

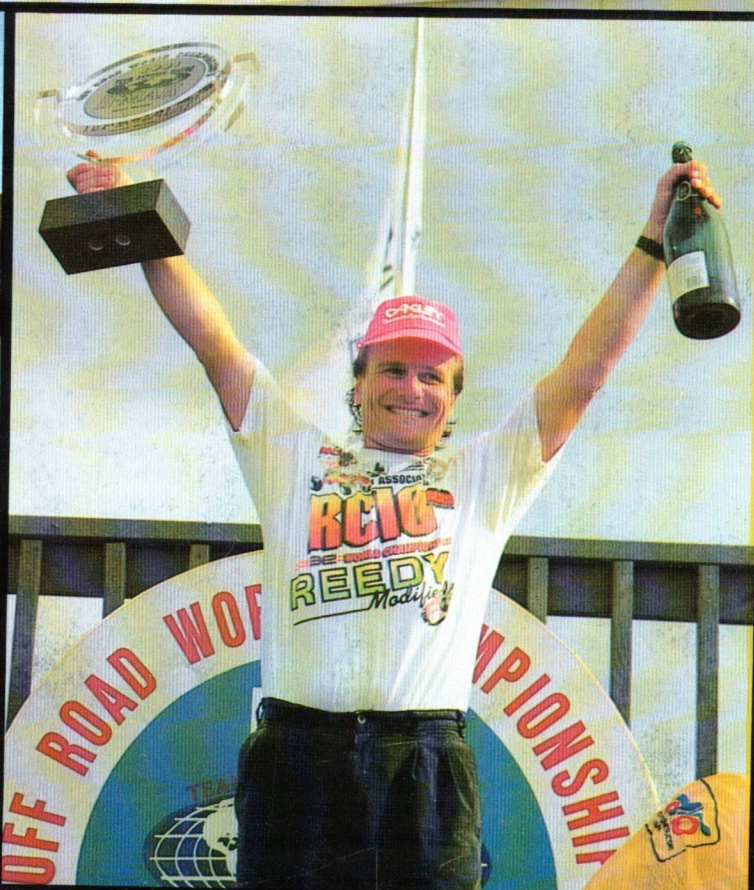
OCTOBER, 1991

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COMPETITION

PLUS THE R/C CAR MAGAZINE

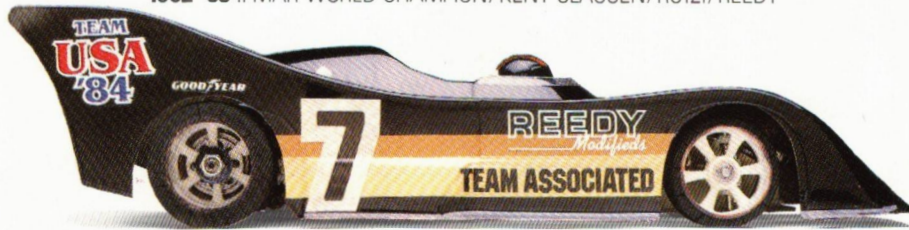


NORRCA DIRT OVAL • TURBO 30 PART II

IFMAR1/10TH WORLDS • NORRCA OFF-ROAD



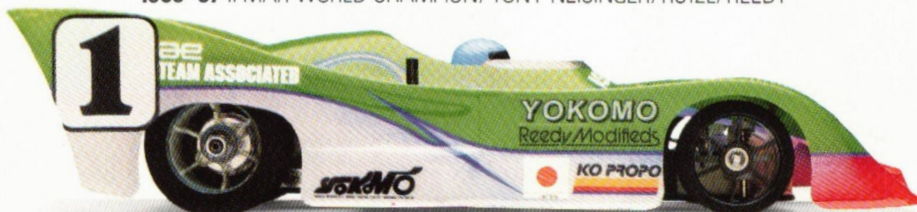
1982-83 IFMAR WORLD CHAMPION/KENT CLAUSEN/RC12i/REEDY



1984-85 IFMAR WORLD CHAMPION/TONY NEISINGER/RC12i/REEDY



1986-87 IFMAR WORLD CHAMPION/TONY NEISINGER/RC12L/REEDY



1988-89 IFMAR WORLD CHAMPION/MASAMI HIROSAKA/RC12L/REEDY

CLEAN SWEEP OF THE EIGHTIES.



A WINNING TRADITION

One team, Team Associated, has won at every World Championship for 1:12 scale cars in the 80's. A clean sweep against the toughest competition anywhere.

And in 1988 the Team sweeps the top three places in the A main for the second consecutive time! In fact, Associated RC 12L's finished first, second, third and fourth in the IFMAR World Championships in Holland. You might say it was a real Baarn Burner of a race.

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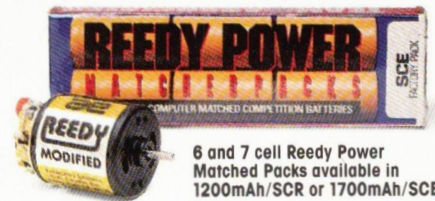
THE POWER TO WIN

World Class drivers know it takes more than a great

1988-89 IFMAR WORLD CHAMPIONSHIPS/BAARN, HOLLAND			
First	Masami Hirotsuka	Japan	RC12L/Reedy
Second	Tony Neisinger	USA	RC12L/Reedy
Third	Christian Keil	West Germany	RC12L/Reedy
Fourth	Kent Clausen	USA	RC12L/Reedy

car to win the World Championship. It takes great motors and great batteries, too. That's why Mike Reedy's motor lab is the nerve center for electric car racing at Associated. And that's why the Team depends on Reedy Matched packs and Reedy Modified motor for the extra power needed to win.

Take a tip from the pros and go racing with the Team. Team Associated. Model Cars for Real Racers.



6 and 7 cell Reedy Power Matched Packs available in 1200mAh/SCR or 1700mAh/SCE

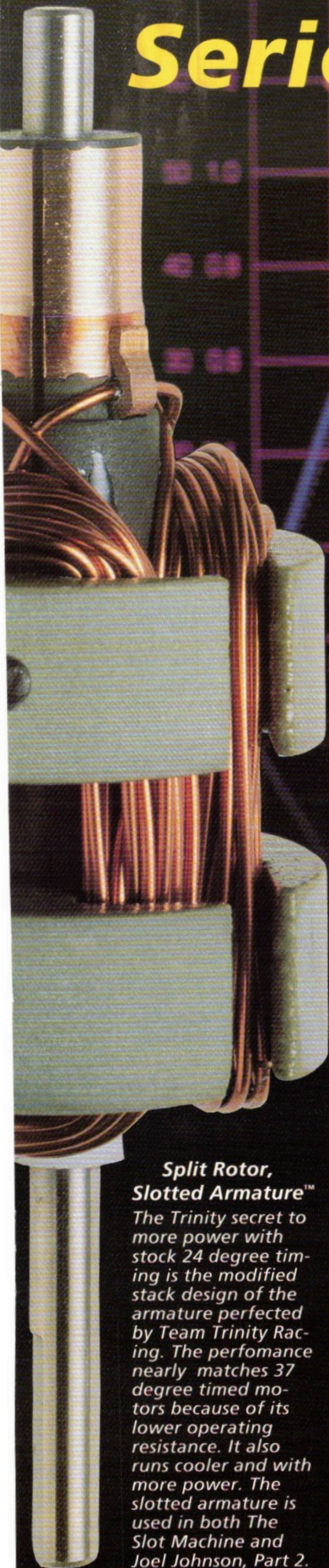


Associated Electrics
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Masami Hirotsuka (center), Tony Neisinger (left) and Christian Keil (right) led a united nations sweep of the 1988-9 World Championships.

Serious Stock Options



Split Rotor, Slotted Armature™

The Trinity secret to more power with stock 24 degree timing is the modified stack design of the armature perfected by Team Trinity Racing. The performance nearly matches 37 degree timed motors because of its lower operating resistance. It also runs cooler and with more power. The slotted armature is used in both The Slot Machine and Joel Johnson, Part 2.



The Slot Machine™, Joel Part 2 and The Boss™ ...A New Era in Stock Motors Has Begun

The 1991 ROAR rules are here and our new Trinity and Speedworks motors are the hottest legal motors available. We've also updated the world's best selling R/C motor, the "Joel Magic Johnson®" stock.

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To meet the new rules, we started with a clean sheet of paper and designed an entirely new, superfast, motor, rather than modifying an existing one. We locked the commutator to the stack very precisely for exact, 24.0 degree timing which works with the slotted armature and 4.9 wet magnets to give the highest rpm of any motor under the new rules.

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The Boss is a high torque, new Speedworks® stock motor which is excellent for small, twisty tracks, 4wd cars and monster trucks. The torque comes from the latest 4.9 wet magnets combined with a full armature. It really punches out of the turns!

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MAKE YOUR DIFFERENTIALS ON THE BENCH, NOT AT THE TRACK

Joel Johnson's "Magic Motorsports[™]" has developed an entirely new concept in differentials... Snap-together diffs you assemble at home before going to the track. No more crawling around on your hands and knees looking for those balls you dropped when trying to clean your diff at the track. Just take a Magic Diff out of your box and drop it in; Spur gear, balls and rings are all in one self-contained unit.

INGREDIENTS

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Magic "Best Balls[™]" actually are carbide, rather than simply hardened steel like some of the others. Carbide is one of the hardest substances known and is virtually impossible to flat spot, or grind dirt and tire dust into. "Best Balls[™]" eliminate the need to throw your diff balls away after every run. Magic "Best Balls[™]" last ten times longer and are the most spherically accurate in racing. Part No. MM602.

Pro Pinion[™] Gears

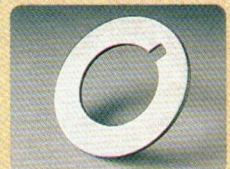
A "high slip" aerospace coating is applied to these beautifully machined, hardened steel, 48 and 64 pitch pinions. The pinions are perfectly matched to our spur gears in tooth shape and pressure angles for positive, low drag engagement and silent, smooth running. They are so efficient longer run times can result. Pinions use a "standard" sized, hardened steel set screw for easy replacement, if lost or stripped.

Pro Spur[™] Gears

The new Magic designed spur gear features a molded shoulder which holds the diff rings and balls in place, so building diffs ahead of time is a snap. Made of a self-lubricating, composite-filled material and available in both 48 and 64 pitch, each is easily identifiable by its fluorescent color. The narrow profile teeth produce less parasitic drag and are resistant to chips, dirt and crashes. Magic Pro gears fit all standard differentials and use standard diff rings.

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Magic notched diff rings are laser cut for perfectly true surfaces with no burrs, which results in an extraordinarily smooth operating differential. Made of hardened, high carbon steel for extra long wear, these fit all standard differentials. Part No. MM600.



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(12 to 30 tooth, i.e. MM012 is 12 tooth)

PINIONS FOR 64 PITCH SPUR GEAR

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(15 to 36 tooth, i.e. MM15 is 15 tooth)

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64 PITCH SPUR GEARS

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MM100/105/110/115/125*

*number of teeth

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COMPETITION



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This Month In Racing

ABOUT THE COVER

The talk of the r/c world was the IFMAR 1/10 World Championships held just outside Detroit, Michigan. As always, the titles were hotly contested. In the end, we crowned one new champ, Cliff Lett, and one who has been there many times before, Masami Hirotsuka.

Letters

Dear Peter:

I read your recent "Finish the Lap You're On" concerning triple "A" mains at major events. I thought you might be interested to know that NORRCA proposed this at our recent On-Road Nationals in August, but could not implement it due to the racers' lack of batteries. However, this format will be run at the NORRCA 1991 Carpet Oval Nationals in Wakefield, MA on October 4-6. Just thought you might like to know that NORRCA is continuing to

-1-

what your membership desires should be an example to all organizations larger or smaller.

-3-

do whatever possible to make racing more fun, competitive and equal (if that's possible).

Sincerely,
J. R. Sitman
President
NORRCA

Editor:

As has been the case many times in the past, NORRCA, under your leadership, is once again on the cutting edge of r/c racing. This fact is, no doubt, just part of why NORRCA has been growing so fast. Your ability to respond to

-2-

Dear Competition Plus:

Is it time for a change? We have been racing for about 2 years and since that time I have seen 4 tracks and 3 hobby shops close in our area. I try to ask why is this happening. In one case it was the people running the hobby shop. One does have to treat its customers right. The second hobby shop and track closed because the rent on the land just kept getting higher than the income. The other two closed because there was just not enough racers and race dates to go around.

That is what I see are the problems . . . We are not growing

-1-

in our racing community. The number of new racers I see at the tracks is going down to nothing. We are losing people who started racing and for whatever reason, money being the number one reason given around here, have sold their equipment and quit. Unless we can rekindle the spirit and introduce some new blood into our racing community we are doomed.

How can we accomplish this you ask? Well everyone has their ideas but the most popular is to get racing costs down to where the average newcomer can enter the racing community and not have to take

-2-

back to who can buy the best wins in stock. We also need to separate the semi-professional racers from the weekend racer. This could be done by having a Pro Stock and Pro Modified class open to anyone who wants to run with the big boys, etc. You would still keep your stock and modified classes for those who wanted to race on a budget.

Last, but by far the least, we need to consider paying prize money in some classes. I know all the arguments on this one but we need to show the beginners that there is some return and not just a bottomless pit we throw money

-4-

out a second mortgage on their home. We need to have a beginner's class with strict rules and we need the local tracks to enforce it. If this means closed endbell's on the motors, T4 type speed controllers and 1200 SCR of 480 seconds at 20 amps and no higher final ratios than XXX. The car must be in production with no hopup parts either by the original manufacturer or aftermarket then that is what we need.

ROAR had a good idea with the 24 degree stock motors but unless you are at a ROAR affiliated track no one runs them at local races and its

-3-

into. The model aircraft community has been doing this for years with great success. They also pay out prize money in most other forms of racing.

Well I have got this off my mind. What is done with it is now is up to you.

WILLIAM CAUGHRON

Editor:

A great letter that deserves a response. I agree with much of what you say, but not everything. As you can see I'm running out of room so let's discuss this topic on the next page in the "Finish The Lap You're On" page.

-5-

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Finish The Lap You're On . . .

By
Peter Barana

If you've flipped to this page first, before reading the letters, go back and check out the comments written by William Caughron. This month's piece will address some of the issues Mr. Caughron so clearly expressed.

Before I address some of the topics brought out by William, let me just express how impressed I continue to be with Competition Plus readers. Points and views put down on paper and sent to us always give me something to think about regarding our sport. Mr. Caughron's letter was no exception.

Bringing in "new" racers should be a priority for not only the print media in our sport, but for manufacturers and, yes, race sanctioning bodies too. But what to do? How do you go about increasing "new" racers to our sport. To the financial pain of many manufacturers it isn't by promoting r/c cars as rad, neon, bitchn' toys. That approach has put a few companies on the verge of bankruptcy.

Certainly, as Mr Caughron points out very clearly, we need tracks to stay in business. Tracks stay in business by selling merchandise, and not by race or track fees. For this reason, Competition Plus, right from the start, has attempted to help the hobby shop and not accept "mail-order" ads from companies that work out of their garage and have no overhead. While this may have cost our readers maybe \$5 on a car kit, it has kept several tracks in business which provide me and you alike a place to race.

Expense is always a problem. This is a competitive sport and at times going fast costs money. Caughron discusses putting some limitations on equipment and forming a true beginner's production class. I couldn't agree with him more. In fact, I've written on more than one occasion the need for "spec" classes in our sport.

Regarding the 24 degree motors in stock class; agreed it's a good idea and also agreed that not all tracks run ROAR rules. Caughron hits the mark dead center with the need to separate those drivers receiving some "help" in the stock class from the driver who must purchase straight off the hobby shop shelf. Some more progressive tracks are already doing this and it is working out very well.

About the only point that I really don't agree with is the racing for prize money. One of my main objections is the fact that entry fees *will* be raised in order to raise a jackpot. If we had to pay \$50 a race day I'm sure entries would be few and far between.

A twist on pay racing, which I am in favor of is for tracks to give back, in the form of gift certificates, small awards. Maybe a \$15 certificate for first, \$10 for second and \$5 for third. Just enough to enable a driver to get a new set of tires or a body.

It's really tough to disagree with much William Caughron has to say. He shows a genuine concern for our sport and should be commended for taking time out of his day to address potential problems before they become too large to handle.

SL500 SuperIron

With enough power from its exclusive 50 watt output heater to keep a half pound of solder molten, think what it'll do with your batteries & motors!

UNGSL500



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PIT BOARD

PSE SWEEPS REGION 4 CHAMPIONSHIPS!

Jacksonville, Florida was the site of the ROAR Region 4 Championships. CONGRATULATIONS to all Three On-Road Champions for selecting Pro-Star Enterprises, Inc. as their tire choice.

Edwin McTurreous became the 1/10th Scale Stock Champion in a commanding fashion, by turning the only 17-lap run in qualifying and in the main event, using Green Dot compound tires.

Bobby Horan, 1/10th Scale Modified Champion and Bob Hall, 1/12th Scale Open Champion had both selected Black Dot compound tires. In both 1/10th Scale Mains, 8 out of 10 drivers selected PSE tires!

MARAUDER HITS TOWN!

Kevin McIntire, PEAK PERFORMANCE, conquered the over 500 ft. Arkansas International Super-Speedway Oval, taking TQ and First Place honors at the 1991 Region 6 On-Road Oval Championships. Kevin's power source is the new PEAK PERFORMANCE 12-Quad Modified Motor, the "MARAUDER."

Congratulations to PEAK PERFORMANCE drivers Derek Furutani and Scott Montgomery, who made it into the finals at the 1991 Off-Road World Championships in Detroit, Michigan. Both drives used the new PEAK PERFORMANCE 12-Quad "MARAUDER" Modified Motor and TEAM ORION Matched Cells.

Norwegian PEAK PERFORMANCE driver, Eirik Andreassen, used the New PEAK PERFORMANCE 12-Quad "MARAUDER" Modified Motor to win 2WD TQ honors at the 1991 Off-Road Nordic Championships. Congratulations Eirik!

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PIT BOARD

TEAM NOVAK NABS NORRCA CROWN

Pomona, California - Team Novak drivers swept the 1/10 and 1/12 Modified Classes at the 1991 NORRCA On-Road Nationals held at the Ranch Pit Shop on August 23-25.

In 1/10 Modified, Fernando Belair led a 1-2-3 Novak qualifying sweep as the newest Team Novak member. Rick Hohwart, also put his car on the front row, followed closely by teammate Ron Schuur. In the main event, Schuur took the National Championship as he led Belair across the line.

All three drivers used the superior performance of the popular Novak 410-MXc High-Frequency MEGAFET Speed Control. In fact, 7 out of 10 A-Main drivers were Novak equipped. They all took advantage of the MXc's linear power delivery, super-low on-resistance, adjustable current limiter, and battery regeneration for the longest possible run times. In addition to their MXc Speed Controls, both Schuur and Belair used the new Novak NER-3FM receiver for crystal clear reception.

David Berger not only TQ'd the 1/12 Modified Class as the only driver to turn 34 laps, but he also led the A Main wire-to-wire to win his first National Championship. Berger's car was equipped with the compact Novak 410-M1c with all the same features and advantages as its MXc stablemate. David clearly put all these advantages to work for him on his way to victory.

Team Novak congratulates Ron Schuur and David Berger on their National Championships!

**WHAT
HAS OVER
2000
TEETH
AND IS WAITING
TO EAT YOUR
COMPETITION
FOR LUNCH?**

TAKE A NEW DIRECTION OFF-ROAD



**NEW BODY
NEW GEARBOX
NEW SUSPENSION**

Traxxas team driver Scott Montgomery sweeps the South with the new Traxxas off-road car.

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- * 1st place A-main, Two-Wheel Modified

R.O.A.R. TEXAS INVITATIONAL:

- * 1st place, Two-Wheel Modified

R.O.A.R. GEORGIA STATE CHAMPIONSHIPS:

- * 1st place A-main, Two-Wheel Stock
- * 1st place A-main, Two-Wheel Modified

N.O.R.R.C.A. TEXAS STATE CHAMPIONSHIPS

- * TQ, Two-Wheel Stock
- * 1st place A-main, Two-Wheel Stock
- * TQ, Two-Wheel Modified
- * 1st place A-main, Two-Wheel Modified

MICKEY THOMPSON OFF-ROAD CHAMPIONSHIP GRAND PRIX

- * 1st place A-main, Two-Wheel Pro-Stock
- * 1st place A-main, Two-Wheel Modified

**TEAM
TRAXXAS**

M O D E L

2701

WATCH FOR IT IN OCTOBER!



PIT BOARD

Trinity Products, Inc. announced today that even they are totally surprised by the initial success of their ROAR '91 stock motor the "Slot Machine," RC 2024. Ernie Provetti said that in the first 12 weeks of its release, it has sold more pieces than the "Joel Magic Johnson Stock" which was the best selling stock in R/C car racing. Sales have been so good, that extra air shipment orders have been placed to speed up delivery time, and reduce any shortages in the marketplace. The sea shipments are taking too long to arrive.

One reason for the "Slot Machines" success is its armature design which makes the motor perform like one of the ROAR '90 37 degree motors, instead of a 24 degree one. The

"Split Rotor" armature stack has laminations removed from the middle which in effect reduces the running resistance of the motor. This along with the latest 4.9 wet magnets makes for more power and rpm's, and gives the "Slot Machine" a clear power advantage over any of the other 24 degree stock motors on the market.

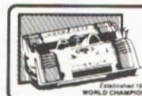
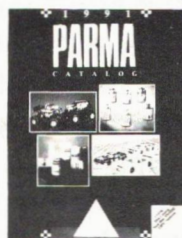
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MACHINE
SALES
SOAR!**

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Parma's wide range of 48 & 64 pitch nylon spur gears have narrowed centers for smoother and truer action while the built-in dirt shield protects the diff from foreign matter. Be sure to check out our complete line of pinions too! Parma 32, 48 & 64 pitch pinions are machined from solid steel and are used by racer's around the world.



**EAT OR
BE EATEN**



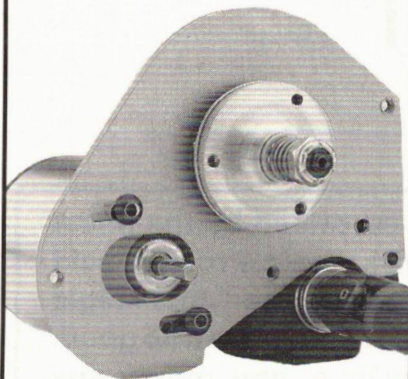
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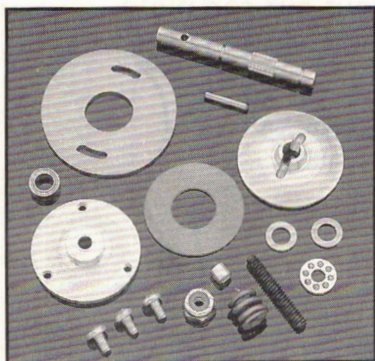
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PIT BOARD

RC10'S AND YOKOMO WIN IFMAR WORLD CHAMPIONSHIPS

The best drivers and teams from 22 countries around the world were in Detroit, Michigan to compete in the 1991 IFMAR 1/10 OFF-ROAD WORLD CHAMPIONSHIPS. TEAM ASSOCIATED had six RC10's in the final Main Event, with MASAMI HIROSAKA, from Japan winning his Fifth IFMAR World Championships! Masami's RC10 was followed across the finish line by the RC10 of Rick Vehlow in Second place. RC10's have now won three IFMAR WORLD CHAMPIONSHIPS!

In the 4WD class, YOKOMO's finished First and Second with CLIFF LETT winning the World Championships, followed by MASAMI HIROSAKA in Second Place. Congratulations to all!

All four of these cars were powered by Reedy motors and batteries.

TEAM COBRA, THE RACER'S CHOICE

C & M's Team Cobra Jeff Rey dominates the 1/12 Scale Region 5 Oval Championships. Jeff, running a LTOUR-12, TQ'd and won the A-Main easily, out-distancing his nearest competition by two laps. Not only was Jeff's time good enough to win the stock class, but his stock time would have won him the Modified Class as well.

Congratulations Jeff!

Competition Plus



PIT BOARD

PEAK PERFORMANCE VICTORIOUS AT 1991 NEW ZEALAND NATIONALS

PEAK PERFORMANCE RACING MOTORS has added two more National Championships to their growing list of international titles. A PEAK PERFORMANCE "RICK'S PICK" MODIFIED MOTOR POWERED, Allen Lundberg to the 1991 New Zealand Indoor Off-Road National Championship. Allan's choice of car was a Yokomo Works '91 with a Novak Speed Control. A PEAK PERFORMANCE "RICK'S PICK" Modified Motor also powered David Bromley to 4WD TQ honors. Congratulations to Allan and David!

Congratulations also to Wayne McNaught, who took First Place in Monster Truck Class with his PEAK PERFORMANCE "ANIMAL" modified motor.

In addition, PEAK PERFORMANCE RACING MOTORS captured the second & third positions in both 2WD and 4WD as well as sixth and seventh, respectively, and also the third and fourth positions in Monster Truck.

