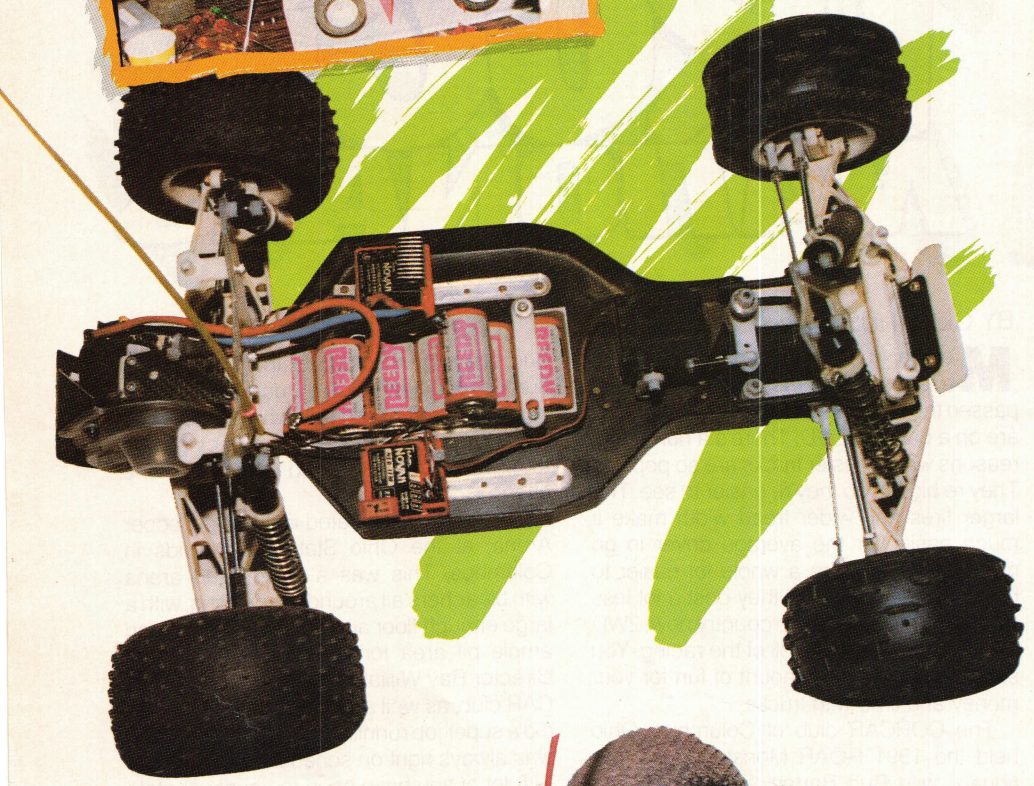
Above, race sponsor Bud Bartos and the Ohio State Fairgrounds racetrack. Below: turn one pileup, with three turn marshals on the way. Below, right: Following the 30 mph straightaway run, drivers had to slow for this sharp left-hander, where all kinds of bad things happen on the starting laps.







At left, Cliff Lett passes the time cutting mini-spike tires spikes between heats. Below, Team Associated's box-stock RC10T driven by Cliff was TQ. It features Airtronics radio, Novak ESC and receiver, plus Reedy motor and batteries.



Below, Chris Doseck's work-of-art truck took him to the top of the Stock A-main. Bottom: Tate McDaniel, CAM motor builder, joined Chris for some fun truckin'.



were being used for a horse show competition the same weekend we were here. There were over 500 horses competing, with trucks and trailers filling the parking lot. Dozens of horses were continually being moved between buildings and trailers. When you walked outside, you never looked straight ahead, you only looked down. It's something like walking in a mine field. I can better understand now one of the reasons cowboys wear boots! I know. I know. Some of you are thinking now, you're just a city boy. In a way you're right, but I was actually born on a farm in Minnesota, but we moved to Southern California when I was only four years old.

Anyway, the first day at the track for practice, we noticed this big brown cloud overhead that got darker every day. It was the dust coming up from the track and we were breathing it all day long, with our throats getting more sore every day. They couldn't water the track because it made it slippery. Finally one of us city boys asked the question to another city boy, "What is that dirt? It doesn't look like anything we've ever seen." We had our suspicions, what with the aroma coming from it and the hay in it. But we were hoping we were wrong.

So I asked one of the club members what they called this dirt. He said, "Well, it's kind of a compost. You know they have livestock exhibits in here, so the dirt gets mixed with some meadow muffins and road apples." (You city boys will have to figure out what those are.) Then he said, "How do you like the track? This is not where our club races, we have a great outdoors track, but we're having this race in here in case of rain."

"It's a great track," I said, "a nice facility and your club is doing a fine job running the race, we were just wondering about the brown cloud."

"Yeah, I know," he replied.

The track layout was actually great. Large black hoses outlined the track area so it was easy to see. But as I said, the track couldn't be watered because it made it very slippery. And because this wasn't regular dirt, it broke up in different ways. The worst place was right at the end of the straightaway, just as you turn to go into the sweeper. It broke up here in large flat sections about 1 inch deep by 2 feet square. It was very common to see trucks come flying down the straightaway, turn left, hit these ridges and then go flying right off the track. This was happening continually.

On practice day it was a little hard to tell who was going fast compared to someone else, because some guys were running their stock motors and some were running modified. Team Losi was running prototype versions of a new truck which they're working on. On the track, it looked to be quite an improvement over their old truck. Team Associated raced box-stock RC10T trucks. Traxxas and A & L were also racing.

Because there were only two classes, stock and modified and drivers were allowed



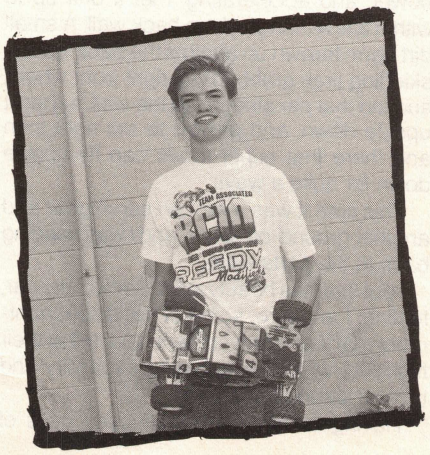
Kyle Reed, Jack Johnson and Kevin Maurer talk horsepower. Kevin sure knows how to make stock motors go fast!

Jay Halsey led Stock class qualifying for a time.









1991 MONSTER TRUCK NATIONALS

MODIFIED A MAIN RESULTS

PLACE	DRIVER	CAR	MOTOR
1.	Jack Johnson	Losi-Proto	Trinity
2.	Rick Hohwart	RC10T	Peak Performance
3.	Brian Kinwald	RC10T	Reedy
4.	Cliff Lett	RC10T	Reedy
5.	J.D. Beckwith	RC10T	Reedy
6.	Jason Foster	RC10T	Reedy
7.	Carlos Gonzales	RC10T	Peak Performance
8.	Jon Anderson	Losi-Proto	Trinity
9.	Scott Moody	RC10T	East Coast
10.	Mike Ankney	Losi	CAM

MODIFIED B MAIN

PLACE	DRIVER
1.	Gil Losi Jr.
2.	Jay Halsey
3.	Byron Peterson
4.	Mike Dunn
5.	Frank Warnke
6.	Scott Montgomery
7.	Scott Hughes
8.	Kyle Reed
9.	Derek Furutani
10.	Bubbe Johnson

MODIFIED C MAIN

PLACE	DRIVER
1.	Jim Bronson
2.	Pat McCreery
3.	Tom Owens
4.	Larry Wilson Jr.
5.	Mike Hampton Jr.
6.	Chris Doseck
7.	Mike Hamilton
8.	Rick Vehlow
9.	Leigh McBride
10.	Mike Marshall

From top, right: Rick Hohwart had one of the fastest trucks on the track, coming from dead last to finish second; Brian Kinwald took third in Modified A-main; Cliff Lett finished second in Stock; J.D. Beckwith wound up in third in Stock with his RC10T.

STOCK A MAIN RESULTS

PLACE	DRIVER	CAR
1.	Mike Dunn	Losi-Proto
2.	Cliff Lett	RC10T
3.	J.D. Beckwith	RC10T
4.	Rick Vehlow	RC10T
5.	Jack Johnson	Losi-Proto
6.	Gil Losi Jr.	Losi-Proto
7.	Kyle Reed	Losi-Proto
8.	Rick Hohwart	RC10T
9.	Carlos Gonzales	RC10T
10.	Jay Halsey	Losi-Proto

STOCK B MAIN

PLACE	DRIVER
1.	Chris Doseck
2.	Mike Ankney
3.	Byron Peterson
4.	Jon Anderson
5.	Frank Warnke
6.	Scott Hughes
7.	Brian Kinwald
8.	Mike Hamilton
9.	Jason Foster
10.	Mike Marshall

STOCK C MAIN

PLACE	DRIVER
1.	Scott Montgomery
2.	Tom Owens
3.	Brad Hughes
4.	Richard Love
5.	Derek Furutani
6.	Pat McCreery
7.	Anthony Bowman
8.	Kirby Tschoepe
9.	Bubbe Johnson
10.	John Kemp

Continued on page 57

THE PRINCIPLES OF STEERING

BY NORB MEYER

Stagger, setup, driving techniques—we hear much about these things in the pits. But not much is heard about *steering*. And I'm not talking about oversteering or understeering or what the driver does with his steering wheel up in the stand. I'm talking about the capability the front wheels of the car have to respond positively and fully to what the driver is doing with his steering wheel.

And this surprises me somewhat, because I have seen cars with such soggy steering capability out there on the track—in a race, yet—that the driver almost has to holler Gee and Haw at his car, like in driving an old Missouri mule, to get it to come around at all.

My own initiating experience into quarter-scale racing dumped this disenchanting awareness onto *me* first off.

I had bought a used super-mod dirt car fresh off the track—right out of a race, you might say—and took for granted it was ready for anything I could do with it. I took it out to Rick James' Outlaw track in Highland, California, for my first thrill in the sport.

Two times around the track and I'm saying to myself, "Is this all the steering capability these things have?"

I found that one of the servo arms had ground off its spline to the point where it was useless, and I was getting no benefit from that servo at all.

I put on a new servo arm.

I went around the track a few more times. Better, but still very unresponsive.

I brought it in and tightened up the tension on the servo—saving linkage springs.

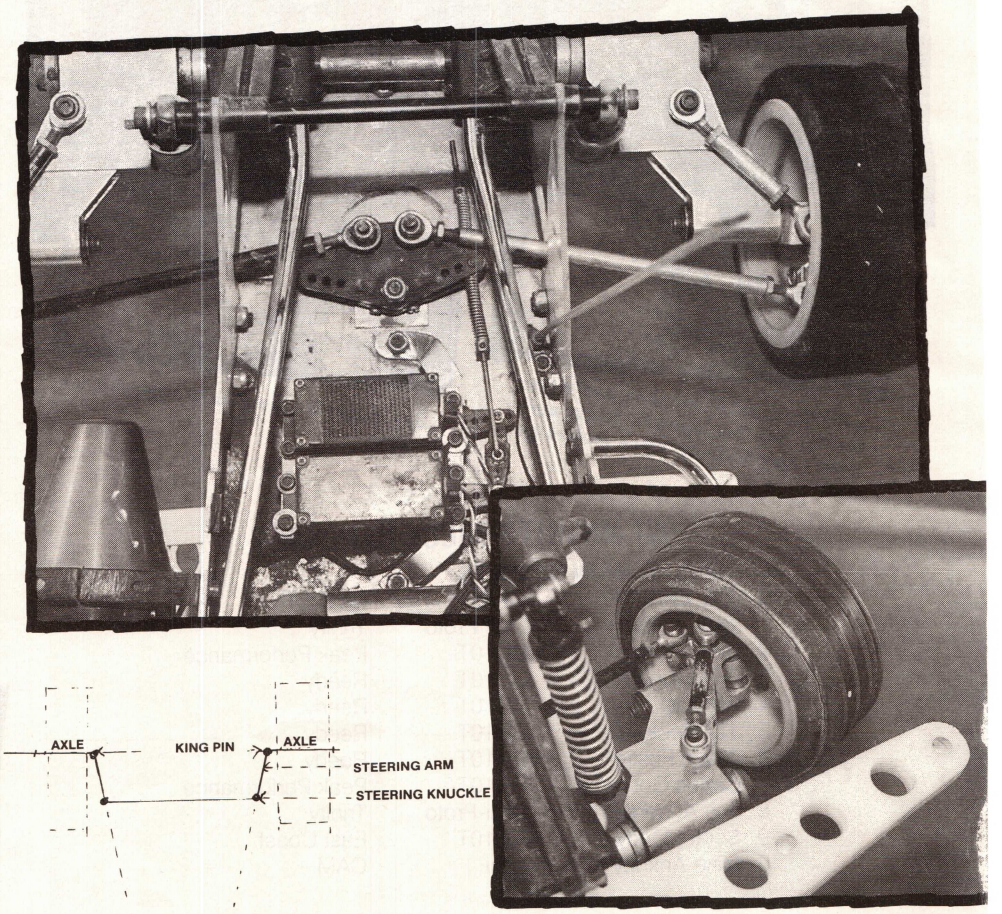
Better still.

Good enough, in fact, so that I chanced running it up to some speed for a few laps. Then, coming out of turn two, under some power, and accelerating, I let it drift up to within a few inches of the back wall. A small dirt berm thrown up against the back wall by skidding tires grabbed my right front wheel, sucked that car straight up the wall, turned it upside down, and proved to me right then and there that super-mods can fly upside down for quite a ways.

This time it was a broken servo gear and another ground-off spline, and I was heading back to the parts store.

I put that little beauty in the back of my car, feeling, I am sure, some of the disenchantment that many newcomers have felt at their first bout with limited turning capability and broken servo gears.

Having come from those early days of



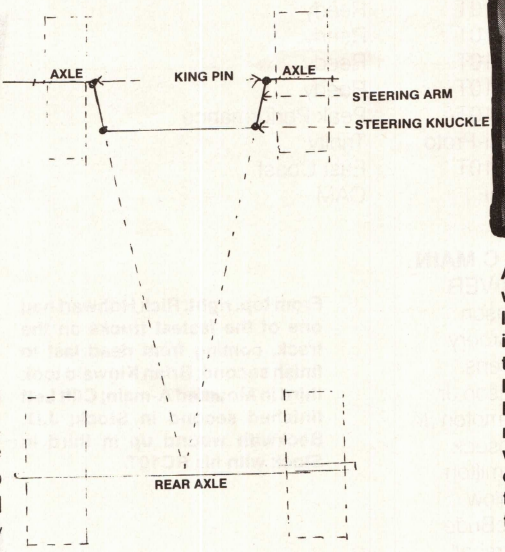


Fig. 2

At top, author's steering modification with servos working side by side with a single spring-loaded pushrod. Above: With front wheel turned inside out, note that the king pin is in line with the center of the tire. Steering arms and knuckles fit inside the four-inch wheel. At left and below, figures one and two illustrate the Ackerman steering principle, which causes the inside wheel in turn to turn to a sharper angle than the outside wheel, which in fact causes both wheels to turn to an angle appropriate to the radius of the arc each has to travel to complete the turn.

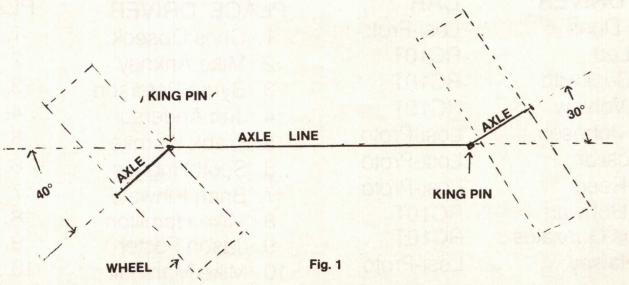


Fig. 1

1/8th-scale gas—where all racing was paved-surface road racing and steering was everything, I determined to get to the bottom of my steering problems even if I had to invent a whole new system.

I made a lot of explorations into the issue, even to the point of checking out the possibility of using *three* servos to steer. But I found there were other ways. I found that a number of drivers, using modification of what they had, had achieved a very adequate steering result. And others, using setup and driving techniques in conjunction with fairly adequate steering capability, had all the steering they felt they needed—and pretty much proved it on the track—without having the hard, positive, stop-to-stop capability that I personally like.

I found also that there were those who needed a lot more steering capability than they had without really realizing that that was what they were missing.

Paved oval racing aside—in that this is a somewhat different ball of wax from the open-wheel dirt racing—the bull-riding of quarter-scale racing—steering capability should be such that when the rear wheels break loose, or slide outward, you should be able quickly to cross up the fronts to roll with the slide and avoid spinout without decreasing your power completely. By the same token, when you are tending to push toward the wall, you should be able to get full throw of the front wheels into the turn to bring it around without a substantial decrease in power.

There are a couple of principles at work here: When the rear wheels are out, broadsliding, they are not only pushing the car forward down the track but are also pushing it infield against the centrifugal force of the turn and are increasing the speed capability throughout the turn provided the car does not spin out in the process. The front wheels, crossed up against the slide, provide a *rolling* guidance through the turn instead of the dead, sideways drag of unturned wheels that stops the front end and causes spinout.

In the push tendency, a full-throw of the front wheels into the direction of the turn, along with a slight decrease in power to dump a little more weight on them will make them bite Into the track and bring the car around through the turn, under power, before you ever get up into the marbles and before everybody in the county gets in under you.

So whether you are managing with soggy steering, or have a full, solid steering arrangement, you cannot get hurt by having the capability. If you don't need it, you don't have to use it. But if you need it, you got it. And if you don't have it, there are ways of getting it.

In my own case, I studied some of the modifications others had made—particularly those of Bill Daniels and Joe Castillo—made some home-grown modifications of my own to beef up the solidity of my steering arrangement (see photos), then did the one thing that seems to have solved *all* of my broken-servo problems *without* softening my steering capability. (We will get into this a bit later in the article.) Then I went back out to Outlaw.

I ran with some of the regulars for a while, just for the hell of it, with no steering problems. I made a few setup adjustments, to get it to handling better. Then, just for some more hell of it, and to prove my theory, I slammed it up against the back wall, right front wheel riding right up on top of the berm, and left a bumper scratch the entire length of the crash wall before bringing it around turns three and four and across the finish line under complete control.

Since then, I have repeated the above, hit other walls, had crashes, been upside down—dozens of times—and have never lost a servo gear or servo arm. I even broke off a steering knuckle and bent an aluminum drag link once without damage to the servo.

Of course, the reason for what I call soggy steering is the manufacturer's attempt to prevent damage to the servos resulting from impact to the front wheels. When a front wheel is impacted sharply and the shock of it is transfered through the linkage to the servo, something has to give. And the rather delicate, plastic arms and gears of the servo is what's going to give unless there is a buffer between the wheel and the servo. *Spring-loading* of the linkage, either by way of servo-savers or linkage springs is the only buffer available under today's technology that I am aware of. And this, of course, is what gives the steering setup its sogginess. With some exceptions and to different degrees on different cars, the turning capability of the servo has to wade through the servo-saving spring-

Continued on page 87

TWO TIME NATIONAL CHAMPIONS!

A&D SELECT CELLS



The Power Source!

*Get the race-winning punch and runtime you need with **A&D** select Sanyo SCR's and SCE's! All cells are matched on the third cycle (after receiving two conditioning cycles) on the Turbo-Matcher to within 3 seconds before being shipped. All of **A&D's** SCE's are matched at 20 amps, and our SCR's are matched at 30 amps. **A&D** packs have powered two ROAR National Champions to victory, and qualified several drivers for the next IFMAR World Championships! **A&D Select Cells** include Dan's Gold Bars and two decal sheets!*

SOME OF THE LATEST WINS WITH A&D:

- ★ *Sammy Blackwell won (1st place) Stock 2WD; A-Main 1989 R.O.A.R. 1/10 Dirt Oval Nationals*
- ★ *Jack Kloeber TQ'd and won (1st place) Stock; A-Main 1990 R.O.A.R. 1/10 Scale Nationals in Dallas, Tx.*
- ★ *Jimmy Piersol TQ'd and won (5th place) Stock; A-Main 1990 Cleveland U.S. Indoor Championships*
- ★ *Sean Cochran qualified 7th and won (1st place) Stock; A-Main 1990 Cleveland U.S. Indoor Championships*

A&D Racing Products

12 Plaza 94, Suite 218 • St. Peters, MO 63376

*(314) **441-0773** • (800) **397-3488** • FAX (314) **447-5662***

Truckin'

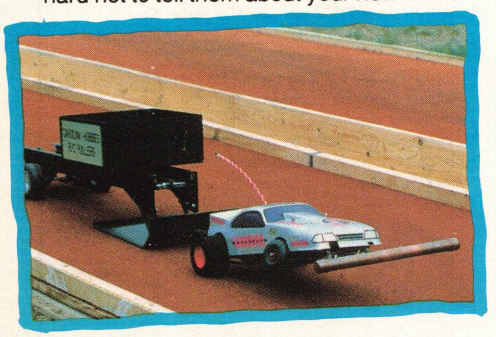
CLODBUSTER GEAR RATIO CHARTS

BY JACK WRIGHT

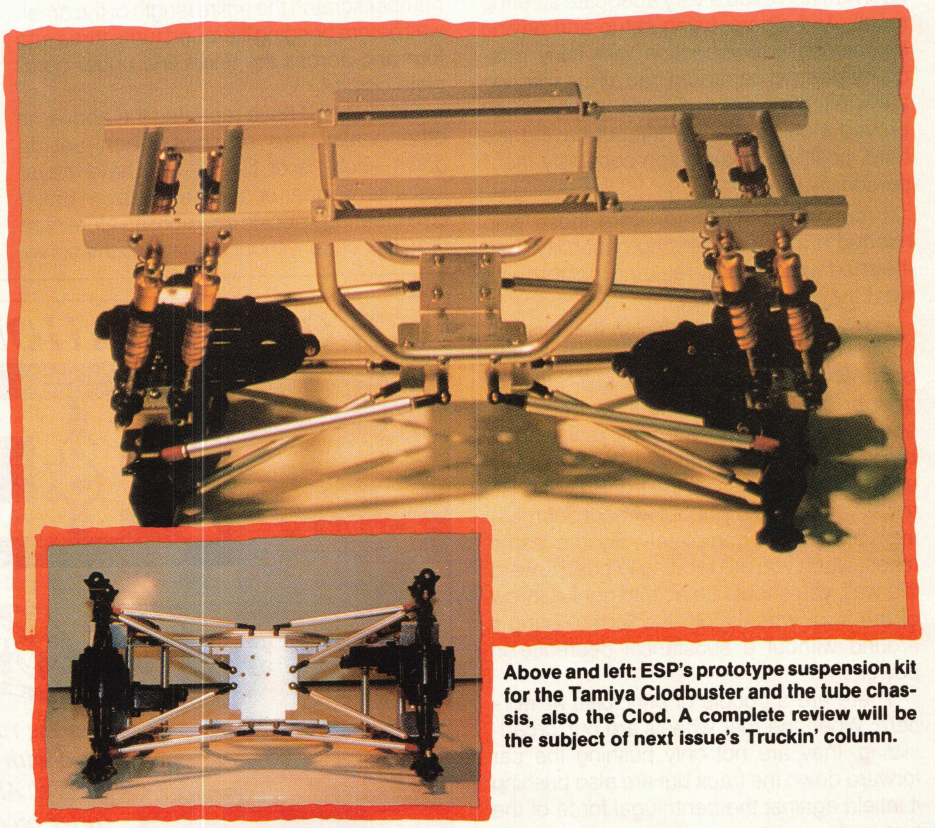
This month I had planned to review ESP's new suspension kit for the Clodbuster, but I've had something that I've been wanting to write about for quite sometime. I'll also go over a gear ratio chart for the Clodbuster and some other product updates. Now, on to the first order of business. Over the past five years I've been involved in truck pulling, and I have seen it mature into a great and popular hobby. But lately I have seen fewer and fewer newcomers to the sport. Why is this? I feel it has to do with the cost of building a truck. Believe it or not, on the average it costs as much or more to build a halfway-competitive stock class pulling truck than a 2WD Sportsman or Open 1 truck. I know many of you may find that hard to believe. But here's some numbers: it costs at least $100 for a basic truck or car, plus another $100 to make it into a puller, plus an assortment of spare parts like gears, speed controls and tires. Of course, most people replace the stock speed controller with an electronic unit, so that's another $80. When you add it all up with radio, batteries and charger—a stock class truck costs $441.79, where a 2WD Sportsman puller costs $432.80. (I figured this based on a kit truck and a factory made puller and averaged the prices from hobby shops and mail order.)

The main point I'm trying to make is that most new pullers want to do more than truck pulling. Some would like to take their truck and run it around the yard, but after you make all of these modifications for pulling that's all its good for.

So what can be done to help? Well, try to see if the local club can create a class for the novice. The Wolverine Pullers of Michigan have a novice class, which has helped their overall membership. And the next time a spectator asks what these things cost try to keep it to what's truly necessary. I know it's hard not to tell them about your new "Trinatron Mega Puller with its ability to pull down a small family dwelling and it only cost $900.00." I even have trouble remembering to do that, but it's important not to scare off the newcomers, they are the life blood of our sport.



Stock class pulling trucks no longer even resemble stock trucks!



Above and left: ESP's prototype suspension kit for the Tamiya Clodbuster and the tube chassis, also the Clod. A complete review will be the subject of next issue's Truckin' column.

Well, I've preached long enough so here's some helpful and informative news. AJ's R/C has released a new six-to-one gear reduction box with an aluminum spur rather than the usual plastic one. AJ's uses a 3/8-inch shaft and larger ball bearings for added strength. For more information call A/J's at (518) 377-7442.

ESP manufacturing has two new products of note. First is their new tube chassis for the Clodbuster. This is a lightweight, direct-replacement and goes well with ESP's Clod Suspension kit; I'll have more on these two products in next month's issue. And speaking of Clodbusters, JPS now offers aluminum axle tubes and ladder bars in addition to their machined aluminum gearboxes. Also JPS has steel gears for the Clodbuster. For more on JPS products check with your local hobby dealer.

Last but far from least, one of the members of the Hobbytown Pullers Club of Oceanside, California gave me a gear ratio chart for the Clodbuster. I've found it to be very helpful and I think you will too—make a copy and keep it in your tool box. The overall gear ratio with the stock 13-tooth pinion is 30.08 : 1.

The following ratios can be obtained by changing the pinion only:

Pinion	Overall Ratio
6	65.18 : 1
8	48.88 : 1
9	43.45 : 1
10	39.11 : 1
11	35.55 : 1
12	32.59 : 1
13	30.08 : 1
14	27.93 : 1
15	26.07 : 1
16	24.44 : 1
17	23.00 : 1
18	21.72 : 1
19	20.58 : 1
20	19.55 : 1

When using add on gear reductions, multiply the overall ratio by the gear reduction ratio. Here are the ratios for most of the

popular gear reductions.

A/J's reduction with an 85-tooth, 48-pitch spur:

Pinion	Ratio
10	8.50 : 1
11	7.72 : 1
12	7.08 : 1
13	6.53 : 1
14	6.07 : 1
15	5.66 : 1
16	5.31 : 1
17	5.00 : 1
18	4.72 : 1
19	4.47 : 1
20	4.25 : 1
21	4.04 : 1
22	3.86 : 1
23	3.69 : 1
24	3.51 : 1
25	3.40 : 1
26	3.26 : 1
27	3.14 : 1
28	3.03 : 1
29	2.93 : 1
30	2.83 : 1

APM gear reduction with 32-pitch, 48-tooth spur:

Pinion	Ratio
6	8.00 : 1
8	6.00 : 1
9	5.33 : 1
10	4.80 : 1
11	4.36 : 1
12	4.00 : 1
13	3.69 : 1
14	3.42 : 1
15	3.20 : 1
16	3.00 : 1
17	2.82 : 1
18	2.66 : 1
19	2.52 : 1
20	2.40 : 1
21	2.28 : 1
22	2.18 : 1

BoLink gear reduction with 30-tooth, 48-pitch main gear:

Pinion	Ratio
10	3.00 : 1
11	2.72 : 1
12	2.50 : 1
13	2.30 : 1
14	2.14 : 1
15	2.00 : 1
16	1.87 : 1
17	1.76 : 1
18	1.66 : 1
19	1.57 : 1
20	1.50 : 1
21	1.42 : 1
22	1.36 : 1
23	1.30 : 1
24	1.25 : 1
25	1.20 : 1
26	1.15 : 1
27	1.11 : 1
28	1.07 : 1
29	1.03 : 1

That's all for this month. Next month I'll have the ESP Clodbuster suspension kit and other great Truckin' stuff. •

Continued from page 10

pushes or oversteers. What changes do you make to the tires to stop the car from pushing or oversteering?

Scott Johnson
Knoxville, Tennessee

A. Scott, you didn't include enough information about the concrete oval you race on. Is it a big oval with banked turns? Is it a small one with relatively flat corners? These are all important factors to consider. However, the 10L-SS is quite easy to setup and I'm going to cover the basic setup procedures for oval racing.

To start with, you should set the car with zero tweak. That is, the front and rear ends of the car should be perfectly "flat." This will ensure equal loading on either side of the car. Now, if you'd like to offset the car to favor left-hand cornering, you might try placing all six cells of the battery on the left side of the chassis. This keeps the left side of the car from lifting in the turns and makes it much easier for the car to turn.

The 10L-SS's front end has a small amount of camber built in. If you find that your front tires wear quickly on the outside so that they're cone-shaped, you can try adding more negative camber using flat shims under the outside edges of the A-arms until the tires wear evenly. In oval racing, the right-side tires take much of the cornering load and I've seen guys using more right-side camber than on the left. But this is something you'll have to experiment with.

As far as springs go, the softer the spring, the more responsive the steering. Using a softer spring on the left-side of your 10L-SS will induce more left-hand steering. The rear dampener should be set to allow the rear pod to move from side to side without binding. Apply a small amount of silicone lube to the friction disks to obtain smooth damping. If the track you race on is extremely bumpy, try a lighter-weight shock oil in the rear shock. This will allow the rear end to absorb the bumps more quickly.

Tires are similar to springs in that the softer the tire, the more the bite. If your car pushes, try a softer front tire. If it oversteers, go with a firmer front tire compound.

Incidentally, if you're into oval racing, be sure to read Snuffy Smith's Between Rounds column for expert advice on paved oval racing.

Dear Answerman,

I am going to purchase a Kyosho USA-1 truck. I want to put four shocks per wheel instead of two, like the Clodbuster on page 10 of your September 1991 issue. If there is none for the USA-1, would the Clodbuster quad shock mount work? Thank you for your time.

Dale E. Buterbaugh
Pueblo, Colorado

A. Dale, at this time, I'm not aware of a quad shock kit for the USA-1. According to ESP, a leading manufacturer of aftermarket parts for monster trucks and producer of a quad-shock kit for the Clodbuster, the design of the USA-1's independent suspension makes it difficult to adapt a quad-shock system.

Dear Answerman,

I have a USA-1 and talk about one tough truck! I'd like to build my truck like Jack Wright's in the June issue of RCMC. I love that truck! But it takes money and lots of it. Mine is basically stock with bearings throughout. My brother has a stock Double Dare and we found my 360 Mega motors really perked it up. What motors can I buy to make my USA-1 come to life like his Double Dare? We have an 18-foot hill out back with a 35-degree slope. Will the Parma pulling motors work for this? Keep up the great work!

Frank Husted Jr.
Canton, Pennsylvania

A. Frank, I can't believe you let your brother and his Double Dare wax you. The USA-1 is supposed to be a much better monster truck than the Double Dare! The Parma motors Jack used in his USA-1 should help you smoke your brother. Remember, though, that the Parma motors aren't sold in sets of two for dual-motor trucks, so you'll have to reverse the normal rotation on one of the motors by turning the endbell 180 degrees.

Dear Answerman,

I have been reading your magazine for three years now. I think it is GREAT! I've been racing cars for seven years and just recently became interested in trucks. I was wondering if the Novak T-1 can be used to run fourteen cells. Also, is the Wimpy a good modified motor? Thanks and keep up the great work!

B.T. Powers
Shelby, Ohio

A. Thanks for the compliments, B.T. 14 cells are a bit much for the T-1 to handle, as the speed control is basically a racing unit. Novak's 828 High Voltage ESC which can be used with up to 28 cells, would be a much better choice for heavy-duty truckin'. Wimpy motors are popular racing motors in the Midwest, but I'm not sure if the manufacturer produces a line of pulling motors. •

DO YOU HAVE A QUESTION for the Answerman you'd like to have answered? It's easy, all you have to do is send your question to Answerman, *R/C Model Cars*, 898 W. 16th St., Newport Beach, California 92663.

WOMEN JUST DON'T UNDERSTAND

BY MIKE LIEM

Men need toys. And women just can't seem to understand that. They don't seem to understand the concept of toys, much less the need for such wonderful, glorious things.

When I take my wife to a stereo shop to browse, the experience ends up as an episode of Educating Diane. Once, I showed her a really bitchin' Kenwood receiver. She didn't seem very impressed when I explained that the system was rated at 150 watts per channel. She just wanted to know how much it cost.

"It's on sale for only six hundred bucks."

"Hmm. That's not too bad. And these are the speakers you get?"

"Uh, well, no. That's just for the receiver. The speakers are another four hundred. But they're Bose and. . ."

"Four hundred dollars?!"

"Um, yeah. But we won't need an amplifier. And we don't have to get an expensive cassette player."

"That thing doesn't have a cassette player?"

I really don't know why I take her with me to such strange places. I mean, this is the girl who's been to three of my Basic VCR Operation class and is just now proficient enough to play the thing. Yes, I mean just play it. The hand-held remote for the VCR has over twenty buttons on its control pad; Diane knows (and cares) for only three. Forget timed programming.

Sound and video systems may not be my wife's forte, but at least she does appreciate quality sound and picture, so she usually ends up buying my song-and-dance routines. R/C car stuff, that's a whole 'nother story.

I don't think Diane even listens to my excuses anymore. I think she simply tolerates my shopping binges at the hobby shop. To a point, that is. After all, she handles the finances in this family. But she still doesn't understand.

Take the time I ordered a box of matched 1400 mAH SCRs. I told her that these were the good stuff and, at a mere $120.00, a real steal. Then I showed her the box with the 24 red cells in it. Diane was not impressed.

"A hundred and twenty for those?"

"Hey, these are hot cells. See these labels? Awesome numbers."

"But they're not even put together."

When it comes to R/C stuff, Diane seems to be of the opinion that less is, well, less and more is more. She doesn't feel quite as badly if I come home from the hobby shop with a bulging bag. I certainly don't have to explain car kits to her. I open the box, she sees all the parts and pieces, and she's satisfied. Good purchase. Lots of stuff. But two modified motors for a hundred smackers? Not a good purchase. Too bad motors don't come in kits.

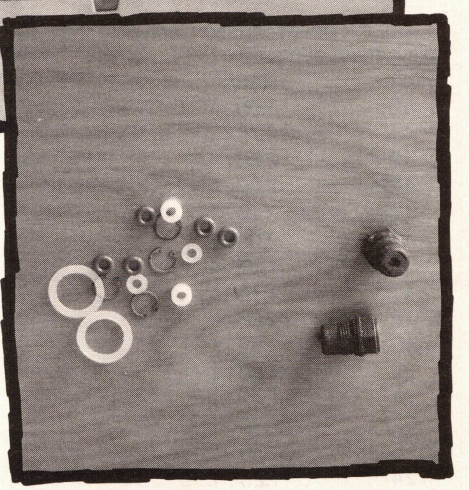
As I'm sitting here banging away on the typewriter, the magazine next to my coffee mug is opened to a page of advertising. That itty-bitty Tekin receiver sure would be nice for my next project. It's so small and light and. . .Nah, she wouldn't understand.

SIMPLY SHOCKING

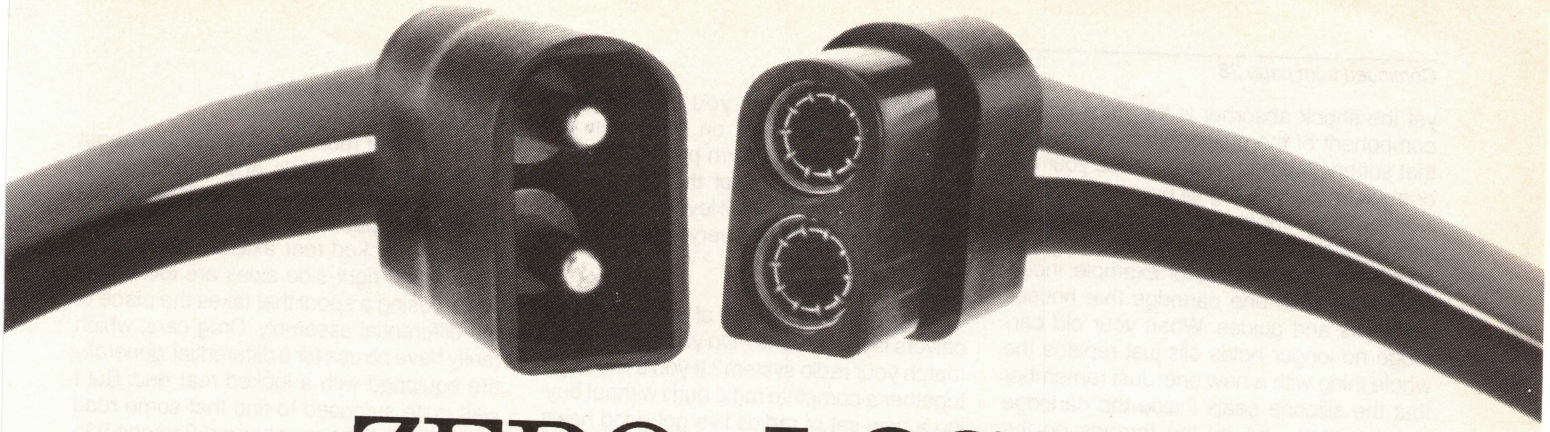
Rebuilding shocks must be a chore that not too many people enjoy. At least that's what I gather, having seen so many offroad cars and trucks with shocks that long ago failed to function as they were intended. And

Continued on page 40

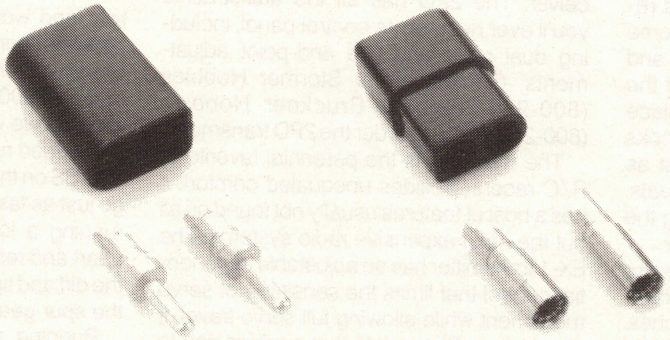




The awesome Futaba Magnum 2PD transmitter can now be purchased without the servos and receiver, allowing the buyer to tailor his or her own radio system. Above: the Team Losi replacement cartridges on the left contain the seals and guides. Associated's shock rebuild kit includes all the necessary parts to do the job.



ZERO-LOSS RACING CONNECTOR



Astro's new killer connector is the best connector ever designed for the R/C market. Our tests proved its voltage loss to be a scant .010 volt @ 20 amp ... the lowest we've ever tested ... equivalent to a 1" piece of 14 gauge wire.

- **Fits 13 and 14 Gauge Wire**
- **Impervious to Motor Spray**
- **Small Lightweight Design**
- **Total Polarity Protection**
  No more meltdowns!
- **Easy Assembly/Disassembly**
  Solder pots make it easy to reuse the connections. Just solder/desolder as required.
- **Tested for 100,000 Insertion Cycles.**
  Precision machined pins and sockets made from Astroloy 174 are plated with 50 microns of pure gold. The unique hyperboloid wire basket will never wear out so your Zero-Loss Connector will last and last!



(actual size)

Order AFI4005

$9.95 retail per pair

AstroFlight INC.

13311 Beach Avenue/Marina del Rey,

Continued from page 38

yet the shock absorber is the most critical component of the suspension. It's the part that softens the bumps and keeps your car or truck from bouncing all over the road.

Rebuilding shocks is no big deal, and some shocks are a piece of cake to maintain. Team Losi shocks, for example, incorporate an all-in-one cartridge that houses the seals and guides. When your old cartridge no longer holds oils just replace the whole thing with a new one. Just remember that the silicone seals inside the cartridge can be easily cut by the threads on the shock piston rod. I usually remove the piston and retaining clips from the rod and insert the piston end of the rod into the cartridge instead of the threaded lower portion. A drop of oil in the cartridge prior to inserting the piston rod helps to lubricate the seals.

Associated shocks take a little more time to rebuild. A good investment here is a pair of snap ring pliers to remove the snap ring at the bottom of the shock that holds the seal and guide assembly. Associated offers rebuild kits for their shocks, and these come complete with seals, guides, washers, and snap rings. Don't try to salvage any of the above parts from your old shocks; replace everything! The guides in Associated shocks take a lot of friction loads, and it's just as important to replace the guides as the seals. A worn guide will result in slop, causing the piston to rub against the shock cylinder.

Before you reassemble the shocks, make sure you flush it clean inside and out. Examine the piston rod for nicks and scratches. Grit embedded in the seals can scratch the rod. Hardened chromed shafts are available from Associated, and these will resist surface scratching better than the standard piston rods.

How often should you rebuild your shocks? That depends on how often you race. But you can perform periodic checks for leaks. Pop the top of the shocks and remove the caps. If the oil level has dropped considerably or the oil is very dirty, it's time to rebuild the shocks.

GUN CONTROL

Do you have a bunch of servos and receivers laying around? Do you like to mix 'n' match your radio system? If you'd like to put together a complete radio outfit without buying a new set of radios I've got good news. You can now purchase the best AM transmitter from Futaba and KO without springing for the whole system. In the case of the KO, the receiver comes with the transmitter, but at a price that's almost too good to be true.

Futaba's Magnum Junior and Sport transmitters have been available for some time now, but I've only recently seen the top-of-the-line AM transmitter, the Magnum 2PD, offered for sale minus the servos and receiver. The 2PD has all the adjustments you'll ever need on its control panel, including dual rates and fine end-point adjustments. Contact either Stormer Hobbies (800-255-7223) or Bruckner Hobbies (800-288-8185) to order the 2PD transmitter.

The KO EX-1 is the perennial favorite of R/C racers. Besides unequaled comfort, it has a host of features usually not found on all but the most expensive radio systems. The EX-1 transmitter has an adjustable exponential control that limits the sensitivity of servo movement while allowing full servo travel. It also has an RF module that enables you to switch to another band of radio frequencies by changing the module. All this plus a receiver for less than a hundred bucks! Check with your dealer or contact Hobby Shack at 1-800-854-8471.

LOCK 'EM UP!

A couple of months ago I told you about limited-slip differentials and how they are used on full-size vehicles. Another way of transferring power to the rear wheels is through a locked rear axle. In this fashion, the left and right-side axles are locked together using a spool that takes the place of the differential assembly. Drag cars, which really have no use for a differential, generally are equipped with a locked rear end. But I was quite surprised to find that some road racing cars, the turbocharged Porsche 935 that dominated endurance racing in the late seventies being the most remarkable example, have also used locked rear axles.

Ten years ago, when I was into 1/12-scale racing in a big way, the hot setup for the JoMac Lightning 2000 car I was racing was a locked differential. We would bolt the spur gear to the wheel hub and go racing. Outdoors, on a large track where the cars could make wide radius turns, the locked rear end worked great on the L2000. The tighter indoor tracks, though, proved to be an entirely different story. The locked rear end of the L2000 would break loose in the corners, so we went back to the differentials.

I've tried running a locked rear end on my 10L-SS on the ovals, and I seem to be able to go just as fast as with a diff. If you'd like to try running a locked rear axle, take your diff apart and remove the diff balls. Reassemble the diff and tighten the adjustment nut to lock the spur gear in place.

Running a locked rear axle with stock motors doesn't present much of a problem. However, without the aid of controlled slip, a torquey modified motor can break the back end loose in a hurry. •

Continued from page 24

made of much-battered car bodies and the object was to get over five bodies in the shortest time.

The Aussie flag was represented by the Flying Falcon which is based on a Ford Falcon Ute "truck" body which are sold here in Australia. It was sitting on a Ford F350 chassis. The power to move this monster comes from a fully worked Ford Windsor 302 motor with twin Aussie-made Sprintex superchargers, Moteo computerized fuel-injection system. Compression is 7.5:1 and the V8 produces around 600 horsepower at only 5,500 rpm. The whole thing sits on 36-inch-wide rims shod with Firestone tires. I could go on with more details but I think that you get the picture. All in all it was well worth the cost of the tickets and having to put up with two kids, as my stepson, Stuart, and his mate, Paul Baker, also went along for a look.

AUSSIE SPEEDWAY TITLES

The Southern District Model Car Club, one of the oldest R/C clubs in Adelaide, have again for the fourth time held the South Australian Speedway titles. The event was held at their track at Morphett Vale, a southern suburb of Adelaide. The racing was held on an oval track made for the speedway racing.

The event had three major classes and subclasses, including 2WD Stock, 2WD Open and 4WD Open. The race director, Wayne Currie, told me that he was a little disappointed at the small number of entries received, only 33 for the day's racing which was a little disappointing as they have in past years had up to 70 entries. Wayne said to me that he thought that it was a reflection of the hard times that this country and this state are having at the moment with people not wanting to travel very far to compete.

The track had a very hard running surface of compacted clay type soil which made the setting up of the cars most important. Being a tri-oval track, no car gained any advantage by starting close to the inside of the track as the start/finish line was on a straight section of track. The setup of the car was very important with a little understeer helping the car get through the corners without spinning out. With the track being so hard and I might say a little dusty, the cars at first glance seemed to be having traction problems but on closer inspection that wasn't the case with the knobby buggy-type tires giving reasonable traction. The cars were mostly Kyosho Lazers, which are a very popular type of buggy here at the moment, but I did see the odd Pro Cat running around as well. I was a little disappointed not to see any sedans or speedway-bodied cars there, as after all, this was a speedway title event! One thing that I was glad to see was a lady driver showing the men a thing or two.

The heats were run over a three-minute race with the most laps posted in that time. Les Scott took out the 2WD Stock class, with Gary Waterman taking out the 2WD Open and in the 4WD class, Mauri Heusler took out top honors.

The Southern District Model Car Club hopes to hold a similar event approximately every three months, with a final title event once a year as in the past. It is hoped that next time there will be a few more entries as a great day was had by those who attended this year's meeting. Catering was provided by the host club in the form of the mandatory Aussie Bar-B-Q which was appreciated by all who were there. Perhaps a few more clubs may become interested in this form of racing in the future. •

EXPERIENCE THE SPEED OF LITE.



Hyperdrive Platinum steel and Platinum Lite aluminum pinions.

Manufactured like no other.
Not a crude extrusion or casting, our space age computer generated machining cuts 48 and 64 pitch gears from solid billet aluminum and steel, allowing exacting tooth contour that, until now, was unattainable. Result? Platinum operation is amazingly quiet and vibration free.

Lighter than no other.
In fact, Platinum steel pinions average ***a 40% lower rotating mass - the lowest in the industry!*** Platinum Lite aluminums are a whopping ***77% lighter than steel gears!*** It doesn't take a rocket scientist to figure the awesome advantage here!

Metal Impregnated like no other.
Platinum steel pinions are coated with ***Stealthcoat.*** No other manufacturer has it. ***Friction is cut up to 68%. Surface life increase 25 times, on average.*** Platinum Lite aluminums are hard coated with our own unique formula to provide planet hopping performance at the ultra high warp speeds today's motors dish out!

Finally, each gear is individually stamped with its correct tooth size to help you make choices quickly and easily.

Sneak past the competition with the stealth-like quietness of Hyperdrive's Platinum series pinions.

Hyperdrive
THE ULTIMATE IN RACING

3210 Howard Nickell Road • Fayetteville, Arkansas 72703 • Phone (501) 444-8200 • Fax (501) 444-8402



KING 8 SUPERNATIONALS!







An impressive lineup of Grand National and spring cars before the heats begin. Right: tech table scrutiny.



Hot Indycars lineup for some wheel-to-wheel action.



King Kenny Higdon astride one of the truck entries.

BY TOM NUSBICKEL

This was it! the quarter scale race of the year. Kenny Higdon's 5th Annual Supernationals, 1991. This year showed some changes over previous years. First off one of the major motels, the King 8, pulled out and a replacement sponsor from the Vegas Area did not materialize so with the help of Ken Harper's Live Performance out of Winter Park, Florida, Skellenger Engineering, *R/C Model Cars* magazine and Kenny's own pocket, the Supernationals were on.

The event was held at Silverbowl Speedway, which was the same location as last year's race but changes were present here too. New lighting really helped with the night racing with bright, even luminescence all the way around the track. The local Q-Scale club (QSARA) has grown up over the last twelve months and not only took on all of the trackside chores but also attacked the monstrous job of track maintenance and scoring.

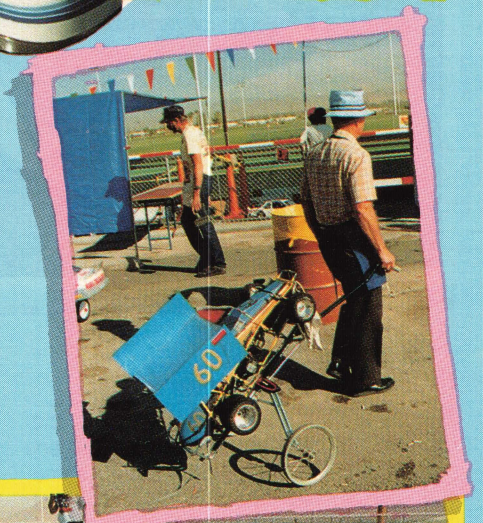
I say monstrous job because indeed it was. When the early arrivals wheeled into town they were met with a track that was far from ready for a major Q-Scale oval race. Many people don't realize that quarter-scale cars don't sauce their tires. We run bare foam or full-size race car type rubber caps. What happened to the track the previous weekend caused these tires to wonder what they were riding on. By Wednesday though with hard work by Ron Schoeb and his crew it looked like the track would come around in time for qualifying on Thursday.

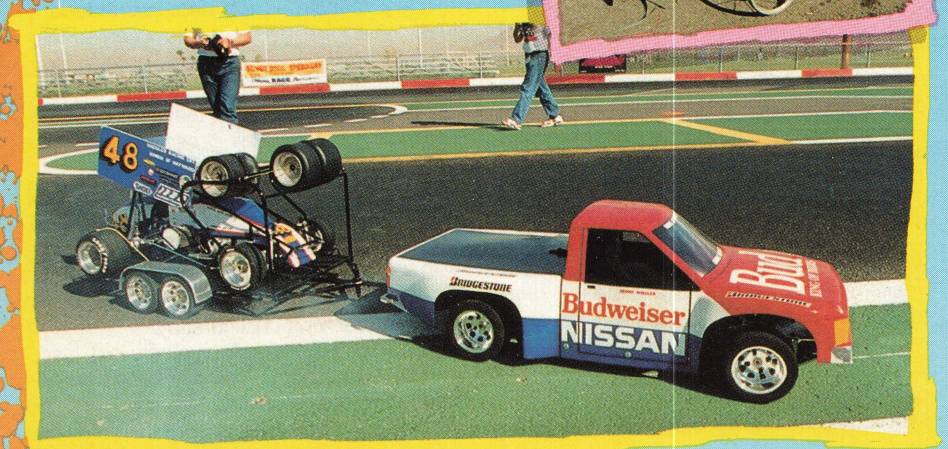
Scoring this year took on a new look also, with QSARA buying a brand new, computerized transponder scoring system. Not only did the club set it up and learn the software

KING 8 SUPERNATIONALS!









At top: the NASCAR Winston Cup cars got together in turn two for what looks like a Martinsville start. Above: The PDS/RACO prototype GTP was one of the slickest-looking road cars ever seen in quarter scale. Right: Long walks to the pits brought out the most unique car carriers imaginable. Below: Bernd Koegler showed his full rig, driving up in the truck-trailer-sprinter.

before hand, they managed to keep the restless drivers happy with qualifying, heats and main listings, frequency conflicts and lap counting.

As always, the manufacturers are a major reason for the growth of the supernationals and this year their support continued in fine fashion. "Manufacturers Row" was the main thoroughfare with RACO, PRC, DeLara, Arrow, Quickdraw, Zoom and many many others lining the path to the drivers' stand. Not only were the manufacturer's there to race, sell cars and parts and assist the other racers they also pitched in with cash and raffle prizes which were displayed in Kenny's Trailer. In addition to the car builders many other manufacturers pitched in with great prizes and cash. They included Airtronics, Quarter Scale Products, B & B Models, Helgeson Racing Products, Sign Art, Victor Products, RC Design Products and, of course, your favorite magazine, *Radio Control Model Cars*.

Nine different classes of quarter scale vehicles were scheduled to compete: including stadium trucks, motorcycles, hobby stockers, Indy cars, super modifieds, ASA outlaws, sportsman GN's, sprint cars, and Grand Nationals. The total car count (130) was down a bit from last year's record turnout. Undoubtedly a result of the economy as many of the Eastern, Southern and Midwest racers found the cost of travel a bit too steep this year. But what was missing in quantity was certainly made up in quality with some of the nicest equipment I've seen.

LET'S GO RACING

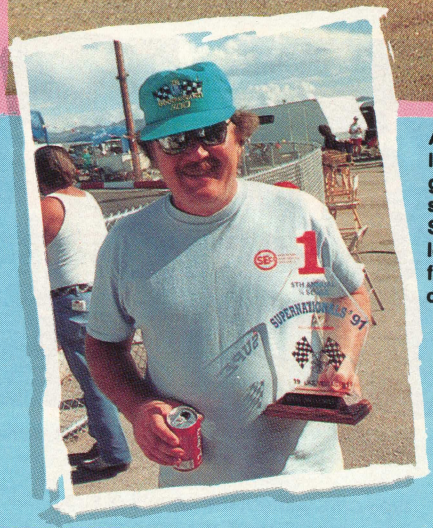
After a full day of controlled practice by all the classes, Wednesday morning and afternoon the track was closed down and a temporary "offroad" track was built for the stadium truck qualifying. This offroad course was created by two ramps that allowed the trucks to get some serious "air". With six entries, qualifying became a battle of bragging rights since everyone was going to make the A-main. But bragging rights mean a bunch to these guys so they went for it hot and heavy. When the dirt cleared Chris Rahe had the fastest lap and the pole for the first heat.

The next morning, Thursday, was qualifying day for all the cars. Each driver in each class was given four laps with the fastest individual lap used to post up the heats and for the lucky few to claim T.Q.

It's always amazing to me how close all of the qualifying times can be considering the wide range of driver experience. But the QSAC rules that govern these cars is a great equalizer. Speaking of rules each car went through the tech table to assure its legality. From there the cars were impounded in qualifying order and fueled in impound. This system really smoothed out any potential questions and made qualifying run smooth and







At top, left: Concours cover matched the flawless paint job underneath. Top: sprint cars tangle in hot racing action. Above: Sign Art cars strut their stuff after the racing was over. Left: Steve Skellenger collects some hardware. Below: Mike Kornblatt was first in the B-main and fourth in the A with his WCM cars. He won concours too!

amazingly quickly.

After qualifying the TQ's were posted and the heats were arranged. Evening came and the track was again transformed into a stadium truck track for the truck heats and main. These trucks were a real breath of fresh air for everyone in attendance.

After the heats the result sheet showed Chris Rahe won the pole. He was ready for the front row. Kenny Higdon warned us before hand that this division might be run a bit differently though and ordered the truck lined up in reverse order.

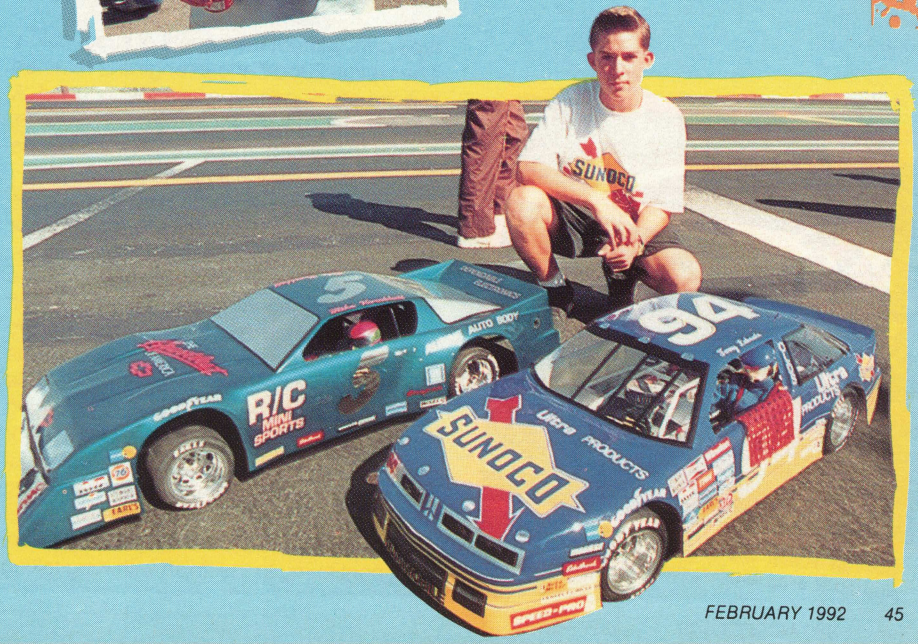
At the start, trucks were going everywhere and the road cones denoting the turns got bounced all over. Rahe would calmly seek out the cones and go around them no matter where they were. Everyone else took a more normal route. In the meantime Bernd Koegler pulled out of the pack and won it in his Hayward Honda. But the fun wasn't over yet. Bernd and Chris kept going and decided to show off. Skipping the first jump in order to gain some speed both drivers would hit the big ramp and try to outdo each other. Two, three, four and finally five feet high landing at least 20 feet down the track each launch brought out raucous cheers from the crowd.

FRIDAY ACTION

Friday was blocked out for heat races. The qualifiers set the heats up and each heat ran twice with the second round being run in reverse order. Each driver was racing for points. One position, one point. The driver with the least points became the polesitter for the A-Main. The more points you acquire the further back in the program you would be on Saturday. Ties in points fell back on the qualifying times. This simple formula worked very well and made the waiting for the posting of the mains short. The rest of the day was devoted to a last shot at practice, because the next day was the Big Day when all the mains would be run.

HOBBY STOCK

The first A-main of the day, Saturday, went to the newest class in Q-scale, hobby stock. This class is a spec class meaning one type of car is used. Hobby stock cars are pan-





Outlaw A-main.



Indycar A-main.



Super Modified A-main.



Grand National A-main.



Sprint Car A-main.



Sportsman A-main.



Best of scale: the Q-scale motorcycles look authentic even when resting on their kickstands.

type cars without the benefit of suspension. The typical 23cc Zenoan engine is retained but the stock can-type exhaust is used. A belt transfers the power to the solid rear axle. Five of these cars made by Precision Race Cars lined up for the start.

Polesitter Gale King and Steve Mylar were on row 1. Bill Schulmann and Rick Wisenor row 2 and Wes Gaede brought up the back.

From the start it was clear that the race would be for second place, as King ran off and hid from the rest of the pack. By the halfway point even this race for second was quickly becoming a two-car duel, with Gaede getting through the traffic and challenging Schumann. After five minutes Wisenor dropped out with broken pieces, bringing out a yellow. This bunched up the pack but King was already three laps in front. When the green came out Gaede and Schumann went at it, continuing to the finish with King taking the checker. Gaede made the better last turn than Schumann and took second by half a second.

OUTLAW

This year saw the emergence of the speed potential within the ASA outlaw class. These cars based on Grand National-type chassis but with more lenient body, aero, tire and carburetor rules. A decrease in lap times compared to their full bodied brothers would be expected but this increase is just now being realized.

Thirteen cars signed up for this class and the B-main saw some familiar names trying to reach the big show. Roger Clodt and Eric Greco took off, with Don Battenfield coming through the pack along with Derek Miller. As Eric got past the polesitter, Rick James crashed. Soon after that Nicholas Schons

Continued on page 72



KNOXVILLE NATIONALS

Each year the Quarter-scale Nationals, held in Knoxville, Iowa seem to get bigger and better. The Sixth Annual version was no exception. With more sponsor involvement than ever before, better organization, and top competitors from all across the country, the 1991 event was a huge success. Nearly 100 entries took their shot at $5,000 in cash awards put up buy sponsors and race promoter, Jon Rahe. Not everyone took home a piece of the purse, of course, but everyone did have a good time, and went away ready for the next one in '92.

This year's race format was changed to a three-day program to allow for an earlier evacuation to the World of Outlaws races held each night at the nearby Knoxville Raceway. The quarter scalers run the same week each year as the "big car" Knoxville Nationals, making for a very full four days of racing for those who like the big sprinters and the smaller radio-controlled versions.

Thanks to Jon, his crew and quite a few locals, who help each year, the track was ready for running by Tuesday at noon, even though official practice day was Wednesday. Many racers who drove long hours to get there really enjoyed the extra few hours head start they had Tuesday to feel out the track and get their cars ready. The track for 360 days of the year is the parking lot for the local high school and is concrete, not asphalt like the majority of quarter scale tracks around the country. Many who travel to Knoxville for the first time are a little nervous about making their cars work there without major, mind-boggling chassis changes. The sigh of relief is almost audible when they find that after only a few laps, that the traction is as good or bette than asphalt; it doesn't wear tires, the track surface is cooler and more consistent *and* they didn't have to change the car at all!

Wednesday's practice saw everyone hit the track (more than a few times) looking for that "racers' edge" over the competition. Out of the box in sprint cars, it looked like the Arizona and New Mexico contingent of Fred and Ben Dowler, Butch Kloeber and Scott Easter were strong, but the Midwest boys had done their homework also. Roger Newell, Dave Giannetto and John Talbert were close behind.

The Southwest Arrow cars were strong in super-modifieds as well, but Steve Quartermouse, Vince Sansone and Gary Gallo looked real good in practice. In the late models, Tom Hargrave was a bullet, with Chris Rahe and Eric Greco, bot Californians, hot after him. The always fast RACO Grand

Continued on page 78



Concours winners.



Grand National winners.



Late Model winners.



Super Modified winners.



Sprint car winners.

KYOSHO

HEAVY METAL

BY R.C. CANON

If you are a fan of monster truck racing, you have probably seen a monster tank at a monster truck event or on TV. If you are not familiar with these unique vehicles, you might just be asking: "What is a Monster Tank!?" Well, it's really very simple. Take one old (1940s vintage) armored personnel carrier or rapid retrieval vehicle, throw in a mega-cubic inch V-8 engine, toss a truck body on top, and you're done! What you now have is a Monster Tank weighing in at around 18,000 to 25,000 pounds and capable of speeds up to 60 mph. Now what do you do with such a vehicle? Crush cars, of course!

Numerous such vehicles have been built and are quite popular with monster truck fans. Famous names such as: Virginia Beach Beast, Bearfoot Tracks, Son of Goliath, Bigfoot Fasttrax and Heavy Metal are just a few. Kyosho USA sponsors the Heavy Metal monster tank, so it was only natural that Kyosho would produce a model of it. The model does differ slightly from its full-scale brother. The full-scale tank currently runs a Ford Aerostar replica body while the model sports a Ford Econoline body. Big Brother utilizes a 1945 M-4 personnel carrier with narrow tracks and rocker-type bogie wheels. The Kyosho model is based on the old Blizzard Snow Cat and therefore has wide tracks and individually sprung bogie wheels. The sharp-looking graphics have been duplicated very realistically on both versions. Let's take a closer look at the kit. . . .

The chassis consists of a one-piece ABS plastic tub which houses a pre-assembled gearbox with two 380 motors, two speed controllers (one for throttle control, one for steering), and ample room for radio gear and battery. The suspension system consists of 10 individually sprung bogie wheels. The wheels are a new design which incorporate 4 x 4 mm bushings and attractive chrome plating. The wheels have also been re-engineered, from the Blizzard design, to better retain the tracks. The body is vacuum-formed poly-carbonate and uses decals for the graphics and front grill. The Heavy Metal is 1/12-scale but, due to its relative size compared to 1/10-scale bodies, you can select from numerous aftermarket bodies which will look good on the chassis. Parma's Ford Aerostar is a good alternative and would look just like the full size Heavy Metal.

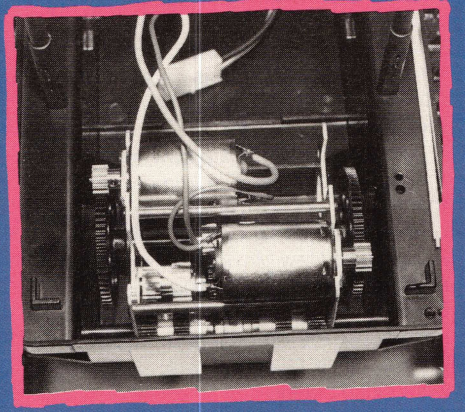
ASSEMBLY

While Kyosho's instruction manual is very good, I did run across a few problems which I will bring to your attention, along with a few tips that I found useful. First of all, the gearbox does come pre-assembled, but to avoid aggravation (and gear damage) later, I would recommend that you remove the gearbox screws, one at a time, and apply a small amount of Blue Loctite to the threads and reinstall. These screws have a tendency to shake loose and can sometimes fall into the gears. A little extra work now can save lots of work later. Also remember to lubricate the gear shafts as shown in the instructions.

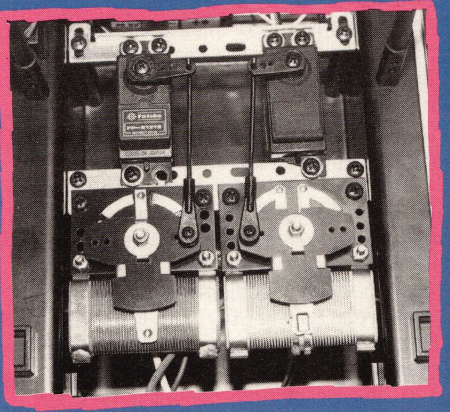
The first step in the manual is to assemble the plastic tracks. If you wish to narrow the tracks, as I have done for more scale appearance, a separate instruction insert is provided to show you how. Keep in mind that this modification may shorten track life and also voids any warranty on the tracks. Per-

Continued on page 56





Twin motors run the Heavy Metal, and provide enough juice to carry it through dirt, grass and other rugged terrain. Running on concrete is a problem; the tracks will spin easily.

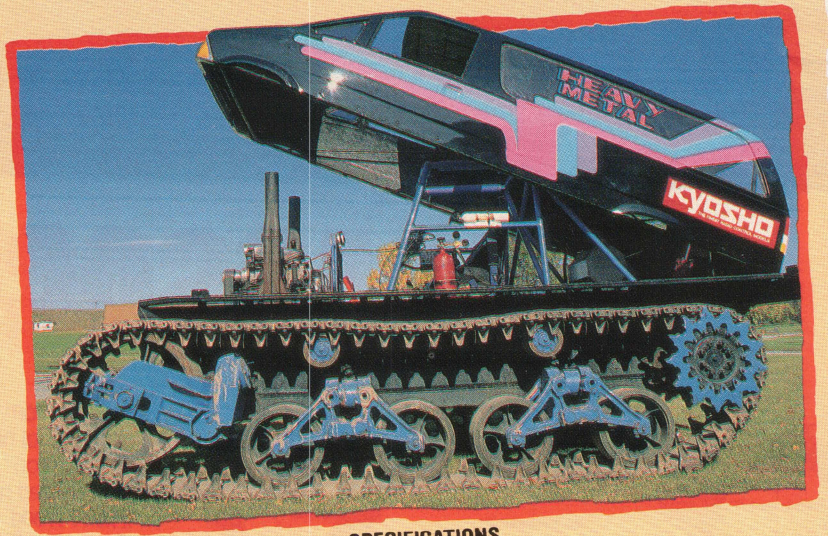


The throttle control is on the left, and the steering control on the right. Turning is accomplished by reducing power to either the left or right motor, just as real track vehicles work.