Congratulations! - to all the great PEAK PERFORMANCE drivers at the 1991 New Zealand Indoor Off-Road National Championships.

Speed Controls, these drivers not only TQ'd both 2WD and 4WD, they ran away with 1-2-3 sweeps in both divisions as well.

In the hotly-contested 2WD division, Masami Hirosaka won his fifth World Championship as he led Novak Teammates Rick Vehlow and Kyle Reed across the line.

Cliff Lett took his first-ever World Championship in the demanding 4WD division, with Novak teammates Hirosaka and Jack Johnson in hot pursuit.

Hirosaka, Lett, Vehlow, Reed and Johnson all chose the Team Novak 410-Series High-Frequency Speed Controls to power their cars. In fact, so did 7 out of 10 A-Main drivers in each division - and they had good reasons.

The Novak 410-Series' high-frequency modulation gave them the smooth power delivery they needed on the long, tough world's track. The super-low on-resistance delivered ultra-quick response. And Novak's specially-designed battery regeneration circuitry helped them get the most out of their batteries during these grueling 5-minute I.F.M.A.R. races. Additionally, Cliff Lett and Rick Vehlow used the new Novak NER-3FM receiver for crystal-clear reception.

Congratulations to new World Champions Masami Hirosaka and Cliff Lett and to all the Novak-equipped drivers, who drove so well at this event. You made World Champions out of all of us!

TEAM NOVAK DOMINATES THE 1991 I.F.M.A.R. WORLDS

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NAME CHANGE TO ADC

Advanced Diversified Composites, Inc. (ADC) is the new name of an old friend in the Hobby Industry - Houge Enterprises, Inc. We recently changed our corporate name and moved to a new location in Orlando, Florida. It has become evident that these changes have caused some confusion among our long time customers in the Hobby Industry, therefore, I am taking this opportunity to explain to you the changes that have occurred within our company, and to assure you that we at ADC are committed to providing you with the same quality service that you relied upon from both Composite Craft and Houge Enterprises.

Houge Enterprises was a leader in the Hobby Industry, specializing in the design and manufacture of hobby related products. Houge leased operating space from CompositeCraft, Inc., whose primary focus was in aerospace related composite structures. The two companies exchanged ideas and utilized each other's expertise in the design and manufacture of both hobby and composite products. It was from this liaison that the award winning Lynx II RC car was born under the CompositeCraft name.

Due to space and scheduling problems which began to inhibit our ability to properly service the Hobby Industry, in the spring of 1991, it was decided that Houge Enterprises would move to a separate facility. Also, ownership changes within Houge Enterprises necessitated a corporate name change, hence, ADC.

ADC has trademarked the CompositeCraft name and attached it to our complete line of radio controlled hobby products and accessories. Please be aware that CompositeCraft is merely the name of one product line among ADC's many manufactured products. Our telephones are answered as ADC, and all outgoing correspondence is sent under the ADC logo.

I hope this explanation helps dispel any confusion that we have caused during the last few months. If you have any further questions, please feel free to contact me directly at (407) 351-6081.

TEAM Class News

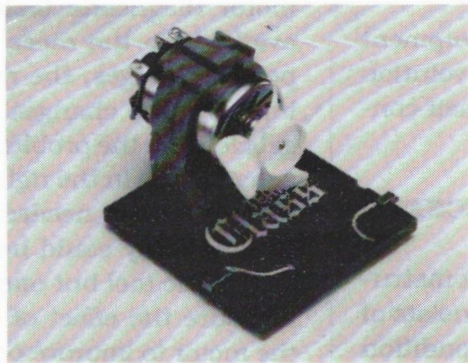
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8002	Soft Venturi Brush w/eyelet	\$4.99
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Class will still offer the full line of brushes *without* eyelets. Just change the first number in the part number to a "7". Example, #7001 - Hard Venturi without eyelet.



MOTOR MAINTENANCE CENTER

Part #6000

The Class Motor Maintenance Center (\$16.95 retail) is a convenient motor workshop that makes motor tuning much easier. The clip that holds the motor is superior to similar products currently on the market. Also, the stand has slots for custom brush cutting. You will also find a handy magnetic strip for organizing motor screw, springs, etc. The small fan, "Turbo Prop", is placed on the motor during break-in, this keeps the motor very cool.

On The Road With Team Class

Date: August 2-3-4

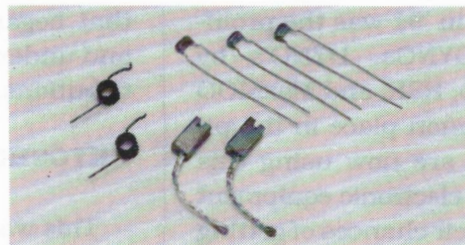
Place: Concept Hobbies, Skaneateles, NY

Event: 5th Annual New York State Championship

Hello R/C racing enthusiasts! We just returned from the 5th annual New York State Championship paved oval event held in Skaneateles, NY. In general, most of the racers had a great time and thanks go out to the race promoters for a good event. During the weekend, I couldn't help but notice some unhappy campers complete with the usual unhappy complaints of — no speed, bad batteries, etc. I happened to keep an eye on one particular racer who was quite vocal about his lack of speed. During his qualifier, I watched him run to see if I might be able to help him out with his speed problem. The car was plenty fast, but his driving was real rough. This driver hit a lot of walls and, combined with a racing line that added many feet to his lap distance, was two laps down to the leader after 4 minutes. The next time I saw this racer he had just left the hobby store after plunking down big bucks for a "naked" battery pack. This is a typical case of someone trying to buy with money what they lack in skill and experience. Needless to say, his next run was no faster and those big bucks spent were wasted. Next time you seem slow at a race, look for driving improvements before equipment improvements. Have someone video tape your qualifier, then check out your racing line as well as the amount of accidents you were involved in. It doesn't take too many brain fades to end up two laps down. After you watch the tape and are confident you got the most out of the car/motor/battery and still seem slow, then look to equipment. You will save money and your racing results will improve.

Keep racing and good luck.

Frank Calandra
Frank Calandra



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Part #7501

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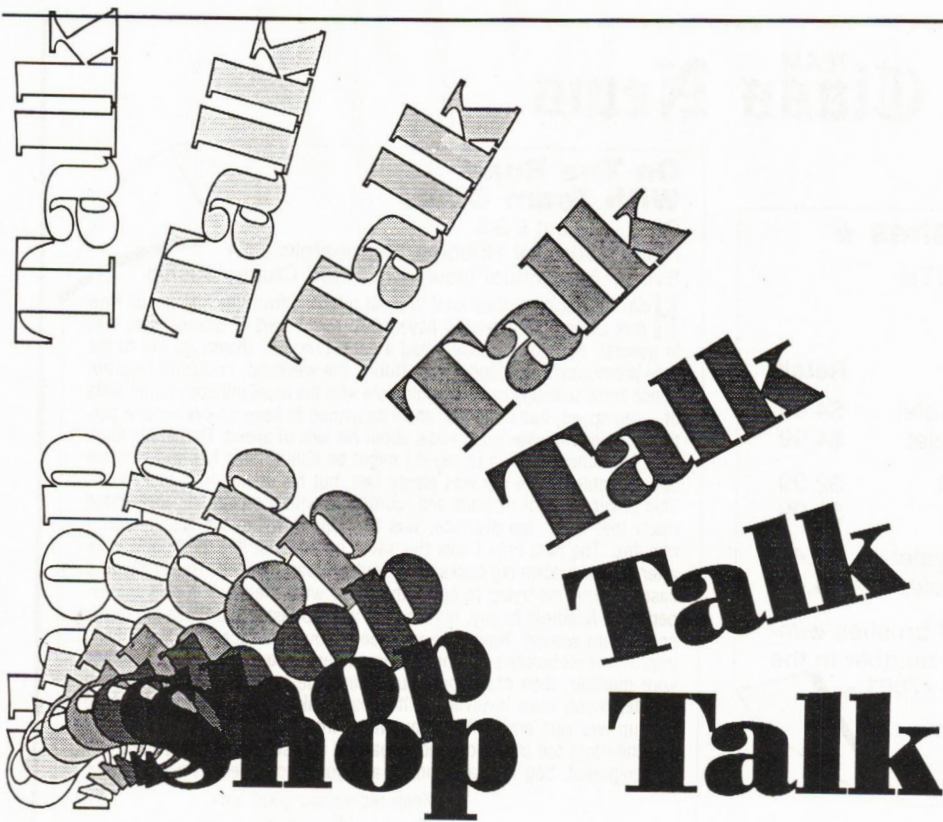
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By Jeff Palmer

The single largest change on the racing scene in '91 was the proliferation of DYNOs. DYNO's by TEKIN, LAVco, RSR, and MaxMOD are now common place in the pit area. Racers are now using this sophisticated electronic equipment to improve their chances of getting to the "winners circle". But it wasn't all that long ago that motor diagnostics and tuning was nothing more than a "black art", requiring luck and a good ear. Most of us racers knew that volts and amps made our motors run and so we built home-made "motor test boxes" which consisted of nothing more than a volt meter and an amp meter; sound was used to evaluate the motors RPM gains or loses. In time, airplane prop tachs were modified for use as motor tachs. These early "test boxes" left a lot to chance. Finally, Kyosho heard the racer's plight and came out with a "Motor Checker", which was followed by equipment from Bud's.

Let's take a look at the equipment that began the DYNO revolution and understand each of their contributions.

KYOSHO MOTOR CHECKER

This was one of the first instruments I ever bought. It consists of an Amp meter and a Condition meter. The "Motor Checker" is light weight and compact, in fact, I still carry it in my pit box for quick tests. The Amp meter and the Condition meter are of good quality. The Condition meter uses a voltage comparator circuit that samples the voltage at intervals and compares the previous interval's voltage to the present voltage. The greater the difference between the two readings, the greater the needle deflection on the volt meter, and the greater the problems with the motor. These problems could be caused by bad bearings, bushings, or brushes. The prin-

ciple involved is: the higher the amp draw of the motor, the greater the voltage drop. The voltage drop could be caused by the binding of bad bearings/bushings or dirt caught between the top of the armature stack and the magnets. Another problem detected by the Condition meter is contact problems between brushes and the commutator. The brush contact problem may be as simple as a dirty comm, bad brushes, or brush hood misalignment, but in any case, the voltage changes caused by the problem will be detected and reported on the display which allows the racer to correct the problem before discovering it in a race. Not only can the Condition meter be used to detect problems but it could be used to test brush compounds or spring tension. Since this was one of the first motor diagnostic tools generally available to the racer, it only reported changes, the racer has to interpret the changes in order to get closer to the problem. This was a major step in the right direction. Still, what was needed was a tool that not only could be used as a diagnostic tool but one that could measure the effect of changes to the motor to improve performance.

BUD'S MOTOR ANALYZING DYNO

A short time after Shinwa and AristoCraft introduced their tools, Buddy Bartos began marketing the first "almost" DYNO. It's an inexpensive unit that uses a slave motor to provide a test load for the motor. By measuring the back voltage being generated from the slave motor, a RELATIVE RPM measurement is made. This is a simple unit. It has three switches, a Load switch, a Motor read out switch and an On/Off switch. One

of the most important features of Bud's DYNO is its ability to use a good quality digital volt meter (DVM) to make the readings; a good DVM increases the racer's RESOLUTION. Another way to look at resolution is the ability to detect smaller RPM gains than could be detected on the analog meters.

I made a mistake with the Bud's unit in the beginning by reading the instructions too literally. They recommend that an "old" motor be used for the slave motor. **THAT'S A MISTAKE!!** Use a good motor, one with good brushes. Any changes occurring to the slave motor will effect all the measurements to date, making them invalid. A new motor with good full brushes will last the life of the dyno and provide good measurements for the life of the DYNO.

The other thing Bud's Dyno did for the racer is establish a logging form for recording motor data. Things like brushes used, brush springs used, and the performance of the motor under various loads established a great data base for motor comparisons. Using this form, a motor could be tested with different brush compounds and spring tensions. What a wealth of knowledge could be gained! This form provided a mechanism for storing results, the same information that motor manufacturers have been storing all along.

THE DREAM DYNO

Each of the early units provided specific information that the racer was looking for. Voltage and amp information, RPM and RPM resolution, logging and a comparison data base, the ability to provide test loads and the ability to store the results. Each generation

Bud's "Motor Analysing Dyno". The first reasonably priced dyno.

of test gear provided the next generation with improved information but the one critical piece of information missing up to this point is TORQUE. Torque represents the power a motor has to accelerate out of a corner or to climb a hill. When combined with RPM, or the top-end speed that a motor will attain in a straight-away, a power figure can be calculated which will eventually lead to HORSEPOWER. None of these early units provided torque information and yet it was what was being looked for when load testing a motor. To understand the importance of TORQUE, let's contrast it with RPM: visualize a scale and TORQUE is in one balance pan and RPM is in the other. If the only material you can work with is the material in the two balance pans, then to increase TORQUE you have to remove material in the RPM pan and put it in the TORQUE pan. The converse is also true; if you want to increase RPM, you have to remove material from the

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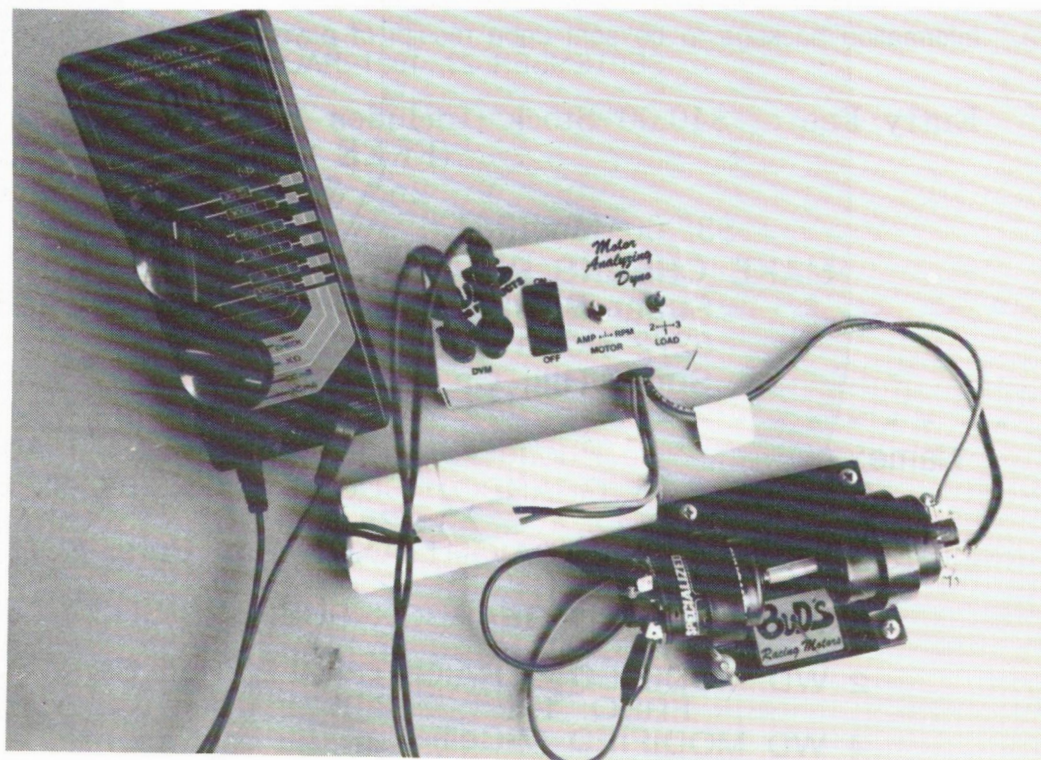
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TORQUE pan and place it in the one for RPM. In the real world, each motor is engineered for specific torque and RPM at zero timing. If you increase RPM by advancing the time, you lose TORQUE. This is an important principle that should be born out on all DYNOs. Some of the things that can be done to increase torque are:

- 1) Increase the number of turns of wire in the armature winding.
- 2) Increase the magnet strength.
- 3) Decrease the timing advance.

Some of the things that can be done to increase RPM are:

- 1) Decrease the number of turns of wire in the armature winding.
- 2) Weaken the magnet strength.
- 3) Increase the timing advance.

What I'm trying to illustrate is

that TORQUE and RPM are a balancing act and you have to have both for a motor to run. TORQUE is measured in "foot pound/second" or for us racers "inch ounces/second". TORQUE, in motors, is the rotational force that can move a specific weight, a specific distance in a specific unit of time; i.e. one ounce of weight a distance of one inch in one second. About as clear as mud?! Let it be sufficient then to say, that TORQUE can be measured by using a static weight or it can be calculated by measuring the output wattage of a motor. Ideally, if we were to build a DYNO from the things we know so far, it would have the following features:

- 1) Measure RPM,
- 2) Measure TORQUE,
- 3) Ability to vary the load on the motor,
- 4) Measure Input amperage,
- 5) Measure Input voltage,
- 6) Vary Input voltage,

- 7) Capture results,
- 8) Easy to use.

Of course our new DYNO would be compact in size and rugged enough to be taken to the track. It would also be consistent in its reading and unlike the test equipment available today, it will be consistent DYNO to DYNO. Is there such a DYNO today?

CONCLUSION

In the up coming months, many of the DYNO's that are currently on the market are going to be evaluated and presented in the pages of this magazine. You will see evaluations of DYNO's from LAVco, Tekin, MaxMod Mini Sport, RSR and others as they become available. 'Til next time, GOOD RACING!!

CP



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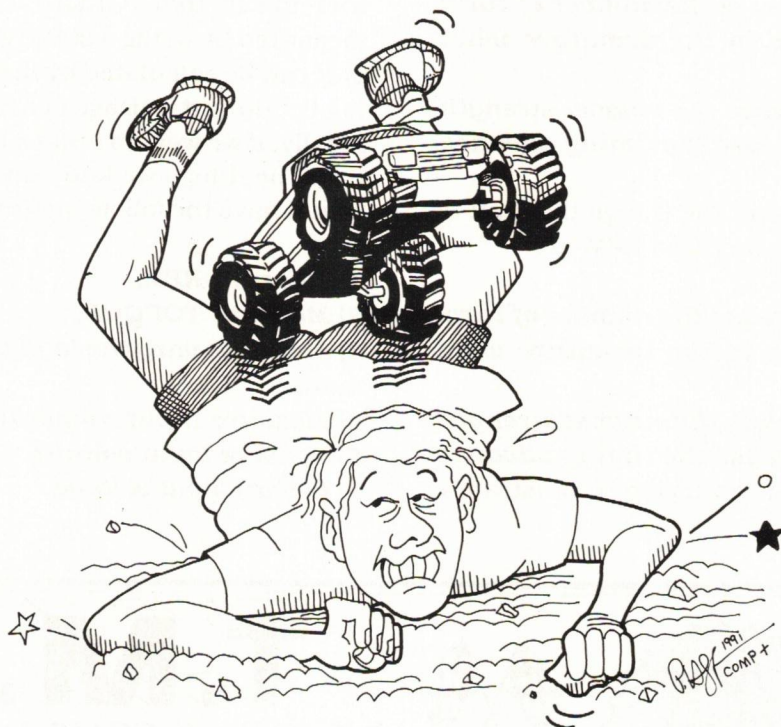
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Frequency Quips

*Rick Eyrich
Cartoon By Pete Hoffman*

The other day I was shooting the breeze with one of my old motorcycle racing buddies. As we talked, the subject of R/C car racing came up. My "buddy" laughed and made the comment that I quit racing dirt-bikes and take up R/C car racing, because since you don't sit in a R/C car, you can't get hurt. At the time I gave him my usual snappy comeback of "oh yeah? well, #%&***# you!", and then we continued on with our conversation. But later that day, I began to think more about what he had said. Of course the chances of any serious injury while racing is very slim (unless you get zapped by lightning hitting your transmitter antenna), but minor aches and pains can sometimes be a part of the R/C game. Believe it or not, I myself can confess to several small injuries over the years, and have personally witnessed others doing damage to themselves while around R/C cars.

Once, I was doing my corner-marshaling duties at the old off-road track. Two cars had just tangled coming out of the turn I was working, and I took off full-tilt across the track to right the cars. But in my haste to get there, I neglected to notice a small clump of clay sticking-up midway across the track. But, I was fully aware of it as I became air-borne and sailed head-first into the two crashed cars. The impact righted the two cars and they continued on in the race—I didn't. My hat went one way, my glasses another way, and some wiseguy used my



rear as a jump for his car. I knew my stunt had been a good one, because I heard the track's PA system pick up the sound of several people standing around the announcer reacting to my "crash" with a chorus of "OOHHHH!" Luckily, body damage was only limited to my knees and elbows, along with all those tiny little knobby-tire tracks across the rear of my neon-yellow shorts.

Another corner-marshaling incident occurred when I was the designated "bird-dog" for my pal Dennis at a big quarter scale stock car race in South Carolina. Each racer had to have a sepa-

rate humanoid to stand track-side during his race to marshal the car. No one was allowed inside the track under the green flag, so if a car flipped or got stuck on the track, they'd throw a yellow flag. The stuck driver's "bird-dog" would wait for the signal (a whistle) from the track steward to run onto the track and either right the car, or pick it up and carry it off the track for repairs.

It should be noted here that the racetrack was very BIG and very BANKED. So picture "yours truly" having to sprint (at the whistle) across the track, pick up a 30 plus-pound R/C car and then run back up a 35 degree

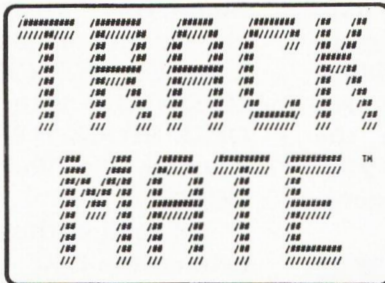
banked track as fast as possible. It might be easy for an 18 year-old, but I'm 35 and sporting a medium paunch around my middle. After my THIRD trip in one 20 lap heat race, (due to a severe radio glitch), I was huffing and puffing like an old tugboat trying to push an over-loaded aircraft carrier. Then after the race, I spent twenty minutes walking off that wonderful in-your-side-pain-from-running-feeling you used to get from doing laps in your school days.

And then just the other day, I was running late for the races-as

usual-and had a accident just trying to load up my race gear! I had already stowed everything in the back of my Bronco, except for my el-mongo, super-sized race/tackle/toolbox.

With toolbox in hand, I started out through my work room doorway. As I passed through the door frame, I glanced at my watch to check the time. Unfortunately, my watch-looking movement shifted my body just enough to the left to allow my pant's belt loop to hook into the metal latch sticking out of the door frame.

Although I was going at full stride, neither the sturdy latch or the well-stitched belt loop gave way. But while I came to a full and complete stop, the two-ton toolbox, through the force of gravity, continued on a split-second longer. Once my eyes un-crossed, I took a quick body check and found no outward damage to my right arm, and carried the heavy race box (with my left arm) to the Bronco and went on to the races. But for the next two weeks afterward, I was able to scratch my right kneecap without bending over...



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as a driver approaches its degree. The 40' driver's stand, handicapped accessible, spanned only 1/3 the length of the long straight away of 120'. Ameri-Trac necessitates the computerized AMB Lap Counting System that is housed in the computer building adjacent to the track.

Racers from a wide area travel to compete at Ameri-Trac, and much effort was given to accommodate them with the facilities. The large A/C accessed pit area covers almost 5 acres with the track and can accommodate 250-300 racers. Every week conces-

sion is available to everyone. Scheduled series racing also plays a part at Ameri-Trac so long distant drivers may have the chance to participate. The hobby shop, Country Corner Hobbies, stocks a large supply of various R/C supplies, with an emphasis on super speedway. Quite a variety of drivers come to compete at Ameri-Trac which is why our classes are divided as such: LIMITED STOCK, LIMITED MODIFIED - with break out lap; OPEN STOCK, OPEN MODIFIED - where it's "Put the hammer DOWN"

Off-road enthusiasts can compete on the 330' off-road track, Country Corner Raceway, directly next door to the concrete track. This track features flexibility and challenge every week. Classes are 2wd stock Jr. 2wd Mod, Open Truck.

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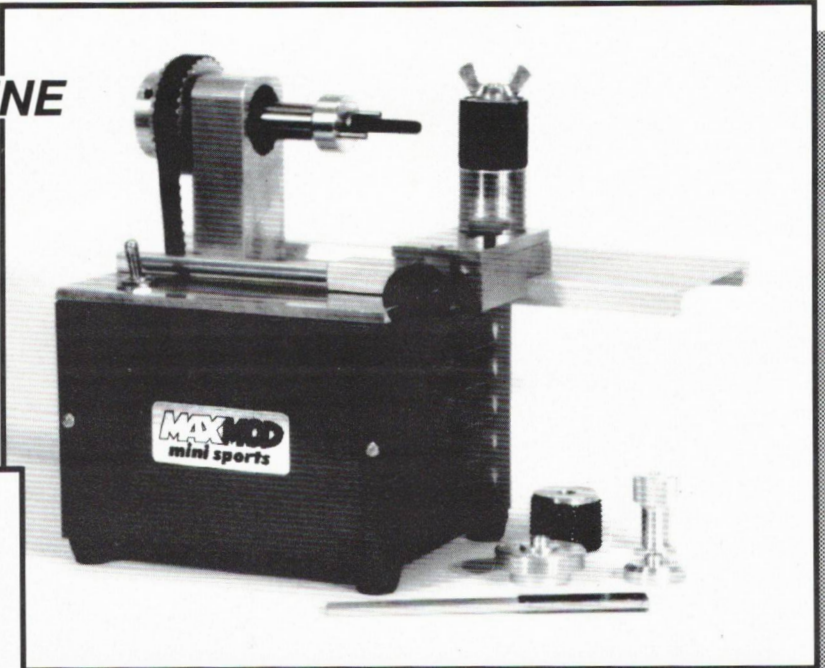
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Trinity and Kyosho present the
**1991 IFMAR WORLD
CHAMPIONSHIPS**

BY MONICA BARANA



WHILE THE TWO RACE FAVORITES, LETT AND MASAMI WOULD TAKE HOME WORLD TITLES, THE RACE WAS ANYTHING BUT EASY. MANY SURPRISES AND A BIT OF CONTROVERSY THROWN IN FOR GOOD MEASURE MADE FOR AN EXCITING WEEK.