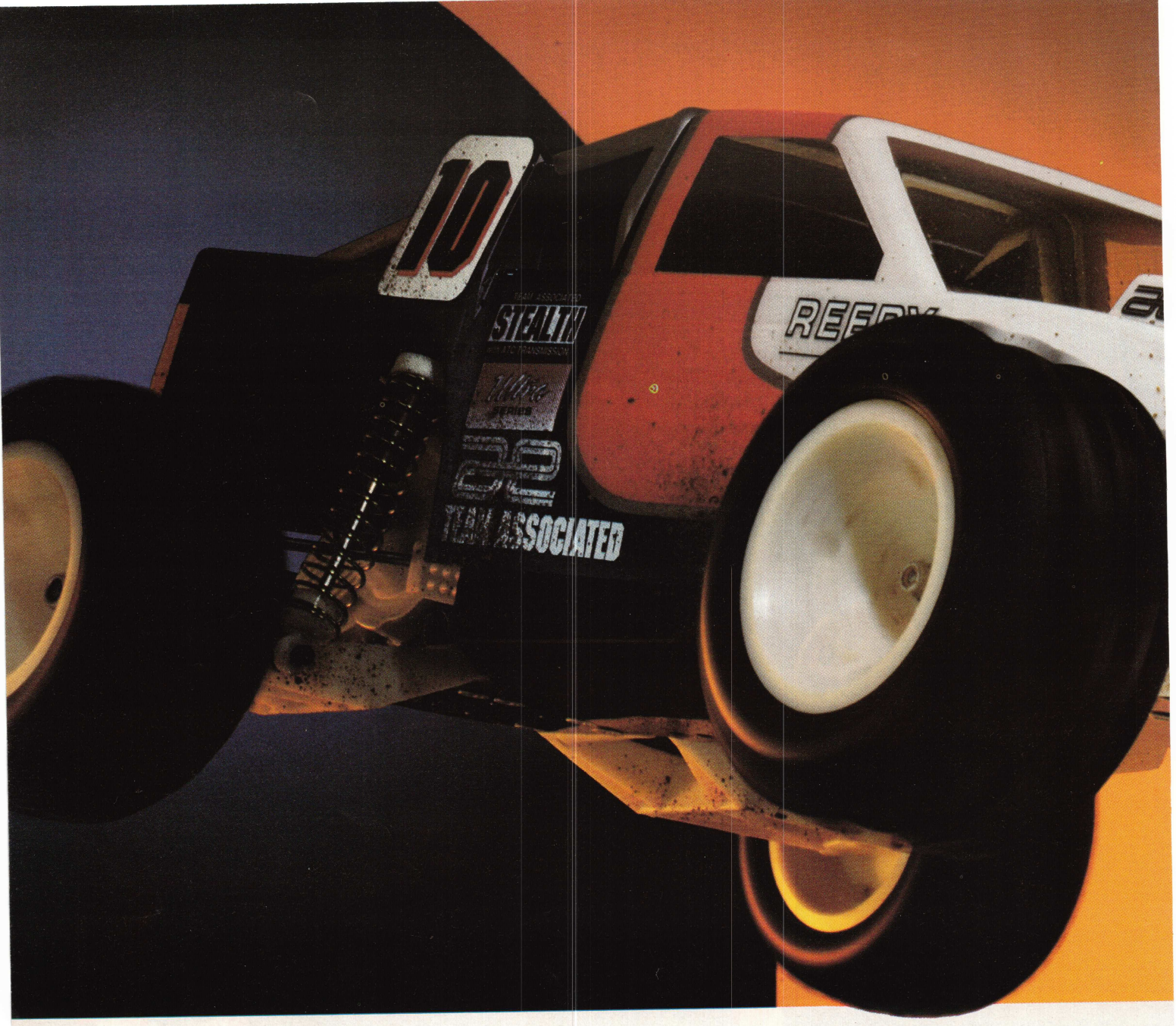
"Patterned after the full-size Heavy Metal, sponsored by Kyosho, the 1/10th-scale version is faithful to the original, able to romp and stomp anything in its path with bloodthirsty abandon."

THE REAL HEAVY METAL!

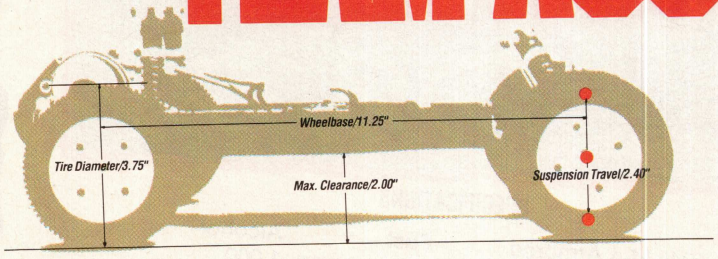


SPECIFICATIONS

Chassis	1945 M-4 Armored Personnel Carrier	**Fuel**	Alcohol
Body	1991 Ford Aerostar, fiberglass	**Horsepower**	1,000
Engine	468 Cubic Inch, Big Block Chevrolet	**Weight**	23,000 Pounds (11 Tons!)
Blower	8-71 GMC	**Speed**	50 mph
Fuel System	Enderle Fuel Injection	**Approximate Cost**	$60,000.00



TEAM ASSOCIATED TAKI TO A HIGI



WE GAVE EVERYONE ELSE A HEAD START AND THE RC10T STILL WON ITS FIRST RACE!

When our RC10T prototypes were first rolled out to the Florida Winternationals we were up against the top truck teams from all over the world. And most of the competition had the benefit of over a year of development.

Well, the Team may have been short on truck racing experience, but we catch on real fast. Up against a field of over 400 hostile entries, our RC10T's finished first and second.

What makes the new RC10T a winner from the start is what has produced an unparalleled nine IFMAR World Championships for the Team. Every component of every Associated race car is engineered and competition-tested until there is no competition....it's the very best.

More specifically, the RC10T uses experience gained with our 2-Time World Champion RC10. In fact , the RC10T shares only the alloy tub, Stealth transmission and shocks with that legendary racer. No compromises were made. Our R&D team worked closely with ROAR specifications to produce the fastest, best handling and most reliable stadium truck available.

THE RC10T HAS WHAT IT TAKES TO OUTHANDLE THE COMPETITION.

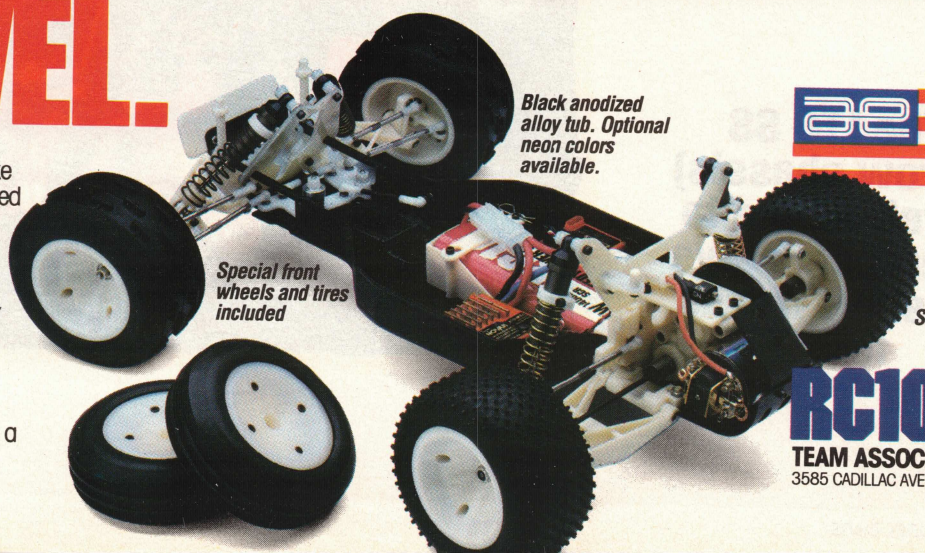
The RC10T handles better, because its front and rear track are wider for higher cornering speeds. The longer wheelbase and special,



S TRUCK PERFORMANCE
ER LEVEL.

narrow one-piece bulkhead make the 10T more stable. Teflon-coated shocks and extra suspension travel keep you in control over the rough stuff. Our special, lightweight stadium pickup body, vacuum-formed in clear Lexan® tops it all off, and we've even tossed in a bonus pair of trick, narrow front wheels and tires.

Now's your time to move up to a real racing truck, the RC10T.



RC10T

TEAM ASSOCIATED

3585 CADILLAC AVENUE/COSTA MESA, CA 92626





"The LTO SS (narrow chassis) is well-suited to superspeedways and short tracks too."

BoLink LTO SS

BY JACK WRIGHT

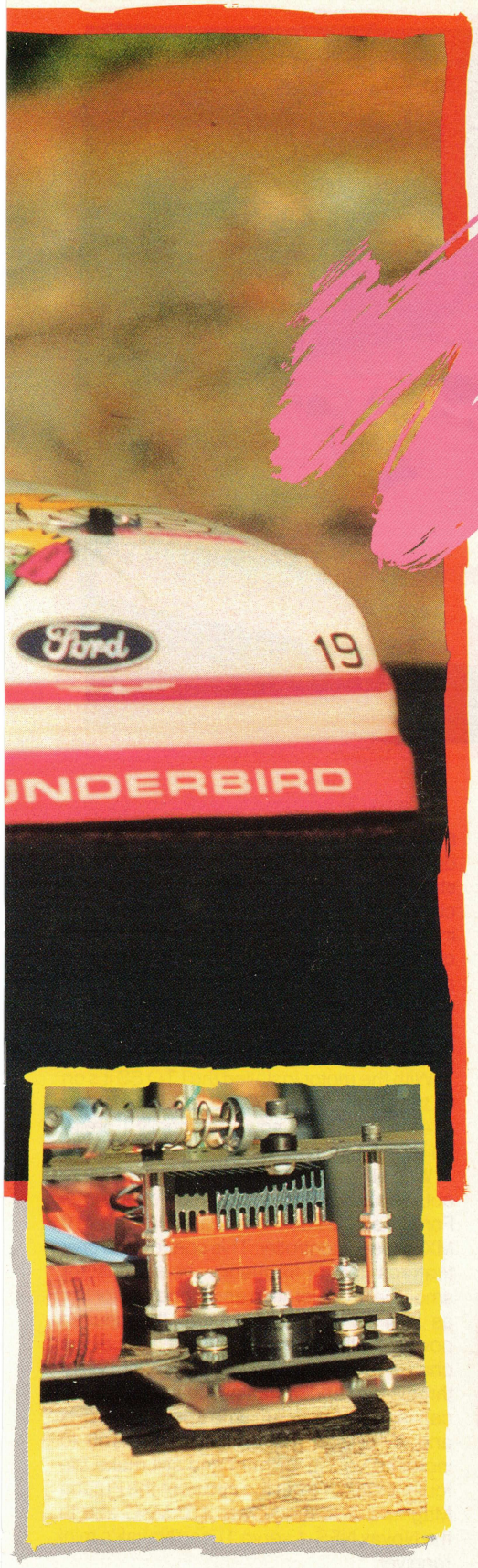
BoLink R/C Cars is one of the leaders in onroad racing. Their LTO SS car, one of the new, narrow-bodied cars that are closer to 1/10th scale than the 'standard' 1/10th cars, is based on the same chassis that won the 1991 ROAR Nationals in King, North Carolina, so you know this car can really fly.

The LTO SS kit as all BoLink kits, is well-packaged and has a very well-written instruction manual and loaded with good photos to make building the LTO SS quick (about two hours). BoLink starts you off with the assembly of the front suspension. (The LTO SS uses the same design as other BoLink cars.) The only tip I can offer here is to take the right axle and bend it about 2 degrees. This will give you 2 degrees of positive camber and it will improve the car's handling. It also helps the right-side tire from coning and reduces tire wear. BoLink supplies the LTO SS with the Blue Pro springs—I recommend that when setting the axle's caster, 2 degrees worked about the best.

The next step is to install the radio tray and the ball brace. There nothing unusual here, just be sure to use Loctite on the shock mount supports so that they won't vibrate loose at the wrong time. Next, we move on to the assembly of the T-plate and motor pod. The LTO SS uses a narrow version of their alumi-lite pod which is not only lighter but it also acts as a heat sink to help absorb the heat. In this step I made only one slight change—after you have installed the pivot ball assembly onto the T-plate, put a small drop of CA on the ends of the screws where they come through the plastic carrier. This will help to prevent the screws from backing out.

Now, once you have the rear pod installed to the chassis and you have installed the ball joints onto the pod and the shock plate, you will find that the stabilizer is too long and doesn't allow the pod to pivot properly. Just remove about 1/4" off both sections of the stabilizer and that will take care of that.

All that is left to do now is to build the diff

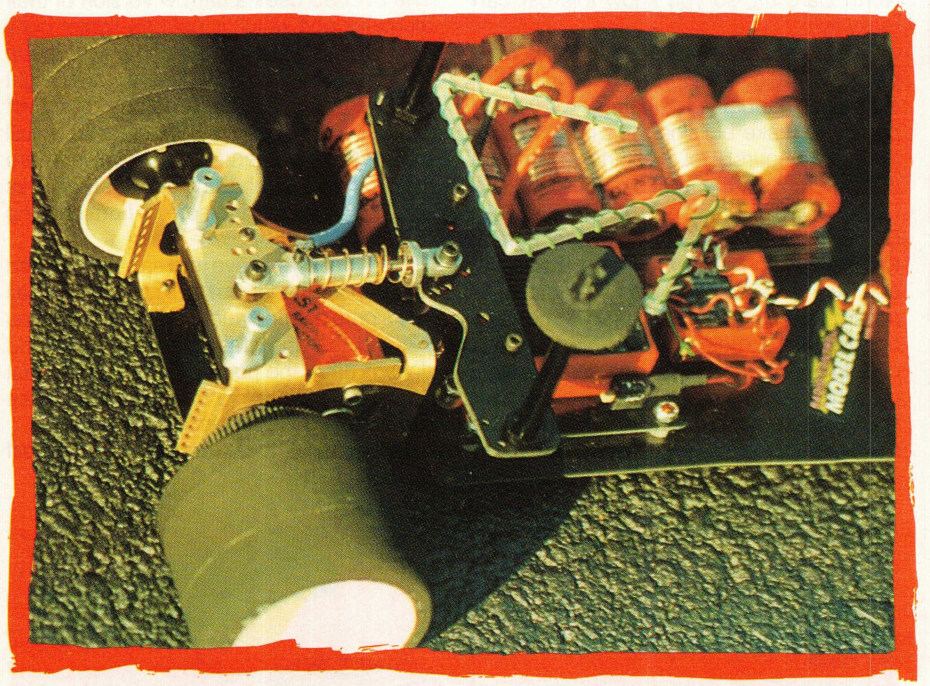


LTO SS chassis with Novak speed control, receiver and servo, at left. Above, the spring-loaded tweak screws showing minor modification by author that improves the car over the stock setup. Test tells how to make the change.



The LTO with Parma's new, narrow T-bird body and BoLink's updated NASCAR fender decals for that finishing touch.





By removing some of the material from the shock plate, you can increase the suspension travel on the LTO SS.

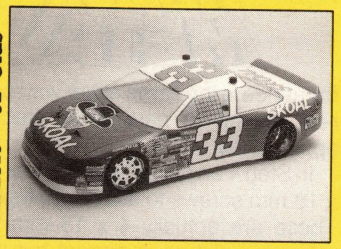
and install the axle in the pod. BoLink supplies you with axle ride-height adjusters by changing the height of the rear axle; you can dial more or less rear end traction. For starters I used the neutral adjuster (the one with the hole in the center). You might have noticed that I left out the shock assembly—well, it does come before the diff assembly but I've found that it is easier to install the motor first before putting the shocks on.

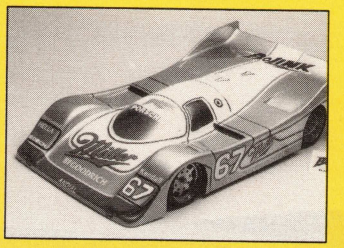
The motor that I used to power the LTO SS is an East Coast motor (2702 ECR) 36-degree stock motor. Of course, under the new 1991 ROAR rules, this motor would be illegal, but most of the tracks that I have talked to said that they only enforce the new 24-degree motor rule in big events and then most of them will have hand-out motors. I've been racing East Coast motors for about a year now and I've found them to be top notch! Even with the higher timing my 30-degree motor is a year old and it is still racing strong. The only thing that I've done to it is clean it after every race and put new brushes in every so often. Some hobby shops don't carry East Coast motors so to find out more about the East Coast product line here's their address: 7407 Whippoorwill Drive (catchy name, huh?), Charlotte, North Carolina 28217. Phone (704) 357-0680.

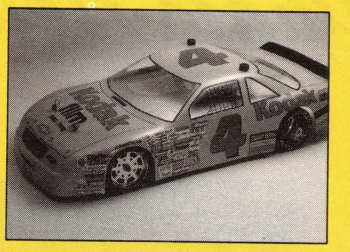
With the motor installed the LTO SS it's on to the gears. The LTO SS comes with an 81-tooth, 48-pitch spur; personally I prefer 48 over 64 for durability.

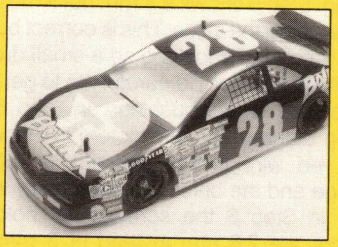
With all of the electronic speed controllers out, it's hard to decide on which one to use. For this article I decided to use Novak's 410 MXC speed controller. This speed controller features the hi-frequency operations for smoother acceleration and longer motor life, as well as the ability to turn the unused power that's normally wasted into a top charge returned to the battery under partial throttle and under braking. I have found this can increase your run time about 15 to 20% and, in onroad racing, that allows you to increase your gear ratio and still make the four minutes. To get the info from the Futaba Magnum Jr to the Novak 410 MXC and to the Novak NES-1 servo, I used Novak's mini receiver.

To power the LTO SS, I used Parma's new Final Matched batteries. Instead of using braid to assemble the cells, I used BoLink's silver Battery Bars. Before you install the batteries in the car, file the edge off of each battery slot in the chassis. This will prevent the cell wrap from being cut and shorting out your pack.


BL-2319 '92 Olds

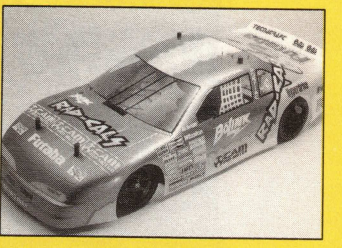

BL-2337 962 Porsche*


BL-2323 '92 Lumina*


BL-2325 '91 T-Bird*

BoLINK

We're Surrounded By Race Winning Bodies!


BL-2329 '90 Pontiac, Narrow*


BL-2317 Chevy Stadium Racer


BL-2322 '92 Lumina, Narrow*

LIMITED FIRST EDITION
BoLINK
R/C COLLECTOR CARDS!
BL-6095 Pack of 15 $3.00
Complete with Collector's Checklist
COLLECT ALL 72!!

*Also Available in Liteweight

For a complete catalog send $3 to: BoLINK R/C Cars (RCM), 420 Hosea Rd, Lawrenceville, GA 30245 (404) 963-0252 FAX (404) 963-7334

Of course, as in all of BoLink's kits, the LTO SS uses BoLink Battery Mounting Blocks. These work much better than velcro or fiber tape. I've never had a pack come out of my car, even in the worst of crashes, and it doesn't really take any longer to install the batteries in the car using these than it does using tape.

The LTO SS also comes with foam tires and a narrow 1990 Pontiac body—but anyone who has ever read any of my articles knows that I replace every body with a Ford, so I replaced the Pontiac with BoLink's new 1991 T-Bird body (part #2324).

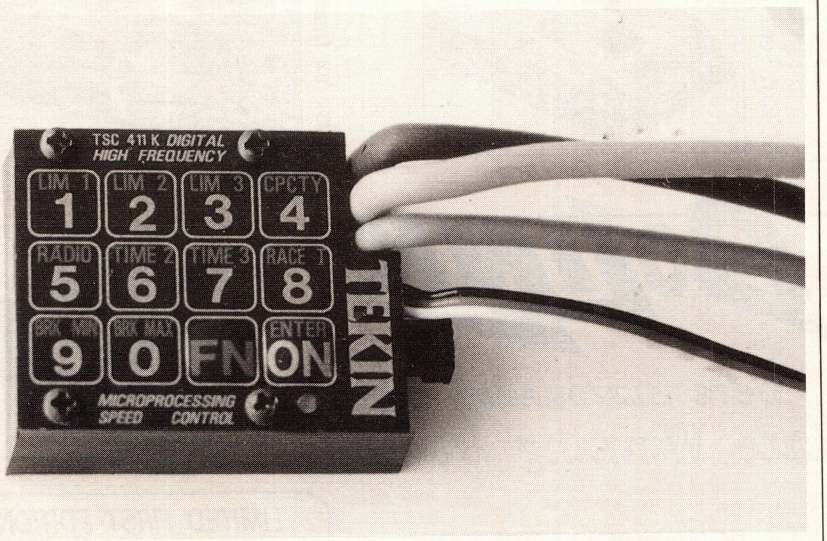
Most paved ovals require capped radial tires; you could use foams but they would wear out three to four times faster and radials are quicker. BoLink offers T/M radials in red, gold and silver compounds.

To start with—I found putting a gold on the right front and silvers the rest of the way around worked the best. Of course, what works for one may not work for another, so try different compounds all the way around. I trimmed and mounted the BoLink ribbed super speedway wing, and with the car completed, it was off to the track. I had picked up the car just days before the ROAR Nationals in King, North Carolina so I went up there just to see how the LTO SS would do and to get a feel for the car. The track is a rather large oval and just the thing to see this baby fly. After four or five battery packs, I had the handling down great but it was hard to judge how I was doing because everyone else on the track at the time was running modifieds. As I headed back to my pit table, I happened to run into David Johnson, an R&D man for BoLink. David was nice enough to give me a few tips on how to make the LTO SS handle better. He showed me his team car and explained how to make these modifications, and as always, I'll pass them on to you. The first mod was with the shock plate. You will notice that if you bend the rear pod up to its full suspension limit, you can see that the Aluma-Lite pod will hit the shock plate. Take a Dremal tool and grind away just enough material off of the shock plate so the pod no longer hits the plate. Another tip David gave me had to do with the tweak screws on the chassis. The ones on the LTO SS are just 4-40 cap screws that go through the ball suspension brace and are adjusted to put more or less pressure on the T-plate which transfers the weight on the car for better handling. The only set back here is that the T-plate only pivots away from the screws and it hits it the other way. The theory behind this is that if the car gets crossed up the suspension only has flexibility one way, making it difficult to regain control over the car. David found a way to have tweak but still allow the T-plate free movement both ways: first remove the rear pod, shock plate and tweak screws. Set the car on a flat surface and be sure that the T-plate and the chassis are level with one another. Carefully drill using a 3/16 drill bit all the way through the holes that are in the ball brace for the tweak screws and T-plate. Then next remove the T-plate, and on the side that faces the ground, countersink two 5-40 x 3/4" screws into the T-plate, then secure them with a washer and a 5-40 nut. Now reinstall the T-plate to the chassis. Once the T-plate is secure check its rocker movement. The bolts should not rub the ball plate. If they do, just enlarge the holes.

Now to finish off this modification, place a 4mm washer over each bolt and one BoLink front suspension spring (part #BL5130). Top this off with a 5-40 nut and there you have it, a spring-loaded tweak adjustment that still has plenty of T-plate travel and actually works better than the stock setup. Since making these improvements, I have driven the LTO SS on short carpet ovals, short paved ovals, and super speedways. The car is noticeably faster than my standard LTO and so far in only three races, I've got 4th in an A-main, 2nd in an A-main, and 1st in a B-main (and that was after a turn marshal stepped on my car).

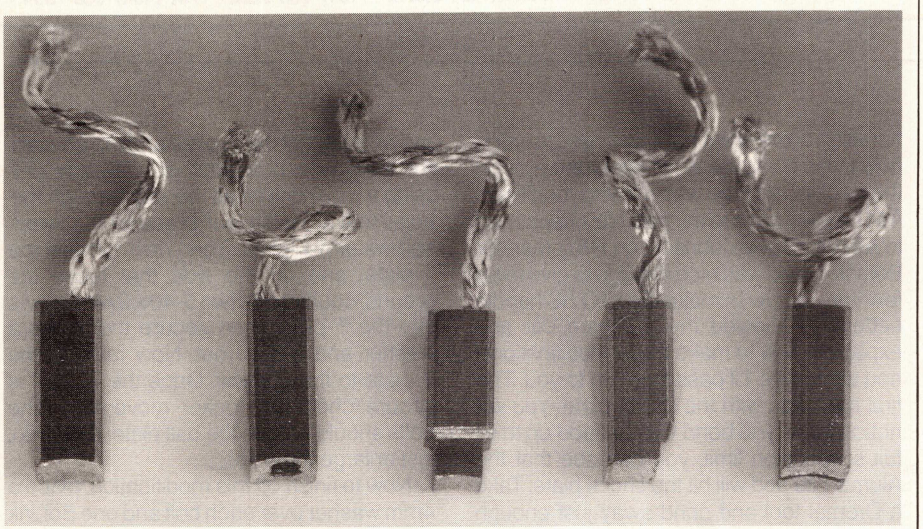
After all of this I have to say that narrow cars run great, not only on super speedways, but on short tracks as well. The BoLink LTO SS isn't a complex car; it just performs that way! •

What's New



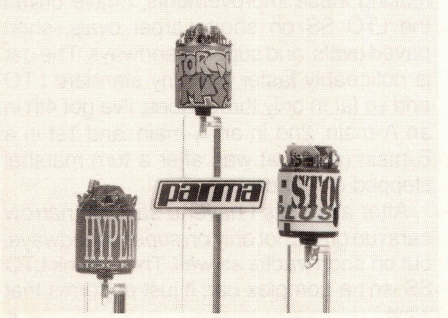
411K ESC

Tekin's new 411K ESC features automatic digital programming to your transmitter. This means there are no adjustment pots to fail or move; just press two keys. Once programmed, the digital values will not change, so the settings will never drift. There is a dumpless mode that allows you to type in your battery capacity and run time. The ESC will tune your driving response to allow the batteries to dump at about the right time. The microprocessor-controlled high frequency circuit produces the most accurate motor pulsing for longer run time. Musical chimes verify that the unit has been turned on and is ready to go. From Tekin Electronics, 970 Negocio, San Clemente, California 92672.



MPS MOTOR BRUSHES

These 15% silver content brushes are the most dependable and long lasting that you can use in your stock or modified motors. Available in standard, hollow, three-side cut, timed and air-cool slot, from Bud's Racing Products, 1575 Lowell St., Dept. RC Cars, Elyria, Ohio 44035.



PARMA MOTORS

New motors from Parma International include the Torque Master with cobalt magnets and 13 turns of triple split-gauge wire for those serious about pulling their weight. Two stock motors, the Hyper Stock and the Stock Plus offer high rpm and more. The Hyper Stock is a 14-turn double and the Outlaw Stock is a 27-turn single with 40 advance timing for extra power when it counts. From Parma International, 13927 Progress Parkway, North Royalton, Ohio 44133.

Continued from page 49

HEAVY METAL

formance is the same either way, so the only real reason to narrow the tracks is for appearance.

In Step 4 on page 7, the manual calls for 3 x 18 mm screws to attach the trailing arms. These are actually 4 x 18 mm. The size reference picture is correct but the text is wrong. Step 5 shows a 4 mm nut to hold the wheels onto the axles. This is correct but the nuts are not self-locking so a small drop of Loctite is needed. Be careful not to get Loctite on the wheel bushings. In Step 6 the wiring diagram for the motors is incorrect. The red wire in the diagram is actually orange and the black wire is actually white. Also in Step 6 the screws that hold the motors are 2.6 mm instead of 3 mm. On page 8, Step 4, you will have to slightly enlarge the holes in the chassis for the gearbox support screws (a 1/8" drill bit is fine).

Other than the above corrections, I had no problem with the assembly process and was ready to run in a very short time. I probably spent more time narrowing the tracks than I did assembling the model!!

Detailing the body is easy—paint it black, apply the decals and you're ready to go!

PERFORMANCE

After charging up some 6-cell battery packs and testing the operation of the motors, gears, etc., it was time to head off to the wild for some fun (and to shoot some photos)! With the standard RS-380 motors, speed is not what you might be used to with other R/C vehicles. There are two gear ratios that can be selected. You might as well go for the high-speed ratio. Low speed is a waste of time and high gear still allows the Heavy Metal to climb or crawl over just about anything. Left and right turns are accomplished by reducing voltage to one of the motors. This creates a slightly weird driving sensation since the vehicle will not turn if it is coasting. You must be applying throttle for it to respond to turning commands. This is not too difficult to get used to.

Handling is exceptional as the Heavy Metal easily glides over any surface and can climb 60-degree inclines. Even grass doesn't seem to slow it down much. Run time is very good due to the small motors. I was able to run 15-20 minutes betweeen charges. If you are looking for higher performance, a pair of Kyosho AP-29 motors can be fitted with some minor modification. A 7-cell hump pack will just fit and the optional ball bearing kit (KYOC2225) will reduce friction and increase speed. With these mods the Heavy Metal becomes surprisingly fast!

OVERVIEW

While it's not real fast in stock form, the Heavy Metal is still a lot of fun to drive, especially in rough terrain. Run time is excellent and the looks can't be beat. If you are looking for a really unique R/C vehicle, then Heavy Metal is your answer. •

Continued from page 33

1991 ROAR MONSTER TRUCK NATIONALS

to enter both, so all the drivers ran both classes. Team Losi was running Trinity motors and batteries again and Kevin Maurer was there working on the motors, which turned out to be a big help for Team Losi, especially in the stock class. Mike Reedy couldn't be here for this race, so Cliff Lett filled in on the stock motors for the guys.

In the Stock class Jammin' Jay Halsey got things started with a super time of 15 laps in 4 minutes and 13.530 seconds or 15-4.13.530. Right behind Jay was Mike Dunn with 15-4.14.210. Carlos Gonzales followed in 14-5.05.620. In the final round Mike Dunn got an unbelievable run of 15-4.10.390. I say unbelievable because Mike's time ended up being better than the Top Qualifier time in the modified class! Kevin Maurer earned his pay today. Jack Johnson jumped to the third spot in the last round with a 15-4.16.010. These three drivers were the only ones to make 15 laps, and they were also the only ones with stock motors to have enough power to clear the double jumps. Amazing.

Rick Hohwart started things off right for the Peak Performance Team with a run of 15-4.14.390 in the modified class, in the first round. J.D. Beckwith followed in second with 14-4.00.680 followed by Jon Anderson with 14-4.01.40. Cliff Lett waited until the last round to get his run in. It's not that he planned it that way. It's just that with 10 trucks in a qualifying heat it gets very congested when you have to slow down to a crawl at the end of the straightaway. Some slow down enough to cut the corner tight, others go faster and just kind of hope they're going to make it. Consequently there's a lot of unintentional contact in this area at the start of races. But Cliff finally managed to make it through and earned himself another Top Qualifier honor with a time of 15-4.13.460 and Brian Kinwald jumped to third spot with a great 15-4.17.640. It was hard to imagine how the stock times were faster than the modifieds. But it happened.

STOCK C-MAIN

Scott Montgomery had an exciting race with Tom Owens, but Scott beat Tom to the checkered flag by two seconds. Brad Hughes followed in third.

STOCK B MAIN

Chris Doseck took the early lead and slowly started pulling away. Halfway through the race he had about a 30-foot lead, and someone said, "Hey Chris, wait up, let's race." And I'll be darned if Chris didn't come to almost a complete stop on the straightaway! A move he could come to regret.

This allowed Mike Ankney to pull right up on Chris's exhaust pipe. During the next two minutes the lead swapped back and forth three times before Chris finally got to the checkered flag just 1-½ seconds ahead of Mike. I don't think Chris will do this again. (I'd like to have heard what Tate said!) Byron Peterson was five seconds back in third.

STOCK A MAIN

At the horn, Mike Dunn jumped in the lead with Jay Halsey right behind in second. As they turned to go into the sweeper there were three cars abreast behind them and then another faster car coming up which ran into one of the three cars, starting a chain reaction which caught Jay. All this allowed Dunn to open up a good lead.

When the cars got straightened out Rick Vehlow was in second with J.D. Beckwith third, Gil Losi Jr. fourth and Cliff Lett fifth. Vehlow started to close up on Dunn, but on the fourth lap he rolled coming off the table top and J.D. went into second. Dunn now had a 20-foot lead.

Gil passed Cliff to take fourth and then on the next lap Vehlow rolled off turn 3 and Gil went to third. Two laps later Gil cut turn 3 too tight and got bit by the hose and Cliff and Vehlow went by. J.D. was closing on Dunn again, but then went too wide on the table top, got stuck and Cliff and Vehlow went by. Then, on the last lap, Vehlow rolled again and J.D. moved into third. Dunn went on to win with Cliff one second back in second and J.D. five seconds back in third.

MODIFIED C MAIN

In another close race, Jim Bronson just beat Pat McCreery by one second with Tom Owens four seconds back.

MODIFIED B MAIN

Gil Losi Jr. jumped in the lead with Jay Halsey right on his bumper. The two of them were no more than two or three feet apart for the next two minutes. Then Gil rolled coming off the table top and Jay took the lead. With one minute to go Jay cut the corner too tight at the end of the straightaway and Gil went back into the lead and held it all the way to the checkered flag. Jay followed five seconds back with Byron Peterson another 11 seconds behind in third.

MODIFIED A MAIN

When the horn sounded, Rick Hohwart shot in the lead with Cliff Lett following in second and J.D. Beckwith and Brian Kinwald following side by side. Cliff had a little more speed in the sweeper, caught Hohwart's rear tire sending Cliff to the outside wall and Hohwart to the inside wall.

J.D. then took over the lead and somehow, Jack Johnson, starting from the 9th position on the grid managed to pass everyone else at the start and move into second place! When it's your day it's your day. When it's not, it's not. Jack must have been feeling it might be his day. Cliff was now third with Kinwald fourth.

On the fourth lap Cliff cut a corner too close, got caught by the hose and his car went into a dead infield area and he had to be marshalled out. Jon Anderson then moved to third with Kinwald fourth.

At the two-minute mark, Johnson cut the corner at the end of the straightaway too tight, got stuck, and Anderson moved into second. Then Beckwith cut a corner too tight, rolled over and Anderson went into the lead. But Anderson punched it a little too hard, got squirrely and Beckwith went back into the lead. It began to look like no one wanted to lead.

Beckwith then rolled over the small bumps coming off the sweeper, and Johnson took the lead with Anderson second, and Beckwith now third. Then Anderson got stuck in the hose at the end of the straightaway and Beckwith went back into second.

Beckwith was closing on Johnson while Cliff was closing on Beckwith. Cliff caught Beckwith just as they went up the hill in turn 3, but J.D. slowed more than Cliff and Cliff bumped J.D. who got stuck in the hose, and Cliff, Kinwald and Hohwart went by.

While all these guys were bumping into each other or hoses, Johnson was pulling away. On the last lap Cliff cut the corner too close at the end of the straightaway, got stuck and Kinwald slowed and Hohwart went by into second. Jack Johnson knew it was his day as he took the checkered flag with Hohwart, who came from dead last to take second with Kinwald third.

Cliff then gave his RC10T truck to the club to be given away to a lucky and happy drawing winner. Losi didn't want to give away one of their prototype trucks, so they awarded a gift certificate to another happy winner, good for one of their new trucks, when it comes out. •

FRANKENSTEIN MEETS THE DIRT OVAL!



BY RICK EYRICH

Legend goes that "once upon a time" a mad scientist made a man from some odd bits and pieces he dug up around his neighorhood. Basically, he took whatever stuff he had lying around and tried to build a better mousetrap—so to speak. Unfortunately, his finished product didn't pan out. The R/C car you see pictured here was designed on that same idea (with much better results). Build a vehicle from different pieces and different manufacturers, and achieve success. So here's how it all happened.

A good friend of min began to daydream about what would happen if someone took the front-end of an RC10, and the backend of a JR-X2, and stuck them together. In this case the two parts added up to a super-handling R/C dirt oval burner! This creation was the brain-child of Dennis Cargal of Lakeland, Florida. He decided he wanted to have an R/C race car unlike anything being run around the local clay oval track, and the finished project has surely accomplished all that and more.

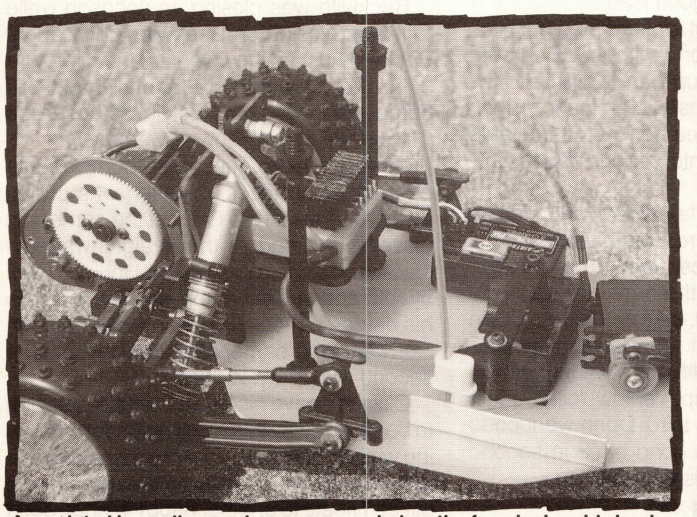
Overall, this R/C creation didn't require Dennis to spend any excessively large amounts of money to complete. He already had a used RC10 front end, and a Losi JR-X2 offroad car lying around gathering dust. The new oval chassis plate was cut out (with a Dremel tool) from a sheet of 3/32-inch thick fiberglass, using the stock Losi JR-X2 buggy chassis an a template. Since the new fiberglass chassis plate didn't require the front kicked-up nose found on the stock JR-X2 chassis, the oval car conversion was even simpler.

Measuring from the rear of the regular Losi chassis, the new fiberglass plate measures out to 11-1/4 inches in length overall. The stock (old style) RC10 nose plate was then bolted onto the new chassis, leaving a 1/8-inch gap between the recessed portion of the aluminum RC10 front plate and the fiberglass chassis' end.

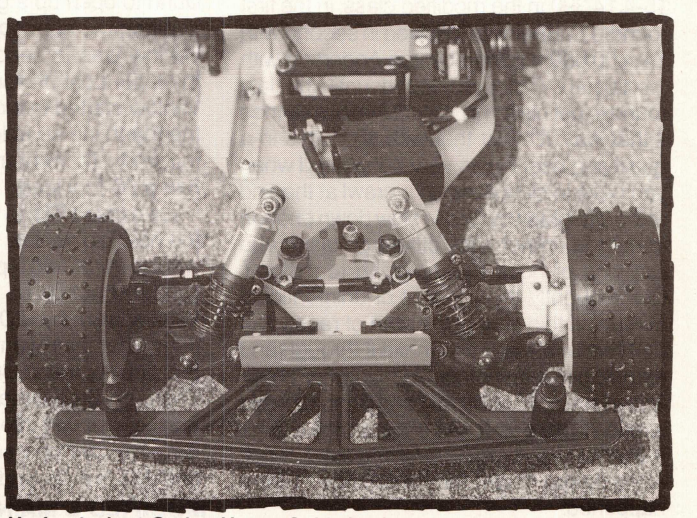
Losi brand RC10 steering bellcranks were then used to help steer the front wheels, which are attached to the standard Associated A-arms and spindles. An Andy's plastic front body mount/bumper was also added to the front nose plate to aid in body mounting. Then 4-inch long BoLink nylon body mount bolts were attached to the rear of the chassis around the link arms to hold the rear of the body.

The major reason for the use of the RC10 front end on this car was to allow for a more narrow front wheel track over the JR-X2. The Losi car front end width makes fitting any wheels under a dirt oval body shell difficult. It also tends to make this car a lot more stable through the corners while under full power. Another change made to the car's front end (which aided body mounting also) was a custom made, front shock tower. Its function was to lay down the front shocks (Option House golds) so that large holes wouldn't need to be cut in the hood area of the oval-type body.

Continued on page 62

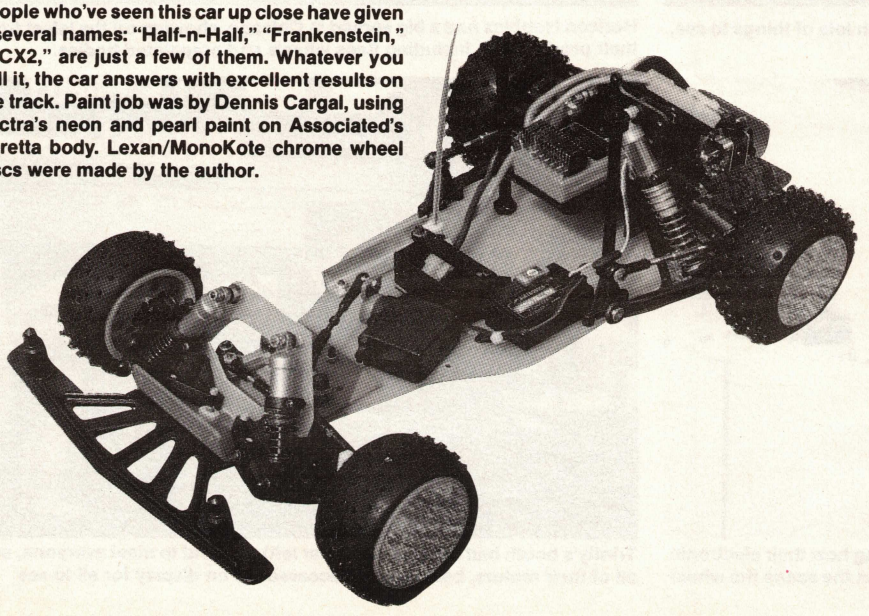


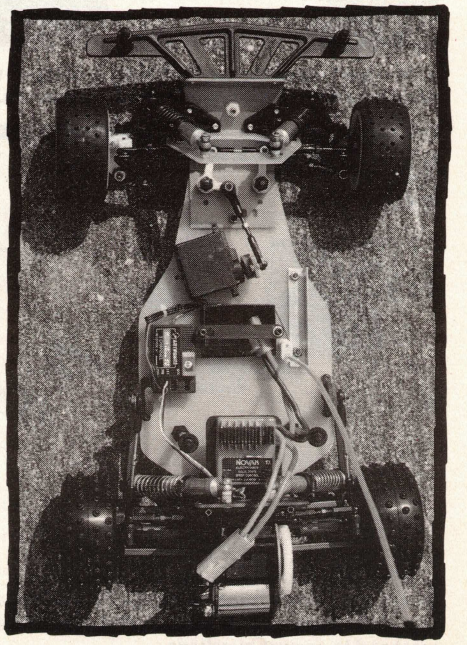
Associated long silver springs were needed on the four-inch gold shocks to achieve the proper pre-load on the rear end. Note adjustable upper link arm. Turnbuckle allows for different rear toe-in.



Up front, short Option House Gold shocks were mounted to a custom-made fiberglass shock tower. The wide track front tires were made by stretching narrow Schumacher mini-pin spikes on wide CRP 2-inch rims.

People who've seen this car up close have given it several names: "Half-n-Half," "Frankenstein," "RCX2," are just a few of them. Whatever you call it, the car answers with excellent results on the track. Paint job was by Dennis Cargal, using Pactra's neon and pearl paint on Associated's Beretta body. Lexan/MonoKote chrome wheel discs were made by the author.





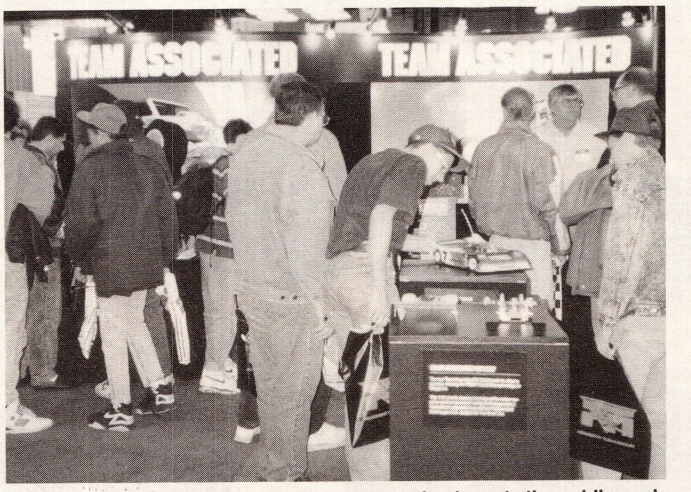
THE SHOW SCENE

7th Annual Chicago MODEL HOBBY Show

If you've never been to a model hobby show, it's a grand affair for anyone interested in cars, boats, planes or trains. With a huge contingent of manufacturers and distributors manning their booth displays, the consumer has the opportunity to see the latest in their particular favorite hobby laid out, sometimes with an elaborate, show-stopping presentation designed to catch the eye of the public. On hand are experts who can answer any question thrown at them; it's a great chance to see what's new in person. If you have the chance, be sure to make plans to attend a show in your area. You won't be disappointed.

This year's Chicago Model Hobby Show was no exception, with row after row of stunning models, accessories and products to make your modeling activity as enjoyable and up-to-date as possible. Here's a brief look at what was shown.





Here's the way it looks on dealer day (left); things are fairly peaceful at the Associated booth, deals are done, then they open the doors to the public, and look out! Waves of people poured in, all eager to see the latest in R/C cars and trucks. It's a lively scene!



This is the Futaba layout. Professional looking, with lots of things to see, and knowledgeable people to answer questions.



Horizon Hobbies had a big spread in Chicago, showing off the latest from their product line, including Sees wheels and prepainted bodies.



Novak Electronics' booth has large displays showing how their electronic speed control functions operate. Bob Novak was on the scene the whole weekend to answer questions.



Trinity's booth had Joel Johnson (far left) on hand to meet everyone, and all of their motors, batteries and accessories on display for all to see.



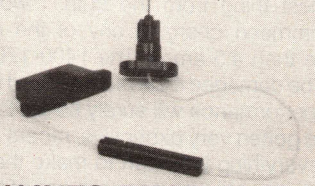
Great Planes/Kyosho had cars, planes, boats, bodies, motors, speed controls (have we left anything out?)! If it's R/C, they distribute it!



This is BoLink R/C's booth, with Rick Jordan in residence along with many of the bodies he's responsible for creating. Their cars were well-received in Chicago.

HAYES WHIP ANTENNA

Vertical whip antenna replaces any 18 or 36-inch receiver antenna for R/C cars and boats. Connectors, vertical and horizontal mounts and safety ball all included. Stainless spring steel whip only 1/32 diameter for minimum wind resistance. Available at your local dealer.



HAYES PRODUCTS
14325 Commerce Wy.
Garden Grove, CA 92643

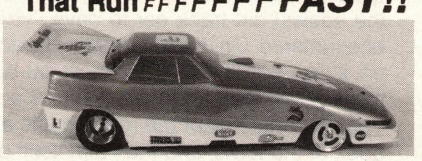
SUBSCRIBE
RADIO CONTROL MODEL CARS

A.J.'s R/C

M/C VISA

New MRC Bruiser Parts Available

Funny Cars That Run FFFFFFFF FAST!!



Guaranteed Graphite Chassis
Polished Aluminum Mag Wheels
Solid Direct Drive 48p Gearing
Aluminum Alloy Motor Pod
High Grade Ball Bearings
NO Electrics

Contender 1/10 Funny Car Kit $189.95
Plus Shipping & Handling

NEW Top Fuel F/C Record

2:14 ET, 64.18 mph !!!

TRUCK PULLING

New: AJ's 6 Tooth Steel Pinion Gear ..... 13.95 ea.
New: AJ's 6 to 1 Clod or Blk. Ft. Gear Reduction Unit with All Alloy Gears !!! NO plastic 79.95
New: Clod Adjustable Aluminum Motor Mounts ..... 19.95 pr.
Clod Steel Differential Gear Set 99.95
New: Astro Flight Elec. S/C with Brake 7-28 cells 149.95
PDI Hydro Zeta 20 cells Dual Motors 169.95
PDI Turbo Zeta w/rev 32 cells 259.95
Sassy Clod Aluminum Chassis, Black, Blue, Gold, Clear 79.95

A.J.'s Scorcher Black Magic Motors:

AJ's Scorcher Mod. Clod, USA-1 Hi-Speed pair 52,000 rpm .. 119.95
AJ's Scorcher Monster Truck Motor 7-14 cells 52,000 rpm ... 54.95
New: Clod USA-1 Scorcher Modified Hi-Torque Pulling pair . 129.95
New: AJ's Scorcher Modified Hi-Torque Pulling 69.95
Stock "550" Can Pulling Motor ..... 28.00 ea. ... Clod pair .. 49.95
New: AJ's Super Stock 35,000 rpm Monster Truck Motor 25.00
Clodbuster Bearing Set - Stainless 48.95
New: AJ's Foam Tire Inserts ..... Blk Ft. 9.95pr.... Clod .. 12.95pr.

DRAG RACING

AJ's 1/10 Pro Stock Kit 199.95
Aluminum Wheels, Bearings, Graphite Chassis, 3 Body Styles
AJ's 1/10 "Force" Rail Dragster Kit 239.95
24" Wheel Base, Graphite Chassis, Aluminum Wheels, Bearings, 76 mph!!
AJ's 1/10 Contender Funny Car Kit ..... SALE 189.95
Graphite Chassis, Aluminum Wheels w/Foams, Bearings, 48p Gears, Buick or Corvette Body No Electrics
PDI Drag Zeta Prog. Speed Controller 20 cells 159.95
Black Magic Voo-Doo 102,000 rpm 69.95
14 cell 600 mah SCR Top Fuel Pack "awesome" 89.95
Black Magic F/C and Pro Stock Motor 82,000 rpm 59.95
8 Cell 900 mah SCR Pro Stock Pack 48.95
10 Cell 600 or 900 mah SCR Killer 59.95
New: "Quarter Scale" New ERA Models in Stock!
Pro-Stocks, Top Fuel Dragsters, Funny Cars, Grand National Prices from $1250.00. *Call for Details*
Catalog 2.00

2102 Guilderland Ave., Schenectady, NY 12306 (518) 377-7442

Dealer Inquiries Welcome

Continued from page 12

(without getting technical), is that the cells become more fragile. The old N-1200-SC cell was bulletproof. You could charge it and run it over and over and it kept coming back for more. The N-1200-SCR was almost as good. The N-1400-SCR cell is good, but more fragile, especially at high charge rates. The KF-1700-SCE is the most fragile so far. The Panasonic P-170-SCR cell should be more rugged than the Sanyo KR-1700-SCE has been. This is due to a new and different type of construction.

I have also not discussed other cell manufacturers' cells. The ones available to the average racer are not run much in competition. I have also had some nasty experiences trying to charge other than Sanyo cells at higher than recommended rates, so be very careful.

A quick mention of charging is needed. Some racers still think that they need to charge at a high rate and get the pack hot to win. With the new cells that are out, this is the farthest thing from the truth. I would not recommend charging any of the cells at more than 4.5 amps. The 1400-1700 cells can be damaged if the rates exceed this and the performance will surely suffer. Batteries have gotten very expensive; racers need to do everything they can to make them last. Charging at the lower rate is one of the best things that can be done to increase the life of the packs. Remember, good driving wins races. An average pack in the hands of a good driver will best a good pack in the hands of an average driver, so practice your driving!!

If your racing requires that you be fast, and you want to get the most energy out of your batteries, then matched packs are for you. If however, you want to just run the car around and not race competitively, then the extra expense of matched packs may not be worth it.

I hope this article has been informative and helpful. As with most discussions of batteries, questions arise. I will try to answer one or two questions each month. If you have a question, please send it to Battery Man, 898 W. 16th St., Newport Beach, California 92663. Until next time, good racing! •

Batteries seem to be very confusing to many racers. If you have battery questions, I would be happy to answer them. Direct your questions to: The Battery Man, 898 W. 16th St., Newport Beach, California 92663.

Continued from page 59

The new shock tower was cut from the same 3/32-inch thick fiberglass sheet as the chassis plate. To strengthen the hood area of the body, a Lexan .030-square was cutout and then mounted to the underside of the body in the front wheel-well area with servo tape. This modification reduces any cracking or flexing around the wheel openings, usually caused from on-track "rubbing" incidents.

Outback, the stock Losi JR-X2 graphite shock tower was used. If you look closely in the photos, you'll notice that the upper rear shock mounting holes have been moved in 11/16 of an inch. This lowered the rear end of the car, and also aided in achieving the proper ride height that's equal to the dropped front shocks. Four-inch Option House Gold shocks were used on the rear of the car; 85-weight Robinson shock oil was used in the rear shocks, and 40-weight was put into the front gold shocks.

Also special to this oval car's rear suspension are the adjustable upper 5-link arms. While kits are available to make the Losi JR-X2 rear toe-in adjustable, this homemade modification adjusts the rear wheels' track, front to rear. That is, you can now chnge this R/C car's wheelbase from *side*-to-*side*. This way, you can make the chassis *want* to turn more or less into an oval's left-hand turns. This is accomplished by either decreasing the outside (right) wheel's toe-in, or increasing the amount of toe-in of the inside (left) rear wheel. With the titanium tie rod adjusters on the top rear links, this procedure is a snap.

Black Option House springs were used on the front shocks, and as you can see, they're compressed on the shock bodies quite a bit. That's due to the severe inward angle of the shocks over the stock tilt of the regular RC10 buggy. The same rule applies to the rear shock springs as well. Associated long rear silver springs were utilized on the rear, and again a massive amount of spring pre-load was necessary to achieve the proper rear ride height for this oval-type R/C car.

Although two small aluminum I-arms were added to the fiberglass chassis to reduce any excess flexing, track testing under racing conditions have shown they're most likely not needed. Future plans may call for replacing the aluminum braces with two small strips made from either more 3/32-inch fiberglass, or maybe even graphite, for lightness. Or they may not be replaced at all.

The radio gear used on this car include the following: An Airtronics CS2P FM transmitter, receiver, and a model 94631 steering servo. The Airtronics CS2P radio system may not have all the bells and whistles of the new Caliber 3P radio, but they share most of the same basic features. They both are FM band systems, have replaceable 27-75 band modules, and they both can be adjusted and used by left-handed R/C car drivers. Another tried-and-true performer was used to control the electric car's motor—the Novak 1X electronic speed control.

With available space very limited on the new chassis plate for any radio gear, the ESC was mounted on a JG Manufacturing Kydex plastic radio tray. This situates the speed control out in the air, where it is cooled by clean air just above the battery pack area. The Novak 1X supplies battery power to a B&R stock class motor and the final gears are all 48 pitch.

Losi JR-X2 wheels were used on both ends of the car, with final tire selection depending on the track conditions. The most commonly used rear tire has been the stock Losi car dimple knob, while up front, tires used include the mini-spikes from Schumacher (for hard surfaces), to the Losi stagger-rib HT fronts (soft tracks).

Another tire/rim combination used on the front of the car is rather unique, just like the rest of this vehicle. Narrow-width mini-pin spike front tires are mounted on extra-wide, low-profile tire/rim selection for the car's front end. If your racetrack's surface traction is slim to none, this setup provides a maximum front tire patch to help *any* oval car grip the dirt.

An Associated NASCAR Beretta Lexan body was used (unfortunately it's no longer available). As you can see, a rather small side air-dam was mounted on the body's left-hand side. The small side dam points out how well this car handles on the track. A bigger Lexan side dam was tried on the car, and was found to be overkill in the turns. Bigger is not always better. It just made the car too steering-sensitive, and with good track traction available, it had massive oversteer. So the smaller dam seems to work the best for all possible track conditions.

At the dirt clay oval this R/C car competes on most often, track rules allow all tenth-scale electric cars to run a two-inch high rear deck spoiler. A .030-inch rear Lexan spoiler, along with the rear bumper area being cut-out of the body, completes the body setup on the present Lexan shell. As to what body style will be used when the current body succumbs to on-track crash damage remains to be seen.

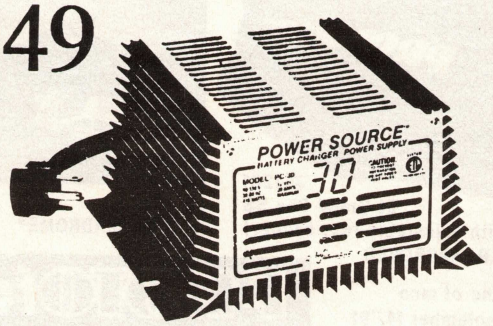
Most likely a wedge-style will be mounted, with the same small side dam used, but who knows? Due to the Frankenstein nature of this R/C car, a body style more out of the ordinary may seem more appropriate!

So how does all this assorted stuff put together work out on the track? Like a dream, that's how! Having driven this R/C car (and raced it once) I can personally attest that it is quite capable on a dirt oval track. It's by far the easiest dirt track car to drive I've ever encountered. On the semi-flat oval I raced it on, it was possible to run almost flat-out all the way around the corners on stock power. The car would plant the rear wheels at the apex of the turns, and then aim itself down the straights, effortlessly. It would also handle various and changing track conditions, with little if any adjustment needed to correct its setup. In most cases a simple shock spring change would allow the car to remain race-ready. Even when run on a wet track,

THE POWER SOURCE PC-30

only

$149



MORE AMPS, LESS WEIGHT!!!

Totally filtered and regulated.

WEIGHT: 4.0 lbs.
SIZE: 7.25" x 4.0" x 6.75"

VOLTAGE:
14 VDC from 0-85% load
12 VDC at 100% load
CURRENT: 30 Amps
WARRANTY: 12 months

Our racers win with *TURBO* CELLS
Call for info

700-A Two Mile Parkway
Goodlettsville, TN 37072
(615) 859-3455

Rivergate HOBBY CENTER Inc.

The perfect portable power supply for the R/C car racer. Cool operation with no fan.

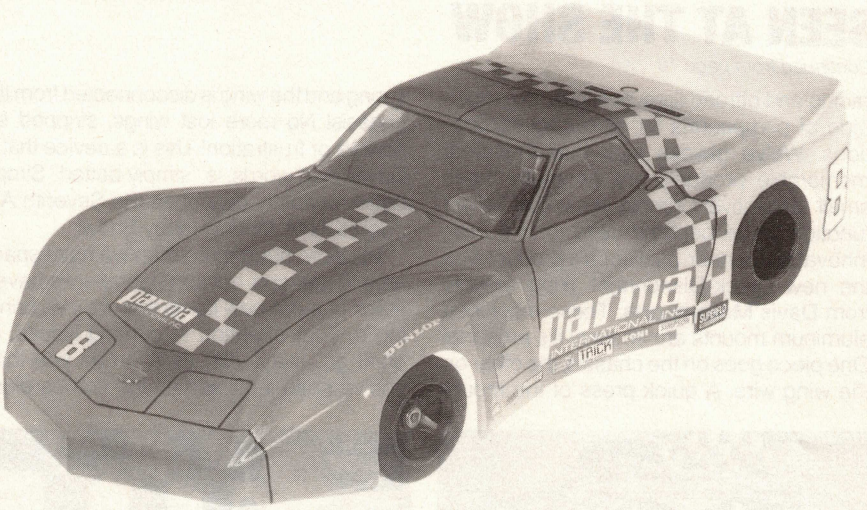
handling remained constant even with heavy clay buildup on the chassis plate.

On the other side of the coin, just having this Frankenstein oval racer sitting in the pits is a plus. It tends to draw a lot of attention. At first glance, people have done double- and triple-takes trying to figure out what the heck it is! Some have thought it was some new prototype super machine, and want to know where they can buy one. Others running in the same class with this car were sure it couldn't be beaten due to its trickness. And there's nothing wrong with pulling a little psyche-job every now and then, is there?

So as you can see, with a little thought, and a lot of ingenuity, plus a double handful of different parts, a car can be created that is unique to you and you only. Why have a cookie-cutter race car like everyone else out on the track? Dare to try something different on raceday.

Who knows, with a little luck, a ton of elbow grease and some time invested, you can have your own special racer. And even though it may look like a Frankenstein, it could pay-off with some additional gold for the old mantlepiece at the house. •

What's New



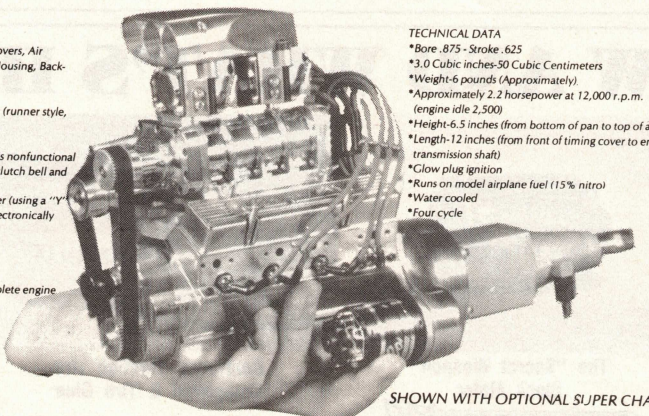
CORVETTE BODY

Parma's new 1/8th scale body is well-detailed and ready to mount on your 1/8th chassis. Paint it up and give it the gas! From Parma International, 13927 Progress Parkway, North Royalton, Ohio 44133.

THE ULTIMATE MODEL ENGINE KIT

The Conley-Small Block-V8 Engine
BASE PRICED $2195.00

FEATURES
- *All new Die Cast Parts (Pan Heads, Valve Covers, Air Cleaner top and base, Timing Cover, Bell Housing, Backplate, Wing Nuts, Wire Separators)
- *All parts fully machined.
- *Intake manifold & Walbro Carb/Air Cleaner (runner style, cast and cored)
- *Centrifugal clutch
- *Replica 4 speed transmission (transmission is nonfunctional but serves as a ball bearing support for the clutch bell and universal joint)
- *Custom designed electronic glow plug driver (using a "Y" harness from the receiver the transmitter electronically turns the glow plugs on and off)
- *Rubber mounts
- *Water pump
- *Ball bearings
- *All screws, nuts and necessary parts to complete engine
- *Instruction manual
- *Only hand tools required for assembly
- *Crankshaft pre-installed
- *Cylinder linders installed and decks ground



TECHNICAL DATA
- *Bore .875 - Stroke .625
- *3.0 Cubic inches-50 Cubic Centimeters
- *Weight-6 pounds (Approximately)
- *Approximately 2.2 horsepower at 12,000 r.p.m. (engine idle 2,500)
- *Height-6.5 inches (from bottom of pan to top of air cleaner)
- *Length-12 inches (from front of timing cover to end of transmission shaft)
- *Glow plug ignition
- *Runs on model airplane fuel (15% nitro)
- *Water cooled
- *Four cycle

SHOWN WITH OPTIONAL SUPER CHARGER

FOR MORE INFORMATION, CONTACT

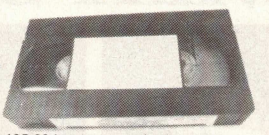
Conley PRECISION ENGINES, INC.

825 Duane Street * Glen Ellyn, Ill. 60137 * (708) 858-3190
"World Class Performance - Made in the U.S.A."
Prices subject to change without notice.

KEY CHAINS



$5.00 $6.00 $10.00

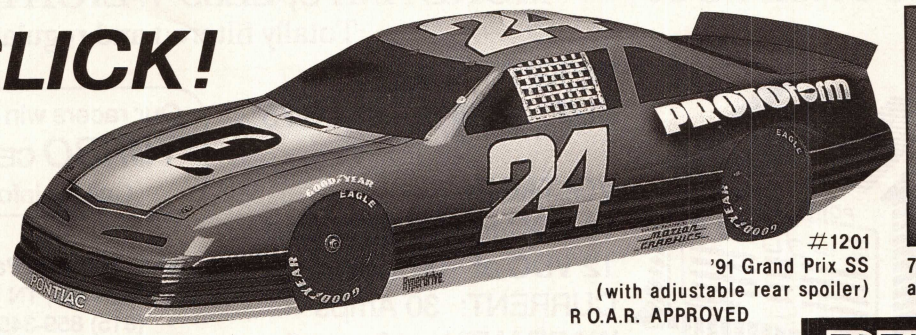


If the $2,195.00 is not in your budget at the present time, enjoy the next best thing...a video tape for only $24.95.

Developed by GARY CONLEY (the designer of numerous original model engines, including the Conley 1.20 c.i. double over head camshaft 4 valve model airplane engine and the world famous Conley V-8 engine) this video will take you through various stages of development, from its inseption in 1979 to the all new supercharged version. The video is a detailed look at the 32' Ford highboy roadster, 1/4 scale Cobra, Butch Leal's pro stock Pontiac Firebird and the original Pacesetter sprint car. For the avid model engine builder you will see complete step-by-step construction techniques and hints. A must for even the most experienced engine builder.

*ONLY ***$24.95 *** VHS Only*

SLICK!



#1201
'91 Grand Prix SS
(with adjustable rear spoiler)
R O.A.R. APPROVED



72 mph.
at THUNDERDROME®

Race results coming in from across the nation indicate that PROTOform's line of race bodies are more than just SLICK looking; they work great! In fact, on September 14/'91 Mike Boylan of Team Twister used a PROTOform Grand Prix body on his Hyperdrive H10SC and ran the fastest single lap ever recorded by a STOCK CAR in the "Insane Speed Run" at the THUNDERDROME® His lap of (9.00 sec) 72 mph. broke the old record by 2 mph. Mike went on to qualify for the A-Main with the same car and body.

If you are looking for the latest speed secret to get the most out of your car...

PROTOform HAS THE BODY FOR YOU!

THUNDERDROME® is a Reg'd Trademark of Dan's RC Stuff & McAllister Racing.

PROTOform
(416)-646-7638
FAX:(416)-625-5171

4444 Fieldgate Dr., Unit 15
Mississauga, Ont., Canada L4W 4T6

1733 Maryland Ave., Unit 3
Niagara Falls, NY 14305 U.S.A.

SEEN AT THE SHOW

Continued from page 18

racing and offroad tires, available in a multitude of compounds for all racing applications. We've always said that the most memorable products are generally those small, deceptively simple items that fulfill a function we've become used to in a new, innovative manner. Just such a product was the new Quick-Disconnect Wing Mounts from **Davis Motorsports.** These machined aluminum mounts are so easy it's amazing! One piece goes on the chassis, the other on the wing wire. A quick press of the mount spring and the wing is disconnected from the chassis! No more lost wings, stripped set screws or frustration! This is a device that in Davis' own words, is "simply better!" Simply better certainly describes the Seventh Annual RCHTA Model Hobby Show!

We saw much more than we have space here to mention, but don't worry—we have a stack of more new items that we'll be bringing to your attention in coming issues, so don't go away! Just as soon as you think you've seen it all, something comes along and changes your ideas about what's possible in the world of radio control racing. And remember, the more you support these fine manufacturers, the more opportunity they'll have to create still better products for you to make your R/C experiences more enjoyable and successful. And, if you have the opportunity to get to a model hobby show in your area, do it! You'll be amazed at the array of products that will stimulate your imagination and get you ready to go racing at first opportunity. •



Parma's full-size Snakebite monster truck.



Paragon Racing Products booth.



Jaco's onroad tires.

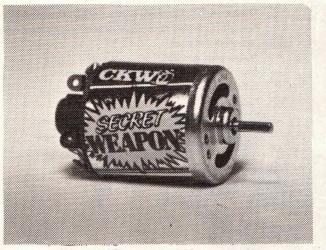
WHAT'S NEW AND WHAT'S HOT!