The off-road world's first came to the United States back in 1985, which happened to be the premiere event. Top drivers of the day descended on Del Mar, California for history in the making.

In 1987 the event was held in Romsey, England and in 1989 it moved on to the Southern Hemisphere, being held in Sydney, Australia. This year it was brought back to ROAR.

Over the past few years it would be difficult to match the accomplishments of the SEMROCC club. From regularly scheduled local races up to regional and national races, this club has held it all. Because of all these previous successes, it came as little surprise that when it was ROAR's turn to have the race again, we looked to Michigan.

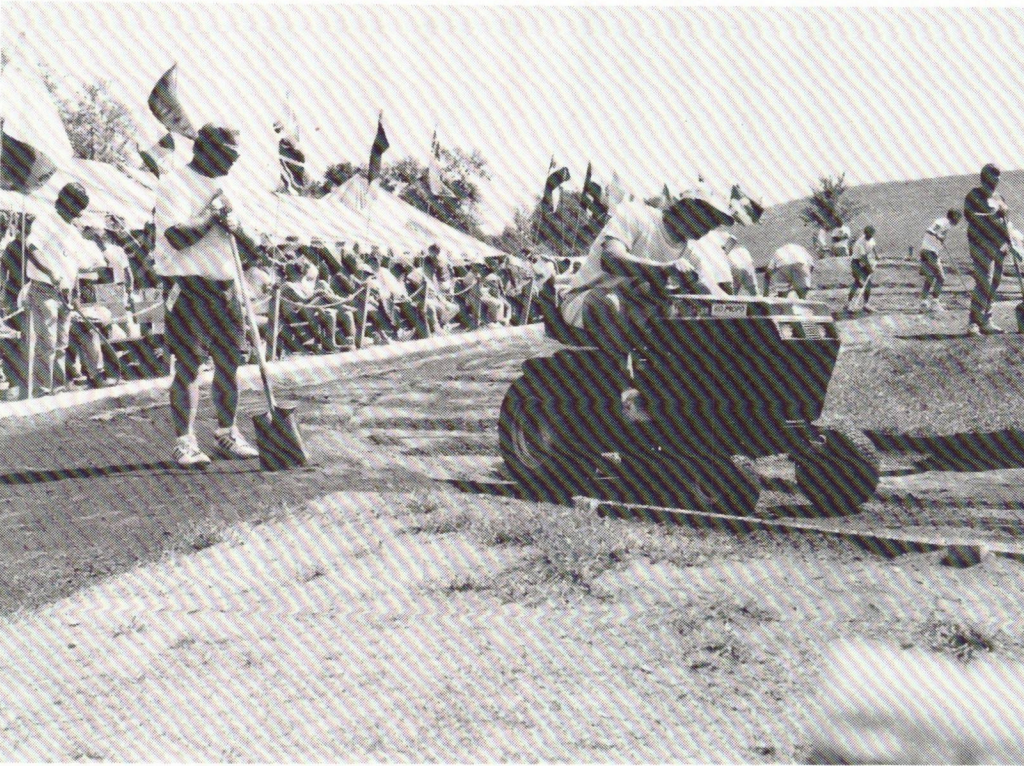
This 1991 IFMAR 1/10th Scale World Championship event was sponsored by Trinity and Kyosho. Both these companies have a long history of competing in 1/10th off-road and their continued support was appreciated by racers and organizers alike.

The large outdoor track was situated at Freedom Hill Park in Sterling Heights, Michigan, which is just outside of Detroit. This track is in a popular park and there's plenty of parking. The facility featured covered pits and tables with AC power for all. The public address system was more than adequate with plenty of speakers around the track so everyone could hear what was going on at all times.

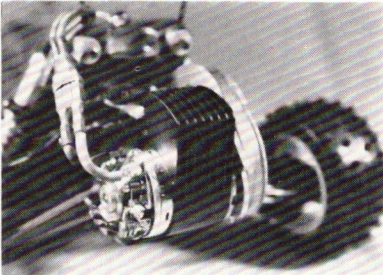
The permanent track measured 70' x 170'. Lanes were 8 to 14' wide with many increasing and decreasing radius turns. The size, not to mention the "bumpy" layout, accounts for runs turned in by the very best at about 12 laps. Most in the know, prefer tracks that produce 10 to 12 laps. On circuits that churn out 16 or even 18 lap runs traffic in both qualifying and mains and can be a real problem. In addition, from the spectators point of view, tracks where cars go close to 20 laps make for confusing racing.

I mentioned the circuit was bumpy. This was by design and not as a result of poor maintenance. In fact, the race track was constantly being worked on in an attempt to keep things as consistent as possible. Whether the final result of the effort put in actually kept the track equal every run is always a matter of debate. For those that run fast the track is equal. For the driver who was just bumped out of the final, the track was obviously faster on that run.

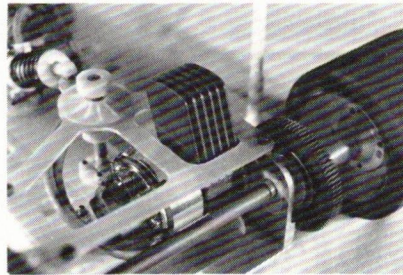
Although track consistency was an issue for the entire event, nobody can contest the SEMROCC club's dedication to try and keep things equal. The volunteers came out in force each time the schedule called for grooming. When all was said and done it was driving and not the track that lead the world champs to victory in '91.



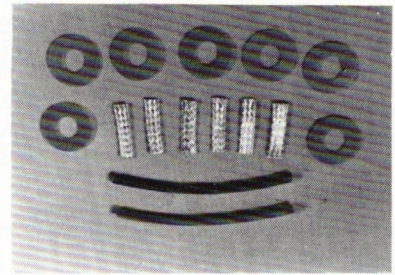
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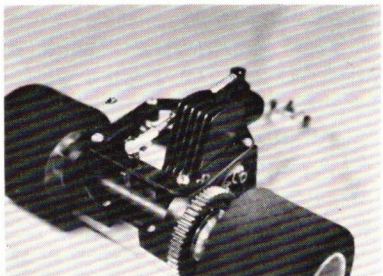
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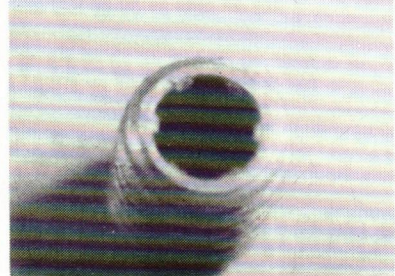
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I'm bringing up track grooming early on in this article because I would be remiss if I did not report that several racers raised more than a question as to the consistency of the track.

This is not a problem that hasn't been faced before. Tracks in the "Sunbelt" face the problem of too much/too little water all the time. If it's not the water that's the problem it will be how high the jumps are after grooming. Even if those two factors could remain consistent the debate about the number of potholes would come into play. Obviously, because of the elements and lack of temperature control, outdoor track conditions will vary much more than those indoor facilities. Until the day comes (and I hope it never does) when we race our off-road cars on carpet, track inconsistencies will be a part of any outdoor race. That's a fact! And, that's off-road!

Although addressed early in

this article, a lot happened between the debate about track maintenance and the opening ceremonies. As this magazine has written in the past, if you've never been to a world championships, you're really missing something! Think of it as our ROAR Nationals, PLUS!

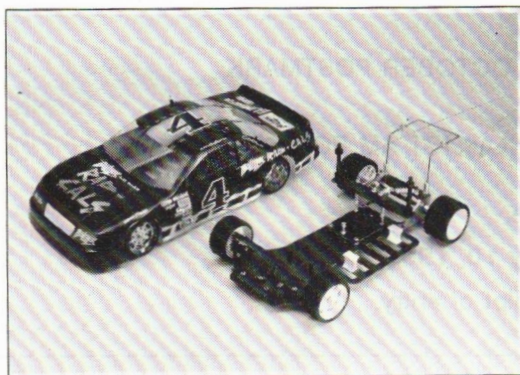
The event was held from August 4th to the 11th. Many of the drivers arrived well in advance of the scheduled open practice date. Some as early as the Warm-up race.

The first day of the event, August 4th was the opening ceremonies. Key speakers were John Thawley and Mike Reedy with the sponsors (Trinity & Kyosho) Ernie Provetti and Tom Grogg welcoming all the racers. The three former world champions Jay Halsey, Gil Losi, Jr. and Joel Johnson presented the flags from the three governing bodies, EFRA, FEMCA, AND ROAR.

Masami Hirotsuka, the defending world champion presented the IFMAR flag. Then each country's flag and race team were introduced. After the opening ceremonies a rotisserie style chicken luncheon was enjoyed by all.

Race faces went on for Monday's events. Registration, semi-controlled practice and tech inspection were just a few assignments awaiting the drivers. This first day of practice was reserved for the 4WD cars. This since the 4WD class would run its events prior to the 2WD class.

Practice is always a good time to get a bearing on who looks fast. Although best times don't mean anything as we commence qualifying, Cliff Lett showed early on that he had arrived in Michigan to capture a World title. After the first day of practice this Associated/Reedy driver posted the fastest run. A big psychological advantage going into qualifying in-



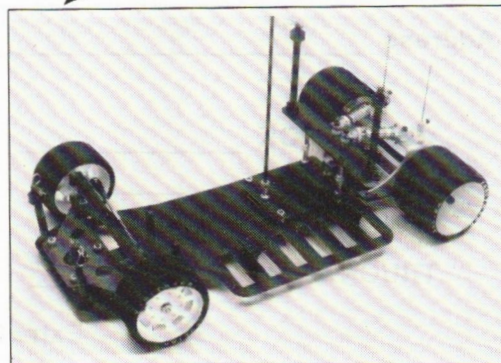
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deed.

As the sun came up Tuesday morning, August 6th, all drivers prepared to run a grueling schedule that called for five rounds of qualifying. The way the schedule was set up, with only one qualifying round the next morning to make the final, you had to figure day one of qualifying was the time to make your mark. This format was unpopular with many, to say the least. That it proved to be very grueling to both car and driver was obvious. But despite that obvious point, the true fact of the matter was that there was not enough time between rounds to dial cars in. To put it in a nut shell, if you were "on" for the kick off of qualifying you had a chance to make the final. If you were not, you might as well have packed it in and waited for 2WD.

This format was originated by IFMAR and not the SEMROCC club. Consequently, it was decided

at the IFMAR meeting that this format would need to be changed. In 1993 there will be four days of practice prior to the start of the event. In addition the track will be a virgin track and no warm-up race can be held on it prior to the event. At the start of the '93 worlds there will be one day of controlled practice, then 2 days of qualifying for each class with three qualifiers each day. On the days of each final there will only be practice before the mains. This format should be more pleasant for everyone.

Qualifying action began with the '89 defending world champion picking up where he left off. Masami ran 12 laps in a time of 5:05.04 in the first round. Masami, who runs for Yokomo/Associated/Reedy, was about two seconds ahead of the number two man. Jack Johnson was this number two man and his 12 lap run was posted with a time of

5:06.97. Jack ran a completely different setup. He piloted a Kyosho Lazer with Trinity power. The rest of the drivers who put themselves in the top ten after round one had times which ranged from 5:07.22 to 5:12.25, all were obviously 12 lap runs.

Round two saw no changes in positions. The run Masami posted in round one was beginning to look faster and faster. After three rounds had been completed, no driver had been able to post a faster run. In fact, after three rounds no driver had been able to post any time fast enough to propel them into the top ten. There was some shifting in the middle of the pack, but this was not due to cars battling on the track.

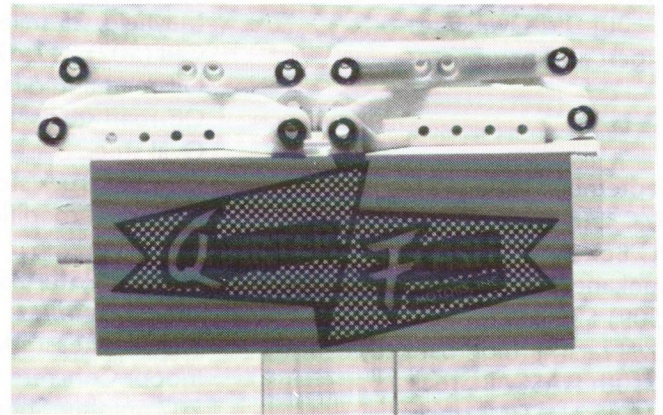
Cliff Lett was late to report to his turn marshaling post after his heat and his best run, a 12, 5:08.76 was lost. His second fastest run a 12, 5:09.68 was still fast enough to keep him in the top

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ten, but it placed him sixth on the grid instead of fifth.

Round four came and went with no change in the top ten at all. With only one round the next day before the main events, you can bet that the drivers were anxious to see what could be run in the final round on day one of qualifying.

Although anxiously anticipated, round five held no fast runs. No changes in the top ten, let alone a real challenge to topple Masami's TQ run.

Personally speaking, I can't remember a race where round one times were so firmly entrenched. I wanted to believe that it was a simple case of everybody putting in their hot stuff for the first round. With the good stuff used up it was little wonder there were not very many changes in the race to make the final. Yes, I wanted to believe that, but if I did I would be a fool. With the evidence in front of me, I had to believe that the track played some role in the outcome of the qualifying times.

QUALIFYING SNAPSHOT!

4WD ROUND 1
Masami Hirozaka
12 5:05.04

Jack Johnson
12 5:06.97

Kris Moore
12 5:07.22

Satoshi Maezumi
12 5:07.43

Cliff Lett
12 5:08.76

Joel Johnson
12 5:09.04

Mike Dunn
12 5:10.9

Kevin Moore
12 5:11.18

Scott Anfinson
12 5:12.21

Kazutaka Sumida
12 5:12.25

4WD ROUNDS 2-6
Masami Hirozaka
12 5:05.04

Jack Johnson
12 5:06.97

Kris Moore
12 5:07.22

Satoshi Maezumi
12 5:07.43

Cliff Lett*
12 5:08.76

Joel Johnson
12 5:09.04

Mike Dunn
12 5:10.9

Scott Anfinson
12 5:11.07

Kevin Moore
12 5:11.18

Mark Francis
12 5:12.09

* Cliff actually wound up 6th on the grid because of a penalty. His back-up time of 5:09.68 was used.

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Top U.S. hopeful Cliff Lett did not disappoint as he went on to take the 4WD World Title.

transponders and frequency compatibility, it was time to run the first main. This first one was a real battle between the two favorites of the event. Cliff Lett and Masami Hirosaka took it right to the wire with Lett able to hold on for the victory. Taking third spot was Jack Johnson. He was followed by Joel Johnson and Kris Moore rounding out the top five.

Going into round two, all the drivers still had a chance to take the title. Even the 10th place finisher, Kevin Moore was still in the running because he could use the previous heat as his throw-out.

While nobody was yet out of it, one driver who could wrap things up in this race was Cliff Lett. At the half way point things were looking good for Lett. He was out in front but Jack Johnson was close behind. At the 3:30 mark, Lett flipped and Johnson was able to squeak by for the lead. As it came to the wire Jack Johnson held on to win. Cliff Lett, while not winning, had to be feeling pretty good at this point with his second place finish. Jack couldn't be too upset with his success thus far, either. A first and a third tentatively put him second overall and one point behind the tentative leader Cliff Lett.

Moving into the third main there were only three drivers who could still take home the title, Cliff Lett, Jack Johnson and Masami Hirosaka. However for either Johnson or Hirosaka to win they would have to make sure Lett didn't win this main. The obvious incentive for Lett in this round was to win this heat, insuring the title. Picking up the action early we find Lett around the middle of the pack. Your early leader was Masami Hirosaka. For Lett, knowing that the man in front could potentially out point him for the title, must have given him something to think about. Lett rose to the challenge and quickly began to move up in the pack. Soon Cliff and Masami were once again battling for the lead. At this

I believe, that the difference in skill level with drivers of this caliber is very small. So small, in fact, that even the slightest advantage one can extract could spell the difference between making the final and being one of the "also rans".

We probably haven't reached the point, like in track and field, where we have to setup wind reading meters to see if a race or a jump is legal, or if the accomplishment was "wind aided", but we're getting there.

With the new day, came a new round of qualifying. Unfortunately for 119 or so drivers, the new day did not bring a new TQ. After the sixth and final round of qualifying Masami Hirosaka of Japan, the defending 4WD World Champion was still on top of the world with his TQ run which he posted in round one.

Likewise, there were no other drivers to make the top ten. The final grid was seemingly cast in stone from round two. The only change from the first round was in the number ten spot. when. In round one the man on the bubble was Kazutaka Sumida with a run of 12, 5:12.25. He was bumped in the second round by Mark Francis of the U.S. with his run of 12, 5:12.09. Splitting hairs, indeed!

With the final round of qualifying completed, a final round of

practice was slated with transponders, and then it was into the main events. Although mains as far down as an "L" were scheduled, we all converged on the SEMROCC club to crown a couple of world champions in our sport.

For the benefit of those readers who are not familiar with the world championship main format, let me briefly describe it to you. There are actually three five minute mains run. Two of these three mains will count for your overall finishing position. The winner is decided by the total number of points acquired in two of the three races. You receive 10 points for first, 9 for second and so on down to 1 point for tenth. In the event of a tie, officials would look to the driver's throw-out main to break the tie.

In past events we've added up the total numbers of laps with the driver's time and come up with a winner in this manner, but this old way doesn't make for intelligent driving.

The smart racer is the guy who wins races under control. When you don't consider position, but merely how fast a race was, you encourage a driver in the lead to drive all out, regardless of how close second place is. The smart driver wins the race in the slowest time possible.

After the practice run to check

point the cards were all in Cliff's hands. Because Masami finished fifth in round two, a victory here with Lett staying in second would not be enough to take the world championship. Lett on the other hand, could afford to back off and finish second, knowing the title would still be his. Although the lead changed hands a few times between Hirotsuka and Lett, in the end Masami held on to win, but only this race.

Lett wound up in second spot which was good enough for the title. Despite all the debate about track consistencies during qualifying, no one could debate how good the newly crowned 4WD World Champion was.

While there were no scheduled parties, they must have been whooping it up in the Associated/Reedy camp that night. A one-two finish for this team was more than anyone could hope for.

Thursday was a day off for everyone. The track was closed and no practice was allowed.

Scheduled events did pick up that evening with the Sanyo Party. The theme was Hawaiian with a full roasted pig and all. The party was held around the pool and a great time was had by all. This is one of those events that separate world championships from other events.

Friday morning started the second half of the world championships. It was now time for the 2WD's. The same format was used with practice all day, followed by five rounds of qualifying on Saturday and one round and the mains on Sunday.

Saturday morning came none to soon as everyone was set to get back into racing. Just like in 4WD, 12 laps is what it would take to make the 2WD final.

Round one was full of excitement. It ended up with Masami Hirotsuka capturing the TQ spot thus far with a 12, 5:18.56. The story of this round however wouldn't be complete without the explanation of a penalty assessed

to Cliff Lett. Cliff came across the finish line with a 12, 5:17.91. While this would have been good enough for TQ, Lett was assessed a five second penalty for "short coursing" the circuit. It was announced, several times that this penalty would be given because track cutting, in the place that Lett had done so, had gotten out of hand in 4WD. The penalty handed out went with much debate and dis-

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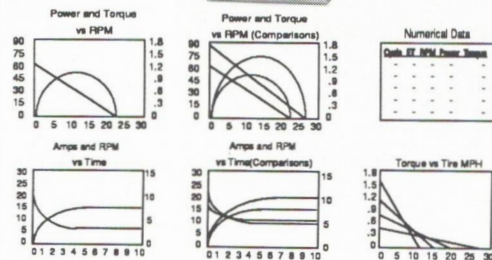
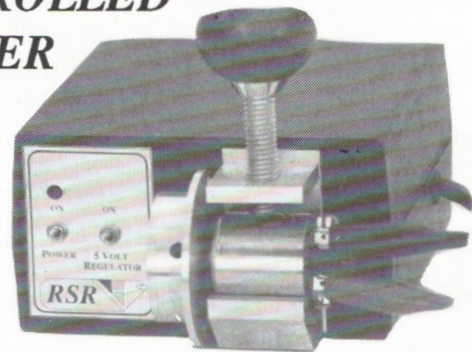
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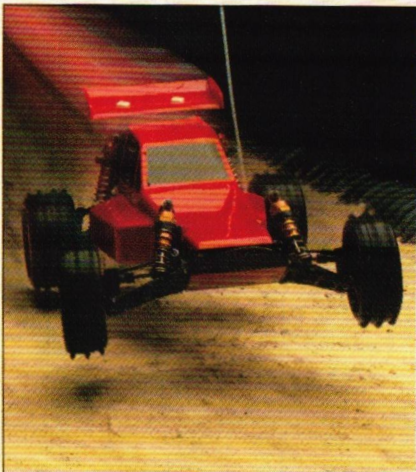
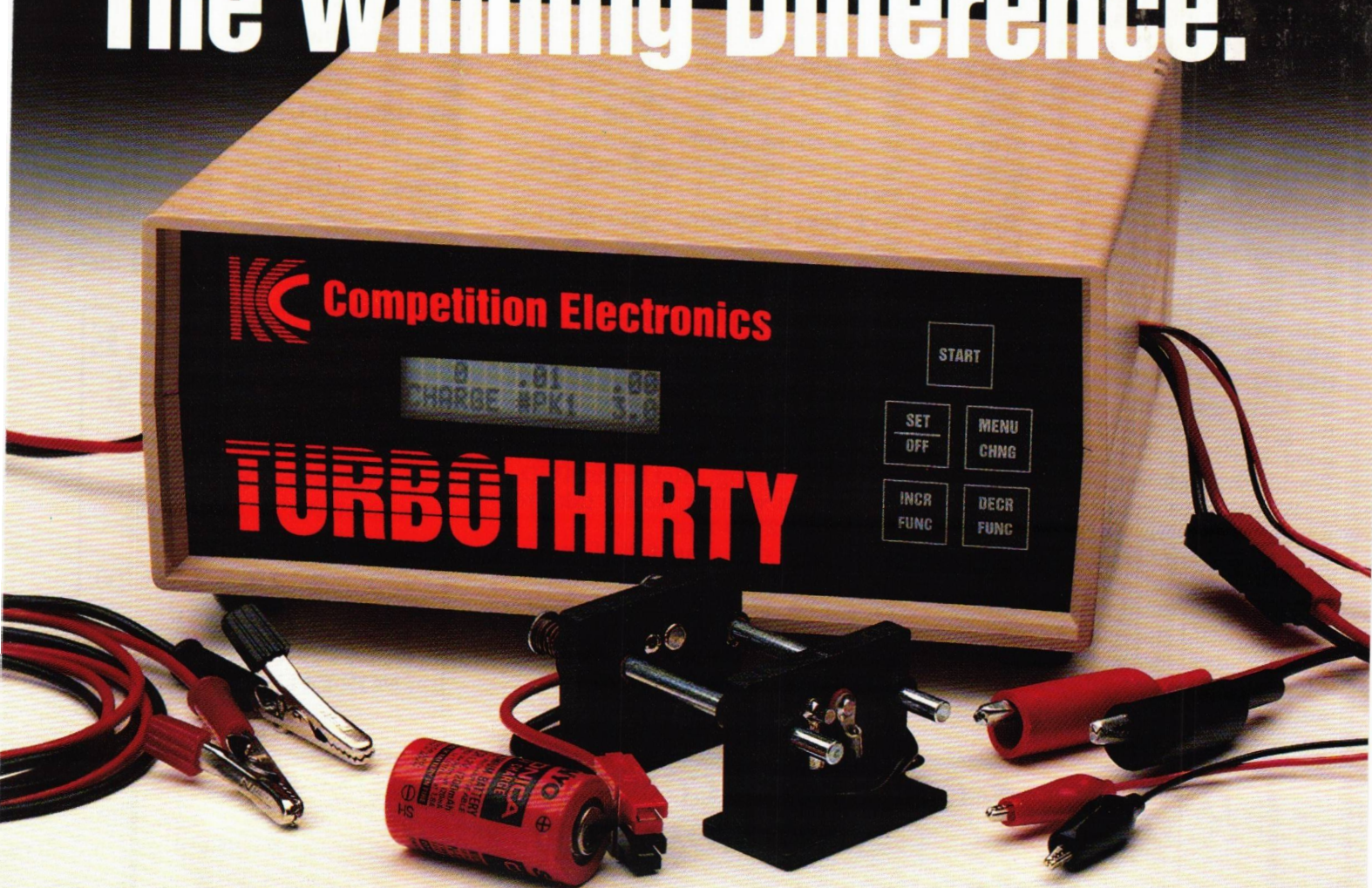
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cussion. To make a long story short, I don't believe Lett cut the track intentionally. It was a very bumpy section and cars were a bit out of control here, besides cutting the track here would not give him a five second advantage. In order to avoid future discussion or penalties, a board was placed on this section of the track, at Cliff's request.