1.8 Aerodish Lightweight Wheels



Yokomo/Dominator Wheel



The "Secret Weapon" Stock Motor



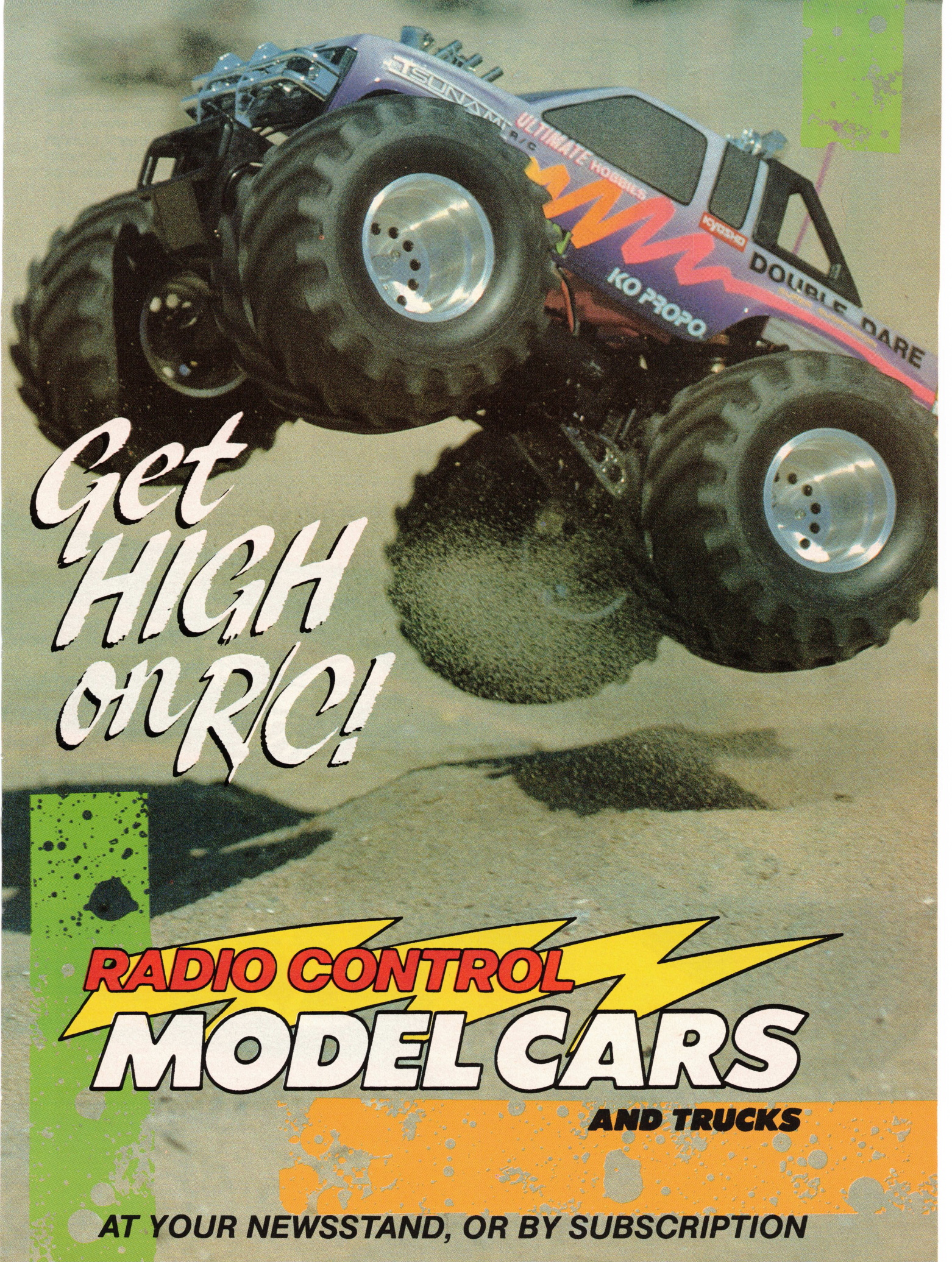
Controlled Traction Tire Compound & Tire Glue



1.8 NASCAR 1/10 Scale Wheels

CKW

1889 W. Commonwealth, Unit #1
Fullerton, CA 92633
Phone: (714) 738-1312 • Fax: (714) 738-1328



Get HIGH on R/C!

RADIO CONTROL MODEL CARS AND TRUCKS

AT YOUR NEWSSTAND, OR BY SUBSCRIPTION



C&M
Left Turn Only/On Road
COBRA LTOOR

BY DEREK ARITA

Have you ever noticed that all Indycars appear similar in design and engineering? As a matter of fact, I'd be hard-pressed to tell the difference between chassis. All of the latest and greatest design features have been incorporated into each chassis. As a result, parts begin to look the same, although their affectiveness will differ with minute changes in other related parts. Such is the case with the LTOOR.

Many of the parts may look familiar to the experienced racer, but remember the old adage, "Looks can be deceiving." Front arms, T-bar assembly, damper plate and mono-shock may have a recognizable ring, but the unique chassis design definitely sets it apart from the rest.

At first glance, you realize that this chassis has the capacity for five cells on the left side and three cells on the right. To an oval racer, this can only mean one thing: LTO, Left Turn Only! With most of the weight distributed to the "inside" half of the chassis, better traction and less roll will be had on an oval course. Several different cell configurations can be had by this arrangement, therefore allowing a driver the ultimate in chassis tuning and weight distribution.

The 'OR' part of LTOOR, refers to the "On Road" capability of the car. Since four or six cells can be evenly distributed in the chassis, an effective on-road setup can be used. As an added bonus to this chassis, the increased surface area allows for easy mounting of the servo, speed control and receiver; not an easy task for the average 1/12-scaler.

As for some extra-special features that make this car the Cadillac of mini-bullets, start with titanium axle and turnbuckles. Titanium has two features that R/C racers love—it's relatively light and it's extremely strong. In other words—if ya' break this axle, you deserve it!

But no matter how good a car is, it has to be built to be raced so, let's take a look. at *some of the finer details. . . .*

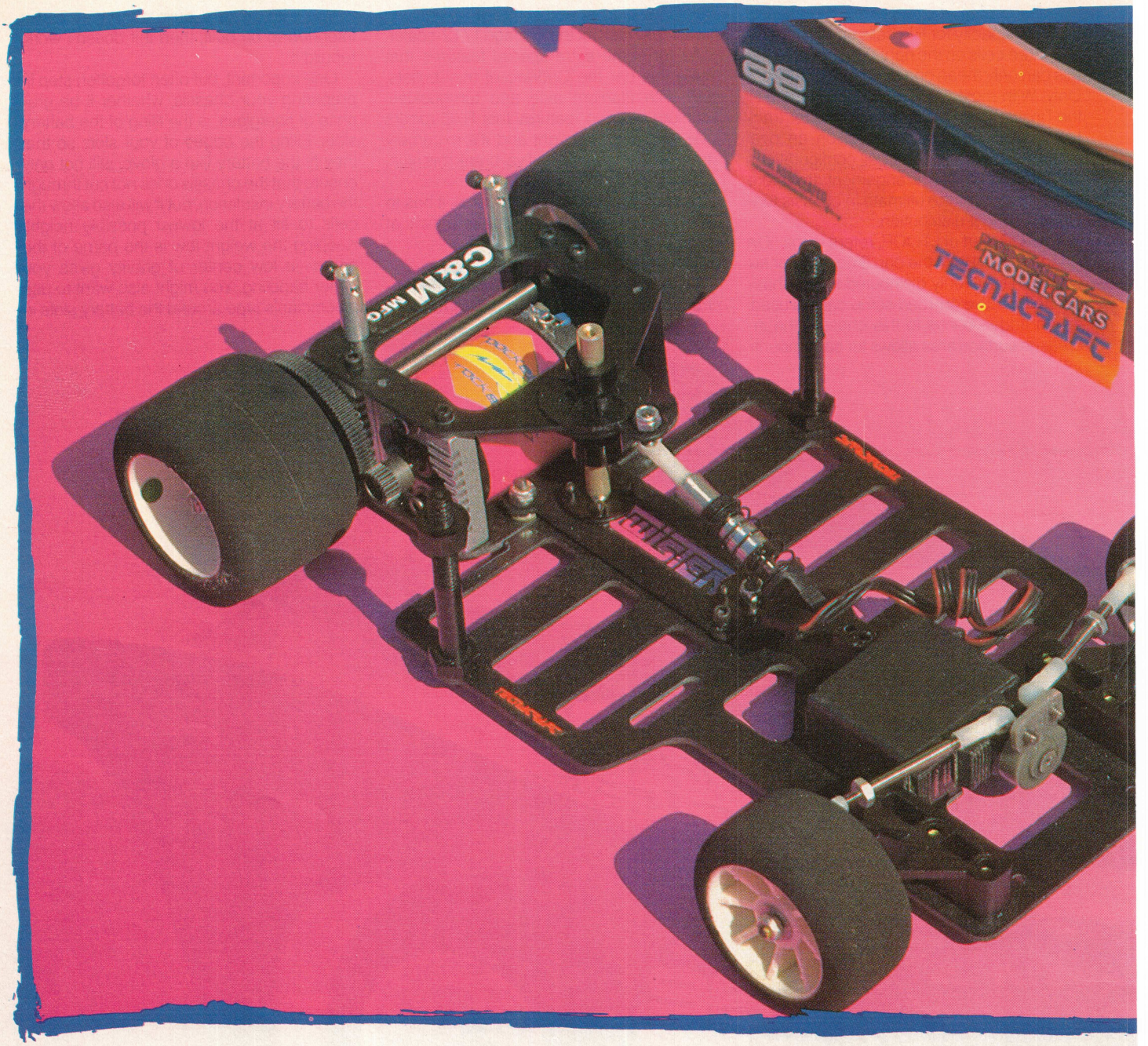
STEP ONE

The manual is complete with written instructions and exploded-view diagrams. As is true with all cars, build it the way it was intended to be built, then if it doesn't work, rebuild it.

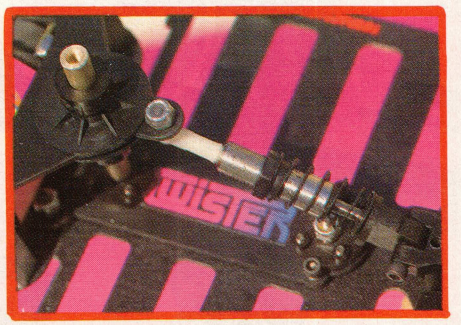
One important, but often forgotten step in preparing your chassis, whether it be graphite or fiberglass, is the filing of the battery slots. Filing the edges of your slots so that they fit the battery like a glove, will not only ensure that the chassis does not cut through the battery insulation, but it will also allow the cells to sit at the lowest possible height. *Keeping the weight low is the name of the* game—a low center of gravity gives you better handling. You might also want to use electrician's tape around the battery slots in



"Whether your game is onroad or oval, the Cobra looks like a winner!"







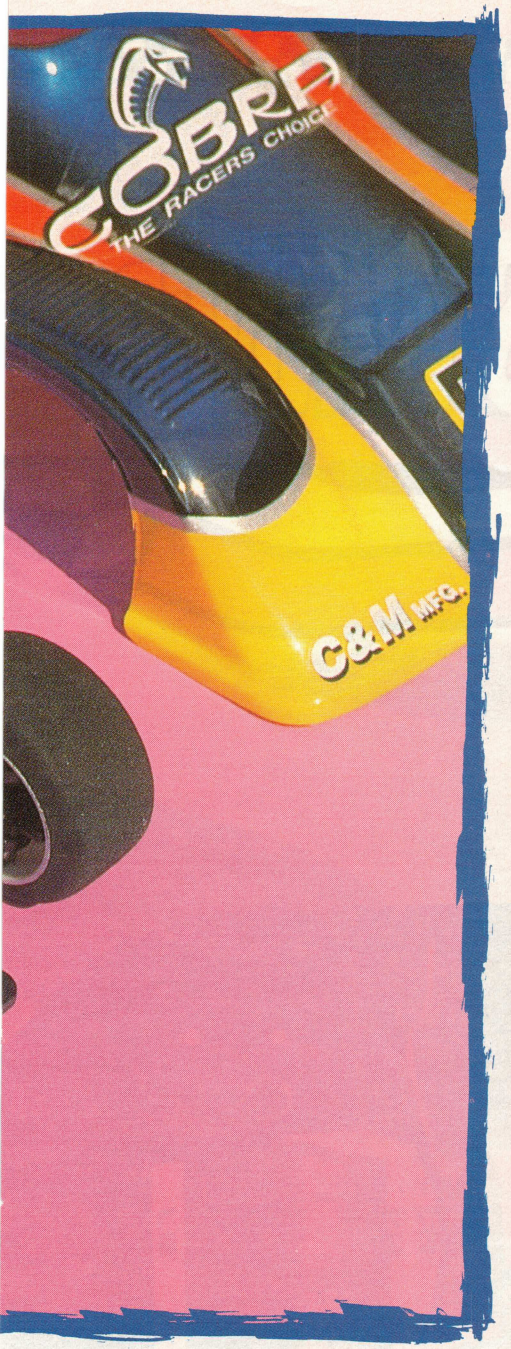
At left, finned motor mount provides added cooling. Above, side-to-side damping via a familiar disc-friction system.

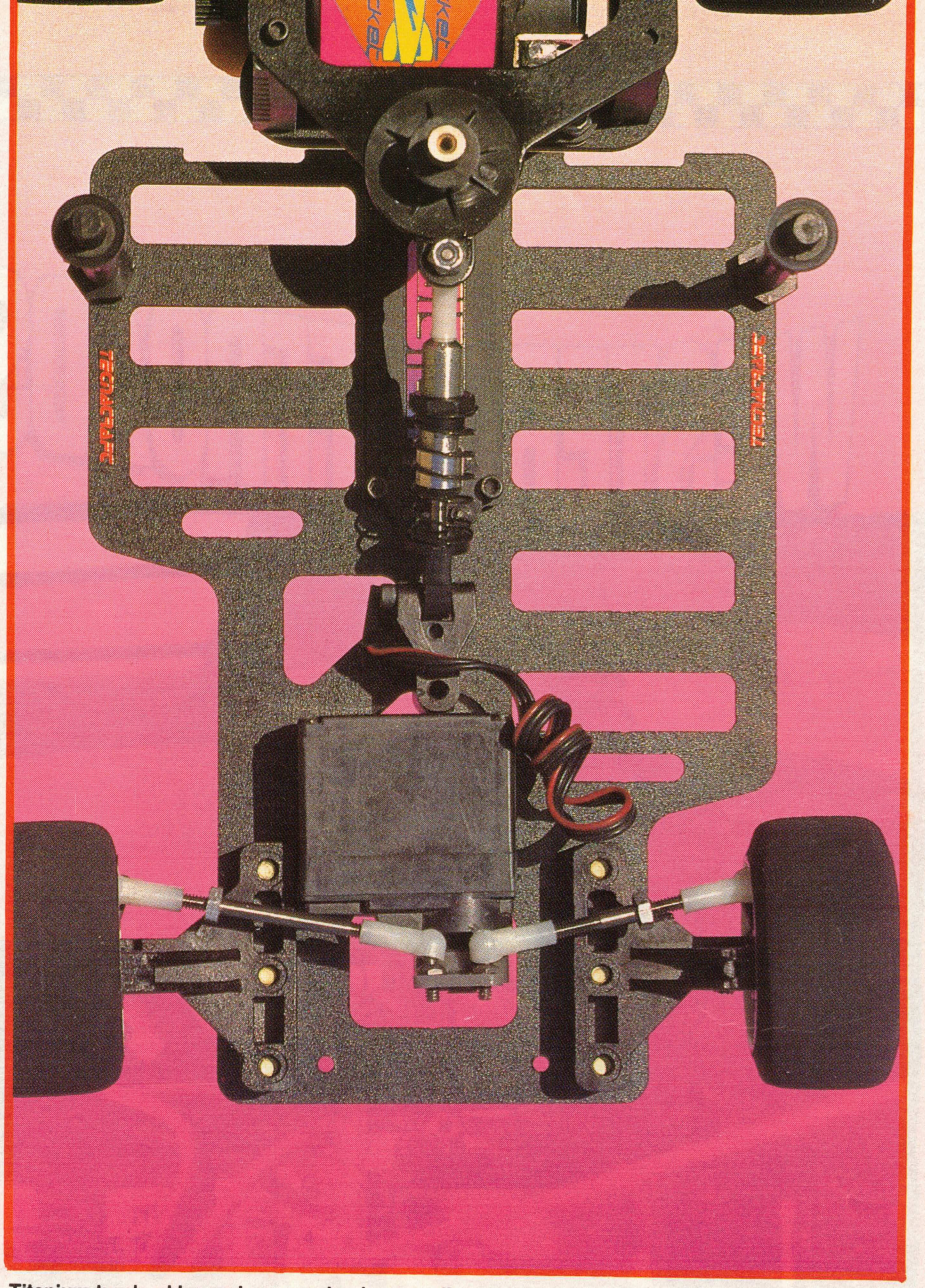
order to make sure that the bare parts of the cells and the connecting wires do not touch any part of the highly conductive graphite.

It is also important to remember to file the part of the chassis where the strapping tape goes. I've tried to get away with not doing it, but it is always graphically illustrated to me exactly why I recommend doing it: if your car hits something at full speed, the chassis stops, but the batteries go on, followed by the electronics. Needless to say, your beautiful car body becomes a bucket with which to carry your car back with.

Also, if you're a parking lot racer, like I am, it might be a good idea to use Associated's Clear Chassis Protective Film, #6312. This highly scratch-resistant material has an extremely strong adhesive backing that adheres very well to the graphite. This bullet-proof stuff reduces the amount of friction caused by the rubbing of a chassis against just about any surface. Less friction means more speed.

Apply the film as though you are applying a decal to the entire bottom surface of the chassis. Next use an X-acto knife to neatly trim around the outer edges of the chassis. remove the film from the strapping slots using the X-acto.





Titanium turnbuckles and a monoshock, normally an aftermarket item, are stock items in the kit.

FRONT AND CENTER

One of the first and most apparent features that the LTOOR provides is threaded, front axles. I can't and won't tell you how many E clips I've lost due to altercations with walls and other moving objects! At any rate, wheel nuts will save you time and hair during race night at the local track. . .Ah yes, the simple things in life.

The springs provided are .018 springs, but softer and stiffer springs are available. Keep in mind that softer springs give you more traction and stiffer springs give you less. Learning how to use all of the springs effectively, could make the difference between a winning race program and a losing one. More importantly, it could make the difference between a fun day at the track as opposed to a frustrating one.

When attaching the suspension arms to the chassis, notice that a flat arm shim is used. The flat shim lowers the chassis height, while the wedge shims add degrees of caster angle. The arms have 2.5 degrees of negative camber and 0 degrees of caster built in.

Included in the kit, much to my surprise, are titanium turnbuckles. Use extra care when installing the balls in the steering blocks. In order to prevent the inside of the rim from rubbing against the ball cup sleeve, when the wheel is at full right or left, the hole must be moved approximately 1/8" or less, forward of the existing hole. Be sure to test and measure before you commit with the drill.

"T" ANYONE

When assembling the T-bar, check to see that the rear-most ball moves freely within the pivot socket. The front one need not move freely because it will be held relatively still by the tweak screws. The "tweak" screw are very important to the handling of your LTOOR and will be discussed later.

Rear end assembly is a snap. The aluminum bulkhead is a machined, finned piece that will no doubt do a great job at providing extra cooling to the motor. The fins create more surface area for the heat to dissipate from, therefore making cooling more efficient.

The Delta-like shock used to dampen the rear is extremely smooth and deceptively simple. Be sure to follow instructions to the "T," and get used to building that shock correctly—smooth damping makes for predictable traction.

Check to make sure that the amount of travel that the shock has is equal to the amount of front and rear movement allowed by the "U"-shaped hole in the upper bracket. Once installed, it is crucial that the shock allows the rear end to have its full front-to-rear pivot travel before striking the center-post. To do this, just keep working on the shock building sequence until the correct amount of shock travel is obtained. If you can't get it there, then trim some of the

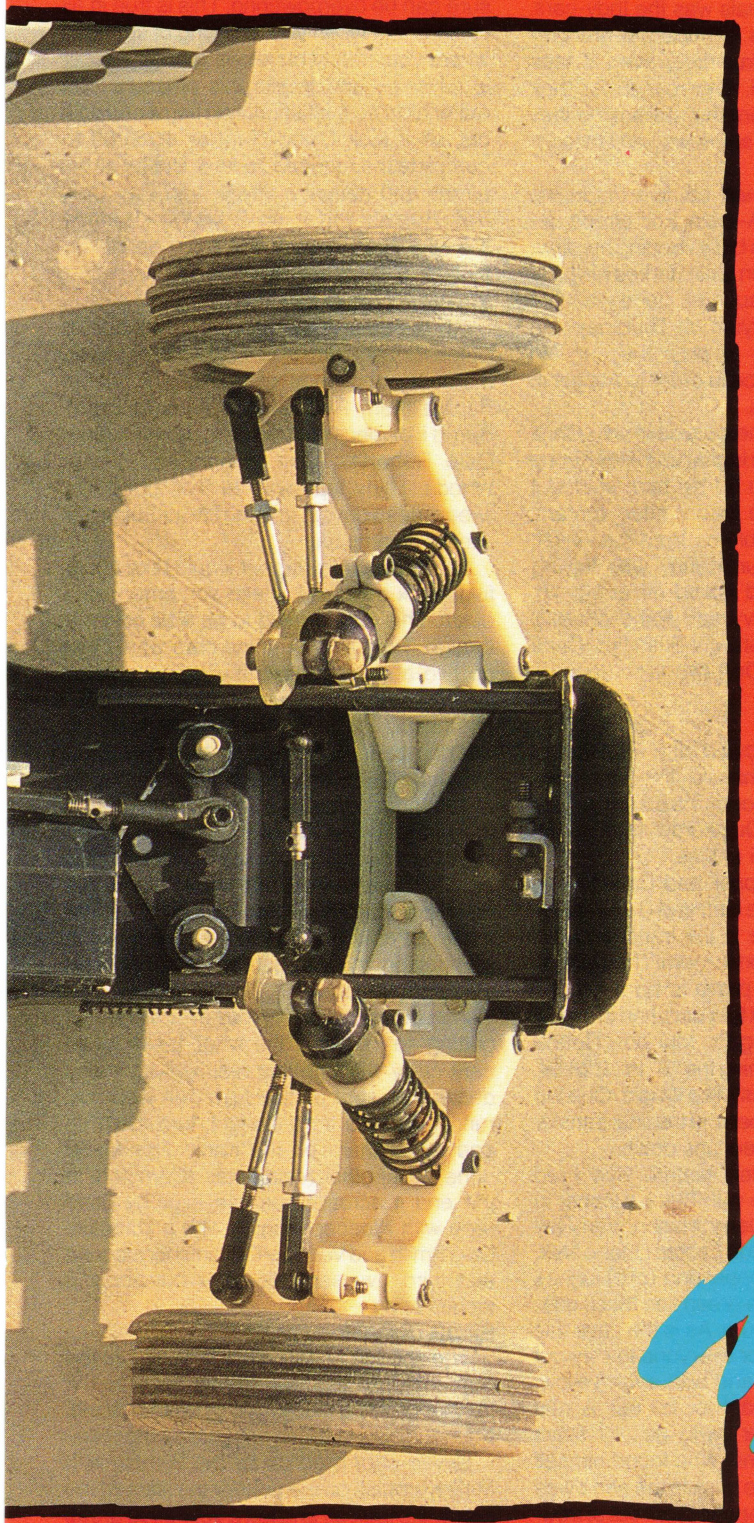
Continued on page 84

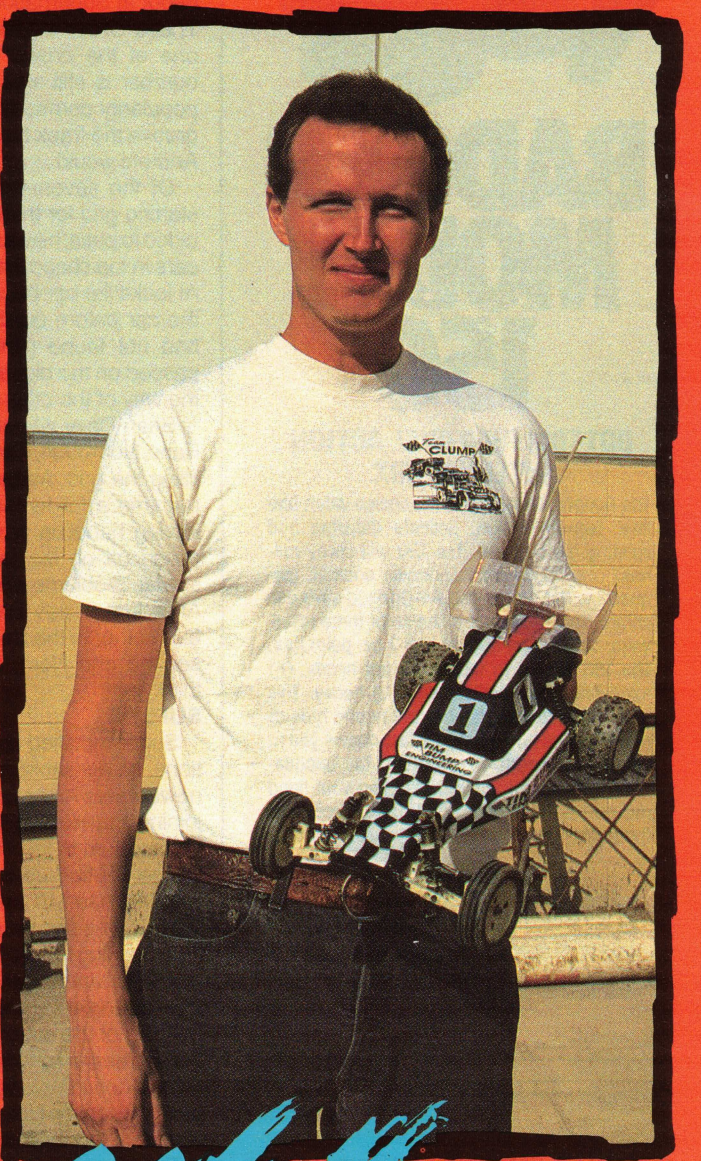
Scene in the Pits

WESTERN OFFROADS WINNER!

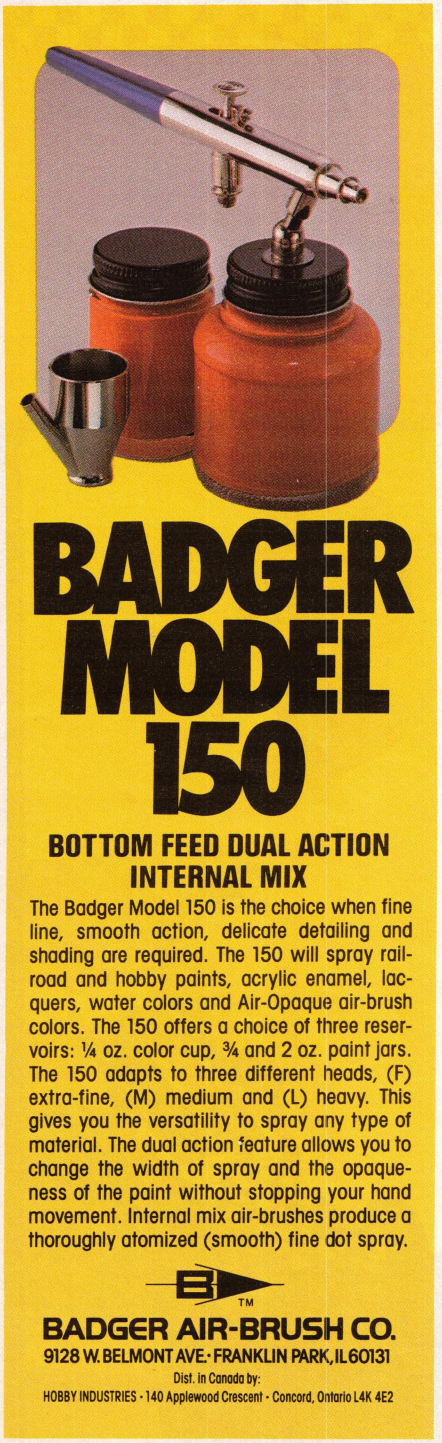


Tim and Jenny Bump, from Diamond Bar, California, are getting to be two of the best-known regulars in Southern California's offroad competition. Tim took this RC10 team car to a first-place finish and top qualifier honors in the 2 Wheel Stock Division at the '91 Western Offroad Championships, and also finished third in the Modified Class with the same car! Tim's car, as you can see here, is not an exotic, high-dollar race car, it's just made of durable, dependable components, starting with an RC10 team car with Stealth tranny. Tim runs Airtronics radio gear and a Futaba S9101 steering servo, a Reedy 13 double "Mr. E" motor, a Tekin 411P speed control and "generic" SCR Sanyo batteries—he doesn't believe in paying more than $25.00 for a pack of batteries! Losi X-patterns in the back and ribbed tires in the front put the power down to the dirt. Tim's proof that you don't have to be high-bucks to be competitive. . . but just think of what he would do if he had sponsors!





T.Q. STOCK 2WD WINNER STOCK 2WD 3rd PLACE, MOD. A-MAIN



Continued from page 46

dropped out. Battenfield past Clodt as Greco lapped the field in the end Greco, Battenfield, Glodt an Miller transferred.

The A-Main saw Chris Rahe and Brian Davy on row 1, Norm Duff and Lance Love on row 2, Tim McMillan and Mike Cornblatt on row 3 followed by the transfers.

The 50-lap dash proved to be one hot race with some of the biggest names in the sport. Going wheel to wheel as if tied to each other. Rahe and Davy pulled away slightly with Love and Greco working on each other for third. Clodt dropped out after fourteen laps with major body work needed and undoubtedly chassis parts not in great shape either. This brought out the yellow and bunched the field. At the restart again Rahe and Davy pulled away and before too long managed to put the field a lap down. On lap 44, Davy driving aggressively trying to catch Rahe, ended up hitting a back marker and hurting the car in the ensuing ricochet. With Davy dropping out, Chris just had to keep his nose clean for the win. Taking second was Lance Love 1-1/2 laps back and Eric Greco one second behind Lance.

INDY

Another class making its competitive debut at Supernationals was the Indy-cars. These CART clones in miniature are truly one of the crowd favorites, even if their number is still small. The reason for their popularity comes from the realism, as they groove the track the same way an Unser or Andretti would.

Of the seven signed up, five made the starting grid for the A-main. Eric Greco decided to pass, he was busy keeping his other cars in top shape. Ben Cole parked his Little Al lookalike car because he literally bought the car before qualifying on Thursday and had not found time to prep the car. He passed on the big race in order to not get in the way of the others.

Brian Davy was the polesitter with Chris Rahe, Norm Duff, Ron Ingram and Phil Kenny filling the grid. As the 30-lap race started it became a follow the leader affair. Ingram, having handling problems from the onset, pulled off on lap four. Kenny was having similar problems and pulled off at lap 16. After that it was Davy and Rahe chasing each other to the finish with Brian first, Chris second and Norm Duff two laps down in third.

SUPERS

Super modified showed off a wide selections of available chassis, this year with newcomers Arrow, Zoom, T&S and DeLara joining the likes of Quickdraw and RACO represented in the 15 entries.

The B-Main 25-lapper had Dane Slack, Mark Jackson, Duane Neff and Gus Gustafson starting the race in the transfer spots, only needing to hold on to them. These quick alcohol burners can prove to be a handful though, and at the end four cars had dropped out and of the starting top four only Duane would transfer by winning the "B" in 10:28.64. One second back was Mike Wright. One lap back was Jason Hopper and the final transfer was Tom Hughes three laps down.

The Super Modified feature had Fred Dowler taking he pole with Butch Kloeber to his immediate right Jerry Mason, Van Ray Cox, Vicky Woods, Scott Easter, Duane Neff, Mike Wright, Jason Hopper and Tom Hughes lined up behind. At the green flag these missiles split for the first turn. As is the case this week it wasn't easy for everyone to stay out of each other's way and with each yellow, cars started to fall back or fall out. A real surprise was Kloeber (who usually stays clear of most problems) who found himself struggling to stay in the hunt. In the end it was Dowler who, with his speed, kept out of trouble for the win. On the same lap, by keeping clean with perfect driving, was Vickie Woods.

SPRINTS

The Sprinters mains started with Scott Easter completing the 20 laps and winning the 'E' with a 4:15:21. Bumping up with him, all on the same lap, were Marv Reichert, Bill Edlar and Gary DeLara. Later Reichert and Easter chased down all but Dale Roberts and Joe Hughes in the D-main. With what ended up as the fastest 20 laps of the day, Roberts ran 20/4:04:21.

As is typical in most B-mains, when you can transfer into the money race, the pressure can be overpowering. This is true in all classes, but when you're talking of sprinters where your safety envelope around the car is so small and fragile this pressure can materialize as a lot of caution flags, and so it did, as it took Clyde Gardner 10:51:09 to complete the required 25 laps. But for all his efforts and patience Clyde, Van Ray Cox, Dale Roberts and again Vickie Woods made it to the Big Show, the A-main sprint car feature of the Supernationals.

SPRINTER A-MAIN ENDURO

On the pole of the sprint car feature sat Butch Kloeber, and next to him Fred Dower; matching bookends of speed and ability. Behind them Red Givens, George Brazil, Bernd Koegler, Ray Van Cox, John Garson, Dale Roberts, Terry Mason and Vickie Woods. Thirty laps was all that stood between these drivers and the title of Supernational's Champion.

Normally a thirty lapper would take about five or six minutes if these screamers stay clean. This race proved to be a bit different though. Time after time the cars would line up two abreast to take the green, only to have two or more cars get tangled before completing the first lap. Finally, after some coaxing by the announcing table, the race got started with Dowler and Kloeber racing at the point wheel to wheel. Then when things finally looked like they had all settled down to a normal race Dower got taken out big time by a back marker making Fred the first car permanently out. The restart proved to be just as difficult as the start with all the competitors trying to get the best position to try to catch Kloeber.

With the race not even half over. Time was getting so long that the small tanks these cars carry were getting real light so it was decided to stop all the cars that were still running on the front straight, turn them off and refuel them on the track. This finally done yet another restart was attempted. In the end it actually became a pretty good race with Kloeber winning with a 25:50:66. Dale Smith and Van Ray Cox finished second and third, five seconds back but about 6 inches apart.

SPORTSMAN

The sportsman GN class was new to the Supernaturals this year. It has become the fastest-growing class in all of quarter scale. Fourteen cars qualified this year for the show.

Seven cars lined up for the B-main with Mike Kornblatt on the pole for the start. At the gun, Mike took off and led a very good group

Advice For Car Modelers: Ram It!