That penalty bumped Cliff back to fourth on the grid with a time of 5:22.91. Qualifying was very tight in 2WD. To illustrate this point you only had to look at the two drivers who were ahead of Lett on the grid. Chris Allec of A & L Mfg., was the number two man at 5:22.33, and at 5:22.47 was Rick Hohwart of Peak Performance. Jon Anderson was the number ten qualifier at 12, 5:26.66.

After the second round Hiro-saka was still TQ, but that is pretty much all that remained the same. Several drivers posted quick times and were able to work them-

selves into the top ten. This same kind of shifting was experienced in round three. Hiro-saka was still TQ but positions two through ten were jumbled quite a bit.

Then came round four. After this round no changes occurred. It's a shame that questions in track consistency continued to creep up. With round four seeing no changes, the debate about track consistency grew.

Round five saw the track grooming discussion reach a new level, when Kyle Reed set the new TQ. Here's the story behind the story. A track grooming schedule was made up by the organizers so everybody knew exactly when the track would be groomed. In this round grooming was slated prior to Kyle Reed's heat. When he set TQ, along with Rick Vehlow also making the final from this same heat, you could imagine the uproar.

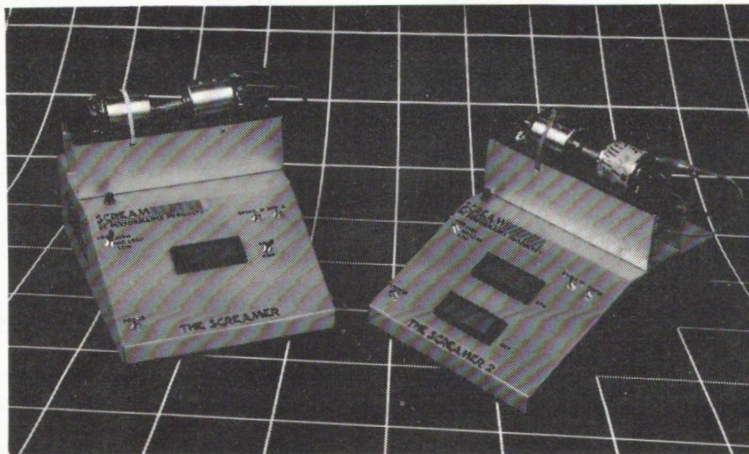
The day ended with this debate being the topic of discussion among all the racers on hand.

What would the track have in store for the final round Sunday morning?

Everyone thought they knew the answer the next morning as they scrutinized the circuit. The track appeared to be fast in the morning. Drivers like Jay Halsey, Gil Losi, Jr., Jack Johnson, Rick Hohwart and Joel Johnson, all not yet in the final, looked like they might make it in the final round. In Halsey's case, one spill cost him the chance to be in the final. He wound up in the B. Losi had a similar misfortune. He was well on his way to a possible TQ run when, at the 3:30 mark, a mechanical problem forced him out of the race.

As the day went on the track appeared to slow down. By the time it was TQ Kyle Reed's turn, everyone agreed the track was not fast. It was very rutted and although you still stepped up to the line with TQ in mind, you knew the track might not allow it. Excellent driving has a way of

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overcoming many obstacles. In the case of Kyle Reed, excellent driving also overcame the critics.

Despite the track not being at its best, Kyle was off on an blistering run. This Losi/Trinity driver turned in six laps in the 25 second bracket. It was only because he dumped a little on the last lap that he did not break his own TQ. None the less, he had an awesome back up run showing everyone in attendance that Kyle Reed, and not the good track condition on Saturday, drove his Trinity powered Team Losi car to the TQ position.

The drama in this round had

It would only be a few short hours until the first final would begin. The 4WD event a few days back saw a great contest between three drivers. This one looked like there could be several more players.

Soon enough the fastest ten men in the world, in 2WD modified climbed onto the stand. Seconds later the horn sounded and we were racing.

Opening moments of the race saw Masami in front with Kyle Reed and Mark Pavidis trailing in second and third. The front two swapped positions once then switched back again. Masami

Reed taking the victory in the first leg with Mark Pavidis, second and Kevin Moore third.

If you weren't a Kyle Reed fan before this race, his performance over the last couple of days would definitely convert you. From his controversial TQ run to winning the first leg of the final, he let his driving speak for itself.

They say when your number two you try harder. Masami finished second in 4WD and while his qualifying performances were outstanding, the first leg of this 2WD world championship chase had to be less than satisfying for him. Another third place per-

QUALIFYING SNAPSHOT!

2WD ROUND 1	2WD ROUND 2	2WD ROUND 3	2WD ROUND 4	2WD ROUND 5	2WD ROUND 6
Masami Hirotsuka 12 5:18.56	Masami Hirotsuka 12 5:18.26	Masami Hirotsuka 12 5:18.26	Masami Hirotsuka 12 5:18.26	Kyle Reed 125:15.27	Masami Hirotsuka 12 5:10.49
Chris Allec 12 5:22.33	Craig Drescher 12 5:20.60	Kevin Moore 12 5:19.49	Kevin Moore 12 5:19.49	Masami Hirotsuka 12 5:18.26	Kyle Reed 12 5:15.27
Rick Hohwart 12 5:22.47	Kris Moore 12 5:21.45	Craig Drescher 12 5:20.60	Craig Drescher 12 5:20.60	Kevin Moore 12 5:19.49	Rick Vehlow 12 5:17.57
Cliff Lett* 12 5:22.91	Chris Allec 12 5:22.33	Kris Moore 12 5:21.45	Kris Moore 12 5:21.45	Craig Drescher 12 5:20.60	Scott Montgomery 12 5:17.67
Andrew Nelson 12 5:23.39	William Mitcham 12 5:22.35	Heikki Naulapaa 12 5:21.76	Heikki Naulapaa 12 5:21.76	Rick Vehlow 12 5:21.06	Mark Pavidis 12 5:18.57
Craig Drescher 12 5:25.10	Rick Hohwart 12 5:22.47	Cliff Lett 12 5:21.82	Cliff Lett 12 5:21.82	Kris Moore 12 5:21.45	Satoshi Maezumi 12 5:19.00
Gil Losi Jr. 12 5:25.97	Cliff Lett 12 5:22.91	Kyle Reed 12 5:21.97	Kyle Reed 12 5:21.97	Heikki Naulapaa 12 5:21.76	Kevin Moore 12 5:19.49
Scott Montgomery 12 5:25.97	Andrew Nelson 12 5:23.39	Chris Allec 12 5:22.33	Chris Allec 12 5:22.33	Cliff Lett 12 5:21.82	Craig Drescher 12 5:20.60
Jack Johnson 125:26.42	Curtis Strawn 12 5:23.99	William Mitcham 12 5:22.35	William Mitcham 12 5:22.35	Chris Allec 12 5:22.33	Derek Furutani 12 5:21.36
Jon Anderson 12 5:26.68	Tony Fagan 12 5:24.23	Rick Hohwart 12 5:22.47	Rick Hohwart 12 5:22.47	William Mitcham 12 5:22.35	Jurgen Lautenbach 12 5:21.37

* Cliff actually turned a 5:17.91, but was assessed a 5 second penalty for short coursing the track. The cut was not intentional, but it was felt that some advantage was gained. After his penalty, a board was place on the spot of the cut to avoid others receiving the penalty.

not played out completely yet. Remember, people thought the track was slow! Again excellent driving prevailed. A few heats later Masami was back on top as TQ with a run of 12, 5:10.49. This was five seconds faster than Kyle's time. A truly outstanding performance.

uncharacteristically, bobbled a few times allowing Reed to move up again. With one minute to go, Reed was desperately trying to catch Masami. A break for Reed was when Masami flipped. Both Reed and Pavidis went by before Masami could be marshaled. The race ended with

formance for Masami would probably cost him the worlds title. With this in mind Masami bolted to the front from the go in the second heat. Second was Rick Vehlow and in third was Kevin Moore from Great Britain. Heat one winner Kyle Reed was sitting in fourth. With one

minute to go Masami relinquished the lead to Vehlow when he got tied up with a board. Masami held on to second and Kyle Reed was in third. With one lap to go, and Masami trailing, Vehlow held off many attempts by Masami to hold on for the victory. Hirosaka did finish second with Reed taking third.

Remembering that only two out of the three heats count, the title was still wide open. Four drivers emerged as favorites for the title. They were Kyle Reed (1st & 3rd), Rick Vehlow (7th & 1st), Masami Hirosaka (5th & 2nd) and Mark Pavidis (2nd & 8th). Kevin Moore also had a chance with his 3rd and 4th place finishes, however he would have to win his third run and Kyle Reed would have to finish no better than fifth.

Masami, as he did in the first two races, jumped to the lead. Vehlow and Reed tucked in behind for second and third. Right from the start you knew this was going to be a race to remember. The three of them drove around the track for the first two minutes without changing positions. Vehlow made the first mistake by rolling his car. Racing luck, for the first time in this event, now played a big part. As I said Vehlow rolled it and his roll was just in front of Reed. Reed's machine wedged inside of Vehlow's and when the marshal came to the rescue he flipped Vehlow back over in front of Reed. Then Reed crashed and Kevin Moore moved into third. With one minute left Masami was still

in front with Vehlow in second. You would immediately think that if Vehlow finished second behind Masami, there would be a tie. However the third round comes into play to break any ties. Therefore if the race ended this way Masami will be world champion. It did. Therefore, Masami was. Vehlow finished second and Reed took home third.

At every major race there are so many stories that deserve coverage. Over the past few years a top US driver in off road has been Cliff Lett. That he should come away with the 4WD World Championship is not surprising.

That Masami should win 2WD is also not surprising. What driver in electric racing has been so dominant? The fact that he TQ'ed both classes even adds to the championship.

Certainly we need to thank the sponsors, Trinity and Kyosho for their support. While we still may have a race without sponsorship it definitely would not be special. Also a special thanks goes out to all the members of team SEMROCC for all the work they did to make this event such a success.

There are other stories just as important as the ones just mentioned, only they are more subtle and take a little more to appreciate. Mark Pavidis and Derek Furutani are two very important stories. While both have won major races such as the Reedy Race of Champions and the ROAR Nationals, putting themselves in the final at the

world championships means they have graduated to an even higher level of performance. We should no longer be surprised to see their names at the top of any list. And I'm sure from this day forward we will be seeing them at the top of many. As a short personal note, I can remember just a few years back when both of these drivers were the terror of novice. Their climb from "worst to first" should give notice to any new drivers starting today who in a few short years, may be trying to make a similar climb.

Scott Montgomery is another interesting story that needs to be told. He was not entered in the race nor was he an alternate, yet came from Texas in the hopes of competing anyway. When a spot opened up the SEMROCC club graciously, as has been done in the past, let him compete as a promoter's choice. Montgomery made the most of his fortuitous opportunity and qualified fourth overall in the 2WD class with his Traxxas car and wound up finishing eighth in the final. A truly remarkable performance from a driver who didn't even know he would be racing until the first day of the event.

I await anxiously the '93 World Championships to most likely be held in Europe. They tell us we will know for sure by the end of November. I'll certainly be there and if you're fast enough I'm sure you'll be there too!

CP

WORLD CHAMPIONSHIPS FINAL RESULTS

4WD RESULTS

POSITION/DRIVER/POINTS/CAR/MOTOR/SPEED CONTROL

- 1st Cliff Lett - 19 pts. Yokomo/Reedy/Novak
- 2nd Masami Hirosaka - 19 pts. Yokomo/Reedy/Novak
- 3rd Jack Johnson - 18 pts. Lazer/Trinity/Novak
- 4th Joel Johnson - 15 pts. Lazer/Trinity/Novak
- 5th Satoshi Maezumi - 14 pts. Yokomo/Atlas/Tekin
- 6th Scott Anfinson - 12 pts. Yokomo/Reedy/Tekin
- 7th Kris Moore - 9 pts. Lazer/Twister/Novak
- 8th Kevin Moore - 9 pts. Scumacher/LRP/LRP
- 9th Mark Francis - 8 pts. Yokomo/Reedy/Novak
- 10th Mike Dunn - 8 pts. Lazer/Race Rep/Novak

2WD RESULTS

POSITION/DRIVER/POINTS/CAR/MOTOR SPEED CONTROL

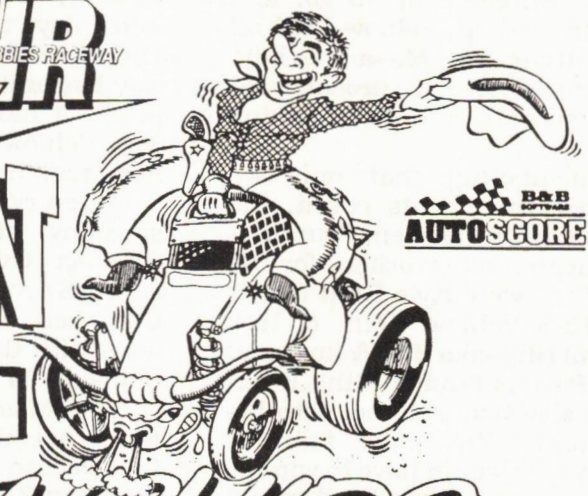
- 1st Masami Hirosaka - 19 pts. Assoc./Reedy/Novak
- 2nd Rick Vehlow - 19 pts. Assoc./Reedy/Novak
- 3rd Kyle Reed - 18 pts. JRXX/Trinity/Novak
- 4th Kevin Moore - 15 pts. Cougar/LRP/LRP
- 5th Mark Pavidis - 12 pts. Assoc./Reedy/Novak
- 6th Jurgen Lautenbach - 12 pts. Cougar/LRP/LRP
- 7th Satoshi Maezumi - 12 pts. Assoc./Atlas/Mach 7
- 8th Scott Montgomery - 9 pts. Traxxas/Peak Performance/Novak
- 9th Craig Drescher - 9 pts. Assoc./Reedy/Novak
- 10th Derek Furtani - 3 pts. Assoc./Peak Performance/Novak

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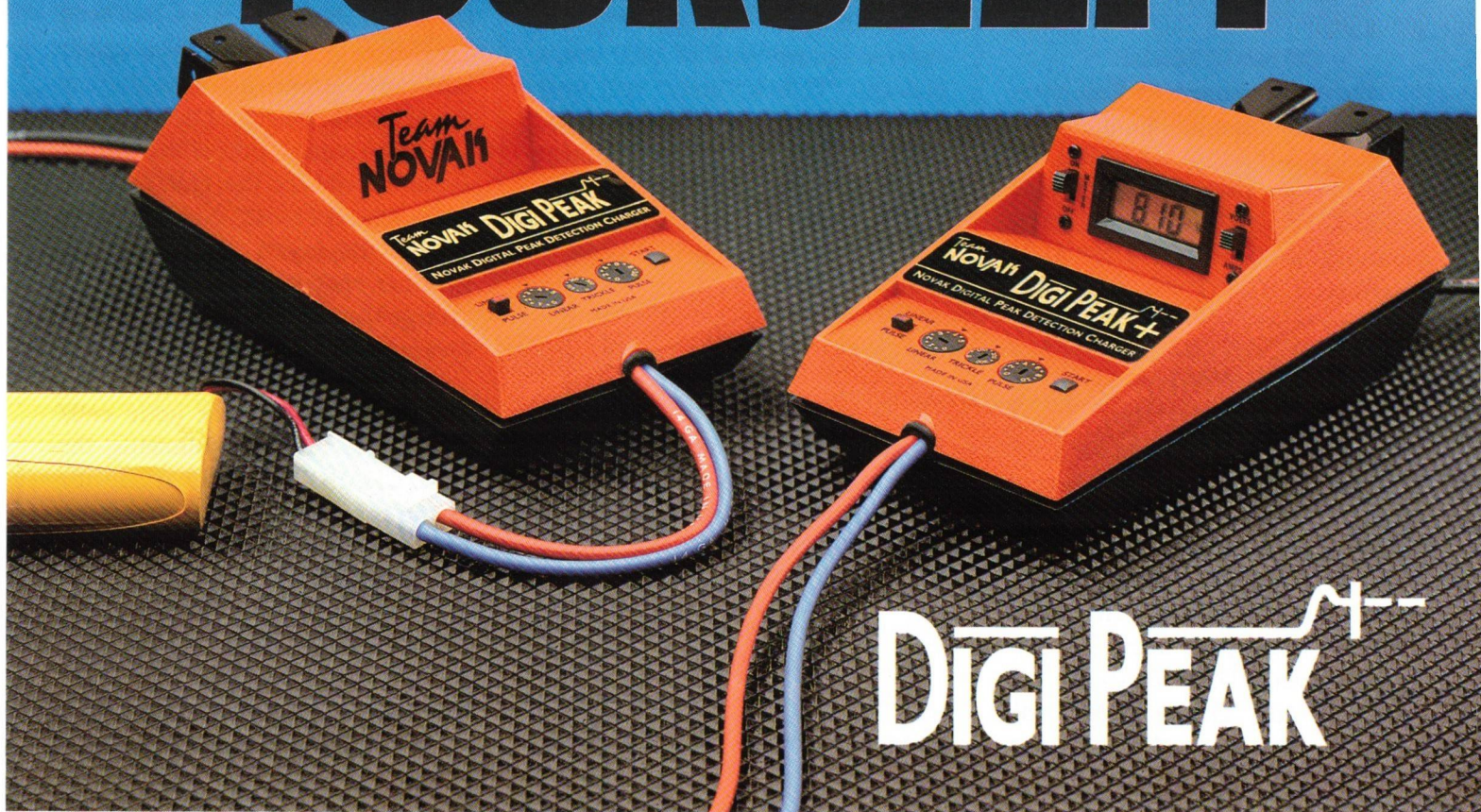
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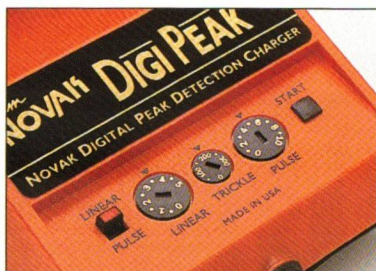


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Last time we looked primarily at the programmable option available on Competition Electronic's (CE) "TURBOthirty". If all is setup correctly, we're ready to begin charging and matching. So let's get to it!!

CHARGE MODE

When the charger is first powered up, it comes up in CHARGE MODE and it will display the default charge rate. You can also quick key to CHARGE MODE by pushing "INCR FUNC" + "START" together. If "START" is pushed, the

```
0000 7.22 .00
CHARGE #PK1 3.50
```

charger will peak charge for your cell/pack. If you need a different charge rate, a combination of three possible keys can be used to set the new rate "INCR FUNC", "DECR FUNC", and "SET/OFF". The "INCR FUNC" will move the underscored(CURSOR) to the left one digit and "DECR FUNC" will move the cursor to the right one

digit. Once the cursor is under the digit to be changed, use the "SET/OFF" key to change the value. Each time the "SET/OFF" button is pushed, it will change the underscored digit by 1. If you will refer back to the first article and the chart 'Default Settings', you can enter a charge rate of 19.9 amps but the "TURBOthirty" will only allow a maximum rate of 12.00 amps. Once the desired charge rate is set, press "START" to begin charging. At this time, the second line of the display will change to read - CHARGING 1 xx.xx where

```
0351 10.92 5.01
CHARGING 1 14.23
```

xx.xx is the power supply voltage. When charging has completed, the charger will shut off and display "CHARGE DONE" on the second line. The "TURBOthirty" will not

```
1302 8.63 .29
CHARGE DONE
```

automatically start trickle charg-

ing since the default setting was set to "NO". With today's charging techniques and PUSHED cells this shut-off feature is perfect. Trickle charging tends to flatten the performance of SCE's and shorten the life of PUSHED cells. Once the CHARGE DONE message has been displayed, the time in the upper left hand corner of the display contains the time that has elapsed since the completion of the charge cycle. To obtain the charge time, press "INCR FUNC". Now, the time being displayed contains the number of seconds it took to peak charge the battery. Record this information for future reference.

The "TURBOthirty" has the ability to triple peak your cell/pack. The number following the word CHARGING on the mode line of the display indicates which re-peak is being done, 1, 2, or 3. To multi-peak your cell/pack, move the cursor using the "INCR FUNC"/"DECR FUNC" keys to the "1" in "#PK1". Use the "SET/OFF" button to change the value from 1 to 2 or 3, depending on the number of times you want the cell/pack re-peaked. Between re-peaks, a delay

time can be specified; see "Setting Up Selectable Values" in article 1. If a delay time is specified, the display will show DELAY TIME_x, where x is the cycle number. The digits after the message

```
1241 7.22 0.00
DELAY TIME1 0120
```

DELAY TIME_x, are the seconds remaining before the next re-peak starts. Once all the re-peaks have been completed, you'll see the CHARGE DONE message; refer to the previous discussion on this topic. One of the safety features of the "TURBOthirty" is the automatic

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TURBOthirty

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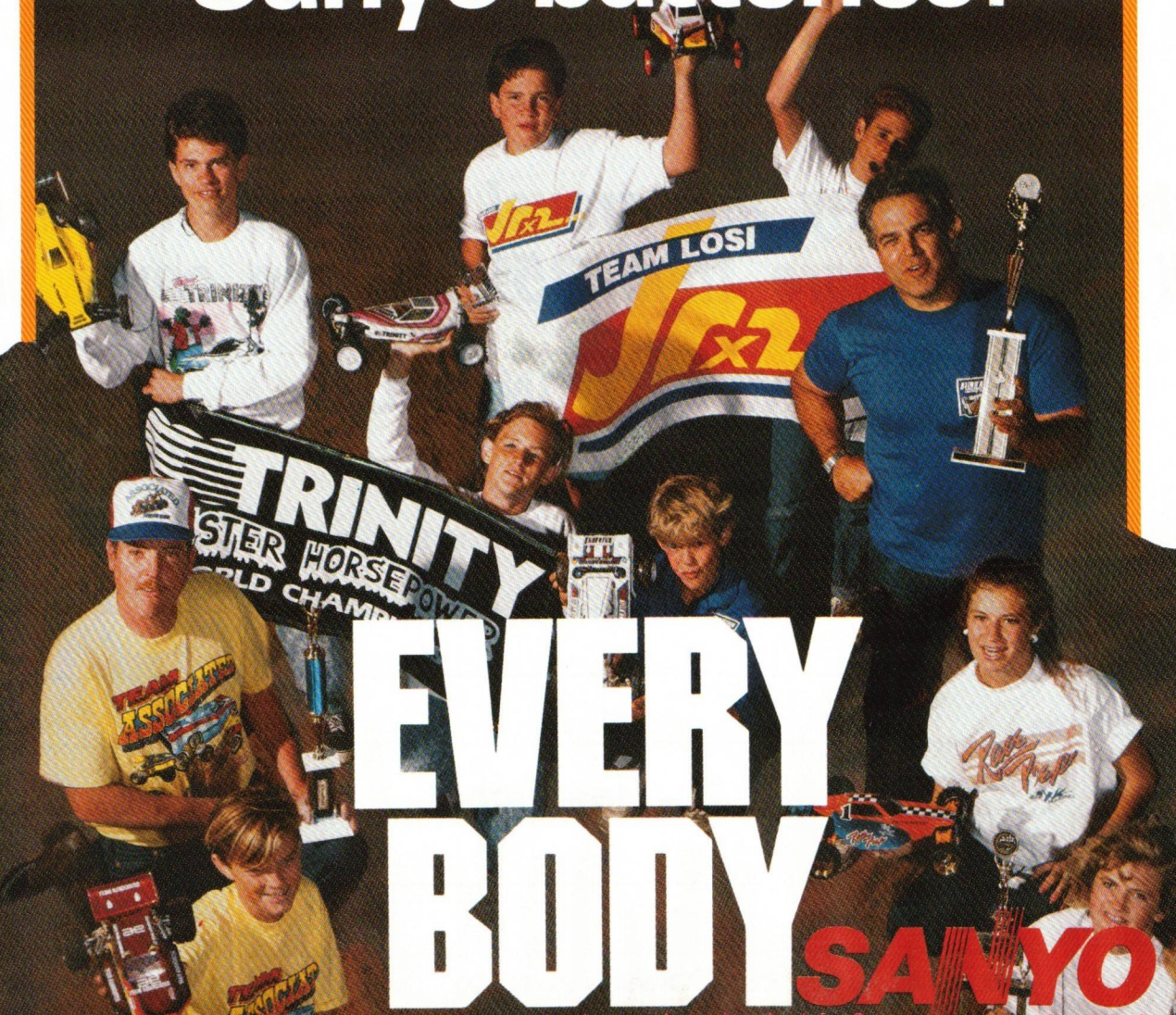
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PEAK CHARGE VOLTS DISPLAY MODE

Use the "INCR FUNC" or "DECR FUNC" keys to change displays until the mode line reads "PEAK CHG V xx.xx", where xx.xx is the peak voltage obtained during the charging cycle.

```
1234 7.12 .00
PEAK CHG V 10.32
```

VOLTAGE DISPLAY MODE

To enter this mode, keep pushing "INCR FUNC" until the mode line reads "SUPLY VOLT xx.xx", where "xx.xx" is the power supply voltage. The power supply voltage is part of the charge/discharge displays and no longer requires a separate display but if your not

```
1234 7.12 .00
SUPLY VOLT 18.12
```

charging or discharging and want to know the power supply voltage, simply press the "INCR FUNC" button until it displays the "SUPLY VOLT xx.xx" and xx.xx is the power supply voltage. The "START" and "INCR/OFF" buttons have no effect in this mode.