#RED 04 Mars Light — rotating beacon	$19.95
#RED 07 Light Bar with Adj. Flasher	29.95
#RED 13 Headlights for Tamiya etc. Molded Grills	8.95
#RED 19 Car Headlights, 7.2 — 9 volt	10.95
#RED 20 Car Tail & Stop Lights — 9 volt	19.95
#RED 21 Car Turn Lights — Automatic operation	29.95
#RED 23 Real Strobe Light (Xenon) — 3 volt	29.95
#RED 24 RAM Lites — Off road, all aluminum	14.95
#RED 28 RAM Lites w/mounts for Tamiya Roll Bar	19.95
#RED 29 RAM Lites w/fold-away Roll Bar	24.95
#RED 31 3 Way Simple Siren — 3 sounds	19.95
#RED 32 Battery Peak Detector — 4-8 cells	29.95
#RED 33 Pace Car, 10 Light Set	49.95
#RED 34 Clearance Lights, amber lenses, 8 bulbs, 7.2-9V	11.95
#RED 36 Cab Marker Lights, alum., 5 light set, amber lenses	19.95
#RED 37 Simple Servo Setter — adjustable fail safe	19.95
#RED 38 Gas/Diesel Engine Sound & Horn, 4" Speaker	39.95
#RED 39 VW Car Engine Sound & Horn, 2" Speaker	24.95
#RED 40 Gas Diesel Engine Sound & Horn, 2" Speaker	39.95
#RED 43 Corner Marshall Alarm — the race winner	10.95
#RED 46 Machine Gun Sound Module	29.95

LIGHTS – Ram It!
SOUNDS – Ram It!
FAIL SAFES – Ram It!

• SEE YOUR DEALER • SEND STAMPED ENVELOPE FOR RAM INFO
If unavailable locally send check, money order or full credit card info for the cost of the item plus $4.00 ($5.00 foreign) for immediate shipment. Include full address for U.P.S. Sorry no C.O.D.

Ram 229 E. Rollins Rd. — Round Lake Beach, IL 60073

consisting of Jerry Epperson, T.Q. Steve Mylar, 73-year-old Willie Snyder, Philip Davy, Bill Schulman and Philip Kenny. Early on it became clear that three transfers would be Mike, Jerry and Steve. The fourth transfer was up for grabs though until Davy fell a couple of seconds back, making Snyder the last transfer and the elder statesman of all the A-mains this year.

The A-main started with polesitter Gail King, who showed superior speed and handling pulling away from the pack.

Battenfield managed to stay on the same lap, though, by keeping out of trouble. This tactic of driving clean is the biggest lesson learned in sportsman racing, and with this lesson learned over the year, King and Battenfield made the race a two-car show. In the end King was crowned champion completing the 100 laps in 19:41:43 with Battenfield 3 seconds back. Jim Hogan took third three laps back.

GN

Grand Nationals represented the largest class this year, with 33 cars (interestingly enough the 34th car should have been Jon Rahe who was at track side all week but at the last minute decided to back out in order to provide better technical assistance to his numerous customers). What a true gentleman! The B-Main looked like it would be a real barn burner with T.Q. Brian Davy leading a whole pack of internationally recognized drivers to the green flag. Only four of the ten would be allowed to continue. It was easy to see that this B-main 50-lapper could be as exciting as any normal A-main anywhere else.

As the freight train took off, lap after lap it looked like anyone could win it. In the end all four transfers were on the same lap, with Ray Zabriskie winning it with a 50/7:56.84. Less than one second back was Brian Davy, Ron Schoeb half a click behind him. The last car to make the A-main was Toby Stanford.

All this was just a prelude to the 200-lap A-main. Being crowned the Grand National Champion of the Supernationals is a dream of all Q-scale stock car drivers, but only a handful are capable of accomplishing the feat. A very large portion of that handful was represented by the ten cars lined up for the final feature of the day.

The front row saw the polesitter (last year's champion), Jim Turner, shoulder-to-shoulder with Chris Rahe, the winner in 1989. Behind them, in order, was Eric Greco, Lance Love, Dino Mowreader, Ron Keith, Ray Zabriskie, Brian Davy, Ron Schoeb and Toby Stanford.

As the green flag dropped, one question was quickly answered. The fastest car on the track was clearly Chris' as his white and blue RACO easily pulled away from the pack, and within minutes was starting to put laps on the field. As Chris did his best to put as much insurance between himself and second place, an incredible battle was shaping up behind him. Turner, Greco, Davy and Love were all freight-training it around the track with the rest of the field not far off them. Mowreader had some handling problems early on and did some serious damage to his P.R.C., and dropped out on lap 69. Everyone else, though, kept putting the pressure on each other, right through the first round of pit stops.

By lap 100 Chris looked unstoppable, with more than three laps on the field. The battle for second continued with Turner, Davy, and Greco. Lance was having some problems fell back and was now being pressured by Stanford.

George Brazil, doing the announcing noticed it first: about lap 140 Chris' lap time started falling off. Could this just be strategy? Take it easy and save fuel? Before long you could see Chris' car was not handling as well. More specifically, his right rear tire was going away. At 150 laps it became clear that another fifty laps would be impossible for the rubber to last. The pack had already made up one lap when the right rear exploded on lap 160. Chris pitted for a new tire, but after five more laps it was obvious the setup would not allow Chris to maintain his position and he pulled it off after 165 laps.

Now it was a whole new ball game. The pressure on the drivers' stand just went up a notch as the new leaders were looking at a 35-lap sprint to the championship. Turner and Davy were still tied to each other with Greco within a half-lap. To be honest I'm not sure how many lead changes these two had but it was great close-in racing. Finally Turner ducked his P.R.C. down low into turn four, and after 35:15:20 minutes and 200 laps, became the champion for the second year in a row.

Suddenly it was over. The track became startlingly quiet as the top four finishers in each class were required to take their machines to the tech area in Jon Rahe's pit. Each car went through a complete check of the rules including an engine tear down. Nothing was found and the final results became official.

As the last of the trailers were loaded, thoughts of the great times and challenger that transpired over the last four days turned to conversations about next year. It will be hard to beat this race—everyone loved it so much, but the dreams of what will be can only wait until next October. Until then, keep your antenna up and your tire side down. •

DID YOU KNOW?

WCM Corp. has the best prices on

- Zenoah Engine Parts
- Tire Bands
- GN Bodies

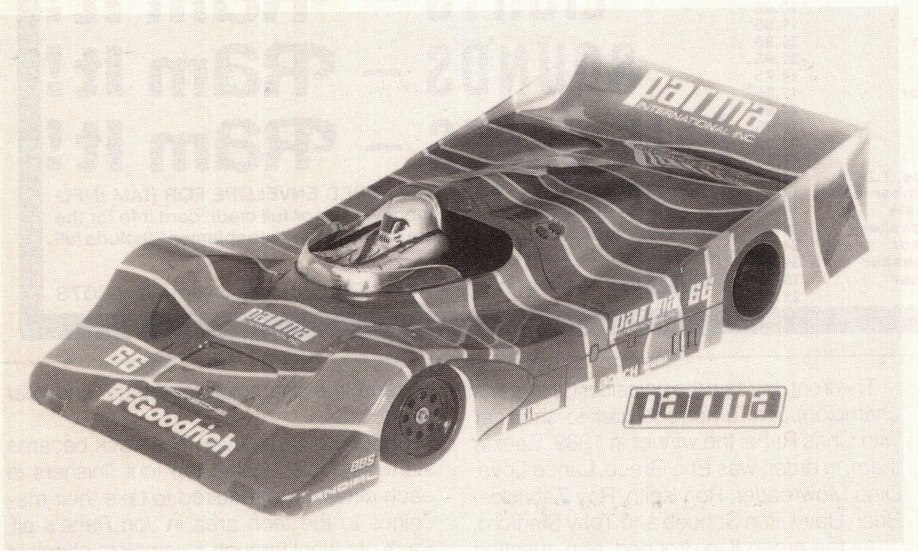
GENUINE Winners Circle PARTS

WCM INC.

CALL TODAY!
(903) 322-4869

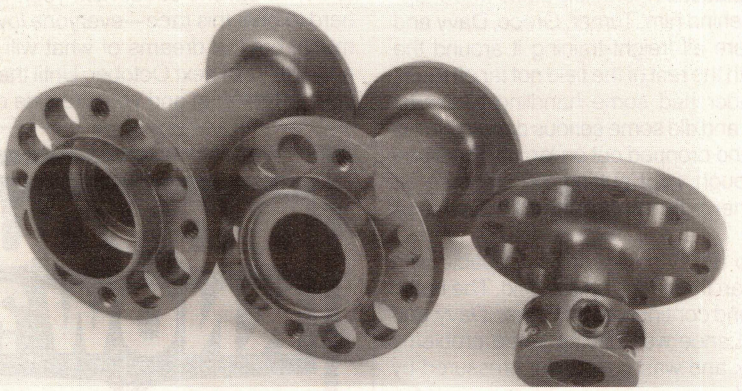
Route 2, Box 207A • Buffalo, Texas 75831

What's New



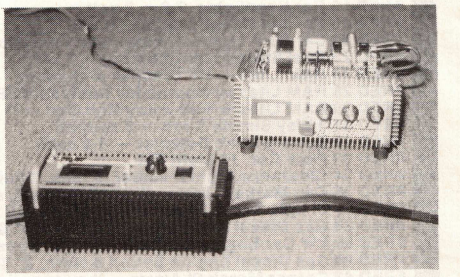
PORSCHE 966 BODY

The only open-cockpit GTP car in competition, which saw limited use in IMSA circuits is the Porsche 966. The open cockpit design allows extra cooling of the motor, an added plus. Parma International makes the fine Lexan body, available at most hobby shops. For more information, including a 52-page color catalog and poster, send $4.00 to Parma International, 13927 Progress Parkway, North Royalton, Ohio 44133.



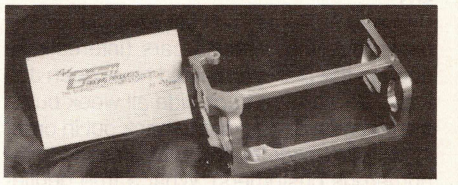
LIGHTWEIGHT PRO HUBS

HPI, 22600-C Lambert St., Suite 904, El Toro, California 92630, are offering these lightweight aluminum Pro Hubs for the RC10L and RC10L SS cars. The left-side hub is balanced, anodized, and lightweight, and the right side hubs for the 10L cars are also anodized. Find them at your hobby shop, or contact HPI direct.



DIGI-CHARGE LINEAR CHARGER

The new Digi-Charge linear battery charger sets the standard for the perfect battery charger, offering many of the same features found in precision industrial chargers, but at a fraction of the cost. Two Digi-Charge models are available to suit your needs. The standard Digi-Charge has all of the listed features, but adds a low-current stabilizing discharge circuit. The Digi-Charge Plus model incorporates a high-capacity 10 amp discharger to quickly dump a battery pack after a run. Both chargers are designed and manufactured in the USA to industrial chargers. Also new is a 12-volt, 10 amp DC power supply, the local companion to the Digi-Charge or any 12-volt DC battery-powered charger. Features include an adjustable 0-9 amp charge rate; sensitive peak protection that prolongs battery life; rugged, compact construction with a limited one-year warranty; ultra-stable linear charge that yields maximum power from both SCR and SCE batteries. From Vantage Engineering, 681 Main St., Waltham, Massachusetts 02154.



10L REAR POD

This super-light rear pod for the 10L is precision-machined to the highest toler-

QUICKDRAW 1/4 Scale RC Sprint Car

ALSO GRAND NATIONALS AND SUPER MODIFIEDS



There's no other car on the market with Quickdraws high level of quality. Call or write for free brochure today.

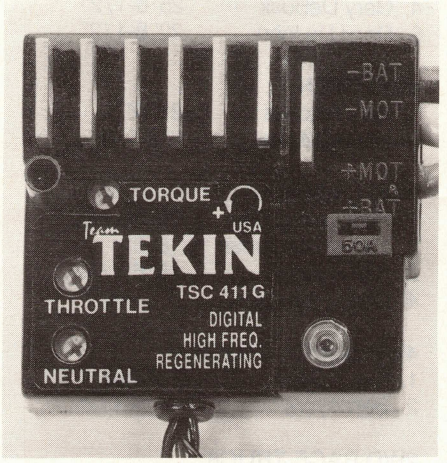
- No belts or chains
- Right and left hand Heims
- SECO mini Halibrand quick change rear end
- Zenoah 22.5cc, 1.25 HP gas powered engine
- 4130 chrome molly tig welded chassis
- Fully adjustable coil over shocks
- All CNC machined parts

Complete kit less radio $1,395.00

Manufactured By

PRECISION BORING & MACHINE
25425 Mission Blvd.
Hayward, CA 94544
Phone for further information
(501) 886-9413

ances to allow better gear mesh and axle alignment even under extreme conditions. From GPM Hobby, Heritage Pl., Rt. 101A, Amherst, New Hampshire 03031.



TSC 411G ESC

Tekin's new TSC 411G Goldfet electronic speed control uses the latest in MOSFET technology (Goldfets) to provide one-half of the voltage drop of previous ESCs, giving your car higher horsepower and efficiency. A high-speed, discreet BEC with RF noise suppression gives the 411G greater range with a wider variety of radios. The normal voltage drop with the 411G is .0015 Ohm, with a voltage input of from 4 to 11 cells. The new Tekin ESC comes with a 120-day warranty. Tekin Electronics, 970 Calle Negocio, San Clemente, California 92672.

PARMA INTRODUCES AN INNOVATIVE IDEA IN HOBBIES ...

ENJOYMENT!



Finally, Radio Control Kits for the common man. You don't need to be an expert, a millionaire or a rocket scientist to enjoy this **Fun Hobby.**

Parma offers a Good Times Rolling Chassis Kit* for a variety of tastes. Choose from the California Sport Truck, any of three Days of Thunder™ Kits or the new, Hemi Coupe.

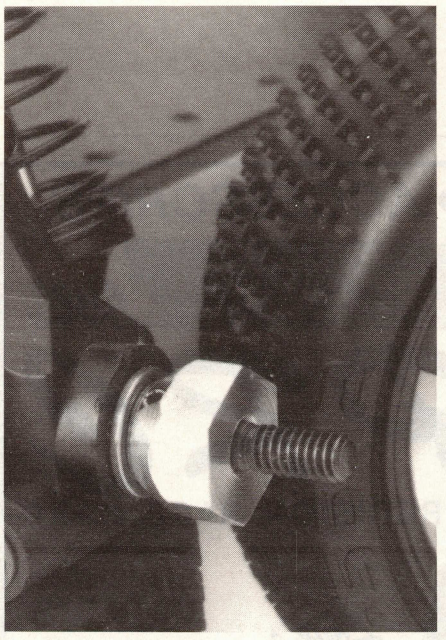
Pick one up, put it together, find the nearest parking lot and **go have fun.** Grab a friend and hold your own parking lot race. It's a Blast!

* Rolling Chassis Kits come with everything you need except Radio, Batteries, Motor and Speed Control. Your hobby shop owner can help you get started.

parma INTERNATIONAL INC.

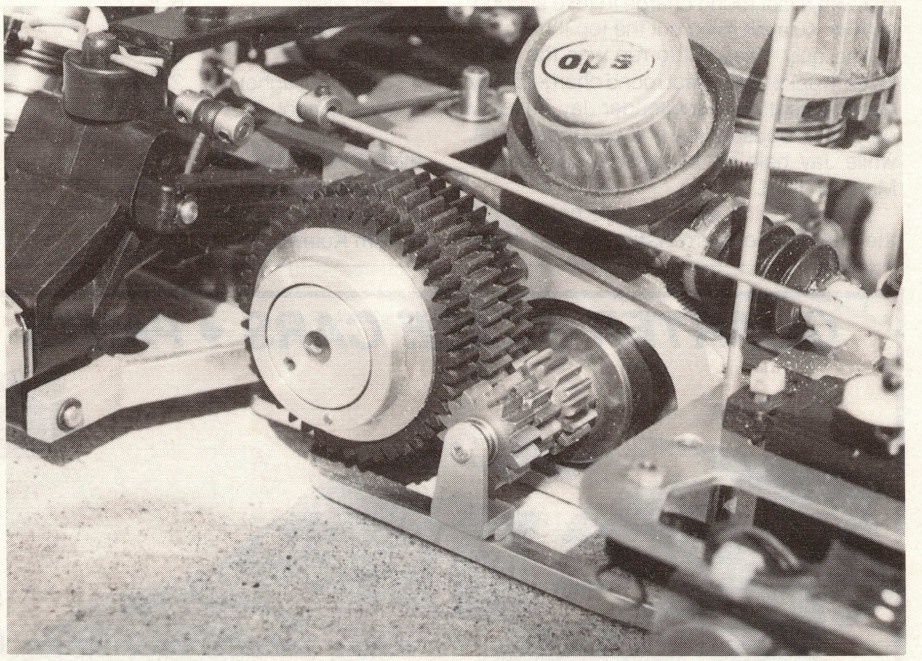
Sorry we cannot make retail sales. For parts an information visit your local Hobby Shop. They are in the Yellow Pages.

PARMA INTERNATIONAL INC. 13927 Progress Parkway, North Royalton, Ohio 44133 U.S.A.



ALUMINUM HUB ADAPTER

The HPI aluminum hub adapter for the RC10 allows you to mount Super Star 2.2 offroad wheels on your RC10. From Hobby Products International, 22600-C Lambert St., Suite 904, El Toro, California 92630.



THREE-SPEED GEARBOX

Now available for the PB Racing Phoenix, an 1/8th scale gas-powered onroad racer is this new three-speed automatic gearbox. This new gearbox employs PB Racing's newest Easy-Adjust gearbox technology for rapid and convenient one-screw adjustment of shift points, which results in a minimum weight differential between this new component and current two-speed gearboxes. With 16 different gear ratios available, you have the flexibility to choose the proper setup for all but the tightest of courses. The PB Auto Gearbox comes with everything required to convert your Phoenix racer to three-speed capability, including all clutch gears and bearings. It is available from all authorized PB dealers, or direct from PB Racing: (414) 789-1288.

Continued from page 29

on to take first with Jay Price holding on for second, and John Hallman moving up with a last round charge for third. Things didn't change much in 2WD Modified—could Paul Lavecchia make it two classes in a row? Well, Albert Janes still had the last word on that and the answer was no! Albert edged out Paul in the pull off to take the gold. In Dual Motor Stock Ed Kraemer Jr. and Derrick Thomas were joined in the pull off by Roy Allen pulling out in the final round. He must have found some magic in that last pull because he passed Ed in the pull off to take the win, with Derrick finishing third. Roy Allen's win in Dual Motor Stock helped his confidence, because in the Dual Motor Modified pull off he squeaked passed defending world champ Doug Howard by only 1-1/2 inches for first, with Paul Conte of the Jersey Power Pullers in third. 2WD Sportsman was all Glenda Bennett in the pull off for the win with James "The Mack" McMasters taking second. Rounding out in third was Kim Kulawik only 1-3/4 of an inch from making the pull offs.

As in the Sportsman, or should I say Sportsperson class, once again it was Glenda Bennett with the only full pull, Mark Hill in second, and Glenda's second entry rounding out the top three. 2WD Stock once again saw the North Jersey Power Pullers Paul "The Master" Lavecchia turned up the wick with a 26 foot, 3-1/4 inch pull to take first with Lenny Gumbman coming from dead last with a last round charge to take second, as Kim Kulawik filling out the top three.

The only class left to run was the 2WD Race Trucks. With a last round charge Darby Greene beat out early leader Jay Price by only nine thousandths of a second for first, while Jay held on to second, with Danny Martin in third.

After all of the awards were handed out the first Southeastern Nationals was in the books. I would like to take the time to thank every one who helped make this event possible: P.C. Hobbies, David Greene, Progressive Technologies, Randy Smith of PTI, PDI Zeda, Custom Chrome Products and Parma.

FINISHING ORDER FOR THE 1991 NR/CTPA SOUTHEASTERN NATS

2DW SUPER STOCK

1.	Paul Lavecchia	Full Pull
2.	Jay Price	25' 9-1/2"
3.	John Hallman	19' 1/4"
4.	John Lane	18' 7"
5.	D. Deal	18' 3-1/2"

2WD MODIFIED

1.	Albert Janes	26' 9-3/4"
2.	Paul Lavecchia	25' 2"
3.	Dave McCarthy	25'
4.	Mary Cole	dnf
5.	Jenny Green	dnf

DUAL MOTOR STOCK

1.	Roy Allen	24' 3-1/2"*
2.	Ed Kraemer Jr.	23' 9-1/2"*
3.	Derrick Thomas	22' 7"*
4.	Mary Cole	26' 8"
5.	Sam Mitchell	15' 3/4"

DUAL MOTOR MODIFIED

1.	Roy Allen	6' 8-1/2"*
2.	Doug Howard	6' 7"*
3.	Paul Conte	dnf*
4.	Brian Gallagher	27' 9-1/4"
5.	Jack Wright	21' 6-1/4"

2WD SPORTSMAN

1.	Glenda Bennett	27' 5-1/2"*
2.	James McMasters	10' 1"*
3.	Kim Kulawik	29' 10-1/4"
4.	Jack Wright	29' 7-1/4"
5.	Kenneth Spann	28' 6-1/2"

2WD OPEN 1

1.	Glenda Bennett	Full Pull
2.	Mark Hill	29' 3-1/4"
3.	Glenda Bennett	26' 1/4"
4.	Gary DeBusk	25' 6-1/2"
5.	Daryl DeJohn	22' 8-1/2"

4WD OPEN 1

1.	Sam Mitchell	21' 6"
2.	Danny Myers	8' 2-1/4"

2WD STOCK

1.	Paul Lavecchia	26' 3-1/4"
2.	Lenny Gumbman	18' 8"
3.	Kim Kulawik	13' 6-1/4"
4.	Chris Everidge	8' 11-3/4"

4WD SUPER STOCK

1.	Kim Kulawik	Full Pull
2.	Ben Ayers	11' 6-1/2"

2WD RACE TRUCK

1.	Darby Greene	9.50 sec.
2.	Jay Price	9.59 sec.
3.	Danny Martin	10.07 sec.
4.	John Lane	

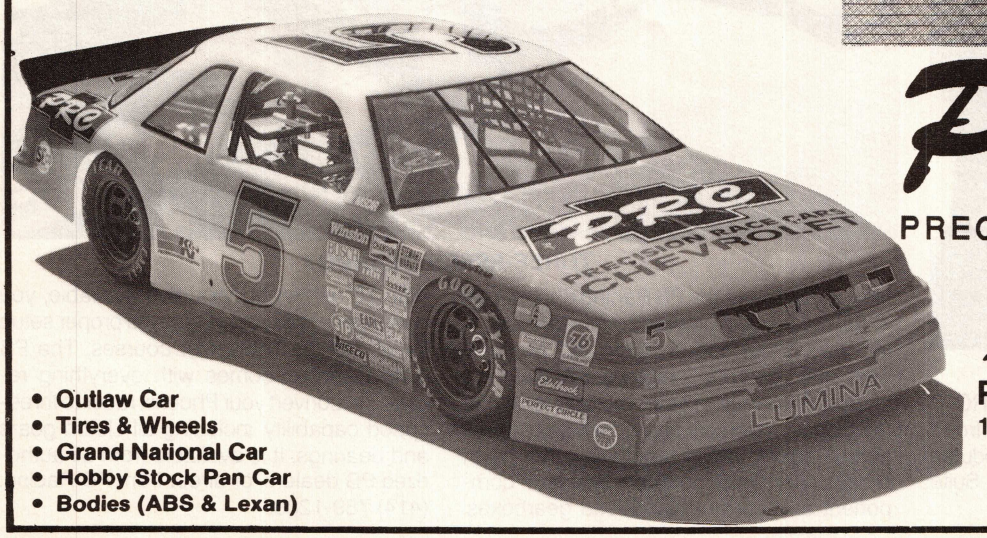
CONCOURS

1. Jack Wright

Best Paint Scratch: Brian Gallagher
Best Paint Kit: Lenny Gumbman

(*Pull off)

QUARTER-SCALE CARS • PARTS • ACCESSORIES



Loves PRC
PRECISION RACE CARS

- Outlaw Car
- Tires & Wheels
- Grand National Car
- Hobby Stock Pan Car
- Bodies (ABS & Lexan)

Love's
PRECISION RACE CARS
18885 Van Buren Blvd. #7A
Riverside, CA 92508
Phone 714-789-9258
Fax 714-789-0682

NO MERCY!

1. Super-efficient transmission has a three-gear design and a unique final drive ratio of 2.14.
2. Adjustable, torque-regulating slipper clutch.
3. Externally adjustable dual-ball bearing "pro" differential.
4. Maximum width rear suspension arms supply unsurpassed stability, plus adjustable toe-in & anti-squat features.
5. Long front and new X-tra long rear oil dampers are hard-anodized and teflon-coated with stainless steel piston rods.
6. Narrow bulkhead and long arms provide unmatched control in the roughest sections and deliver precise steering.
7. High ground clearance with 2.1" of suspension travel in the front and a full 2.5" of travel in the rear.
8. Durable nylon materials prevent breakage of the suspension components.
9. American-made, 100% graphite chassis completely minimizes flexing.

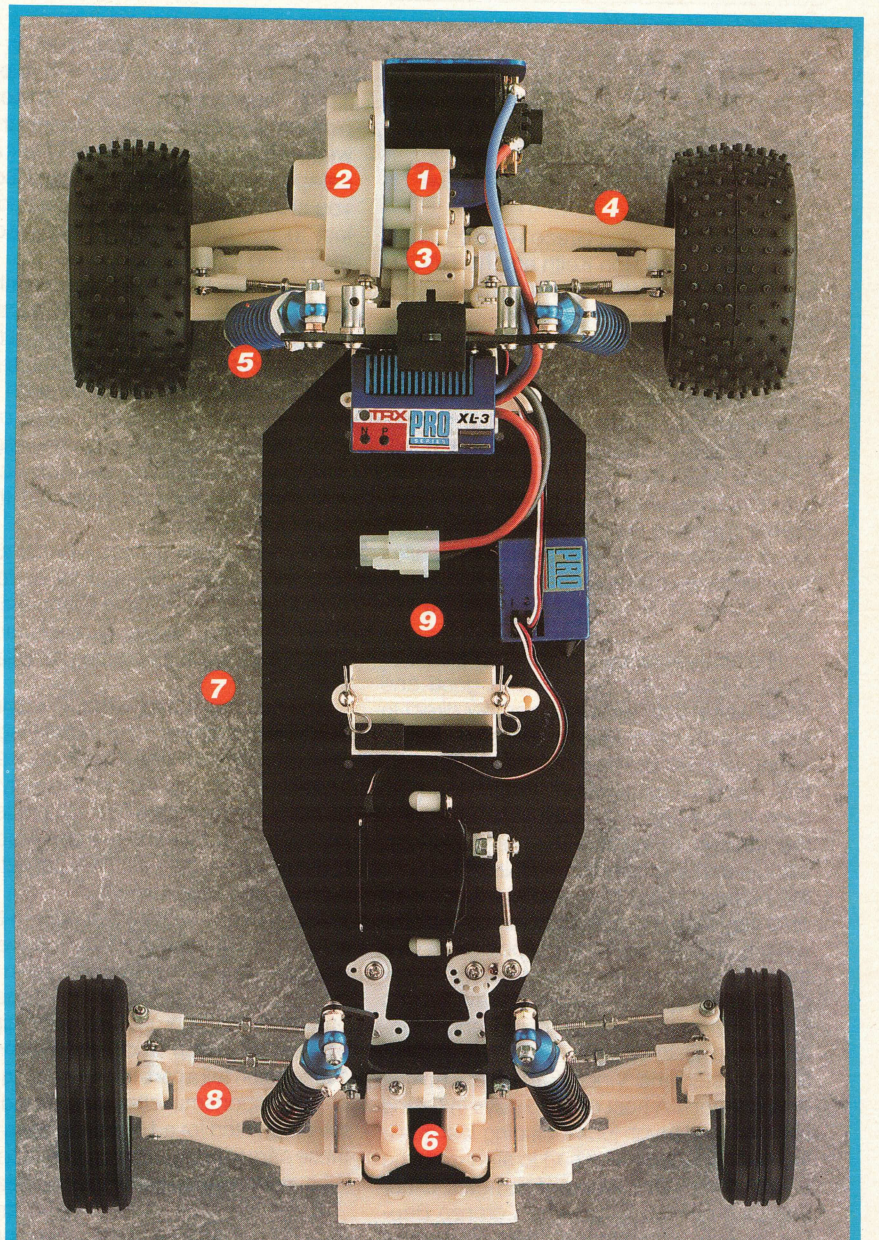
"The consensus agreed (Scott Montgomery's car) was the most impressive car on the track."

Competition Plus, August 1991

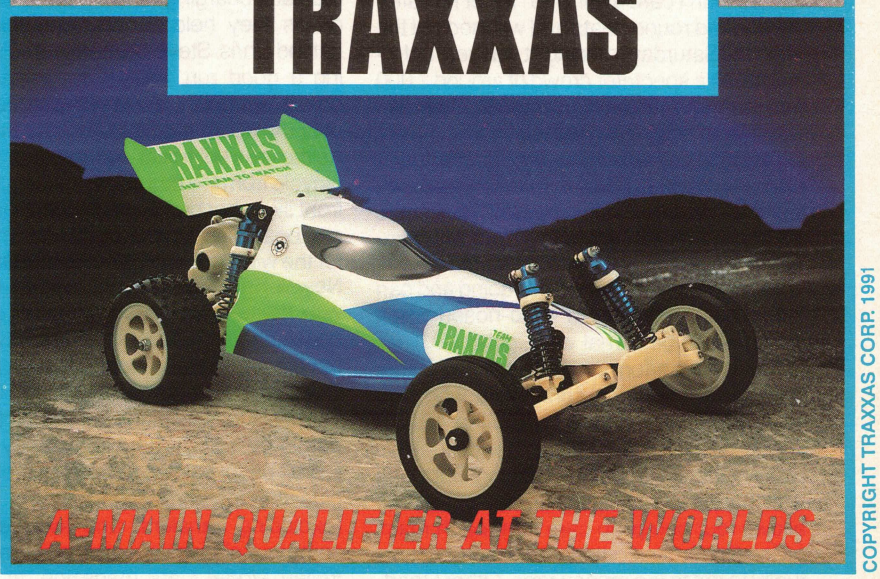
"The Traxxas car looked good at all times."

Radio Control Model Cars (England), October '91

The TRX-1, driven by Team Traxxas' Scott Montgomery, impressed everyone at the Worlds Warm-Up and IFMAR World Championship races in Detroit. Only a handful of the cars on the track were box-stock; and of those, Scott's TRX-1 had the fastest qualifying time (4th in the A-main!). The TRX-1 comes fully loaded with all the special "team" parts and trick set-ups giving you the advantage over the competition. Ask for the new TRX-1 "Worlds Car" at your favorite hobby shop and see first-hand what world-class performance is all about.



TRAXXAS



A-MAIN QUALIFIER AT THE WORLDS

TRX™

TRAXXAS CORP. 12150 SHILOH RD., DALLAS, TX. 75228

ELECTRONICS AND MOTOR ARE PICTURED BUT NOT INCLUDED IN THE KIT. SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

COPYRIGHT TRAXXAS CORP. 1991

Continued from page 47

KNOXVILLE NATIONALS

Nationals of Rahe and Greco were obvious but Kansas City's Ron Keith and his RACO was flying, as was WCM's own Carroll Cheek and Roger Newell.

Qualifying and the first round of heat races took place Thursday with mostly expected results but a few surprises: Butch Kloeber bested the field in both supers and sprints with his Arrows cars, but it was Carroll Cheek's WCM that came out on top in GN over Chris Rahe and Eric Greco's RACOs. Carroll surprised the "kids" in that he hasn't raced on the national level for quite a while. It's good to see him back. In the Late Models, the RACOs of Rahe and Greco were up front.

The heat races are the "make or break" in quarter-scale. You have to run good and finish well in both rounds to transfer direct to the A-mains. Otherwise you start in the lower mains, and we all know what that's like! The first round of heats starts straight up (fast guys in the front), but it's the inverted start in the second round that makes it real exciting—and a challenge. A DNF or a 5th or 6th place in either heat and you can count on a very long day getting to the "A" against drivers of Knoxville Nats caliber. Such was the case with a number of top drivers Thursday and Friday. Robert Baca of New Mexico had to start in the E-sprint main, Randy Behrends the D in supers, while top runners Scott Easter and Vince Sansone were B-main starters. A host of good guys in Grand National had tough luck including fast qualifier Carroll Cheek who had to start from the E-main after a DNF in one of his heats. Other bad-luck-but-fast guys were Lorenzo Benton of Auto Engineering, Steve Hauge of Minnesota and Kansas City's Tom Wilson.

Friday was main event day, but Mother Nature didn't care at all. She "let 'er rip" after the second round heats and washed out the mains till Saturday morning. It was real unfortunate, as a spectator crowd of around 2,000 had gathered for this final day. So, Saturday we started again, but without a few drivers who had to be on their way home. The lower mains went off quickly, thanks to the excellent work of Gina Pirello and Gail Dagenhart, the seasoned scoring team from Machesney Park Raceway in Rockford, Illinois. These girls know what they're doing and can either be very sweet or hard-nosed when they need to be. Great work, girls!

The best performance of the day came from Robert Baca in sprint cars who survived from the E-main to make the A-main lineup. I will tell you from experience that this was an unbelievable feat of driving! But along with that it's a credit to the QSAC format that allows four bump-up cars from each main, giving Robert and others the second opportunity to get to the money race. Other Good-Run Awards go to Steve York in sprints, "Hard Luck" Vince Sansone in supers and Jason Brommerich in GN. Sansone was plagued with carburetor problems the entire week which put him behind in the car setup category (the motor has to run good before you start on the chassis). He was often the last to leave the track as he tried to get everything together.

The A-mains are always good with drivers of this caliber. In the sprint cars, Butch Kloeber looked to have the edge at the start, but Roger Newell kept the pressure on while Ben Dowler was charging through the field along with father Fred, who came out of the B-main. Kloeber's steady yet aggressive driving and his lightning-fast Arrow car came home the winner and collected the $330 First-Place money.

In super modified it was Kloeber again, but he had to work a little harder as four other drivers, Iowa's own Dave Giannetto, WCM's Mike Schmidt, Steve Quartermouse and Gary Gallo were all on the same lap at the end.

The late models saw RACO's Chris Rahe and Eric Greco go 1-2 with Bill Dagenhardt third. Machesney Park Raceway's standout Tom Hargrove was very strong early, but late race problems netted him 7th place. Of the 10 starters in this class, 6 are Machesney Park Raceway regulars. They get better each time we see them race.

In the warm-up laps just prior to the 150-lap Grant National A-main, the week-long wear and tear on equipment began to show up. WCM's Steve Crane developed radio problems, Rahe broke his dad's highly experimental clutch and Tom Wilson's front suspension fell apart. In a surprising gesture of good sportsmanship the other drivers in the race voted for a 15-minute delay to allow these cars to be fixed before the race started. Who says quarter-scale has no heart?

Once the race started, Rahe and good friend Greco took off at a blistering pace with Roger Newell, Steve York and Ron Keith in hot pursuit. After mid-race pit stops for fuel, the hard-charging of Newell and Keith paid off as they held second and third spots behind Chris. Steve Crane likewise was having a good run. Late in the race, Rahe's consistent driving gave him a sizeable lead over the still charging Ron Keith and Greco. As the tires got hotter, Newell's car began to bicycle from too much side bite, and Greco's front sway bar had worked loose, making the car loose also. At the end it was Chris Rahe for the win followed by Ron Keith, Greco and Newell. Keith's second-place finish, matched with these guys, was especially gratifying considering his home Kansas City doesn't have a track where Ron can even practice! The winner took home $340 while 10th place Tom Wilson, who didn't get to start the main, netted over $80—double his entry fee. The QSAC payot paid all 10 spots in the A-mains plus the top three spots in the B-mains (excluding transfers) and awarded handsome wall plaques sponsored by *Radio Controlled Model Cars* magazine. In fact, we need to make mention of all this year's contributing sponsors:

Knoxville Chamber of Commerce
Knoxville School District
Knoxville Raceway
QSAC
Radio Controlled Model Cars Magazine
Autographics
Airtronics
Machesney Park Raceway
RACO Modelcraft
K&N Airfilters
NGK Spark Plugs
Blendzall Oil

A special thanks must go to starter Pete Qualine from Dallas, Texas, who volunteered his time at the last minute to help make Knoxville 1991 a success. The Knoxville Quarter-scale Nationals has firmly placed itself as the second largest quarter-scale event in the country, next to the Supernationals, but it's quickly catching up. We hope you will be there in '92.

KNOXVILLE NATIONALS RESULTS

INDYCARS

A-Main

1.	Chris Rahe	15
2.	Dave Campbell	15
3.	Eric Greco	14

LATE MODEL OUTLAW

A-Main

1.	Chris Rahe	50
2.	Eric Greco	50
3.	Bill Dagenhart	50
4.	Wayne McGraw	49
5.	Bob Williams	48
6.	Dave Pirrello	48
7.	Tom Hargrave	47
8.	Dave Litten	30
9.	Frank Dickerson	23
10.	Jim Blaha	DNS

GRAND NATIONAL

A-Main

1.	Chris Rahe	152
2.	Ron Keith	149
3.	Eric Greco	145
4.	Steve York	142
5.	Roger Newell	142
6.	Steve Crane	140
7.	Bill Gilmore	113
8.	Berl Gharst	59
9.	Jeff Boelkee	33
10.	Tom Wilson	DNS

B-Main

1.	Bill Gilmore	30 TR
2.	Berl Gharst	30 TR
3.	Steve York	30 TR
4.	Tom Wilson	30 TR
5.	Steve Hauge	30
6.	Jason Brommerich	30
7.	Ace Acevedo	29
8.	Lorenzo Benton	26
9.	Jack Hada	26
10.	Greg Parmalee	1

Continued on page 80

R/C MODEL CARS DECALS ARE HERE!



Now you can show your true allegiance to the Number One R/C car magazine with these brilliant new pressure-sensitive decal sheets. Each large 7 x 10-inch sheet has four sizes of ***R/C Model Cars*** logos in full color, ready to stick on your car, truck, or toolbox. Get yours now! Only $2.50 a sheet, including postage and handling, direct from ***R/C Model Cars*** magazine.

Order now: Send $2.50 by check or money order to: Decal Deal, c/o ***R/C Model Cars***, 898 W. 16th St., Newport Beach, California 92663.

Continued from page 78

SPRINT CARS

A-Main

1.	Butch Kloeber	30
2.	Roger Newell	30
3.	Ben Dowler	30
4.	Scott Easter	29
5.	John Talbert	28
6.	Dave Giannetto	28
7.	Fred Dowler	25
8.	Steve York	4
9.	Robert Mann	3
10.	Robert Baca	DNS

B-Main

1.	Fred Dowler	20 TR
2.	Robert Baca	20 TR
3.	Steve York	20 TR
4.	Robert Mann	20 TR
5.	Roger Hollingsworth	20
6.	Philip Neck	19
7.	Randy Behrends	18
8.	Vince Sansone	18
9.	Dale Walker	10
10.	Mike Means	2

C-Main

1.	Steve York	15 TR
2.	Robert Baca	15 TR
3.	Dale Walker	15 TR
4.	Randy Behrends	15 TR
5.	Phil Gazer	15
6.	Steve Hauge	14
7.	Mike Wright	13
8.	B.J. Goodin	3
9.	Curt Vershure	1
10.	Bob Boetger	DNS

D-Main

1.	Robert Baca	15 TR
2.	Phil Gazer	15 TR
3.	Curt Vershure	15 TR
4.	Randy Behrends	15 TR
5.	Dale Walker	15 TR
6.	Bob Boetger	14 TR
7.	Bob Moore	11
8.	Jim Farmer	11
9.	Frank Peterson	6
10.	Dave Solon	DNS

SUPER MODIFIED

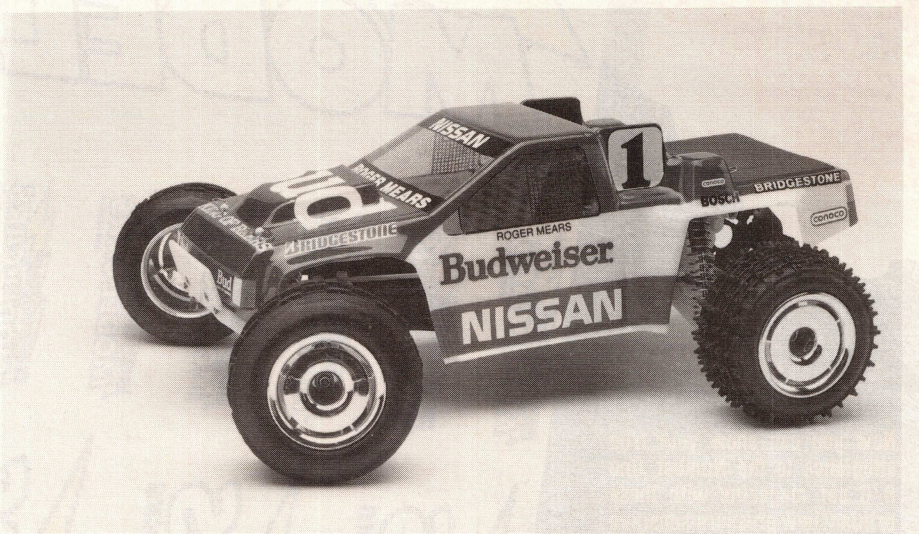
A-Main

1.	Butch Kloeber	30
2.	Dave Giannetto	30
3.	Mike Schmidt	30
4.	Steve Quartermouse	30
5.	Gary Gallo	30
6.	Vince Sansone	28
7.	Vick Hale	28
8.	Roger Hollingsworth	25
9.	Scott Easter	22
10.	Dave Smith	DNS

B-Main

1.	Scott Easter	20 TR
2.	Gary Gallo	20 TR
3.	Vick Hale	20 TR
4.	Vince Sansone	20 TR
5.	Levi Coultas	18
6.	Robert Mann	10 •







RC10T STADIUM BODIES

Pro-Line has just introduced a line of bodies for the RC10T stadium truck. They include a Chevy, Jeep, and Nissan. All fit directly on the RC10T chassis with no modification. The low-profile design maximizes air flow and the durable polycarbonate construction will hold up to considerable racing abuse. From Pro-Line, 201 W. Lincoln St., Banning, California.

You Can't Touch These Prices!



ASSOCIATED
RC-10ST
THE HOTTEST NEW R/C TRUCK!
$189.95
NEW!



NEW!
TAMIYA
BEARHAWK $79.95



TAMIYA
KINGCAB $161.95



TAMIYA
FERRARI F-1 $129.95



ALUMINUM $159.95
GRAPHITE $179.95
ASSOCIATED
RC-10 TEAM CAR



NISSAN
300ZX
TAMIYA
MERCEDES GTP $129.95



NEW!
TEAM LOSI
JUNIOR-T $119.95



1/8 4WD GAS **PIRATE**
$349.95
TAKING THE COUNTRY BY STORM!
TRUCK BODY ALSO AVAILABLE!

Offroad

ASSOCIATED

RC-10 W/BEARINGS	$ 145.95
RC-10 ALUMINUM T/C	159.95
RC-10 GRAPHITE T/C	179.95

MRC/TAMIYA

MADCAP	109.95
SAINT DRAGON	69.95
MANTA RAY 4WD	129.95
BEARHAWK	79.95

TEAM LOSI

JRX-PRO	159.95
JUNIOR TWO	109.95

MRC/TAMIYA

CLODBUSTER	$ 234.95
KINGCAB	161.95
TOYOTA HI-LUX	145.95
BULLHEAD	239.95

MARUI

BIGBEAR	79.95

TEAM LOSI

JRX-T	169.95
JUNIOR-T	119.95

TRAXXAS

SLEDGEHAMMER R/TR	189.95
BLUE EAGLE	167.95
HAWK	89.95

Onroad

ASSOCIATED

10-L FIBERGLASS	$ 89.95
10-L GRAPHITE	129.95
10-L SS GRAPHITE	124.95
10-L SS FIBERGLASS	89.95

BOLINK

SPORT	54.95
GTP	132.95
STOCK	132.95
GOLD	149.95
LTO	159.95
SUPER SPORT	69.95

COBRA

LTOOR	$ 159.95
SPEEDWAY	139.95
IIV	109.95
IIIV PRO	139.95

MRC/TAMIYA

MERCEDES GTP	129.95
NISSAN 300ZX	129.95

PARMA

HEMI COUPE	69.95
CAL SPORT TRUCK	59.95

Accessories

CHARGERS

ASTROFLIGHT 114	39.95
ASTROFLIGHT 115	49.95
ASTROFLIGHT 111	79.95
TEKIN BC-100L	69.95
TEKIN BC-250S	109.95

SPEED CONTROLS

NOVAK 410 M5	69.95
NOVAK 410 M1C	95.95
NOVAK 410 MXC	109.95
NOVAK 610 W/REV.	99.95
TEKIN SC 408 SPT.	65.95
TEKIN 411P	95.95
TEKIN 410S	79.95



RC-10 ALUMINUM
SHOCK TOWERS
CALL FOR PRICES!

RC-10 ALUMINUM
BELL CRANKS
WITH BEARINGS
$29.95

BATTERIES!

WE CARRY A VERY LARGE SELECTION OF SANYO BATTERIES, FROM STOCK TO PRO-RACING PACKS! CALL FOR PRICES!



Combo Deals

1 STARTER COMBO
2 NCS RADIO
BATTERY PACK
ARISTO-CRAFT CHARGER
ONLY $79.95

2 NOVICE COMBO
MAGNUM SPORT RADIO
ASTRO #114 CHARGER
1400 MAH PACK
ONLY $99.95

3 PRO-STOCK COMBO
MAGNUM SPORT RADIO
NOVAK M5 ESC
1400 SANYO PACK
ONLY $129.95

4 PRO COMBO
MAGNUM JR
NOVAK 410 M1C
TEKIN 100L
ONLY $239.95

Shipping plus $3.00 Handling
COD's add $3.75
California residents add 8.25% sales tax. No extra charge for credit card orders Allow time for personal checks to clear.

VISA MasterCard DISCOVER

ORDERS ONLY!
800-446-6335
OUTSIDE CALIFORNIA
INFORMATION & PRICES:
818-787-5431
CALIFORNIA ORDERS:
818-787-5851

©1991

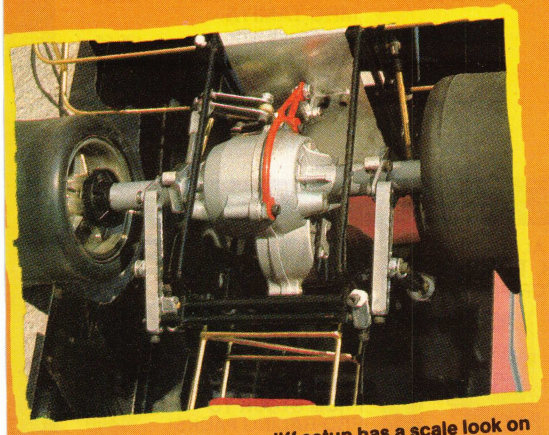
MK MODEL PRODUCTS

7209 Balboa Blvd. • Van Nuys, CA 91406
HOURS: Monday-Friday 10-7 • Saturday 10-5 • Sunday 12-5

*ALL ITEMS SUBJECT TO PRIOR SALE AND AVAILABILITY. PRICES SUBJECT TO CHANGE WITHOUT NOTICE. PRICES LISTED ARE FOR MAIL ORDER ONLY. NOT RESPONSIBLE FOR TYPOGRAPHICAL ERRORS.



KENDRICK'S SUPER MODIFIEDS



From the bottom, diff setup has a scale look on the Super Mod.



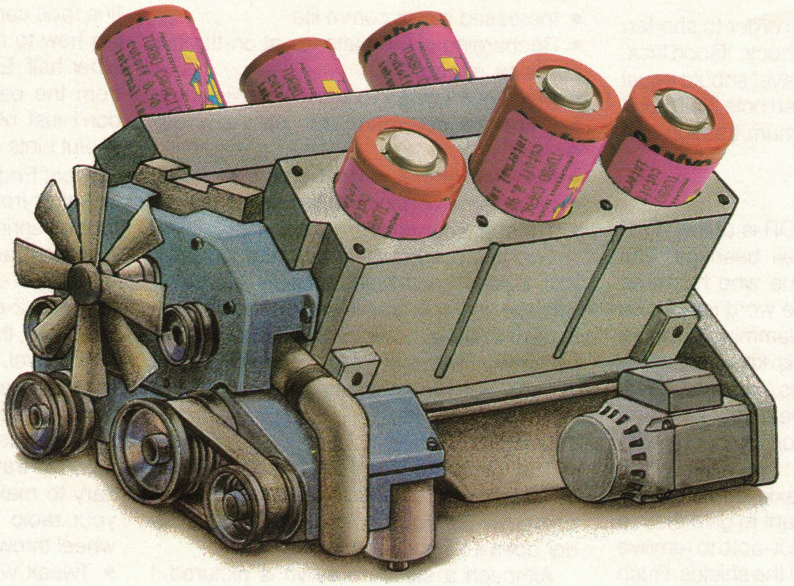
Mild steel nerf bars protect body and chassis from bumps and bangs. Overall quality of car is excellent.

Here is another beautiful 1/10th-scale creation from Canadian manufacturer Gary Kendrick. This East Coast Super Modified racer can be bought just as you see it here—painted and ready to race—or in several other configurations including a rolling car, without paint job or radio gear; a turn key car, which includes paint, radio gear, wheelcaps, batteries and peak charger; or the complete car plus special lettering and airbrushing.

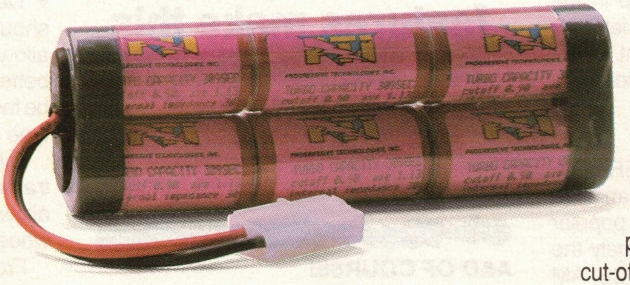
The East Coast SuperMod racing series as conducted up in the Great White North (in Ontario), specifies a 15-turn double Twister motor, a seven-cell, 1400 SCR battery pack and a four-cell receiver pack.

The car itself features a jig-built chassis, made of hand-welded hardened steel, with downtube and upright chassis also available. Mild steel nerf bars up front and in back protect the eight-piece lexan and aluminum body from racing damage. The car uses 32-pitch gears, and is direct drive with a differential. The suspension is brass or mild steel rods (4-40 thread), with BoLink coil-over shocks or torsion bars up front, and BoLink shocks with torsion bars in the rear. Caster and camber are adjustable, and the torque arm can be made adjustable by simply lengthening or shortening the fifth link.

Want one? Then get in touch with Gary Kendrick, who also produces gas-powered sprint cars, and electric Grand National and sprint cars. Kendrick Racing Products' address is: 5 Emmett St., Box 630, Fonthill, Ontario, Canada LOS 1EO. Phone: (415) 892-4285. •



Be sure you're running on all cylinders with Progressive Matched Packs



To get top performance out of your full size car engine, each cylinder has to be tuned to perfection.

Same thing is true for your R/C battery pack. You could have five of the best cells on the planet...but if the sixth is a turkey...so is the pack.

With our matched and assembled packs, you'll know each cell is a top performer because we computer test them individually for voltage, capacity and impedance. Cells are then labeled and grouped according to capacity levels. Often, you'll get a pack with six or seven exactly matched cells.

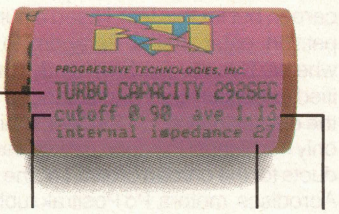
That's top-notch tuning.

High numbers from high volume

While your local basement matcher may test *hundreds* of cells to get some pretty good cells and a lot of mediocre ones, we test *hundreds of thousands* of cells. Which gives us a whole lot of cells that are way above average. Sanyo 1400's are always 280 or better, with many ranging over 300. And SCE are 330 and up.

No funny number business

Any manufacturer can get great numbers on computer matching systems...all you have to do is adjust the cut-off point to a lower number and voilà...you have a longer amp-second rating. We've always used industry standard numbers and are now printing our cut-off point right on our labels. So when you compare numbers with a home-brew program...make sure you're comparing cut-off points too.



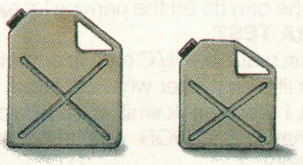
capacity (longer runs) | cut-off voltage (indicates computer cut-off voltage for accurate comparison) | impedance (more punch) | voltage (higher speeds)

Sticks, humps and saddles.

Using quality Sanyo SCR and SCE cells, our matched packs are assembled in a variety of styles and sizes to suit every need. Six and seven-cell packs in stick, hump and saddle configurations.

If you need it...we make it!

So what are you waiting for? Make sure you're running on all cylinders. And make your next pack a PTi matched and assembled one. They're at your local shop today.



Because we test tens of thousands of cells, you're going to get better batteries from Progressive. It's like having a bigger fuel tank for your car.

PROGRESSIVE TECHNOLOGIES, INC.
P. O. Box 4648, Winston-Salem, NC 27115
Telephone: 919-761-1375
Fax: 919-748-0495

Distributed through Horizon Hobby Distributors, Inc.

Continued from page 69

sleeve off of the ball cup in order to shorten the effective length of the shock. "Good luck, Mr. Phelps." Total shock travel should equal the length of the "U"-shaped hole. Full travel in both will give you maximum traction and maximum performance.

BEG TO DIFF

Differential for the LTOOR is of the "Pro" persuasion, with three ball bearings. The axle is titanium. To anyone who has ever broken a graphite axle, the word titanium is music to the ears. Wheel-slamming hits were well considered when this kit was put together. If you can break this axle, it deserves to be broken! Diff balls were provided and used along with a Du-Mor, 64-pitch, 104-tooth gear.

Before you place the axle bearings into the rear end, you might want to give them a thorough cleaning. Use an X-acto to remove the large c-clips that retain the shields. Flush the bearing out with Paragon Formula 1 motor spray, then reassemble. Be very careful not to damage the shields or lose any of these tiny parts. Successfully accomplishing a bearing cleaning will automatically put you up for Surgeon of the Year. Failing will put you back at the parts counter.

Last but not least, for a smooth side-to-side action, use some Protective Film on the damper disc assembly. Simply cut a piece out in the shape of the damper washer and stick it to the graphite upper brace in the center-most position. Now you can let it dry for a really free, smooth movement, or increase the damping with some kind of silicon "snot."

NOVAK'S BACK

For a receiver, I am using the NER-3FM. This is Novak's 3-channel, narrow band, FM receiver that is compatible with all popular FM transmitters and it is approximately the same size and weight as the NER-2S, AM receiver.

I was impressed by the FM's small case and the fact that it operates at a low voltage, eliminating glitches caused by acceleration. A glitch at high speed could be a life or death situation for any 1/12th scale. If you're using an Airtronics servo, bust swap plugs with the plug-plastics provided and there will be no need for an adapter. A Paragon Pro Stick rollover antenna gave support to the wire.

The Pro Stick now comes with the Associated-type shock mount base. For these little jewels, you may want to trim the Stick 1 inch to 1-1/2 inch in order to keep the center of gravity of the chassis low. If you do this, be sure to cut the Stick at the bottom end. Drill out the hole in the shock mount so that when slid in, the Stick fits snugly in place. Use some super glue to help slide the Stick into its final resting place. Remember, 1/12-scale racers are extremely exacting people! Every minute detail will add up to the winning combination for which they strive!

Along with the NER-M, I am using the 410M1c - a high-frequency, digital electronic speed control, made for electric cars, boats and airplanes. We all know that its features include:

- Increased motor comm life.
- Recharging of the batteries at on-throttle positions, except full.
- Megafet transistor for least on-resistance.
- Linear acceleration for ultra-smooth driving.
- Fully adjustable current limiter to maximize run time or minimize tire slip.
- Thermal shut-down.

The instructions all but do the work for you. Speed control adjustments are done with the red and green lights on the speed control itself, with the exception of the current limit adjustment. The limiter can be used to tune out unnecessary wheel spin and prolong battery life.

TRANSMITATION

The Caliber one of, if not, the best—radio produced for the RC car fanatic. This computer-controlled, digitally directed wonder does it all and then some!

Although a standard servo is pictured, I opted for the performance and durability of the Airtronics 9414. Being extremely fast and very small, the 143 lends itself perfectly to 1/12-scale racing. On a 1/12th chassis, space is at a premium!

"Extra-special features make this car the Cadillac of mini-bullets."

A&D OF COURSE!

Well, if it ain't broke, why fix it! And, if it worked one time, do it again! That's just what I did with A&D, 1400 SCRS. With number like 299 1.14v, I can't go wrong. Tested on the Turbothirty, these cells held their numbers over it cycles in the car! Thirteen-gauge Pro wire and Gold Bars accompany the cells, so all you need is the solder.

A good stock motor like the Pocket Rocket may be a fine place to start your 1/12-scale career, but for this test, I used a purple competition eater called Paragon, to turn the wheels. This 15-quad is a hand-wound modified, precision-built and balanced motor for the discriminating 1/12 scaler. If this LTOOR only had wings! Paragon makes several products for the onroad crowd, i.e., the Pro Stick, Aerodiscs, motors, Pd Positrak rubber, not to mention Prolite cut and uncut odd sized gears. Paragon is committed to quality.

BODY BUDDY

As for the all important body, many thanks to Curtis Husting, of Associated, for painting this beauty. The Associated TOJ has always been the body of choice for the fastest in the bunch. With a paint job like that, you're bound to blast 'em on looks alone!

HINT, HINT!

It's common knowledge that building a fine race car is only half of the battle. Learning how to make it handle efficiently is the other half. Enter Team Cobra Racing Hints from the back of the instructions. Please, don't just blow by these pages. They are useful hints and will work for all chassis.

Front End:

- Softer front springs equal more steering. Harder springs, less steering.
- Caster adjustments will allow for oversteering or understeering. For road courses, use 0- or 2-degree shims. The more bite the track has, the less caster the car requires.

For oval, 2-degree blocks are normally used. Because of the speeds involved, a minimal amount of steering is preferred.

Servo: center the servo and use a lot of steering travel, but no more than is necessary to make all turns. For oval, dial down your radio to give a minimum amount of wheel throw.

- Tweak will allow for adjustment of compensation of weight bias. In order for a car to turn equally well in both directions, the tweak must be set. Place the car on a flat surface. Lift the front end of the chassis from the front center, using the tip of an X-acto. Both front wheels should leave the surface at the same time. If they don't, carefully adjust tweak screws until they do. "Tweaked" is a term that came from the appearance of those who did not check the effective weight balance of their car, before the race.
- Damper plate—for road racing, spring should be left fairly uncompressed. This will allow the rear end to move very quickly for better rear traction. For oval, rear end should be fairly tight. Use a small amount of "stringy" type of diff lube.

Diff: The diff allows for smooth power transfer from the motor to the wheels and allows you to go around corners without one wheel dragging. A smooth diff is essential.

From a dead stop, apply full power and the diff should slip for 1 to 3 feet. A looser diff is easier to drive—a tight diff will make the rear end break loose a lot. Use super glue to glue the drive rings to their mounting surfaces. This will keep the drive rings from spinning. Be careful not to get the glue anywhere else on the diff assembly! If you do, you'll have what is known as a straight axle!

General Rules: When the car is sitting on a flat surface, make sure that the chassis is level from front to back—use the damper spring, axle cams and front arm shims to adjust ride height. Always make one adjustment at a time, and test after each adjustment. This will allow you to understand what each adjustment did to the car.

Now that the hard part's over, let's see what she can do on the parking lot express!

COBRA TEST

I must really like R/C cars or something. It seems like no matter what car I take out for testing, I come back smiling. I'll tell you right now that this LTOOR was absolutely no exception!

The mere nature of 1/12-scale racing is such a blast, that only an ill-handling car could squelch your squeals of enjoyment.

The mini-Cobra seemed to squirt out of every turn and top speed was reached in a nanosecond. Even on the asphalt, outdoor surface, a quick change from greens to PD Positraks, on all four corners, gave me all of the traction I needed to round the turns in quick time.

I began with the stock setup and stock green rubber. After carefully checking out all of the electronics and tweak, I set the diff. On this untreated surface, traction was not in abundance, so the diff had to be pretty loose to keep the rear in gear.

The first pass demonstrated the phrase, "Loose as a Goose!" so out came the Paragon, FX II. FX II is a specially formulated, liquid compound, that when applied to your tires, delivers traction in short order. Applied to the rears only, the FX II provided too much traction—the LTOOR began to push like crazy. About half of the inside fronts treated with FX II resulted in a predictable and controllable amount of oversteer, which to me, means fast.

Because I'm a real cheap-O at heart, I switched from the stock greens, to some PD Positraks, all the way around.

This high traction, low-wearing rubber compound provided me with just enough traction to stay on the jagged edge of breaking loose. Whenever you use sauce on your tires to increase traction, you greatly increase the "wear-out" factor—this in turn, increases the "more dollars for tires" factor, of which I do my best to avoid. Well, the moral of the story is, use Paragon Positraks when ever you can; in the long run, they're easier on the wallet.

Turn-in capability was smooth and positive and it was fully controllable via the throttle. The car traveled as straight as Robin's arrow and never gave any unwanted resistance to a change in either direction.

"The LTOOR has enough forgiveness built in to permit even me to look good behind the wheel!"

Just as a comparison, I brought out another 1/12th chassis of championship character. The two cars we're set up with extremely similar parameters, and both were shod with Positrak shoes. Under these particular conditions, I could not make any appreciable differentiation between the two. That is not to say that the two chassis are essentially the same they appear to be the same, but there are fundamental design differences that a Bud Bartos or Cliff Lett could tell blindfolded. Fortunately, for me, the LTOOR has enough forgiveness built in, and will permit even a weekend marauder like me, to look good behind it's wheels.

I am very pleased to say that the Caliber was in it's usual top form and never once even threatened a glitch or shift in adjustment. It's so nice to have a transmitter that you know you can depend on when the stakes are big-time.

The 410 Novak was set at about 40 amps, because traction was at a minimum. Trigger response was excellent.

I don't think you could get any more linear than that. The 3FM received with no runs, no glitches and no errors. An awesome combo indeed.

A combo of A&D SCRs with the Paragon 15 Quad, made this tiny torquer strike with the speed and agility of its reptilian namesake. The "quad" part of the motor smoothed out any of the massive surges that might accompany singles or doubles of the same 15 winds. A&D has my vote for consistency and power!

The Cobra LTOOR is certainly a car that will challenge the best of them. It has all of the components that makes a championship chassis and without a doubt, in the hands of a true 1/12th-scale expert, could do battle to the not-so bitter end, with any of the top contenders. Thanks to Novak, C&M, A&D, Airtronics, Associated, Paragon and Du-Mor. •

SUBSCRIBE NOW AND SAVE!

☑ Yes, start my subscription to Model Builder!

☐ New ☐ Renewal

Name _____

Address _____

City _____

State _____ Zip _____

☐ $25.00 for one year (12 issues). Over $10.00 off newsstand prices.

☐ $47.00 for two years (24 issues). Over $23.00 off newsstand prices.

M/C or Visa # _____

Expiration Date _____

Signature _____

$38.00 for one year (includes postage), outside U.S. including Mexico and Canada. For two years (24 issues) send $68.00. ALL PAYMENTS MUST BE IN U.S. FUNDS DRAWN ON A U.S. BANK

MODEL BUILDER
898 W. 16th St., Newport Beach, CA 92663
California residents add 7-3/4% sales tax.



FEATURING:
Construction Articles
Product Reviews
Radio Control
Peanut Plans
Electric Flight
Old Timers

MODEL BUILDER
WORLD'S MOST COMPLETE MODEL AIRCRAFT PUBLICATION

Continued from page 20

race-day morning wearing long pants and a sweatshirt. Then good old Mother Nature throws you a curve. The temperature and humidity jumps up and you're sweating bullets just sitting around in a lawn chair. A spare pair of shorts and a T-shirt would have saved your day.

Now let's say a short, heavy rain turns the outdoor track pit area into a gooey mess. Small trash bags can be used as makeshift "rubbers" (along with a little tape) for your sneakers. Plus the bags are always good for their intended use—keeping your local racetrack clean of trash and litter.

With a lot of R/C circuits situated on public rather than private land, keeping the garbage to a minimum is important. Good relations with land owners will insure future use of the properties for R/C car racing.

Now if that racetrack, which is located on prized public property, holds its races at nighttime, some different problems can crop up. A good 12-volt trouble light (along with a flashlight backup) can be run off your peak charger battery source to provide needed light to work on your race car. A 110-volt AC clip-on light (which can also be changed over to a 12-volt bulb), found in most hardware stores, will also work well. Bugs are also a potential problem at night races. Insect repellant or Avon's Skin-so-Soft should be found in any racer's toolbox, *day* or night.

Also when racing in the darkness, if you're prone to losing small car parts while working between races, be sure you have enough spares for night races. That's because when you lose that last tiny circlip at night, it's gone for good! You can aid in reducing lost widgets by investing in a square piece of indoor/outdoor carpeting to place under your outdoor work area. Keep your car's body pins, clips, nuts, or whatever in a small container (a spray can top works well) to keep them from disappearing just before your heat race. And what's that I hear, you already have too much junk now to load up on race days? Well, all the stuff mentioned here in this column would fit (except for the stool and carpet) in an old gym bag, and you could just leave it in your race vehicle all the time.

While all these things may seem like overkill, why should you bother? Hell, that's the point. Those racers who don't (or won't) go that extra mile to insure their comfort are targets for another R/C car problem—burnout. It's a subject not discussed nearly enough. If you push yourself too hard in any sport or hobby, burnout is a major concern. The strain of racing every weekend, and working on the cars all week can lead to your fun hobby seeming more like work. Two ways you can avoid this problem would be to either cutback on your racing, or to diversify *how* you race.

How so? Take a weekend off and go to the local full-sized car races. Make the rounds one Saturday of all the hobby shops in your area. Visit an R/C racetrack you don't compete on normally and just kickback and watch the races. If you tape your races, go back through them and review your performances and driving. Invite your racing pals over (with their race tapes) and watch them together. You may pick up some helpful tips.

Now if you're the type who has to race every weekend, here's some other ideas to avoid R/C burnout. If you've been running offroad constantly, mount an oval-wedge body on your buggy and go dirt-tracking. If you spend a lot of time speeding around paved ovals, switch to a GTP body and try a road race one weekend. Or you can just mount some semi-road tires on your offroad car and go enjoy zipping around the local parking lot. The main idea here is to do something different to break up the routine that can lead to racer burnout.

The point of all this is simple. To have an enjoyable day racing your R/C car, no matter what scale or type it is. So let's add it all up. You're fighting an ill-handling car on race day. Now add a headache and a backache from the lack of a pill and a stool. Now throw in the loss of the last widget-nut in your toolbox to "the grass demons. Here's the total: All these things may dramatically increase your chances of suffering R/C car racing burnout. And as you can see, the actual *racing* part isn't always the problem! If you're not comfortable working on your car, or just *being* at the racetrack, for any reason, stop and think about WHY you're not having fun.

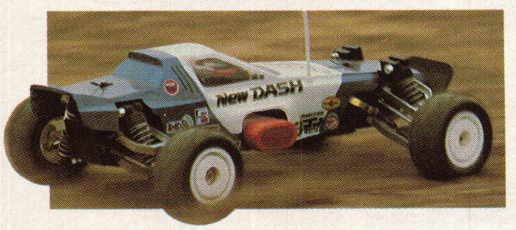
It just may be in this article—and that's the bottom line. •

RADIO ACTIVE

Take charge of the track with JR! JR quality and popular Max style have been combined to create the brand new Max 2 channel radio system for the ultimate in racing control. Features include ABC&W™ receiver with BEC, 2 JR 507 sport servos, BEC switch harness, new multi-tilt racing type short stick system, battery case, interchangeable frequency crystals (27 MHz), servo reverse and computer designed transmitter case. JR's exclusive ergonomic "Bio-Shape" grips fit the human hand for great racing comfort! Off-road or on, JR radios leave the competition in the dust! Great for R/C boat enthusiasts too!



Available at your local hobby dealer.



Max 2

hobby Dynamics DISTRIBUTORS

Distributed by Hobby Dynamics Distributors • Phone 1-217-355-0022
P.O. Box 3726 • Champaign, IL 61826-3726 • FAX 1-217-355-0058

JR REMOTE CONTROL
RADIO CONTROL SYSTEMS

Continued from page 35

iness of the linkage before the front wheels can respond. And this means also that a portion of the ultimate turning capability of the servo is used up in the servo-saving; and in many cases, the wheels never do go stop-to-stop under the resisting pressures of a high-speed turn or the sudden need for full throw in one direction of other.