DISCHARGE MODE

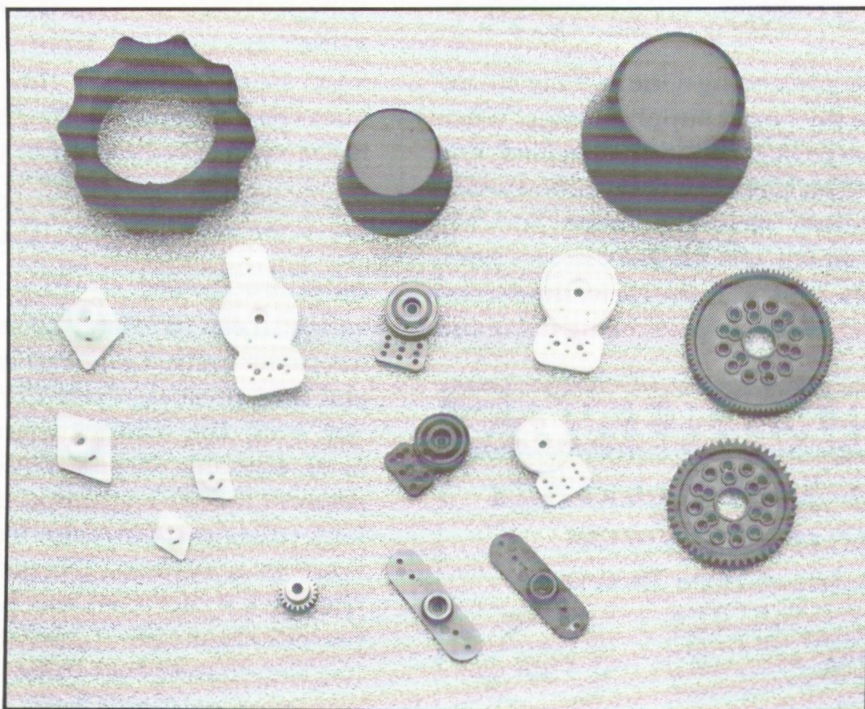
To get to the DISCHARGE MODE, press "INCR FUNC" until the mode line displays "DISCHG AMP 20 6C" or you can quick key it by pressing "INCR FUNC" + "SET/OFF" together. This line contains two of our default settings, the "20" amp discharge rate and the "6" cell pack. Again the "INCR FUNC"/"DECR FUNC" keys can be used to move the cursor to the digit requiring modification and

then the "SET/OFF" button can be used to change the value; i.e. to change the number of cells to be discharged from "6", press "SET/OFF" and the values 1, 4, 6 or 7 will alternately appear. The "TURBOthirty" can discharge a single cell at a maximum rate of 30 amps, however, only a 25 amp max. discharge rate can be used for 4, 6, or 7 cell packs. Once the discharge rate and cell count is set, press "START" to begin the discharge;

```
0391 6.84 4.00
DISCHGING 14.23
```

the mode line will change to "DISCHGING xx.xx", where xx.xx is the power supply voltage. Discharging will be completed when the mode line display's "DISCHARGE DONE". The time in the upper left hand corner of the display gives the number of seconds

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```
0391 6.84 4.00
DISCHARGE DONE
```

it took to discharge this cell/pack at the specified rate. To get to the average discharge voltage, press the "INCR FUNC" key until the

```
0608 7.17 .00
DISCHG AVE 6.89
```

mode line displays "DISCHG AVE xx.xx", where xx.xx is the average discharge voltage. By continuing to press the "INCR FUNC" key, the mode line will change to "INTERNAL RES xx", where xx is a relative internal resistance value.

```
0608 7.17 .00
INTERNAL RES 37
```

Relative internal resistance is a concept devised by Jeff Pack and licensed by Competition Electronics. It needs to be noted that internal resistance is a relative number and by itself has no cell matching qualities. However, internal resistance, when used with the other traditional cell matching values like discharge rate, discharge time, charge rate, and charge time, is a valuable tool to better cell matching.

CYCLE MODE

Cycle mode combines the charge and discharge modes. To get to this mode, push "INCR FUNC" until the second line of the display reads

"CYCLE x CELL x" or you can quick key it by pressing "INCR FUNC" + "MENU CHG" at the same time. In the message "CYCLE x CELL x", the first "x" represents the number of cycles to be done and the second "x" represents the cells in the battery pack. With all of the default work done in the first

```
0000 7.17 .00
CYCLE 1 CELLS 6
```

article, cycling a cell/pack is a breeze. Use the "INCR FUNC"/"DECR FUNC" to move the cursor to either of the two digits that can be modified and when you're ready, press "START". Charging will be done as described in the "CHARGING MODE" section of this article. If re-peaks are set to be done, then they're done. The only real difference is the mode line display which will read "CYCLx CHGx xx.xx", where the first "x" is the cycle being done, the second "x" is the

```
0000 7.17 .00
CYCL1 CHG1 14.23
```

re-peak being done and the "xx.xx" is the power supply voltage. When re-peak has been specified and when there is a delay time specification also, the mode line will display "CYCLx DLYx xx.xx", here, the first "x" is the cycle, the second "x" is the re-peak being done and

```
0000 7.17 .00
CYCL1 DLY1 14.23
```

xx.xx is the power supply voltage. When CYCLE MODE has entered the discharge phase, the mode line display changes to "CYCLx DSCG xx.xx". Again, the first "x" is the cycle number and "xx.xx" is the

```
0000 7.17 .00
CYCL1 DSCG 14.23
```

power supply voltage. There is a "cool down" phase in CYCLE MODE, which is the time between the end of one cycle and the start of the next one. During this time, the mode line will display "COOL DOWN CYCLEx", here "x" is the NEXT cycle to be done.

```
0000 7.17 .00
COOL DOWN CYCLE2
```

MOTOR RUN MODE

The "TURBOthirty" has a motor test and break in mode. To get to this mode, use the quick key combination of "INCR FUNC" + "DECR FUNC" or press the "INCR FUNC" key until "MOTOR VOLTS x.xx" is displayed on the mode line. The x.xx value in this display is the voltage to be used to power

```
0000 7.17 .00
MOTOR VOLTS 3.00
```

the motor. As with all other digital values, it can be altered by moving the cursor to the digit to be changed and then pressing the "SET/OFF" key until the desired value has been entered. Once "START" is pressed, the "TURBOthirty" checks for a voltage on the motor leads. If there is a voltage, the message "HOOK UP MOTOR" will be displayed. Once the "TURBOthirty" has determined that there isn't a voltage on the motor leads, it "soft starts" your motor and displays "MOTOR ON xx.xx", here xx.xx is the power supply voltage. A "soft

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- 🚩 **NORRCA PRESIDENT, J.R. SITMAN WILL BE PRESENT**
- 🚩 **NORRCA MEMBERSHIP REQUIRED**
- 🚩 **HOST HOTEL: RAMADA INN, LONG BEACH, (601)864-8811 • LOCATED ON THE BEACH • POOL & HOT TUB**

NORRCA

NORRCA OFFICIAL 3RD ANNUAL MISSISSIPPI STATE OFF-ROAD CHAMPIONSHIPS ENTRY FORM

NAME _____ PHONE _____ ADDRESS _____

CLASS(ES): 2W STOCK 2W OPEN 2W PRO STOCK SUPER STOCK TRUCK

OPEN 2WD TRUCK PRO STOCK TRUCK NOVICE

RADIO FREQUENCIES 1. _____ 2. _____ 3. _____

SPONSOR(S) _____

ENTRY FEES: OPEN AND PRO-STOCK...\$30.00. STOCK...\$40.00 (includes one handout motor)

PRE-ENTRIES CLOSE NOV.25. ENTRIES AFTER THE 25TH ADD \$5.00

.NO REFUNDS. SEND ENTRY FORM AND CHECK PAYABLE TO: NORM'S HOBBIES

GOOD LUCK RACERS, AND HAVE FUN!

NORRCA# _____

DIRT OVAL
Florida

NORRCA

STATE CHAMPIONSHIPS

NOVEMBER 23 • MARTIN COUNTY SPEEDWAY

- ☞ FREE T-SHIRT FOR ALL ENTRANTS
 - ☞ TQ HAT PINS FOR ALL CLASSES, TROPHIES 1-3 PLACE, RIBBONS 4-10 PLACE, ALL MAINS.
 - ☞ CONCOURS TROPHIES 1-3 PLACE.
 - ☞ NORRCA MEMBERSHIP REQUIRED. MEMBERSHIP AVAILABLE AT THE TRACK.
 - ☞ HOST HOTEL IS...HOLIDAY INN OF STUART (407)287-6200 ASK FOR R/C RACE RATE
 - ☞ T.Q. PINS • TROPHIES 1-3 PLACE • RIBBONS 4-10 PLACE ALL MAINS
 - ☞ PRESIDENT'S CUP RACE...COME WATCH NORRCA PRESIDENT, J.R. SITMAN AND ROAR PRESIDENT, ROY WEAST DO BATTLE ON THE TRACK, BEST TWO OUT OF THREE RACES
 - ☞ THERE WILL BE AN INVITATIONAL TEAM FROM BOTH ORGANIZATIONS
 - ☞ A.M.B. AUTOCOUNT SCORING SYSTEM WITH B&B SOFTWARE WILL BE USED
 - ☞ TRACK LOCATED 10 MINUTES FROM BEACH • 35 MILES FROM WEST PALM BEACH
- RACE SCHEDULE...**
 NOV. 22-OPEN PRACTICE NOON TO 8PM.
 NOV. 23-PRACTICE TILL 9:15AM • ENTRIES CLOSE 9:00AM • CONCOURS 9:30
 RACING STARTS 10AM • THREE ROUNDS OF QUALIFYING AND MAINS



J.D. CUSTOM HOBBIES



LOU'S R/C HOBBIES & RACEWAY



ED'S AUTO REPAIR

5TH ANNUAL VICTORY CHILDREN'S HOME CHRISTMAS RACE

NOVEMBER 24 • \$10.00 ALL CLASSES! • PRACTICE 7AM TO 9:15 AM • CONCOURS 9:30 • RACING AT 10AM • 2W OPEN • 2W PRO STOCK • OPEN TRUCK • 4W OPEN • NOVICE • CAMPING O.K. FOR BOTH EVENTS • CONTACT JERRY LANDRY FOR MORE INFO (407) 220-1816 • NORRCA OR ROAR MEMBERSHIP REQUIRED FOR THE VICTORY RACE

NORRCA

NORRCA OFFICIAL 1991 CALIFORNIA DIRT OVAL STATE CHAMPIONSHIPS ENTRY FORM

NAME _____ PHONE _____ ADDRESS _____

CLASS(ES): 2W STOCK 2W OPEN 2W PRO STOCK OUTLAW SPRINT

4W OPEN OPEN TRUCK SUPER STOCK TRUCK OPEN 6 CELL EAST COAST MODIFIEDS NOVICE

RADIO FREQUENCIES 1. _____ 2. _____ 3. _____

ENTRY FEES: NOVICE, 2WS, SUPER STK TRK=\$35.00 (includes one handout motor). OPEN AND PRO CLASSES= \$25.00. ENTRIES DAY OF RACE ADD \$5.00. NO REFUNDS. SEND ENTRY FORM AND CHECK PAYABLE TO: MARTIN CTY SPEEDWAY, 2953 S.E. ELLENDALE ST., STUART FLORIDA. FOR MORE INFO CONTACT: JERRY LANDRY (407)220-1816 OR NORRCA (714)981-9641

GOOD LUCK RACERS, AND HAVE FUN!

NORRCA# _____

0000	.17	.00
MOTOR ON	14.23	

start" is a controlled start up of your motor to eliminate amperage spikes. It will take about 3 seconds for the motor to come up to speed.

BUZZ BOX MODE

Are you an oval racer or someone who likes to heat up your batteries at the starting line? If you are, you're going to love the BUZZ BOX MODE of the "TURBOthirty". If you're not familiar with "buzz box" you might recognize the term "bump box" but in either case, to locate this mode, press "INCR FUNC" until "BUZZ

0000	7.17	.00
BUZZ BOX SEC	19	

BOX SEC xx" is displayed. The "xx" value is the number of seconds that this mode will operate before it shuts off; there's a 19 second maximum. By pressing "INCR FUNC" again, the "BUZZ BOX AMP xx" menu will be displayed. The "xx" value here is the number of amps bumped into your packs to heat it up; there is an 18 amp maximum "bump" rate. Use this option with care, it's possible to vent cells.

OTHER MESSAGES

One of the benefits of intelligent hardware is its ability to notify the operator of problems and protect itself from damage. The following examples are some of the self-explanatory messages displayed by the "TURBOthirty":

Of course, if it's determined that

0000	8.28	.00
HOOK UP BATTERY		

0000	1.17	.00
BAT VOLTS TOO LO		

0000	7.98	.00
BAT VOLTS TOO HI		

a function needs to be stopped, press "SET/OFF".

CONCLUSION

Competition Electronics' "TURBOthirty" is a great addition to its product line. This unit is one of the best designed units available today. CE continues to set high standards to which all other chargers of this class will be compared. Choose a good power supply that can provide 20 amps continuously. 'Til next time, GOOD RACING!

Competition Electronics

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Rockford, IL. 61109
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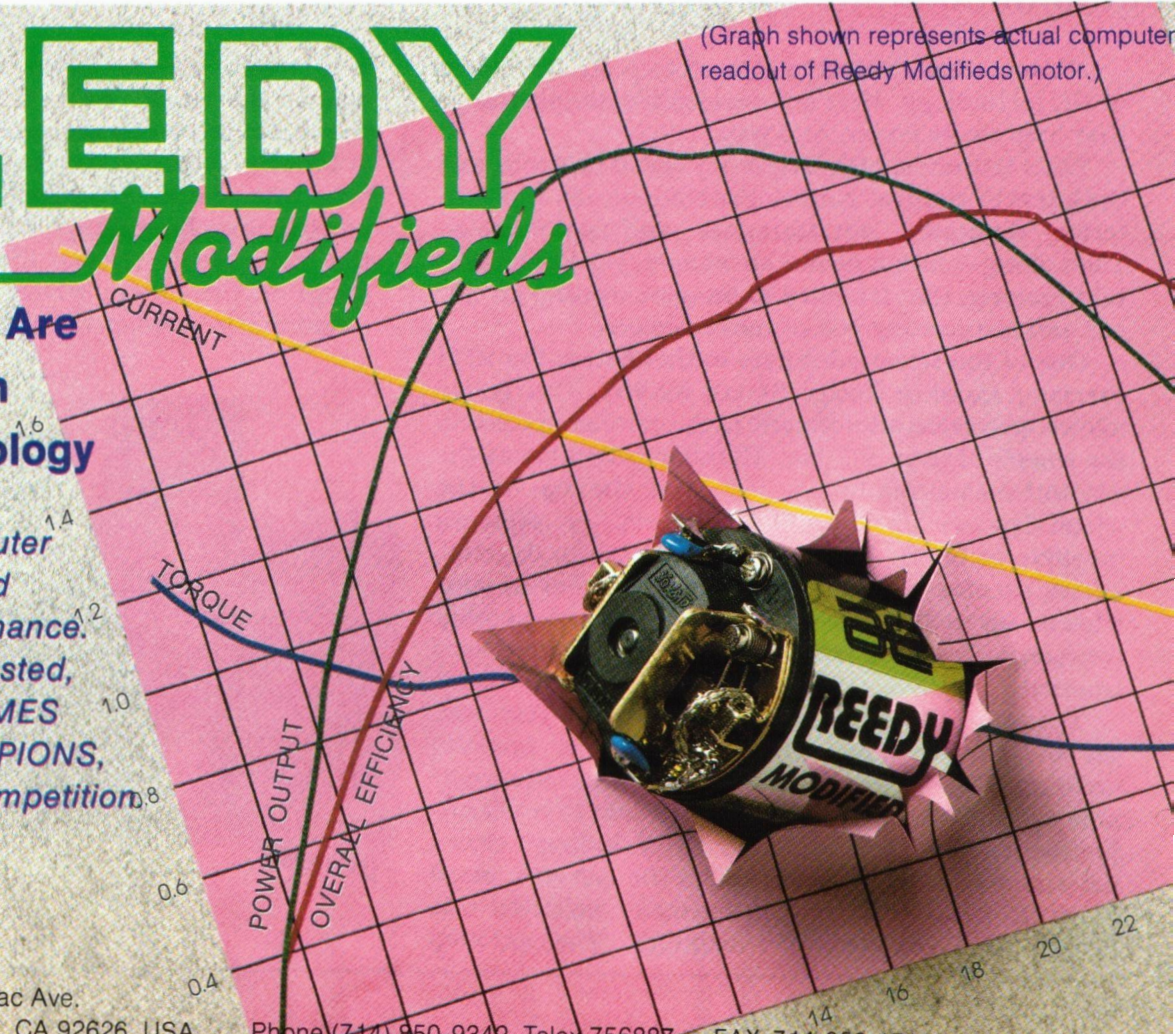


3585 Cadillac Ave.
Costa Mesa, CA 92626 USA

Phone (714) 850-9342 Telex 756887

FAX 714-850-1744

(Graph shown represents actual computer readout of Reedy Modifieds motor.)



RPM PRECISION CAMBER GAUGE

By Jeff Pack

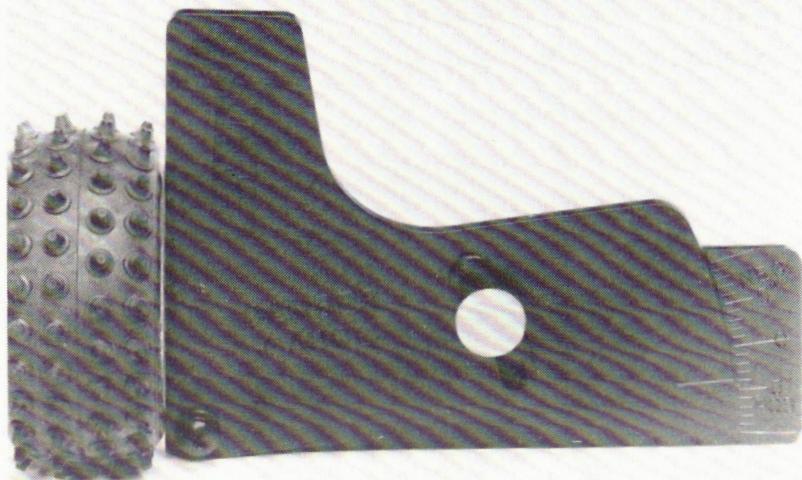
All too often, we get so caught up in the latest of RC technology, that we overlook the simple things that help us go faster, and win.

Killer batteries, high frequency speed controls, and the latest in natural rubber tire compounds and patterns, dominate our thoughts and pocketbooks. Then along comes a device so simple, yet fundamental to racing, that it's hard to imagine owning an RC car and not owning one of these devices.

One of the latest additions to this list, is the RPM Precision Camber Gauge (Retail \$9.95). This gauge allows precision adjustment of the camber applied to the wheels of your RC car. Camber is defined as the amount (measured in degrees) that the top of the wheel tips inward (negative camber), or outward (positive camber). This gauge, graduated in degrees, allows precise adjustment of the camber in your wheels, up to 10 degrees. Typically, positive camber decreases traction and negative camber increases traction.

The use of the gauge is very simple. First, you must get the camber equal on each side. This involves creating a "static" position, that guarantees a recreatable condition we can use at a later date to verify adjustments. The simplest way, (after finding a clean, flat space to work from), is to set the car on a wood block, that raises the car to normally weighted ride height. My block is about 1 inch high. The next step

is to weigh the car down, so that the chassis is flat against the block. From this position, we now have the car set so we can measure the tire's camber. This is done by loosening the gauge's locknut, holding the base with one hand against the work surface, and moving the adjustable portion of the gauge up against the tire. Now, tighten the locknut, and move the gauge to the other wheel. You can now see the difference in camber between the two wheels. Most



likely the gauge will not move up flush against the other wheel. You need to decide which side to add or subtract camber from, based on your own knowledge of car setup. With the graduated dial, you can always recreate the same static camber adjustment anytime. This is especially helpful if you break a tie-rod end, or tie-rod. This is the most simplistic use of this gauge, but prone to a lot of error, since it does not take into account camber change through the suspension, or worn/misaligned parts. A more advanced use of the gauge, allows measure of camber change through the suspension travel up and down, and how tie-rod placement can affect this camber change. In order to measure this camber change, I need to introduce two terms. "Unloaded" camber and "Loaded" camber, which I will explain further in this article.

In the above paragraph, we used a block of wood which approximated ride height. For the following measurement, you need a block of wood which raises the tires barely above the work surface. We'll refer to this measurement as "Unloaded" camber (The suspension is fully extended,

and no load placed on it). From this position, you now proceed to verify that the camber is equal per side. Read the graduated dial, and record this number on a piece of paper. Do not be surprised to find that the camber is not equal per side, even though our original measurements above, left us with equal camber. This is because of parts' tolerances, and worn/misaligned parts. After recording these numbers, we now proceed to the next measurement. How much camber do the tires have upon full suspension compression? To get this final number, remove the wood block, so that we can flatten the chassis to the work surface. You need two extra hands, or need to place enough weight on the car, to fully flatten the chassis on the work surface. It's necessary to flatten the car to the work surface, to once again guarantee a recreatable condition to measure from. We'll call this measurement the "Loaded" camber. Once the car is flattened, you follow the same steps to measure each wheel. I say measure each wheel, because the camber will be different for every wheel. The difference between Loaded camber and Unloaded camber, is your camber change

through the suspension travel. (Camber change - Unloaded Camber - Loaded Camber). Because each wheel will be different, you'll need to play around with the camber adjustments of your car to determine the balance, because as you adjust one camber position, you effect the other. Experience is the best teacher here.

I've found this gauge most indispensable. Not only for my off-road cars, but also on road cars. Examples like the Associated RC 10L, which has a nasty habit of changing camber on the front wheels, due to movement and stretch of the nylon used in the suspension blocks, can be adjusted. With this gauge, I can easily tell when it's time to shim up a block, so that the camber is equal on each side.

In the past, I've used a carpenter's square and basically "eyeballed" the difference between wheels. Now, I can absolutely measure the difference between sides, recreate camber adjustments that worked better between different tracks, and furthermore, experiment with tie-rod positions, and how these positions effect camber travel. This gauge is a permanent addition to my tool box, and should be to yours too!



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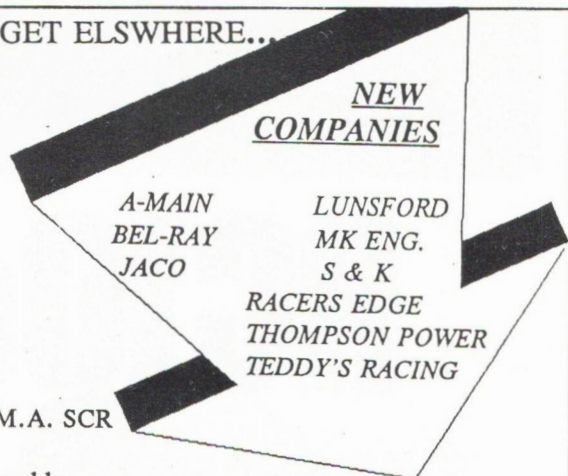
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If you do not see it here, just ask!

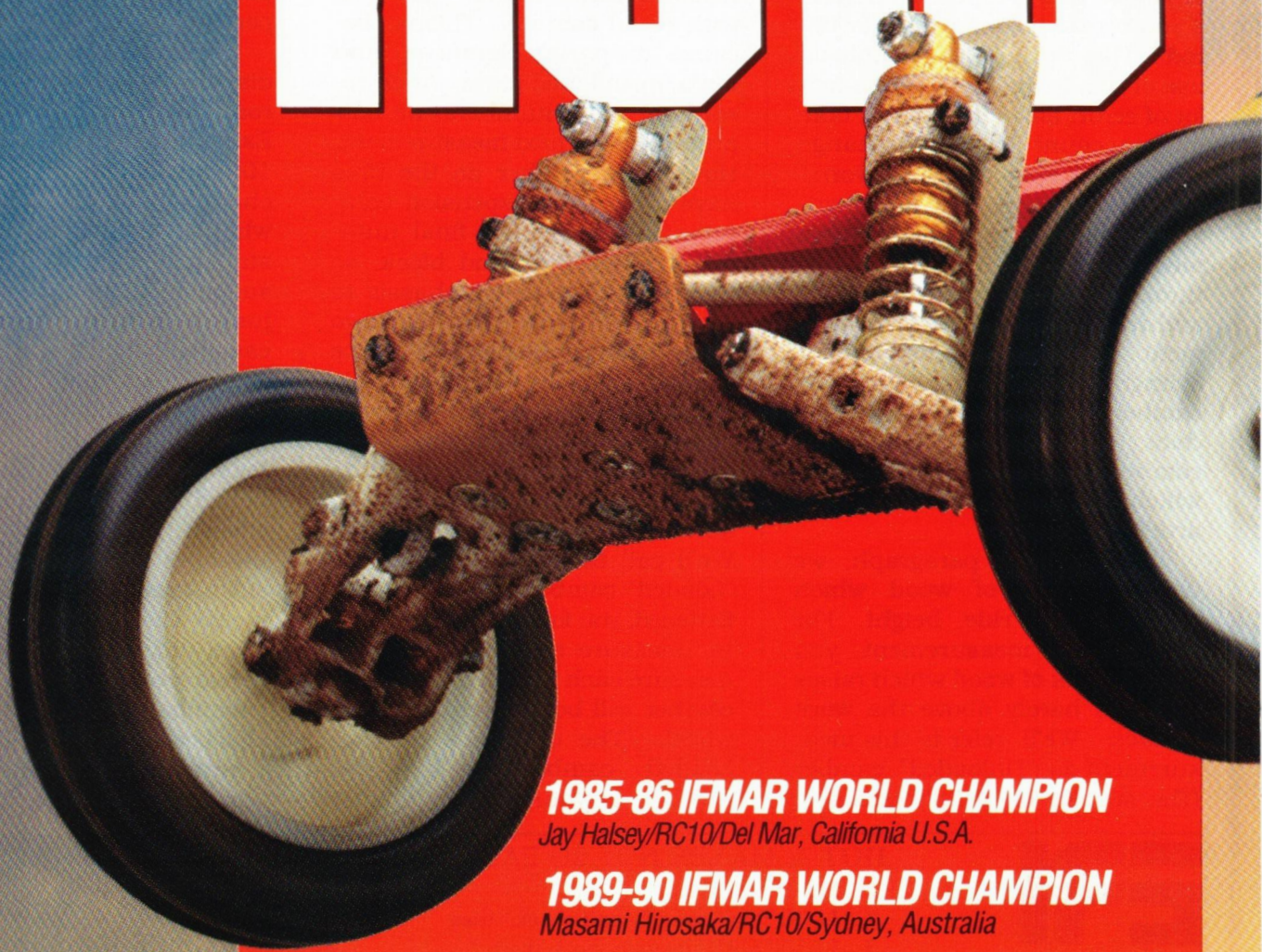
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RC10ce. THE BEST

New wide track front and rear suspension and shock towers.

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New low profile tires and superlight, modular wheels help the new RC10 hook up and corner faster than ever.

Zero offset steering blocks.

Introducing the RC10ce Championship Edition

The RC10 for the 90's takes advantage of all of Team Associated's hottest new options to make it faster than ever. We've widened the track to the legal limit and added suspension refinements to keep you ahead of the competition. And we've included our second generation, modular low profile rims. These rims don't need glue and eliminate mud packing.



Livermore, CA—Lett leads RC10CE
1-2-3 sweep of 1990 ROAR Nationals!

OF TWO WORLD'S.



Masami Hirotsuka, Jay Halsey and Cliff Lett.
1-2-3 in Australia.

If it ain't broke, don't fix it.

The Championship Edition RC10 may be faster, but we've changed none of the features and components that made the

original the toughest, winningest RC car ever. The incredibly tough alloy tub, the heavy-duty gearbox with VariLok diff and aircraft grade hardware are all there.

We never quit racing.



Team Associated's nine World Championships are impressive testimony to our commitment to winning. No other

manufacturer has won more than two. But the Team won't slow down because we're continually developing newer and better components, all to be completely compatible with our existing models.



Associated Electrics
3585 Cadillac Avenue/Costa Mesa, CA 92626

478 At NORRCA Nats!

By Rick "The Hammer" Houle

*Jason Foster took second place
in the Open A-main with his
new RC-10-T.*

Suppose they gave a race and EVERYBODY came! That's exactly what happened at the 1991 running of the NORRCA Off-Road Nationals held at the first rate facility of Zero-N4 Hobbies, air-conditioned, indoor track located in Visalia, California.

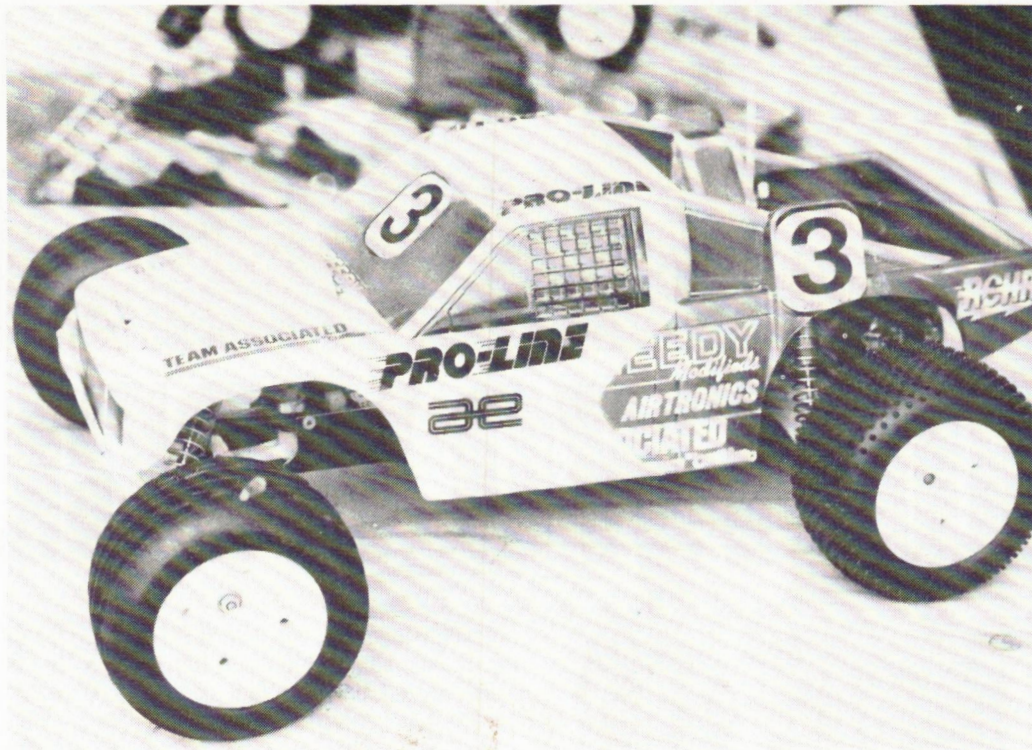
A whopping 478 drivers raced their heart out to earn the most prestigious bragging right, and titles available from the NORRCA racing sanctioning body. With all of these racers competing under one roof, it's truly amazing how well this event came off, and the vast majority of the contestants definitely walked away with their fun meters pegged to the max.

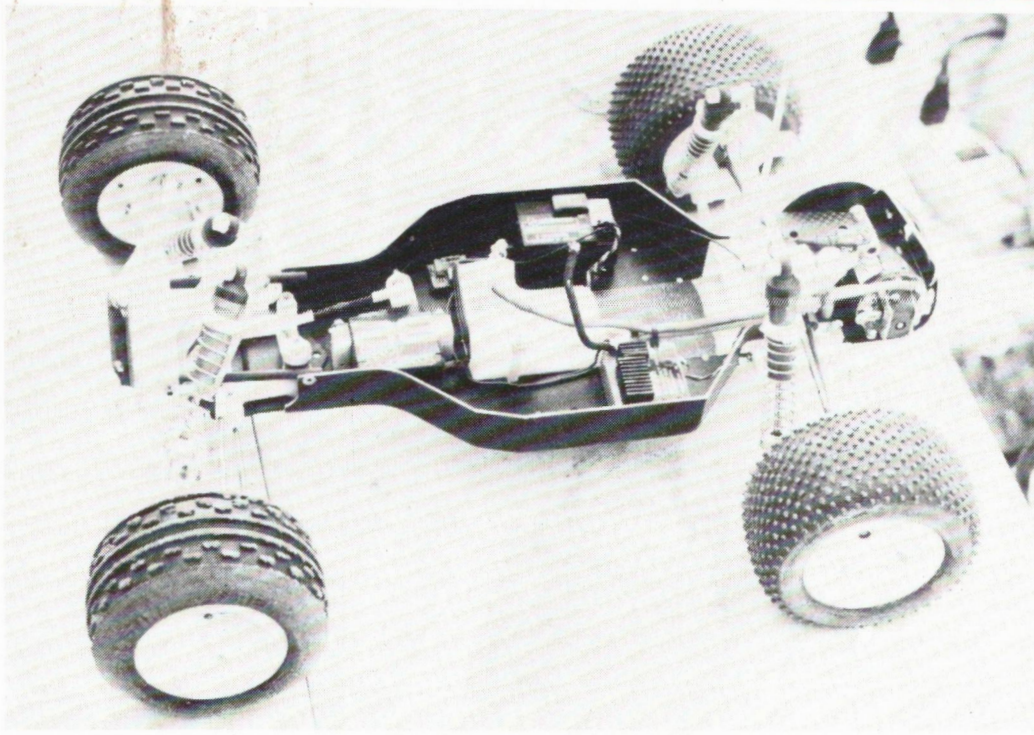
Team Losi was the major sponsor for the event and the participation of many of the largest manufacturers' teams in this country helped to generate some of the most intense competition

that can be found anywhere.

Team Associated entered eight of their new 10-T race trucks with incredible success, taking TQ, the top six qualifying positions, and winning the top three positions in the Open Truck, A-Main. The Associated trucks were, for the most part, stock out-of-the-box with only the tires being changed to meet the track conditions.

The Traxxas Corporation was out in full force and they pulled out all the stops with their Blue Eagle race truck (also with satisfactory results), as well as their soon-to-be-released new buggy car that at the time of this writing, remains nameless. (Traxxas refers to this car as model 2701, for the time being). The Traxxas buggy's body was an interesting affair that definitely appeared to be designed more for function than for its esthetics.





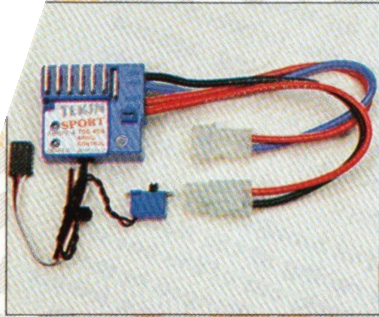
practice, and the IFMAR style of qualifying was used for the qualifying heats with great success. Instead of the usual hell-bent-for-leather free-for-all-starts, each car started in one second intervals and were all timed separately. This method worked out extremely well for many reasons. With the time lapse between each car, everyone was racing against themselves only and not merely trying to get to the finish line first. Starts were casual and clean,

Top: The handful of RC-10T trucks racing at the Nats were mostly stock, out of the box with only the tires changed to meet track conditions. This is a tribute to the design. Bottom: Happy concourse winners.

As is the norm at any race event, the first order of the day is to determine the best tire and wheel combo. Mini-pin spike type tires such as the Kyosho Micro-Block (commonly referred to as "fuzzies"), Pro-Line "Reds" and Losi Mini-Pins in conjunction with foam inserts were the overwhelming choice for the hard-packed, clay-based track. Virtually every car or truck in any A-Main was sporting a set of these "velcro" tires as Team Losi's, Jack Johnson referred to them. The on-going battle of racing truck tire and wheel dimensions continued at the Nats as some low-profile truck tires, not conforming to the minimum 3 7/8" diameter rule, were spotted during the first round of qualifying and were summarily banned for the remainder of the event.

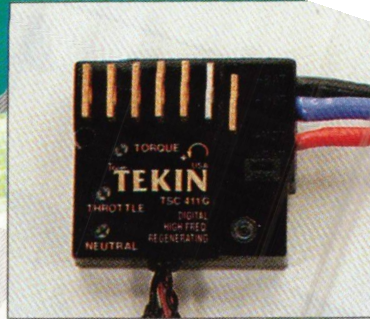
The O-N-4 track crew and NORRCA staff can really pat themselves on the back for pulling this incredible event off without any major glitches. The large number of racers, spent all day Thursday dialing-in their cars in an orderly manner by way of controlled





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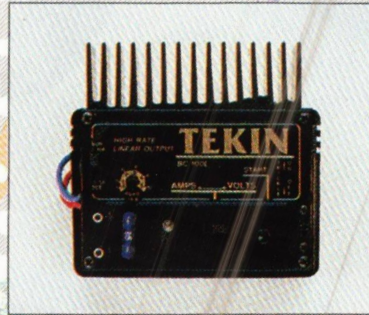


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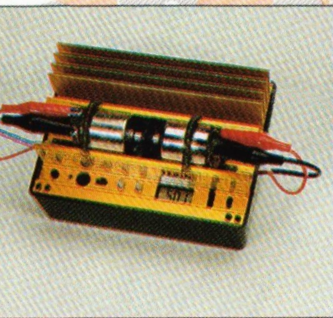
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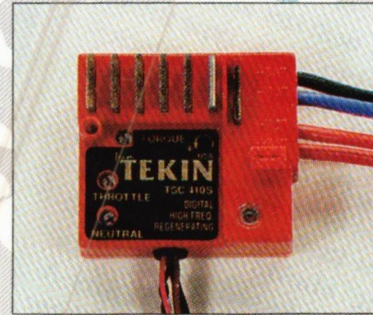
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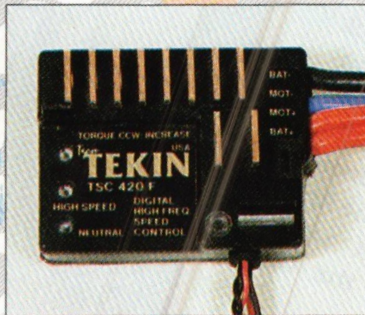
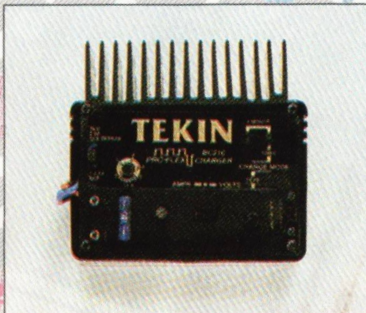
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devoid of the usual first turn pile-ups. Further, it didn't matter if you started at the front row or the back because you were going for your own individual time. NORRCA President, J. R. Sitman plans to use this technique for future major NORRCA events.

The O-N-4 facility is top notch. Unlike most indoor race tracks that are merely converted industrial warehouses, the O-N-4 building was specifically designed for racing and racers. The well stocked Pro-shop up front, as you might guess, had plenty of the mini-spike tires and foam inserts. As mentioned earlier, the track is air-conditioned and this feature along with the carpeted driver's stand, spectator bleachers, electronic scoreboard and clean pit areas - all make this a very comfortable venue for racing. Al-

though there isn't a snack shop in the building, a large mobile kitchen was parked outside, cranking out delicious Tri-tip steak sandwiches, hamburgers and hot dogs and they had ample supply of ice-cold lemonade all weekend.

One of the more intelligent features of the track layout was the turn-marshal's causeway located in the center of the course. So many track owners have a bad habit of designing their courses with little or no regard for the fact that turn marshals have to do their jobs without interfering with the traffic or getting in the way of the drivers' line-of-sight. With this finger in the track's center, one or two marshals could handle three or four turns, as well as keep an eye on the large table-top without ever blocking a driver's view of the turns. The course layout was ex-

tremely challenging and the 80 foot straightaway in front of the driver's stand saw some great horsepower wars.

The only complaint about the track from the racers, was the fact that some of the jumps had been changed halfway through the event. This was just a coincidental result of the fact that the course had to be rotor-tilled each night and it was next to impossible to re-shape each jump exactly the same way each time.

Concourse was held Saturday morning with an incredible field of sharp looking trucks and cars. Jack Leighan's (Endurance Racing Products/Lunsford Racing) First Place entry was a JR-XT with a handmade, aluminum chassis sporting Dialed Racing Products bulkheads and shock towers, polished to a mirror-like finish. In

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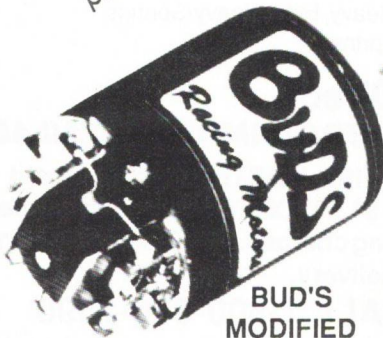
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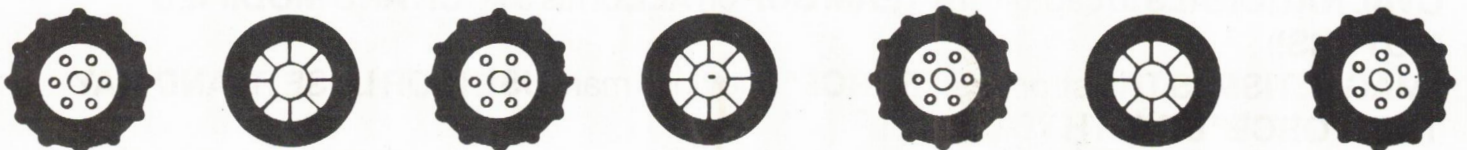
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fact, Leighan's truck was displayed on a mirror so you could appreciate the undercarriage as well as the top of the chassis. Alex Chavez took Second Place also with a JR-XT and Jay Roberts earned Third Place with a JR-X2.

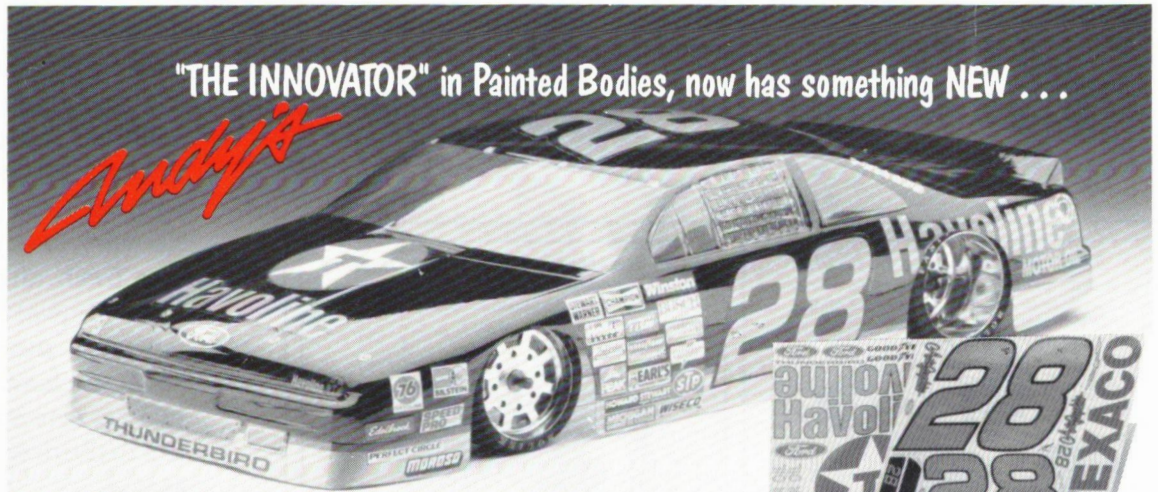
TROPHY DASH EVENTS

The top four qualifiers of each class competed in Trophy Dashes at the end of qualifying much to the delight of the spectators. With the fastest of the fast competing on the track with only four cars, the Trophy Dash heats witnessed some of the quickest lap times all weekend.

In the 2WD Open Race, TQ'd Brian Kinwald (Associated, Reedy, Proline, Novak, Airtronics, R.C.P.S., Kimbrough) jumped into the lead from the start and



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never looked back, handily winning another bragging right.

The 2WD Stock dash saw an exciting race to the finish line between TQ'd Jack Leighan and Chad Bellin (independent) both drivers coming across the finish line almost simultaneously with Leighan besting Bellin for the win.