And again, I cannot and do not speak for all makes and models of cars as to their steering capabilities or arrangements, as I have not studied them all.

But let's get into the nitty-gritty of the *real* problem.

The real problem lies in the fact that in many cars—some more than others—the centers of the front wheels; that is, the centers of the tire treads, are set some distance outboard of the king pins. In some cases, where the double bearing is used, the outside edge of the front tire may extend as much as three-inches outboard of the king pin.

Now this is like swinging on a barn door. The leverage at that distance is such that even a relatively light impact to the outer edge of the front tire can transfer the shock right through the servo-savers to the servo arms, and Wham!, there goes another million kilowatt dam.

To realize this for yourself, disconnect your linkage from your servos. Then hit one of your front tires with your fist, or a rubber hammer, or such. You will see the wheels flop unresistingly in the direction of the impact, all the way to the stop.

Of course, on the ground and running, with both wheels down, the tie between the two wheels, whether it be two drag links or one tie rod, offsets the tendency for either wheel to turn as a result of normal track resistance. They hold each other into the steering-directed position. But when one or the other is impacted from the front, there is nothing about the other to keep it from going along, and it flops with the impacted wheel to the detriment of the servos.

If, however, you were able to set your wheels so that the center of the front tires were directly over the king pin, you would find that you could hit the front tire with a very heavy blow and it would not flop one way or the other. Regardless of where the wheel bearing is in relation to the king pin; that is, how far it may or may not be outboard of the king pin, so long as the wheel and tire extends back over the king pin, the barn-door leverage is lost and the wheel is stable under impact. The principle involved here is not important, so long as it is a fact.

And it is a fact.

So here is what I did:

In addition to modifying my servo arrangement and linkage to take out much of the servo-saving springiness, I bought a couple of 4-inch wheels with the maximum offset between hub and outer edge of the rim. That is, I matched up a 1/2" rim with a 1-3/4" rim for an overall wheel width of 2-1/2". Then, by filing a bit here, a bit there, and cutting off a bit of the steering arm and placing the steering knuckle in the second hole instead of the outer hole of the steering arm, I was able to put the wheels on inside-out and fit the deep side over the king pin and steering arm assemblies, and end up with the center of the tire almost directly over the king pin. Voila! My troubles were over. I can hit either front wheel from the front to the extent of bending the suspension and the wheel doesn't flop one iota.

I continue to use a bumper, of course, to help prbtect my suspension; and I assume I would be able to break a servo gear or arm in one way or other. But I haven't yet!

And I get the feeling that the wheels are easier for the servos to turn full throw because they are now on a pivot, rather than being out there on the end of a barn door.

Of course, this narrows the overall front wheel width somewhat. But so what? There are those who say the car will turn over easier this way. I don't believe it. In my case, I was able to space the suspension arms out about 3/4" on each side without any effort, and thereby put back about 1-1/2" of the width I had taken out; but I see no reason to go to great bother to do this.

THE ACKERMAN PRINCIPLE:

There is another feature to steering that is not often talked about it the pits of quarter-scale America: The Ackerman principle.

When the front wheels are turned in either direction, the car then travels in an arc. The inside wheel, of course, travels a tighter arc—or shorter radius—than the outside wheel, and therefore, all other things being equal, should make a sharper turn; that is, turn to a sharper angle, than the outside wheel. Without this differential in the turning angles of the two wheels, one or the other, or both, has to scrub away the differential against traction throughout the turning arc. To the extent it does this, it is a breaking loose of the involved tire and a loss of traction as well as a loss of efficiency and precision in the steering

The Ackerman principle is an arrangement of steering linkage that causes the inside wheel to turn to a sharper angle of attack than the outside wheel; and, in fact, causes both wheels to turn to an angle of attack appropriate to the radius of the arc each has to travel.

Figure I below, demonstrates this *in exaggerated form, and the angles are not necessarily realistic.*

The means of achieving Ackerman steering are varied. The simplest and most commonly used in the big cars is by creating an angle greater than 90-degrees between the axle and the steering arm on both sides. See Figure 2.

Movement of the tie rod in either direction then will cause the inside wheel to turn sharper than the outside wheel for geometric reasons I will not go into here, but which can be observed or tested through a minimum of experimentation.

Using this method of achieving Ackerman, the aficionado need not be concerned with all kinds of angle measurements, but simply make the angle between the axle and the steering arm such that an imaginary line through king pin and steering knuckle will cut the center of the rear axle when the wheels are directed straight ahead.

Another method of achieving Ackerman is through tying 90-degree steering arms individually to different points on a bellcrank so that the circular action of the bell crank creates the same effect. One needs to watch, however, the angle of the individual tie rods, or drag links, between the steering knuckles and the bellcrank, in that too much of the wrong angle can wash out the Ackerman, or even reverse it.

A third method is to tie the individual wheels to individual servos, and adjust the individual servo arms, or servo savers, to an angle that causes each to turn its wheel sharper in one direction than the other—that is, to a sharper angle when it is the inside wheel than when it is the outside wheel.

But there are those who contend that Ackerman steering is not all that critical in quarter-scale racing, particularly on the dirt track, and nothing to get all that concerned about. And perhaps they are right. I personally think that a positive and full response to the steering wheel is more important, but that Ackerman simply brings your steering to the ultimate. The simple way to tell if your car is delivering Ackerman to your steering capability is to turn your wheels fully in one direction or the other, extend a line forward from but parallel to each wheel. If the lines get farther apart as they extend forward from the car, you have Ackerman.

All race car development is a matter of continued exploration and modification of your car after factory, and is as much a part of racing as is the driving and setup. One of the most exciting aspects of racing is looking the situation over and saying, "I can make it work better." And this is the case with your steering. Until a fast-acting, break-proof servo is developed, the problem of spring-loaded steering response and servo breakage will be with us. But through intelligent modification and adjustment, we can live with it and have nothing but fun. •

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION (Required by 39 U S.C. 3685) 1. November 5, 1991. 2. RADIO CONTROL MODEL CARS MAGAZINE. 3. Monthly. 4. 898 West 16th St., Newport Beach, Orange County, CA 92663-2802. 5. 898 West 16th St., Newport Beach, CA 92663-2802. 6. Publisher: Mark Thiffault, 898 West 16th St., Newport Beach, CA 92663-2802. Editor: G. Richard Dowdy, 898 W. 16th St., Newport Beach, CA 92663-2802. 7. American Press, Inc., Marshall Pettygrove, President, 1 American Place, Gordonsville, VA 22942. 8. NONE. 10A: 129,120; 126,538. 10B: 1. 117,640; 115,287. 2. 5,151; 5,048. 10C: 122,791; 120,335. 10D: 3,266; 3,201. 10E: 126,057; 123,536. 10F: 1. 1,385; 1,357. 2. 1,678; 1,645. 10G: 129,120; 126,538. 11. I certify that the statements made by the above are correct and complete. Mark Thiffault, Publisher.

FIRGROVE INTERNATIONAL RACEWAY

Puyallup, Washington

BY MIKE LIEM

A while back, the Firgrove International Raceway's offroad track was featured in the "Track of the Month" section. Lots of things have happened since then. The track that hosted the 1990 Region 7 Offroad Championships has been completely revamped. Green grass separates the racing lanes, and an outdoor lighting system gave way to nighttime racing. But the best news is the completion of Washington State's first purpose-built outdoor asphalt oval that gives FIR the distinction of an outdoor racing complex.

The paved oval was not completed until last summer, although construction began in late 1990. Owing to owner Walt Hale's busy schedule, it was noteworthy that the track was finished at all. Located in an adjacent lot next to Walt's R/C supply shop, the paved oval measures 320 feet in circumference. Two straightaways measuring 140 feet from apex to apex connect a pair of slightly banked turns. The surface is smooth and the bite is good, precluding the need for such surface preparations as sugar water, VHT, etc.

Weekly races were conducted on the paved oval throughout the 1991 season, but 1992 will see even more improvement. An AMB lap counting system will monitor the races on both the paved and offroad tracks. The paved oval will also have its own lighting system so racing will continue well into the evening on race nights.

Walt supports the racers at FIR with a complete race shop. In addition to parts and equipment, the shop offers in-house services like tire truing, motor commutator re-cutting and battery evaluation. Racing at FIR need not end with equipment failure; if it can be fixed at the track, chances are the shop has what you need to get your car back on track, as it were.

Racing at FIR will resume in March, weather permitting, of course! There will be special events in 1992 in addition to the regular weekly racing program. If you plan to be in the vicinity of western Washington this summer, make it a point to see one of the best outdoor R/C racing facilities anywhere. Visit the Firgrove International Raceway, located at 10611 136th St. East, Puyallup, Washington. •



Firgrove's track includes a well-stocked hobby shop on premises. An AMB counting system for races is coming, along with lights for nighttime racing.



With a paved oval measuring 320 feet in circumference with 140-foot straightaways, the Firgrove facility is a welcome addition to the Northwest racing scene.

DON'T MISS A SINGLE ISSUE!

12 ISSUES ONLY $17.00!



Save now like never before!

R/C Model Cars, the first magazine of radio control, is offering you an unprecedented deal: subscribe now, and you'll save a whopping $8.00 over the regular subscription price, and an incredible $17.00 off the newsstand price! How can you pass up a deal like this? By subscribing or renewing your present subscription right now, you'll be assured of getting each and every action-packed issue of the best in R/C car information, reviews, tips, and more, delivered right to your door. Do it today!

(Canada and Mexico, add $15.00 postage & handling charge.) Foreign orders, write for details.

Offer subject to cancellation without notice.

NAME _____

ADDRESS _____

CITY _____

STATE _____ **ZIP** _____

MasterCard or Visa # _____

Signature _____ **Exp. Date** _____

(Canada and Mexico, add $15.00 postage & handling charge.) Foreign orders, write for details.

California residents add $1.30 sales tax.

No bill me laters on this special offer.

Winston Cup Series

NASCAR



HOLLY FARMS 400

BY JACK WRIGHT

Once again we are here at the North Wilkesboro Motor Speedway for the Tyson Holly Farms 400. As in the past, I always bring a quarter-scale car to this event, as they are really a big hit with the crowd. This time I brought a one-of-a-kind car—it's a prototype electric quarter-scale car that Fine Design is working on.

And once again, the NASCAR teams shine through, as Sterling Marlin and the Maxwell House/Junior Johnson team helped out with the paint job and decals for the car. Sterling liked the low-profile foam tires so much he wanted a set for his race car.

As for the race, Harry Gant was making the most of the month of September with four straight Winston Cup wins. Harry was heading for a record fifth by taking the top spot on the front row (his first pole of the year). At the drop of the flag it was all green as Harry Gant's green and white Oldsmobile almost had the whole field lapped, until a loose brake line would cost him the checkered flag as well as his fifth victory in a row. The man in black, Dale Earnhardt, was there to capitalize on Harry's misfortune to take over the lead which Harry had held most of the day.

Earnhardt went on to win the Holly Farms 400 with Gant finishing second. Harry can't complain too much, he had a great September with his four Winston Cup wins and two Busch wins as I guess that's why they call him Mr. September.

I'd like to thank everyone at Universal Services, Hank Schoolfield, Junior Johnson and Associates and Sterling Marlin for all of their help in making this possible. •



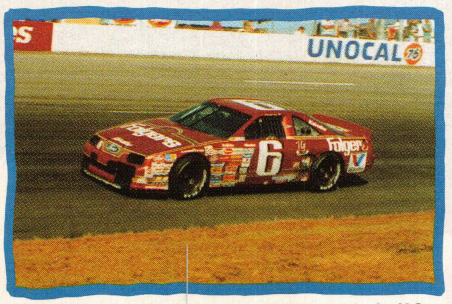
Dale Earnhardt, Winston Cup Champ.



Harry Gant, multiple winner in '91.



Bill Elliott will switch teams next year.



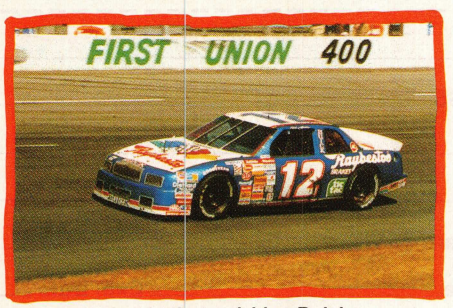
Mark Martin gets Valvoline sponsorship in '92.



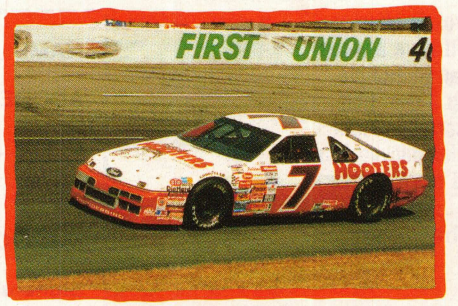
Kyle Petty, Pontiac Grand Prix.



Derricke Cope's Purolator Chevy Lumina.



Hut Strickland in the vanishing Buick.



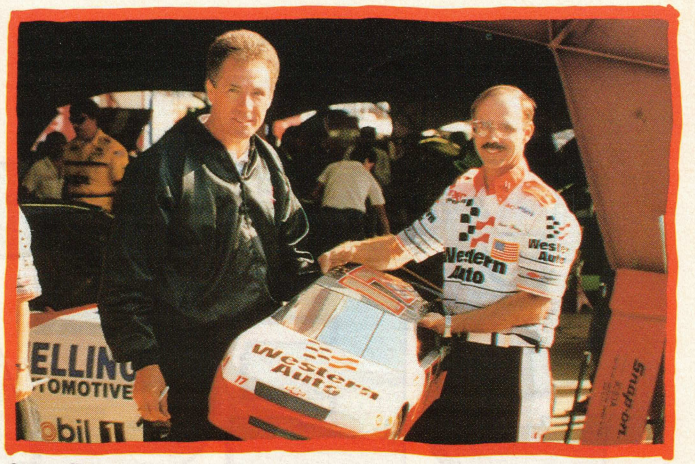
Alan Kulwicki in the Ford T-bird.



Sterling Marlin's Ford T-bird.



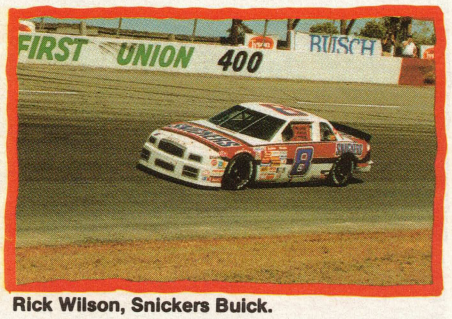
Driver Sterling Marlin with author's Fine Design electric quarter-scale replica of Marlin's T-bird. Junior Johnson's team helped with the paint job and decals for the Q-scale racer. There are a large number of Winston Cup drivers who enjoy quarter-scale racing during their time away from full-scale racing.



Steve Sharp shows his boss Darrell Waltrip his latest toy. Darrell says Steve's playthings just keep getting bigger!



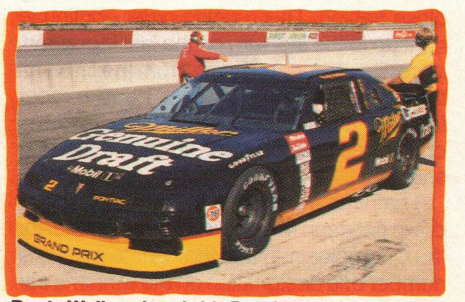
The Western Auto Q-scale Chevy meets the Fine Design T-bird.



Rick Wilson, Snickers Buick.



Bobby Hamilton's Olds paint job weighs 22 pounds!



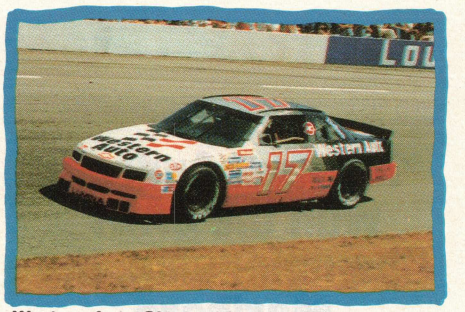
Rusty Wallace heads his Pontiac out for practice.



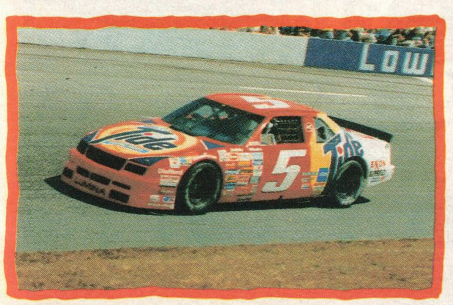
Michael Waltrip's Pontiac Grand Prix.



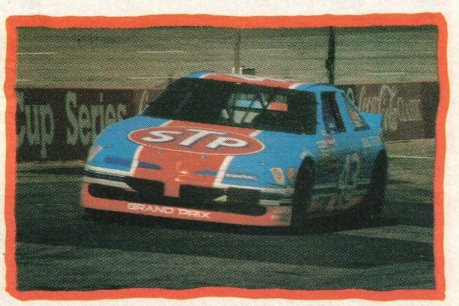
Joe Ruttman, Chevy Lumina.



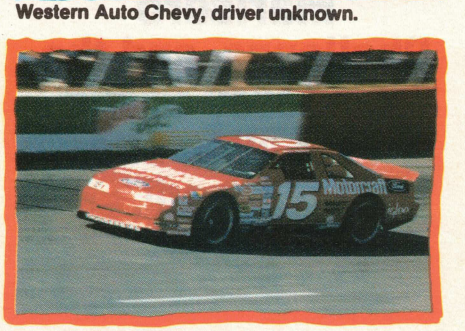
Western Auto Chevy, driver unknown.



Ricky Rudd, Chevy Lumina, second in the points race.



The King, Richard Petty in his next to last year of racing.



Morgan Shepherd, Ford T-bird.

LAGUNA SECA

The 1991 CART Finale!



The final weekend of the 1991 CART Indycar racing season was a fitting stage for the climactic showdown between point leader Michael Andretti and runner-up Bobby Rahal, but first there was a small matter of the Marlboro Challenge to clear up. The Challenge pits the top 10 drivers against one another in a 100-mile, one pitstop race with more than $200,000 at stake. Michael was on the pole, but at the start Rick Mears took off in the lead, with Andretti following close behind. This running order continued right up to the last turn on the last lap, when, incredibly, a hundred yards from the finish as they rounded turn 11, Mears' Penske racer faltered, and Michael raced by to take the checkered flag, a thrilling finish to a top-dog shootout.

That was a prologue to Sunday's showdown between Michael and Bobby Rahal for the Championship and the right to carry the number one designation on the winner's car for the '92 season. Once again, Michael Andretti was on the pole, with the Penske-91 car of Marlboro Challenge nemesis Rick Mears next to him, and Rahal close behind in row two. After a clean start, the race settled down to some good dicing between Andretti, Mears, Fittipaldi and Rahal.

By lap 24 the championship was decided, as Rahal's Kraco Lola-Chevy overheated and retired from the battle. Now Andretti could breathe easy and just go for the win, the 1991 CART-PPG Championship in the bag.

With his dominance of the Indycar series, the next goal for Michael Andretti is to win the Indianapolis 500, before making his long-rumored jump to Formula One. It will be interesting to see if this aggressive, talented driver can achieve the same domination on the world circuit that he gained in CART racing. •

"Michael Andretti won the CART Championship, the Marlboro Challenge, and the Monterey Grand Prix all in one weekend!"

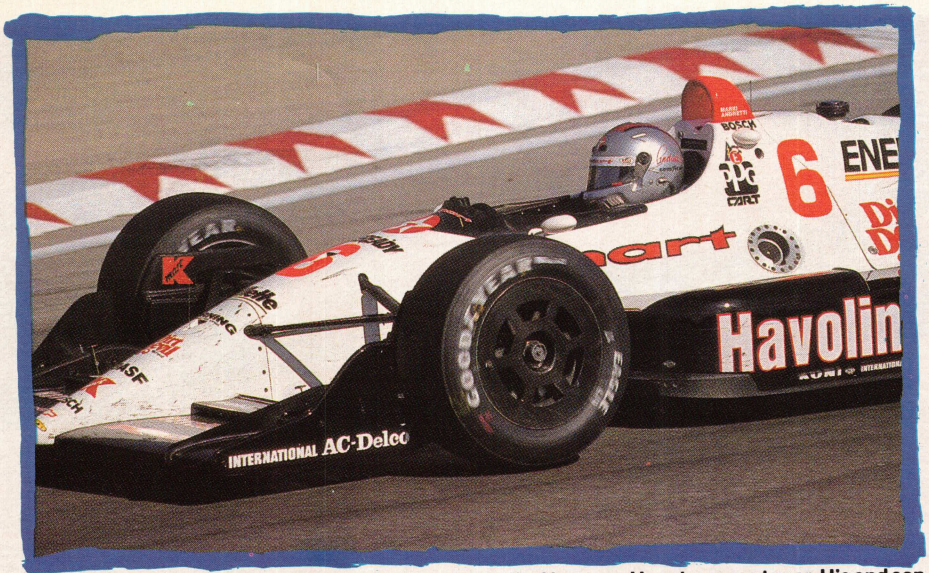


PHOTOS BY RICHARD & CHRIS DOWDY





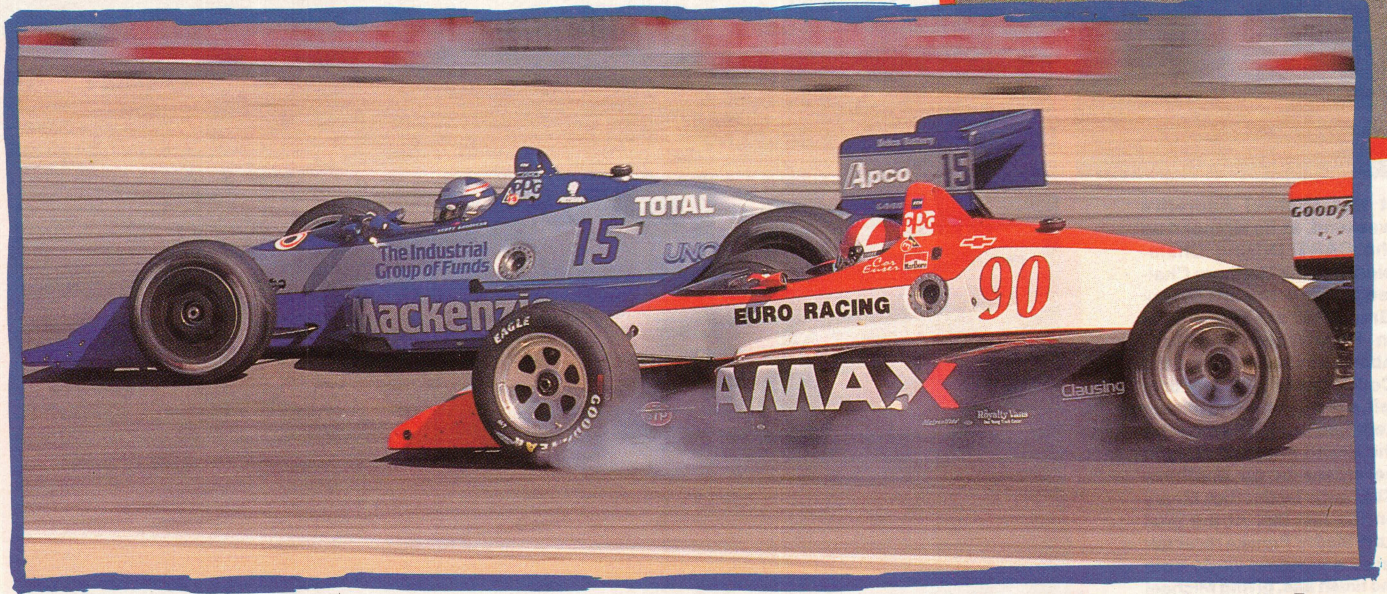
It was Michael Andretti's weekend, as he wrapped up the CART Driving Championship, the Marlboro Challenge, and the Monterey Grand Prix at Laguna Seca in impressive fashion. Above, he streaks toward the Corkscrew unchallenged; at left, a picture-perfect pitstop kept him out in front during the Grand Prix; and at right, he closes in on Marlboro Challenge leader Rick Mears on the last lap. At the final turn, Mears' Penske racer faltered a hundred yards from the finish line, giving Michael the Challenge win on Saturday, along with a very big paycheck.



Mario Andretti, third at the Monterey GP, will return to the Newman-Haas team next year. His and son Michael's car will be powered by a new Cosworth engine instead of the Chevrolet powerplant.



Emerson Fittipaldi drove a spirited race, but couldn't get past third-place finisher Mario, having to settle for fourth in his Penske '91 Chevy.



Cor Euser, driving Tony Bettenhausen's 1990 Penske-Chevy, smokes 'em coming into the Corkscrew as he battles Scott Goodyear for position. Euser, a European Group C driver competing in his first CART race, finished an impressive tenth at Laguna Seca.

Al Unser Jr., 1990 CART Champion, finished in second place behind Michael Andretti at the Monterey GP, and third in the driving championship.



Eddie Cheever managed to hang on for a sixth-place finish in his Chevy-powered Lola. The former Formula One driver returns to the Ganassi Racing team in '92.



The heartbreak kid, Rick Mears, led for 99.8 miles of the Marlboro Challenge, then faltered on the last turn of the last lap, allowing Michael Andretti to speed by and win the Challenge. Mears won the Indy 500 and the Michigan 500 in '91.



Scott Pruett was seventh at Laguna Seca, and 10th in the driving championship. His American-made and Judd-underpowered Truesports racer performed well in its first season.



Danny Sullivan suffered through a miserable season with the Patrick Racing Alfa-Romeo. Next year he takes over the Kraco car abandoned by Bobby Rahal, who will move to the Patrick team with a new Chevy engine powering the Lola racer.



Arie Luyendyk won two oval races in '91, and struggled with limited sponsorship throughout the season. His determination and driving ability brought him sixth place in the driving championship.



Bobby Rahal took more second-place finishes in '91 and dogged Michael Andretti for the championship right down to the last race at Monterey. His studied concentration and ability brought him second-place honors in the 1991 driving championship. Next year he will be racing for the Patrick team, carrying Miller colors on his Lola car.

Schumacher

2WD

COUGAR

EXPERIENCE SUCCESS !



COUGAR II 'TEAM' SPEC ALSO FEATURES:

- Fully ballraced kit
- New Slipper Clutch
- Ballraced Super Diff
- Alloy Roller Drive Shafts
- Ballraced steering pivots
- Varimount shock brackets

COUGAR II 'SPORT' FEATURES:

- Latest 'Aerodisc' 2.2" wheels with all new 'GREEN' compound tyres.
- Super hard 'Black' shocks with new volume compensating design. Adjustable damping provides 10,20,30, and 40w settings when used with 20w oil.
- P.E.P. Performance Engineered Polymer, material used in all suspension and steering components for fantastic strength and reduced flexibility.
- New rear wishbones medium/long, with larger 1/8" inboard pivots and new swept back front wishbones both moulded in P.E.P.
- New silent running 48dp 'Whisper' gears.
- New large diameter 14 ball diff with super hard self locating diff washers, fully sealed thrust race and extra wide twin bearing pulley supports.
- New sleek, low bodyshell combined with new rear bulkhead and wing mount for great style and low centre of gravity.



COUGAR II TEAM BALLRACED SUPER DIFF



COUGAR II TEAM ALLOY ROLLER DRIVE SHAFTS

PHOTOGRAPHS SHOW PRE-PRODUCTION COUGAR II TEAM CAR, DETAILS MAY VARY

CAT

COMPETITION ALL TERRAIN

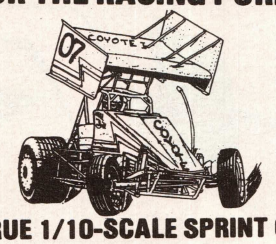
DESIGNED AND MANUFACTURED BY

Schumacher

302 Benjamin Road, Suite 404 • Tampa, FL 33634
Tel (813) 889-9691 • Fax (813) 889-9593

COYOTE 1

FOR THE RACING PURIST



TRUE 1/10-SCALE SPRINT CAR

B-B MODELS
ALBUQUERQUE, NEW MEXICO
(505) 883-4561

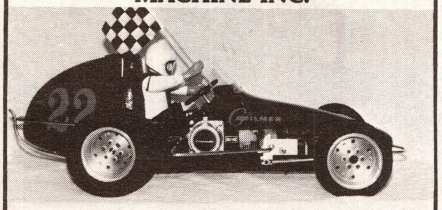
TEAM SHADOW RACING
1/10TH SCALE ON ROAD KITS
PRO- STOCK DRAG CARS
FUNNY- CAR DRAG KITS.
GLASS OR GRAPHITE CHASSIS
SLIPPER CLUTCH & 2-SPEED TRANS
ALSO AVAILABLE.
CLEAR BODIES AND COMPLETE
PARTS SUPPLY.

SEND $2.00 FOR CATALOG

DEALER INQUIRES WELCOME

P.O. BOX 1003
Kaneohe, HI. 96744

GILMER HOBBY AND MACHINE INC.



MANUFACTURER OF 1/4 SCALE
RADIO CONTROLLED MIDGETS.
"KAWASAKI POWERED"
SEND $2.00 FOR INFORMATION
AND PRICES.
DEPT. RCM 1213 4TH AVE.
HOWARD LAKE, MN 55349

1/8 SCALE RADIO CONTROLLED GAS SPRINT CARS!

- Aluminum and Steel Construction
- Same Components and Adjustments as on Real Sprinters!
- In-Line Drive, H.D. Clutch
- Disc Brake, Coil Suspension
- 19" Long, 6.5 lbs.
- Races at 45 M.P.H.!!!

BASIC KIT. $595.00*



*ENGINE AND RADIO NOT INCLUDED.

MOODY Automotive

6-TIME NATIONAL CHAMPION

CALL OR SEND $1.00 FOR MORE INFORMATION.

(708) 799-5597

755 ASH ST. DEPT. MC FLOSSMOOR, IL 60422

AD INDEX

A&D Racing	35
A J'S R/C	61
Andy's R/C Products	3
Associated Electrics, Inc.	50, 51, Cover 3
AstroFlight	39
B-B Models	98
Badger Airbrush	72
BoLink R/C Cars	55
Bud's Racing Products	21
C&M Team Cobra	11
CKW Manufacturing	64
Conley Engines Inc.	63
Davis Motorsports	16
D.T.N.	98
Dialed Racing Products	89
Futaba Corp. of America	Cover 4
Gilmer Hobby & Machine	98
Hayes Products	61
Hitec/RCD	13
Hobbico/Kyosho	7
Hobby Dynamics Dist.	86
Horizon Hobby Distributors	9
Hyperdrive Racing Systems	41
JPS	6
Litespeed	6
Love's Precision Racing Cars	76
MK Model Products	81
Moody Automotive	98
Novak Electronics	Cover 2
Paragon Racing Products	11
Parma International	25, 75
Progressive Technologies	83
Pro-Line Mfg. U.S.A.	5
Protoform	62
Quickdraw Quarter-Scale Cars	74
R/C Buyers Guide	21
R/C Model Cars Subscriptions	89
R&L Hobbies	98
Radio Controlled Models (RAM)	73
Rick's R/C	23
Rivergate Hobby Center	63
Rupp Enterprises Inc.	98
Schumacher, Inc.	97
Tekin Electronics	19
Traxxas Inc.	77
Victor Engineering	17
WCM Inc.	64

Fallen

SUBSCRIBE
RADIO CONTROL MODEL CARS

WHOLESALE
$ $ $ $ $ $ $ $

START OWN HOBBY SHOP, BUY FOR A GROUP, OR JUST FOR YOURSELF.

INFO. $1.00 #10 S.A.S.E. TO:

R & L HOBBIES
10334 PORTAGE ROAD
PORTAGE, MI 49002

WE LIVE FOR WEEKENDS

FROM REEDY Modifieds

7 TIMES IFMAR WORLD CHAMPIONS



TRU-STOCK MR. OUTLAW

TRU-STOCK IS MADE TO ROAR 91 SPECS WITH 22-24° NON-ADJUSTABLE TIMING, COMM-LOCK DEVICE, WET MAGNETS, VENTED CAN TO ALIGN THE MAGNETIC FIELD FOR WET MAGNETS, & 27-TURN WIND. WITH SILVER SHUNT BRUSHES & REEDY COPPER HEAD SPRINGS. ROAR LEGAL. #550, $28.00.

MR. OUTLAW STOCK MOTOR IS FOR RACES WHERE ROAR SPECS ARE NOT IN FORCE. MR. OUTLAW USES THE SAME WET MAGNET/ CAN AS THE TRU-STOCK BUT COMES WITH 38° TIMING FOR INCREASED PERFORMANCE. SILVER SHUNT BRUSHES & REEDY COPPER HEAD SPRINGS INCLUDED. #551, $28.00.

TEAM ASSOCIATED

TEAM ASSOCIATED
3585 CADILLAC AVE.
COSTA MESA, CA 92626

PUT FUN AND PERFORMANCE BACK INTO YOUR STOCK CLASS RACING! JOIN THE REEDY TEAM AND JOIN THE WINNERS.



PCM 1024 guided the Clausen missile to a 70+mph Insane Speed Record and Enduro win at the T-Drome.

Only Futaba's PCM 1024 gives you the ultimate in radio control range and servo resolution. 1024 took on the ultimate challenge of speed at the RC Thunderdrome...and for two straight years, Kent Clausen and his Magnum 3PB were unbeatable.

Now 1024 comes with sticks. And the dual stick 3UCP is simply the most advanced three channel system available. Push-button, user friendly programming includes mixing and memory, precise adjustment of dual rate, exponential, curve, ATV, ATL plus twin servo, 4WS and outboard tilt mix for total control over anything on land or sea.



Road and Oval National Champion 3PB now features external Ch. 3 and 27MHz or 75MHz modules.



Outboard Tilt Mix is one of the many 3UCP boat programming features.

Futaba®
P.O. Box 19767/Irvine, CA 92713-9767

1024. NOW IN TWIN STICKS.

Programmable one-touch keys gives the 3UCP instant control of rates or trims.

3UCP system available with two S9301 or S132H servos.



© 1991 Futaba Corp.