J.D. Beckwith (Associated, Reedy, Yokomo, Airtronics, Jammin Products, R.C.P.S., Competition Electronics) smoked the fastest drivers at the Nats in the 4WD Open class by piloting his Reedy powered, Yokomo YZ-10

into the pole-position with the fastest qualifying time of the event (14/4:10), and the fastest Trophy Dash time (14/4:05) which coincidentally was also the fastest recorded time for the entire event!!

Four Associated trucks put on an awesome race in the Open Truck Trophy Dash with Jason Foster (Associated, Reedy, Proline, Airtronics, R.C.H.R., Waldo Racing) taking the win after a bad start. The 2WD Pro-Stock was also a close contest between Mike Tuntakit (Twister, Losi, M.I.P.) and Matt Francis (Associated, Reedy,

Ultimate Racing Batteries, Team B & C) with Tuntakit taking the win.

The Super Stock Truck Trophy Dash and A-Main had to be started by the wave of a hand (courtesy of JR. Sitman) for the benefit of a deaf Bruce Chamberlain (independent), who summarily won the race.

It was only a few short months ago that young Scott Hughes (Twister, M-N-M Hobbies) was driving a JR-XT in the Novice class at his father's recently purchased track, M-N-M Hobbies, in Corona, California and already he is blowing the doors off of some of the more seasoned drivers in Pro-Stock truck. Hughes TQ'd in class, won the Trophy Dash and finished a respectable Third place in the A-Main.

THE A-MAIN EVENTS 2WD OPEN

The diminutive Brian Kinwald was by no means diminutive in his performance at the Nats. Kinwald set the pace for the largest field of entries of any class (110) with his Reedy powered RC-10 on his very first run while the track was fresh and still had plenty of bite. Kinwald posted the sole 14 lap run during qualifying (14/4:18) in class, and was one of the two TQ drivers that didn't fall victim to the dreaded TQ jinx in the A-Mains.

Brent Wallace (Twister, Associated, Tekin, Futaba, O-N-4 Hobbies, Leading Edge, R/C Performance) settled in behind Kinwald at the start of the A-Main with Jack Johnson (Team Losi, Futaba, Novak, Victor, Jammin Products) close behind. At about lap three, Mike Tuntakit pulled ahead of Johnson and it was pretty much a freight train of Kinwald's and Wallace's RC-10's and Tuntakit's JR-X2, all the way



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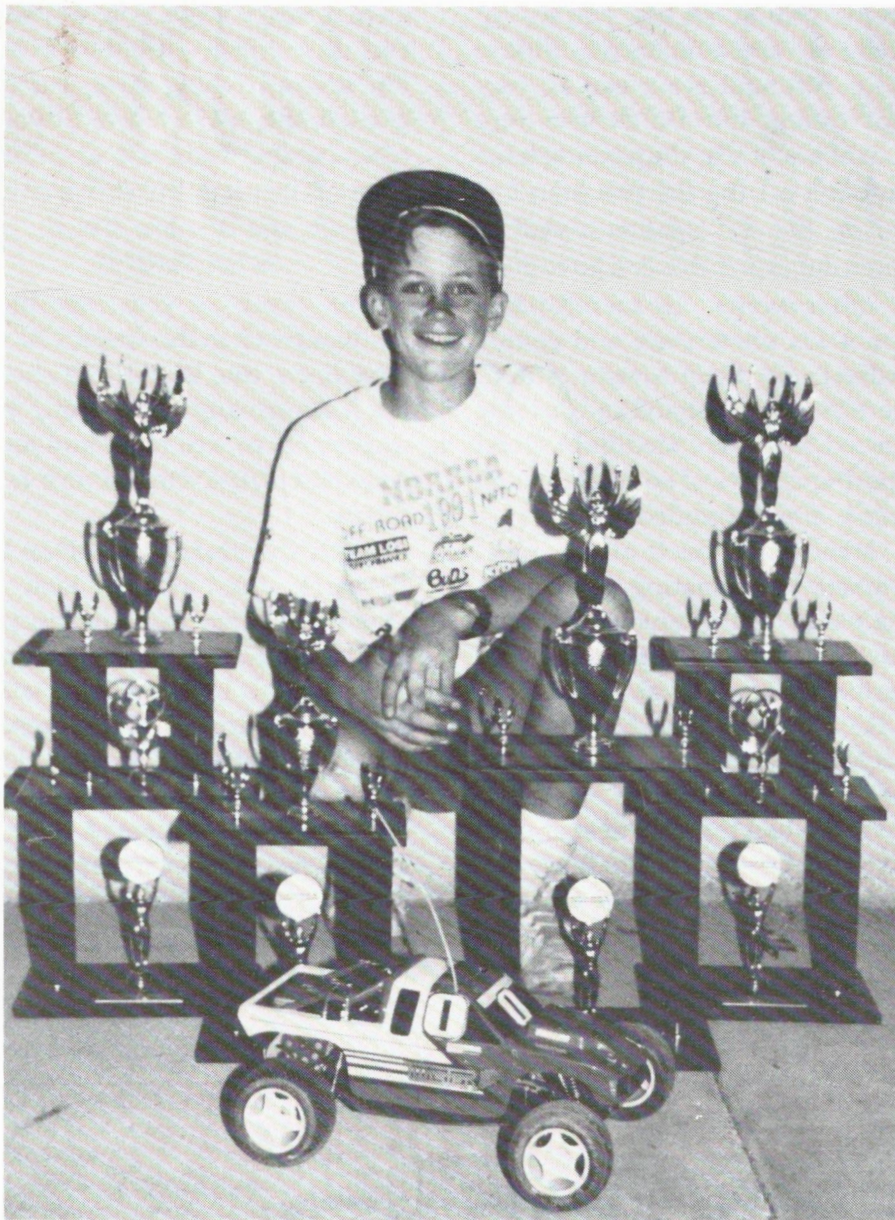
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Scott Hughes was racing in Novice only a few short months ago and is now blowing the doors off of many more seasoned truck racers. Maybe the fact that his father owns M-N-M Hobbies race track helps.

to the finish line. Johnson made one last bid for the third position but suffered a break-down in the process and was out of the running. The closest threat to the trio after that, came from Kyle Reed (Team Losi, Novak, Airtronics, Jammin Products) but the leaders just couldn't be reeled-in. At the wire, Kinwald took the 2WD Open Title with Wallace - Second and Tuntakit - Third.

2WD STOCK

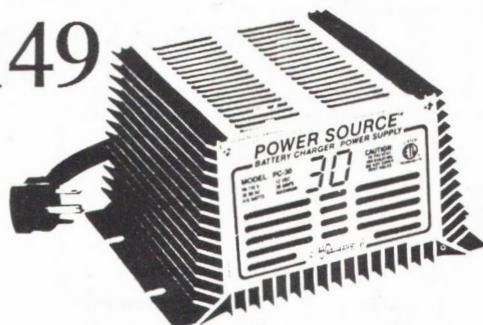
Jack Leighan had to rent a moving van to get all of his trophies home as he won the lion's share of the spoils at the Nats. A-Mains at National events are won through hard work and concentration and Leighan certainly fits the bill. Leighan placed his JR-X2 on the pole with a qualifying time of 12/4:05.

Leighan took the early lead at the start of the A-Main with Jimmie Williams (Independent) and Mike Twynning (Fast Trax Hobbies) in hot pursuit. Curtis Peterson (independent) moved into the third position briefly before getting edged back out. A hack-attack developed between three cars all trying to occupy the runner-up spot at the same time. Peterson, Williams and Bellin banged doors while Leighan ran away from the pack. When the

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clay had stopped flying, Leighan was the 2WD Stock National Champion with Williams - Second and Mike Twynning - Third.

4WD OPEN

The 4WD Open class had as diverse a field of car makes in the A-Main as the Open Truck class. Yokomo YZ-10's, Schumacher Pro-Cats and Kyosho Lazars put on the fastest battles of the day.

The A-Main started off clean enough but it wasn't long before things got down and dirty. Twister powered, Brent Wallace took the early lead followed by Garret Ertel (Peak Performance, Orion Batteries, Kyosho, Novak, R.C.P.S) and Rick Vehlow (Associated, Reedy, Yokomo, Novak, Airtronics, Pro-line, R.C.P.S.). Derek Furutani (Peak Performance, Schumacher, Novak, Airtronics, Team Orion, R.C.P.S.) suffered a break-down at the start of the race and was done for the day. Ertel also broke and

had to relinquish his runner-up position. Breaking in the A-Main of a National event can be very frustrating, but Derek was very cool about it. He didn't smash his antenna on the driver's stand or throw his car against a wall as some immature driver's have done at other events. He merely joked about his misfortune and calmly walked off the driver's stand. Derek's sportsmanlike reserve earned him the Modified Good Sportsman award so he didn't go home empty handed.

Meanwhile, back at the race, Wallace was blasting away from the pack with Vehlow in tow. Carlos Gonzales (Kyosho, Peak Performance, Novak, R.C.P.S., E.R.P., Team Orion), Vehlow and Beckwith were all banging doors for the runner-up position. Gonzales had the second spot until he went on his lid as Beckwith moved up. Vehlow was hanging

on to third position even when the rest of the pack closed in on him like an on-rushing wave. Wallace earned the 4WD Open National title, posting the fastest A-Main time of the event with Beckwith in Second and Vehlow, Third.

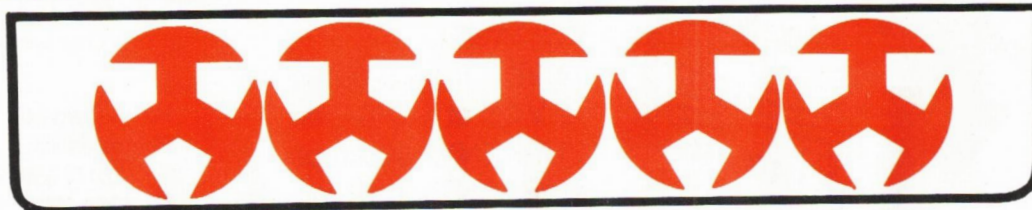
OPEN TRUCK

For over a year, the most familiar truck in the truck classes have been the Losi JR-XT, but if the Nats are any indication, you can expect to see more and more Associated 10-T's in the very near future.

With the emergence of the 10-T truck, the overall look of Monster trucks (an unfortunate misnomer) has changed dramatically from high-profile, stiffly sprung affairs to the present generation of sleek looking, low-profile race trucks. The 10-T's body shell was designed to fit as low as possible over the shock towers and still conform to

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NORRCA rules. Also evident at this race, was a large number of Premier Design's low-profile Toyota replacement shell seen on many trucks including some of the Team Losi rigs. A & L Manufacturing debated their new truck shell at this event that features manufacturer's claims of "ground affects" design with a built-in wing and spoiler. Even Pro-Line had their own version of a rules-eluding low-profile truck body.

After a hack-attack start in the A-Main (which is to be expected anyway in Open Truck), Brian Kinwald was leading the pack with J. D. Beckwith and Jason Foster hot on his heels. It wasn't long before the leaders were in among the backmarkers, including factory authorized hack, Steve Dunn (Race Prep, Team Losi) who wasn't making things easy for them. Suddenly, Beckwith's truck came to a grinding halt and his race was over. Mike Dunn's (Race Prep, Team Losi, Novak, K.O.) truck was inadvertently knocked over a lane barrier in front of the leaders, but he waited, without being flagged by the race director, until the leaders went past before he resumed the race. Kinwald took the Open Truck National title, with Foster in Second and Vehlow in Third.

2WD PRO-STOCK

Mike Tuntakit placed his Twister powered JR-X2 on the pole with a qualifying run of 13/4:11 but received a mega dose of the TQ jinx in the A-Main. Matt Francis was about the only driver to avoid the massive hack-attack at the start of the A-Main and piloted his RC-10 wire-to-wire. Tuntakit held on to the runner-up spot for awhile with Lance Bakkl (Pack Shoppe, E.R.P., Lunsford) in third. A three-way battle soon developed for the third spot with

Carlos Gonzales coming out on top. Chris Walrod (Peak Performance, E.R.P., R.P.M., Scat, Saiko, R.C.H.R., Waldo Racing) was coming on strong after a back row start and was soon in the runner-up spot. Gonzales made a clean inside pass on Walrod with less than a minute left in the race. The three leaders freight-trained in their positions to the finish line and when it was all over, Francis was the new 2WD Pro-Stock National Champion, with Gonzales in Second and Walrod in Third.

SUPER STOCK TRUCK

Jack Leighan and Bruce Chamberlain were the only drivers to qualify with 12 laps, Leighan posting 12/4:14 and the bets were on as to who would be the next National Champ in class. Endurance powered, Leighan shot off

the line and was headed for a clean holeshot but stuffed it in the wall, letting Chamberlain take the point position. Entering lap two, Chamberlain's truck lost the pinion gear and his day was over. Leighan assumed the lead with Daniel Beurrier (J.G. Mfg., E.R.P., T.R.P.) and Rich Rodriguez (independent) in tow. Beurrier moved into the runner-up spot and began banging doors with Leighan. Beurrier tagged the leader from behind, spinning Leighan around, and took over the lead. At this point with Beurrier in the lead, Leighan in second, Rodriguez in third, it was a classic battle between J.G., Traxxas, and Losi trucks (in that order). Beurrier went upside down, and Leighan, then Rodriguez was past him in a flash. Beurrier tried to hang on to

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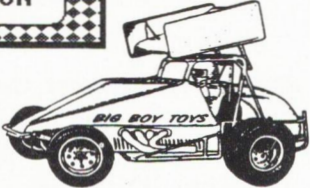
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third but went on his lid once again letting Jason Sugg (independent) get past. At the wire, Leighan took the top title in class ahead of Rodriguez, who came in Second, then Sugg in Third.

Andrew Saldate from San Diego, has got to be the youngest driver ever to compete in a National event. I first met this three year-old wonder kid at the Welcome Home Troops race a few weeks ago, where he was running in the Novice truck class and here he was rubbing shoulders (thanks to a large milk crate) with much older drivers and racing like a pro. This kid has got to be seen to be believed!

PRO-STOCK TRUCK

The up and coming 15 year-old from Corona, California, Scott Hughes, set the pace with his Twister powered JR-XT, posting the TQ run of 12/4:02. Entering lap three of the A-Main, the three leaders were in the same position they had qualified in with Hughes in the lead, "Rocket" Ron Rossetti (Team Losi, Airtronics, Novak, Jammin Products),

"Flyin" Brian Peterson (Twister, A & L, Proline) and Charles Erickson (Precision Motors, Traxxas, Proline) - freight-training in that order. Rossetti pulled-in close to the leader and pressed Hughes to make a mistake. The ploy worked, and when Hughes went upside down, Rossetti and Peterson were past him in a flash. Shortly after, all three leaders had a gnarly hack-attack and now Bryan Barns (Precision Motors, Pacific Batteries, Proline) was in the runner-up position. The race really got intense at this point as the trucks literally tore up the track as one of the PVC pipe lane barriers was knocked loose and it rolled out into a turn. Fast acting turn marshals managed to put the pipe back into its place before it interfered with the race. Meanwhile up at the front, Rossetti's JR-X Junior truck with the brightly colored "Wonder Bread" truck body (courtesy of A & L's Daryl Lane) was stretching out his lead. The fourth place, Hughes made a clean pass on Erickson's Traxxas truck, but Erickson stuffed Hughes into

the wall and reassumed his position. When the clay stopped flying for the last time, Rossetti earned top honors in class, with Erickson in Second and Hugh taking Third.

Jorge Takamoto thought he was one unlucky racer at the Nats after breaking three of his four qualifying rounds until he received the Stock Good Sportsman trophy for his troubles.

Many of the lowest qualifiers of each class didn't go home empty as some really awesome prizes were given away to them by random drawing. Some of the prizes included a Kyosho Lazer Z-X, Traxxas Blue Eagle Truck, Novak High-Frequency Speed Control, to name a few.

With three days of racing over, all that was left was the trophy presentation and for many, a long drive home. All in all the 1991 NORRCA Nats were a resounding success and most of the racers left the track with high spirits and the whine of 05 electric motors ringing in their heads.

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3rd - Mark Francis
4th - Jon Anderson
5th - Eddie Woolley
6th - Paul Garcia
7th - Brent White
8th - James Brown
9th - Tim Bump
10th - Bubba Johnson

C MAIN

1st - Carlos Gonzales
2nd - Garret Ertel
3rd - Scott Brown
4th - Jay Halsey
5th - David Potter Jr.
6th - Lance Bakki
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D MAIN

1st - Chris Allec
2nd - Derek Furutani
3rd - Jeff Wittman
4th - Ron Williams
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2nd - Wayne Tingley
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4th - Dustin Leonard
5th - Cameron Kellogg
6th - Joe Morettini
7th - Daniel Souza
8th - Caleb Crow
9th - Tom Hightower

F MAIN

1st - Thomas Pendergast
2nd - Nichelle Rivera
3rd - John Meyer
4th - Steve Ozuna
5th - Chad Davis
6th - Robert Hoffman
7th - Tom Owens
8th - Phil Vitale

G MAIN

1st - Rob Low
2nd - Bill Halley
3rd - Ken Peterson
4th - Dominic Sellers
5th - Jay Robinette
6th - Daren Westman
7th - Gene Hickerson
8th - Andy Bartucca
9th - Arthur Porosoff
10th - Ken Bolle

H MAIN

1st - Matt Francis
2nd - Jammer
3rd - Matt Milstein
4th - Nicky Thantrong

5th - Mike Hamilton
6th - Steve Williams
7th - Quincy Hughes

8th - Chris Daniels

9th - Al Bridges

I MAIN

1st - Todd Handel
2nd - Carl Sorensen
3rd - Clark Hulet
4th - Jerry Winkelbauer
5th - George Cherry
6th - Gregg Fritchey
7th - Ron Goforth
8th - Joe Martin

J MAIN

1st - Aldo Ruiz
2nd - Michael Schiebout
3rd - Jerry Owyong
4th - Jenni Bump
5th - Russell Coleman
6th - Brian Gisi
7th - Steve Schuyler
8th - Rick Wood
9th - Don Graham

K MAIN

1st - Damion Lowry
2nd - Karrie Bridges
3rd - Orlando Prieto
4th - John Cento
5th - Carter Lowry
6th - Brett Reichert
7th - Gary Waymire

2WD STOCK

A MAIN

1st - Jack Leighan
2nd - Jimmie Williams
3rd - Mike Twynning
4th - Brad Long
5th - Chad Bellin
6th - Steve Patton
7th - Curtis Peterson
8th - Steve Keiser
9th - Jim Ray
10th - Jason Sugg

B MAIN

1st - Kasey Kore
2nd - Bruce Chamberlain
3rd - Regie Pineda
4th - Matt Ganske
5th - Mike Dickenson
6th - Tim Weinzirl
7th - Rusty Jones
8th - Daniel Beurrier
9th - Bob Reid

C MAIN

1st - Danny Quinn
2nd - Frank Braswell
3rd - Rich Rodriguez
4th - Dustin Hansen
5th - Brent Quinn
6th - Chris Bird
7th - Joel Downs
8th - Reese Dennis
9th - Gil Aguilar
10th - Steve Brown

D MAIN

1st - Robert Troy
2nd - April Van Dusen
3rd - Todd Cariseo
4th - Gabe Acompora
5th - Chris Hamer
6th - Rick Dennis

7th - Collyn Berling
8th - Jonathan Monte
9th - Shane Bowen

E MAIN

1st - Jack Baldwin
2nd - Randy Harada
3rd - Philip Green
4th - Scott Daniels
5th - James Stapleton
6th - Ed Sly
7th - Robert Jones
8th - Mark Sanders
9th - Larry Rivera
10th - Josh Handel

4WD OPEN

A MAIN

1st - Brent Wallace
2nd - J.D. Beckwith
3rd - Rick Vehlow
4th - Carlos Gonzales
5th - Mark Francis
6th - Steve Dunn
7th - Jon Anderson
8th - James Brown
9th - Garrett Ertel

B MAIN

1st - Scott Roberts
2nd - Brain Kinwald
3rd - Mike Dunn
4th - Dominic Sellers
5th - Aaron Biner
5th - Phil Vitale
7th - Steve Ozuna
8th - Jay Halsey
9th - Chris Walrod
10th - Kyle Reed

C MAIN

1st - Jeff Wittman
2nd - Richard Trujillo
3rd - Eric Vasutin
4th - Rick Wood
5th - Bubba Johnson
6th - Eustace Moore Jr.
7th - Jay Robinette
8th - Andrew Bolton
9th - Lance Bakki
10th - Brent White

D MAIN

1st - Nichelle Rivera
2nd - Paul Gurule
3rd - Joe Morettini
4th - Bill Halley
5th - John Cento
6th - Joe Martin
7th - Aldo Ruiz
8th - B.J. Christensen
9th - James Ward

E MAIN

1st - Damion Lowry
2nd - Irving Norwood
3rd - Tom Cox
4th - Mike Farnesi
5th - Mike Botelho

OPEN TRUCK

A MAIN

1st - Brain Kinwald
2nd - Jason Foster
3rd - Rick Vehlow
4th - Scott Hughes
5th - Carlos Gonzales
6th - Derek Furutani
7th - Kyle Reed

8th - Steve Dunn
9th - Mike Dunn
10th - J.D. Beckwith
B MAIN
1st - Ron Rossetti
2nd - Scott Brown
3rd - Jack Johnson
4th - Frank Warnke
5th - Todd Handel
6th - Kenny Burt
7th - Joe Guerzon
8th - Jay Halsey
9th - Cliff Montgomery
10th - Quincy Hughes
C MAIN
1st - Thomas Prendergast
2nd - Bryan Barns
3rd - Charles Erickson
4th - Chris Allec
5th - Dan Kitterman
6th - Dustin Leonard
7th - Tom Owens
8th - Brendon Sarracino
9th - John Lawson
D MAIN
1st - Tony Fagan
2nd - Tom Green
3rd - Chad Cannon
4th - Bubba Johnson
5th - David Potter
6th - Jeff Wittman
7th - Michael Phillips
8th - Ron Williams
9th - Kirby Tschoepe
E MAIN
1st - Jivin Jeremy
2nd - Alexander Chavez
3rd - Roger Dahler
4th - Brian Gisi
5th - Eustace Moore Jr.
6th - Steve Ozuna
7th - Jerry Winkelbauer
8th - Jade Kurtchi
F MAIN
1st - Mike Dunlap
2nd - Brant York
3rd - Randy Noll
4th - Mike Hamilton
5th - Anthony Bowman
6th - Steve Sandoval
7th - Wylder Barrows
8th - Mike Greer
9th - David Wilson
G MAIN
1st - Hammer Smith
2nd - Scott Reed
3rd - Nick Yaw
4th - Steve Amador
5th - Rick Barry
6th - Mike Bridges
7th - Cameron Kellogg
8th - Nathan Welch
9th - Don Graham
H MAIN
1st - Brain Matthews
2nd - Daryl Lane
3rd - Michael Schiebout
4th - Gary Kortz
5th - Jon Warren
6th - David Cornell
7th - Gary Sellers
8th - Randy Shewey

9th - Michael Wunderman
I MAIN
1st - Danny Monterroso
2nd - Bob Bean
3rd - Dennis Ewing
4th - Steve Jackman
5th - Bob O'Mea
6th - J.R. Sitman
7th - Rick Cook
8th - Gary Griffin
9th - Dana Silva
10th - Rick Houle
J MAIN
1st - Doug Lewis
2nd - Steve Saldate
3rd - Devon Lowry
4th - J.G. SR.
5th - Judson Aerni
6th - Richie Davis
7th - Matt Van Pelt
8th - Scott Montgomery
9th - Ray Quackenbush
2WD PRO STOCK
A MAIN
1st - Matt Francis
2nd - Carlos Gonzales
3rd - Chris Walrod
4th - Greg Hodapp
5th - Mike Tuntakit
6th - Curtis Stock
7th - Lance Bakki
8th - Jammer
9th - Scott Roberts
10th - Jivin Jeremy
B MAIN
1st - John Lawson
2nd - Andy Bartucca
3rd - Tony Fagan
4th - Ron Williams
5th - Bill Halley
6th - Ron Rossetti
7th - Eddie Woolley
8th - Wayne Tingley
9th - Carl Zumwalt
10th - Clark Hulet
C MAIN
1st - Craig Lair
2nd - Dale Wenstad
3rd - Scott Montgomery
4th - Phil Vitale
5th - Cameron Kellogg
6th - Michael Phillips
7th - Quincy Hughes
8th - David Potter
9th - Todd Handel
10th - Joe Guerzon
D MAIN
1st - Caleb Crow
2nd - Daren Westman
3rd - Tim Hansen
4th - John Meyer
5th - Daryl Lane
6th - Nick Thantrong
7th - Charles Erickson
8th - Gene Hickerson
9th - Matt Milstein
10th - Ken Bolle
E MAIN
1st - Arthur Porosoff
2nd - Gregg Fritchey
3rd - George Cherry
4th - Mike Hamilton

5th - Paul Gurule
6th - Rob Low
7th - Jay Robinette
8th - Ron Goforth
9th - Robert Hoffman
10th - Rick Wood
F MAIN
1st - David Cleveland
2nd - Steve Schuyler
3rd - Orlando Prieto
4th - Roger Dahler
5th - Carter Lowry
6th - Gary Waymire
7th - Devon Lowry
SUPER STOCK STRUCK
A MAIN
1st - Jack Leighan
2nd - Rich Rodriguez
3rd - Jason Sugg
4th - Daniel Beurrier
5th - Regie Pineda
6th - Brad Long
7th - Mike Kurtchi
8th - Joel Downs
9th - Gene Hobbs
10th - Bruce Chamberlain
B MAIN
1st - Ed Sly
2nd - Jeff Clay
3rd - Jason Mayhew
4th - Tom Sugg
5th - Chris Clark
6th - Brent Quinn
7th - Reese Dennis
8th - James Evans
9th - Lorin Ganske
10th - Gil Aguilar
C MAIN
1st - Noel Guinard
2nd - Mark Sanders
3rd - Rick Dennis
4th - Jack Baldwin
5th - Robert Troy
6th - Josh Handel
7th - Sandy Hunt
8th - Charles Welborn
9th - Bob Reid
10th - Greg Torres
D MAIN
1st - Steven Wizman
2nd - Bob Reynolds
3rd - Jacob Ewing
4th - Charles Berling
5th - Bill Van Pelt
6th - Brandon Rasenti
7th - Andrew Saldate
8th - Mark Gisi
9th - Chris Lingenfeller
10th - Robert Romo
PRO STOCK TRUCK
A MAIN
1st - Ron Rossetti
2nd - Charles Erickson
3rd - Scott Hughes
4th - Bryan Barns
5th - Tom Owens
6th - Bryan Peterson
7th - Jivin Jeremy
8th - Scott Brown
9th - David Potter
10th - Kenny Burt
B MAIN
1st - Brendon Sarracino
2nd - James Ward
3rd - Kirby Tschoepe
4th - Rick Barry
5th - Jade Kurtchi
6th - Michael Phillips
7th - Cliff Montgomery
8th - Nick Yaw
9th - Mike Kendall

10th - Mike Dunlap

C MAIN

1st - Dan Kitterman

2nd - Mike Bridges

3rd - Brian Gisi

4th - Chad Cannon

5th - Alexander Chavez

6th - Brooks Davis

7th - Richard Trujillo

8th - Joe Guerzon

9th - David Wilson

10th - Robbie Popp

D MAIN

1st - Scott Reed

2nd - Tom Green

3rd - Hammer Smith

4th - Gary Kortz

5th - Steve Sandoval

6th - Roger Dahler

7th - Jon Warren

8th - Mike Greer

9th - Gary Sellers

E MAIN

1st - Brian Matthews

2nd - Wylder Barrows

3rd - Doug Lewis

4th - Steve Amador

5th - Eric Vasutin

6th - Irving Norwood

7th - Danny Monterroso

8th - Gary Griffin

9th - Dennis Ewing

10th - Todd Handel

F MAIN

1st - Aldo Ruiz

2nd - Bob Bean

3rd - Rick Cook

4th - Michael Wunderman

5th - Robert White

6th - Dave Lopez

7th - Randy Shewey

8th - Jorge Takamoto

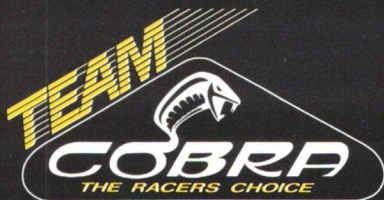
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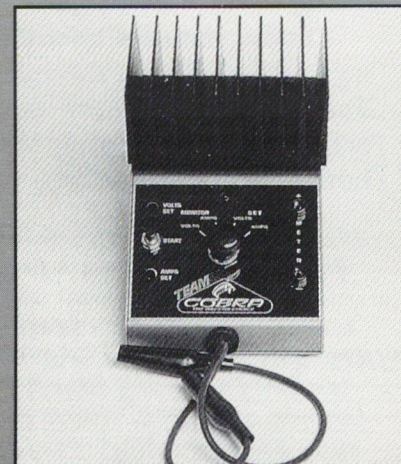
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- Single cells or entire packs

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By Doug Simmons &
Kris Nordstrom
Photos By Dave Cleveland

Dirt Oval Nationals

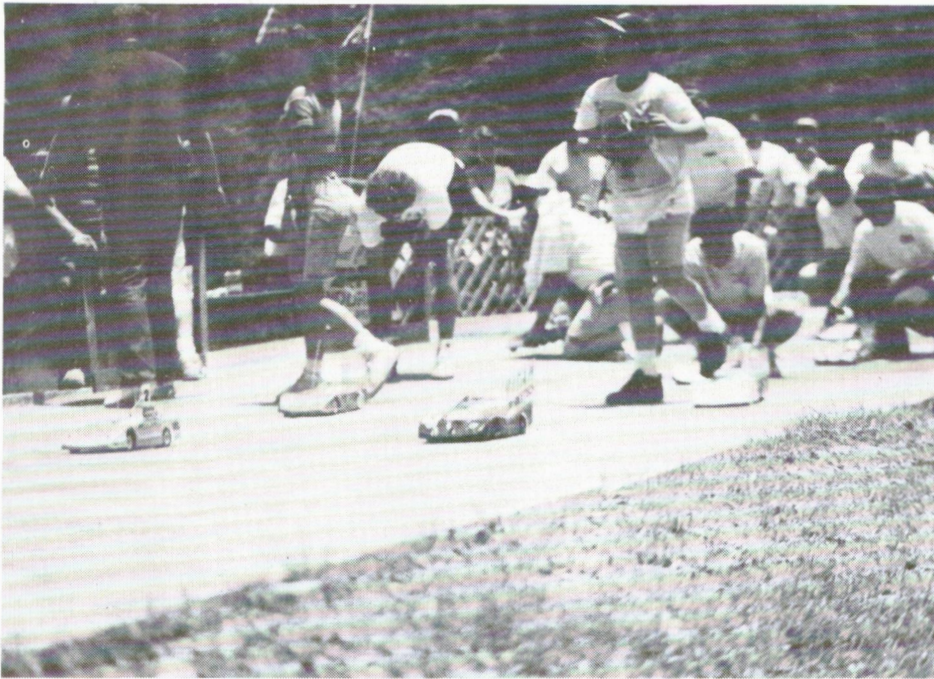


It was a typical summer day in Houston, Texas as NORRCA President J. R. Sitman touched down for his first race in our fair city. A wave of hot, sticky air hit him in the face and hit him hard - "It's gonna be a long week," he thought.

Fifteen minutes later though, he was standing in the midst of The Oasis Hobby Park amid two acres of tall pines and redwood buildings - the relief was visible.

The atmosphere at the Oasis was fun and festive. Top: A juggler entertains the crowd while everybody waits for the track to dry. Bottom: Another "big" hit was the belly bouncing contest. Rob Cutman of Custom Works and the 1991 2WD Roar National Champ, learns what "push" is all about. Cutman is the one on his knees.





The Oasis was built and designed for major racing events such as this, with three tracks and a pond for boat racing. Adjoining acreage provided ample parking and camping areas, full service concession area and a tasty BBQ kept, racers and spectators hydrated and fed.

Racers began arriving on Tuesday, with the qualifying rounds actually beginning on Friday. Racers from coast to coast gathered under the trees to prepare themselves for the challenges that lay ahead. The smooth, very hard packed surface made soft cap tires the order of the day. The dirt was sealed with track owner Israel Ben-Ezra's "secret sauce" to keep the dust down. The turns had a slight bank to them. J. R. got a chance to show-off NORRCA's new lap counting software by B & B Software, and it functioned flawlessly for the entire event. Not seen before in Texas was the fluorescent yellow B & B Software

Top: The A main 2WD Pro-Stock line up. Bottom: Brian Landgraff of Custom Works was the winner of the 4WD Modified class.

Leader Board display, showing time and laps for the first three places. "Fantastic" was the comment heard again and again - we need more of this quality at all events.

The qualifying rounds brought great times in all classes. Two wheel stock saw TQ driver Chris Stahl bring in 35 laps in 4:04.33. The pro stock class saw near TQ times from Gary O'Brien in the

first round with 37 laps in 4:05.15. Two wheel open, with over 50 cars was not in true form until the second round with Will Whisler turning 42 laps in 4:05.24. The cliché "on a rail" gained new meaning at this race. Four wheel open was just barely above the two wheel TQ with 43 laps in 4:06.22 by Sean Young. Sprint cars came in at a quick pace of 37 laps in 4:03.75 for TQ driver David Markert.

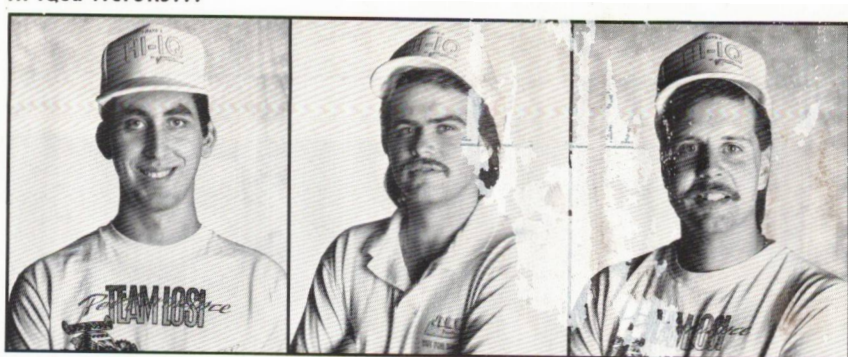
The hours passed and the periodic thunder showers came and went, with the track crews drying this hybrid track in less than an hour!!! A contractor by trade, Israel has engineered tracks with excellent drainage. Saturday's third round started off great, but was staggered by a torrential rain around noon which poured more than 2 inches of water in less than two hours. Immediately upon stopping, the Oasis tech crew, assisted by lots of racers, went at it with fans and brooms - and the racing went on! We were entertained throughout the weekend, during the breaks, by jugglers and magicians, who



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Gil Losi Jr.

Jay Halsey

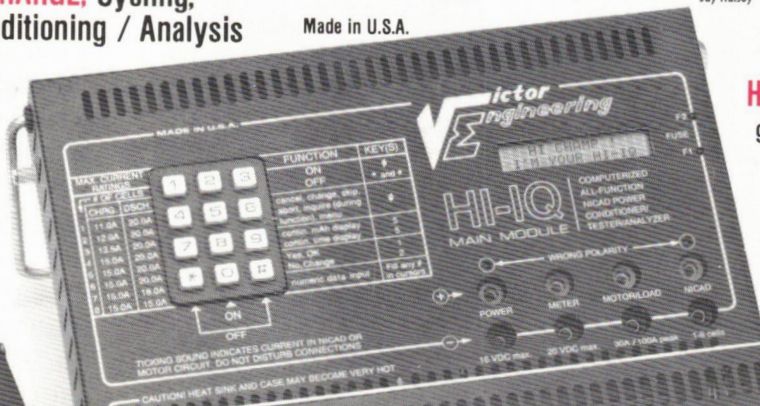
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SATURDAY & SUNDAY OCTOBER 5 - 6, 1991
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COMPETITION PLUS

PARAGON RACING PRODUCTS

BOLINK R/C CARS

MAJOR EVENT NUMBER 2

COMPETITION PLUS

THE 1991 ROAR REGION 2 INDOOR CARPET OVAL CHAMPIONSHIPS
SATURDAY & SUNDAY OCTOBER 12 - 13, 1991
SANCTION NUMBER 212191MC

BULLET MATCHED CELLS

TRINITY

PARAGON RACING PRODUCTS

REEDY MODIFIEDS

MAJOR EVENT NUMBER 3

BUD'S RACING PRODUCTS

THE 1991 ROAR U.S. INDOOR ON-ROAD CHAMPIONSHIPS
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THIS WILL BE RUN ON THE LARGEST INDOOR ON-ROAD TRACK EVER,
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NOVAK ELECTRONICS

PARAGON RACING PRODUCTS

WEBB TECH

COMPETITION PLUS

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PARMA INTERNATIONAL

MAJOR EVENT NUMBER 4

PARAGON RACING PRODUCTS

THE 1991 ROAR U.S. INDOOR CARPET OVAL CHAMPIONSHIPS
SATURDAY & SUNDAY NOVEMBER 16 - 17, 1991
SANCTION NUMBER 212-OV-91MC

BULLET MATCHED CELLS

BEL-RAY LUBRICANTS
COMPETITION PLUS

NEW WAVE BATTERIES

broke the tension and added a creative flair to this event.

After Saturday's heavy rains, the weather in Texas was beginning to make NORRCA's president a little nervous. Well, Sunday came and he wasn't feeling any more comfortable as the clouds were overhead, as he and Ed Rains drove to the track. Shortly after arriving, the clouds cleared and the sun came through and lasted until the event had completed. However, an hour after trophies had been handed out, the rains came again.

Enough about the weather and back to racing. You could feel the tension in the air as you walked through the pit area and watched the racers carefully make their last minute adjustments to their cars. Each and everyone of the Mains had their own pits of excitement. The 2WD Stock "A" Main was good clean racing with a very close finish showing the top four cars on the same lap and only separated by 4 seconds. The class T.Q. Chris Stahl (Endurance Racing) took the win with Tim Watson and David Vanderwerf finishing second and third.

The 2WD Pro Stock class found RevTeck's very own David Potter taking top qualifying honors and the win by almost a full lap over second place, Ben Porter and Gary O'Brian.

Outlaw Sprint is always one of the largest and favorite classes. This event was no exception.

With 50 cars entered, you really had to have your car well prepared and your driving skills fine-tuned to make the "A" this weekend. Well, the "A" was definitely a wild one. With 10 open wheel cars headed into the first turn, you know somebody's not going to come out of it. After the turn marshalls had pulled apart the wreckage, two sprinters were out of the race with 8 remaining. The racing was great, and once again the ever feared T.Q. Jinx played a factor with David Markert's Sprinter. Rob Russell took home the title with David Markert in second and Michael Miller bringing home third.

The 2WD Open "A" Main was incredible to watch as Jim Dieter of RevTech/Titan, and Brian Landgraff of Custom Works/Trinity were showing some incredible

driving skills as they raced around the track literally within inches of each other. Dieter had the lead and Brian kept trying to get around him in the corners. Going into turn number 3, Brian tried a little to hard to get by Jim and the two cars touched. Brian hit the wall and Jim pulled away. Jim took the title, Will Whisler top qualifier took second only two seconds behind, and Rob Cutman placed third.

Up next, were the 4WD open drivers with more horsepower than they knew what to do with. At the start of the race, out shot the T.Q. Sean Young of Superior Racing. Early into the race, Sean developed problems and Brian Landgraff of Custom Works flew by to take the lead - but not a comfortable lead over the second place car of Will Whisler and Brian's teammate Paul Dionne in third. Brian held them both off and took home his National Title with Will and Paul finishing second and third, only one second behind Brian.

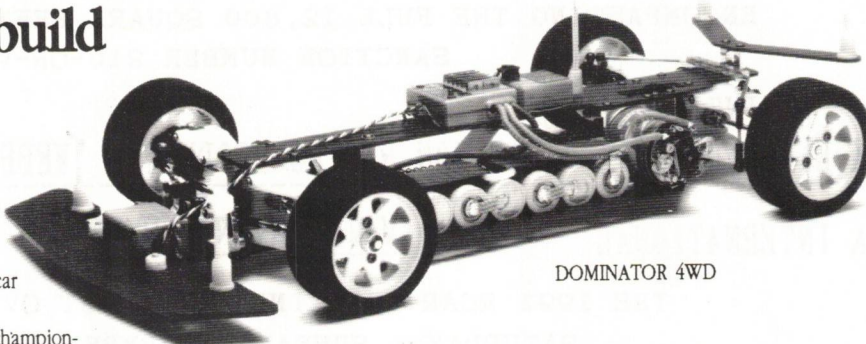
NORRCA's president, J. R. Sitman, would like to express his congratulations to all the racers

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and a very special thanks to the sponsors who so graciously helped make this event possible.

Mother nature was the only culprit at this event, and even she was beaten by the skill and tenacity of these racing professionals. J. R. was organized, prompt, and incredibly in control as Race Director. The Oasis tech crew, headed by Ed Rains, was absolutely flawless, with not one complaint registered by the more than 250 racers! Overseeing it all, with his usual attention to every minute detail, was track owner Israel Ben-Ezra. Announcing throughout the event was handled with flair by J. R., Ed Rains and Oasis regulars, Bill Shaeffer and Mike Watkins.

Prizes - we had prizes!! - as race sponsors gave generously to add to the excitement of the event. The Kyosho fluorescent pink "Fanny Packs" were a great hit, as were the boxes of gifts from Bolink, Custom Works, Team Novak, RevTeck, Dan's R/C Stuff, Victor Engineering, Bud's Endurance Racing Products, Race Prep, Team Hammer, Competition Plus and B & B Software. Gary McAllister

did a great job on the T-Shirts.

The NORRCA Team Cup went to RevTeck, with a combined point total of 428.25. The trophies were spectacular. The race was the most tightly organized event possible with a minimum of confusion. Special thanks to Dave Cleveland of Endurance for his great photography.

The only questions remaining are: where did those amazing purple battery packs originate, will Cap Tires ever get less expensive than full size car tires, and whose voice is that on the pre-recorded message between races?

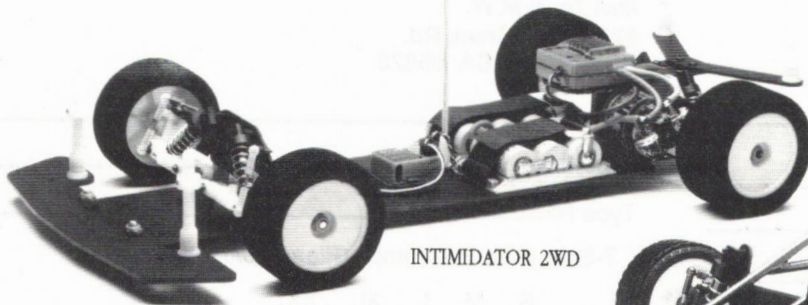
NORRCA 1991 DIRT OVAL NATIONALS

2WD PRO STOCK

- 1st - David Potter
- 2nd - Gary O'Brien
- 3rd - Ben Porter
- 4th - Darrell Moore
- 5th - Barry RaBorn
- 6th - Todd Fox
- 7th - Richard Starr
- 8th - George Vardzik
- 9th - Jeff Lee
- 10th - Shane Kocher
- 11th - Rusty Hudson
- 12th - Allen Nielsen
- 13th - Danny Taylor
- 14th - Shawn Jankowiak
- 15th - Dennis Watkins
- 16th - Joe Goodwin
- 17th - Jim Gard
- 18th - Dee McGee
- 19th - Craig Arnold
- 20th - Roger Watkins

- 21st - Jason Belton
 - 22nd - Bob Hillin
 - 23rd - Jess Belton
 - 24th - Rick Harden
 - 25th - Edwin Braziel
 - 26th - Art Farrell
 - 27th - Larry McGee
 - 28th - James Hobby
 - 29th - Stanley Huey
 - 30th - Mark McGraw
 - 31st - Chris Tunstall
 - 32nd - Chris Allison
 - 33rd - Shawn Stevenson
 - 34th - Gary Smith
 - 35th - Ed Rains
 - 36th - Richard Stahl
 - 37th - Jeff Orsak
 - 38th - Carroll Peters
 - 39th - Ben Johnson
 - 40th - Lyn Pate
 - 41st - John Kelly
 - 42nd - Mitch Mitchamore
 - 43rd - Doug Simmons
 - 44th - Trois Mitchamore
 - 45th - Jeff Belton
 - 46th - Steve Nelson
 - 47th - Allen McQueen
 - 48th - Jack Boyd
 - 49th - Bill Harrison
 - 50th - Scott Muster
- ##### 2WD OPEN
- 1st - Will Whisler
 - 2nd - David Potter
 - 3rd - Rob Cutman
 - 4th - Mike Garcia
 - 5th - Jim Dieter
 - 6th - Brian Landgraff
 - 7th - Ben Porter
 - 8th - Craig Perry
 - 9th - Warren Darby
 - 10th - Nathan Magruder
 - 11th - Charles Huckabee
 - 12th - Darryl Reich
 - 13th - Chris Smith
 - 14th - Richard Starr

after another,



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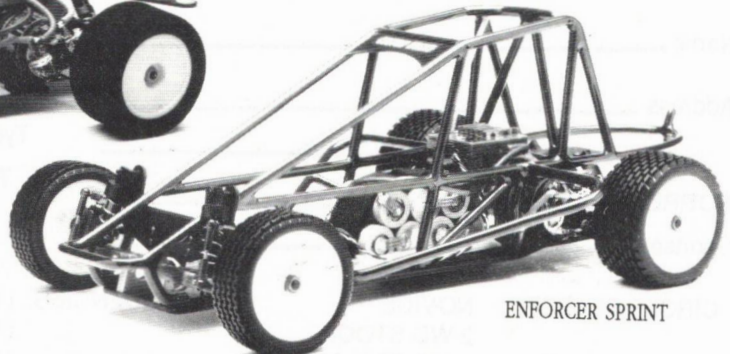
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 17th - Barry RaBorn
 18th - Jim Gard
 19th - Paul Dionne
 20th - Art Farrell
 21th - Rico Boccoleri
 22th - Jim Shea
 23th - Kevin Davis
 24th - Todd Fox
 25th - Gary Smith
 26th - Sean Sinclair
 27th - Rick Brown
 28th - Chris Allison
 29th - Duane Pierson
 30th - Mark McGraw
 31st - Wayne Tuthill JR
 32nd - Chris Tunstall
 33rd - Mickey Tunstall
 34th - Carroll Peters
 35th - Wayne Tuthill SR
 36th - Brian Fielder
 37th - John King
 38th - Allen Nielsen
 39th - Stanley Huey
 40th - Chris Jones
 41st - Trois Mitchamore
 42nd - Dick Munde
 43rd - Ken Buzzard
 44th - Bill Griffin
 45th - Donnie Tuthill
 46th - Mitch Mitchamore
 47th - Bill Harrison
 48th - Jess Belton
 49th - David Morrison
 50th - Mike Winfield
 51st - Steve Nelson
 52nd - John Walters
 53rd - Sean Young
 54th - Billy McMahan
 55th - Jason Belton
 4WD OPEN
 1st - Sean Young
 2nd - Chris Smith
 3rd - Todd Fox
 4th - Craig Perry
 5th - Darrin Zimmerman
 6th - Chrispin Aribas
 7th - Brian Landgraaf
 8th - Paul Dionne
 9th - Will Whisler
 10th - Rob Cutman
 11th - Bob Light
 12th - Nathan Magruder
 13th - Warren Darby
 14th - Russell Hudak
 15th - Jim Dieter
 16th - Charles Huckabee
 17th - George Vardzik
 18th - Gary O'Brian
 19th - Jess Belton
 20th - Sam Williams
 21st - Matt Splivalo
 22nd - John King
 23rd - Jim Shea
 24th - Bob Hillin
 25th - Justin Hartinger
 26th - Jason Wilkey

27th - Dale Burrow
 28th - Brian Fielder
 29th - Kevin Davis
 30th - Chris Allison
 31st - Jonathan Morgan
 32nd - Bret Mirick
 33rd - Danny Drummond
 34th - Scott Muster
 35th - Joe Goodwin
 36th - Jason Belton
 37th - Sam Daugherty
 38th - Gary Wilkey
 39th - Richard Stahl
 40th - Bert Massengale
 41st - Jeffrey Kerner
 42nd - Tommy Horvath
 43rd - Tim Grimes
 44th - Perry Stevenson
 OUTLAW SPRINT
 1st - David Markert
 2nd - Rob Russell
 3rd - Darrin Zimmerman
 4th - Bob Light
 5th - John Peterson
 6th - Michael Miller
 7th - Mike Morris
 8th - Rick Presley
 9th - Jimmy Gouge
 10th - J. R. Sitman
 11th - Chris Rahe
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 14th - Johnny Boccoleri
 15th - Larry McGee
 16th - Dennis Watkins
 17th - Ken Buzzard
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 24th - Wayne Tuthill JR
 25th - Barry RaBorn
 26th - Kurt Lechel
 27th - Roger Watkins
 28th - Ronnie Turner
 29th - James Hobby
 30th - Rick Brummett
 31st - Mark McGraw
 32nd - Earl Erdmann
 33rd - Darrell Moore
 34th - Jerry Godfrey
 35th - Jeff Belton
 36th - Bert Massengale
 37th - Wayne Tuthill SR
 38th - Gary Giles
 39th - Donnie Tuthill
 40th - Duane Pierson
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THIS MONTH IN RACING

NORRCA/MICKEY THOMPSON COMES TO DALLAS

BY DOUG HANDEL

On this Saturday, almost one hundred 1/10 Scale Off-Road drivers began a day of rough and tumble racing in front of excited and sometimes puzzled crowds in Dallas, Texas at the Texas Stadium (home of the Dallas Cowboys), in conjunction with the famous Mickey Thompson Stadium "full scale" Off-Road Racing Challenge. The crowds of curious spectators all day made this NORRCA race as much an "event" as it is a race.

BACKGROUND

As at all the NORRCA/Mickey Thompson events around the country, the R/C track is a miniature "duplicate" of the "real" dirt track inside the stadium. The R/C races are part of the entertainment proceeding the full scale stadium races, and in return the drivers get the opportunity to show the general public what R/C racing is all about.

Not only do R/C drivers race, but there is a special R/C

One of the most devastating occurrences that can happen to an r/c track is a storm. This is evidenced by the work this crew now had to do to get the track in shape for racing.



THIS MONTH IN RACING

Challenge Race between "real" Mickey Thompson Drivers like Roger Mears Jr., Ivan Steward, and Danny Rico, driving "identically prepared" Traxxas Trucks.

PREPARATION

The day before the races J.R. Sitman, NORRCA President, and Steve Webster of Indy R/C, Callas, (the host hobby shop), arrived at the Texas Stadium parking lot to find a 60x60 foot pile of wet black clay looking more like the world's largest mud wrestling pit than the makings of an R/C off-road course. This was the same dirt used inside for the stadium races, and would have been just great if our R/C cars weighed 2000 pounds each. But, they don't!

It took 6 volunteers working with one bulldozer, 2 water trucks, one generator, and 3 tillers, over 9 hours to get the jumps and turns on our "little" track matched to the contour of the "big" indoor stadium track. Super thanks to Steve Webster and his volunteer crew, who worked the track until darkness fell that night.

RACE DAY

In addition to the entered R/C drivers, Dan Moynihan of Dan's RC Stuff, Jim Jenkins of TRAXXAS, and Specialized R/C Motorworks of Oklahoma (motor rebuilders), were on hand to give out prizes, help the drivers and generally add to the excitement. Additional race sponsors were Associated, Reedy, and Autoscore. Most of the R/C

entrants were from Texas, Oklahoma, and Louisiana, but the event drew drivers Armando Rodriguez, Jose Diaz, and Juan Carlos Jenkins all the way from Mexico City.

Our race schedule was set to have a Concourse, two rounds of qualifying, and a break for the full scale Mickey Thompson drivers "R/C Challenge Race".

Then if the rain stayed away, we would run the third round of qualifiers and the mains.

Well, the Concourse part went off without a hitch, with trucks taking the 3 top honors. Kevin Mitchell from Dallas, for the second time at a NORRCA event, won 1st place in Concourse with his Losi "exact duplicate" of Roger Mears Jr's real Nissan Stadium



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- #7023 - 1/8" Chrome Steel G5, 10/bag
- #7024 - 1/8" Tung. Carbide, 32/bag
- #7027 - 1/16" Tung. Carbide, 25/bag
- #7028 - 3/32" Tung. Carbide, 25/bag
- #7029 - Stealth Tung. Carbide Kit, 18 balls
- #7030 - JR-X Tungsten Carbide Kit
- #7031 - 1/8" Ceramic Ball/Ring Kit

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- #7025 - Mach I Modified Drops
- #7017 - Battery Strapping Tape
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- #5258 - 1/10th Purple (MF) Fronts
- #5207 - 1/10th Silver (MS) Rears
- #5210 - 1/10th Pink (Med) Rears
- #5211 - 1/10th Purple (MF) Rears
- #5203 - 1/10th Dirt Oval (MS) Rears
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- #5236 - 1/12th Pink (Med) Rears

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- #6207 - 1/10th Silver (MS) Rears
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THIS MONTH IN RACING

truck. Roger Mears would later autograph Kevin's winning truck body.

The first round of qualifying let everyone know that our "one-day-track" could flip any truck or car. There was so much flipping, that the stock and open times were virtually the same. No one was immune to the tracks irregularities.

SO FAR SO GOOD AND THEN...MARINE AIRBORNE ASSAULT!

At 11:00 a.m., the U.S. Marines launched "Operation Blow Over the R/C Track". We knew our track was only 40 feet from where two Marine assault helicopters were to land for the public

to see, but what could just two helicopters do to our track and pits?

The first helicopter was a Cobra Attack Helicopter with rotor blades that had to be 3 feet wide and 60 in. diameter. Our track was directly in its approach path. It roared in 25 feet over us, blowing over pit tents, (one landed on the officials motor home), throwing R/C cars, lifting tables, sailing banners and extension cords, creating a dandy 20 second tornado on the track, and ultimately blowing over one of the three "port-a-potties"! (We never did find out if someone was inside the "pottie".) A few minutes later a second helicopter landed, but we

were ready this time with everyone laying over their R/C equipment with their bodies.

BACK TO RACING..."IT'S JUST A SPRINKLE"

The second round of qualifying got underway with everyone again looking to the sky. Not for Marines this time; we were looking at the threatening storm clouds gathering directly over our track.

With just 4 heats to go in the second round, the rain started to fall. A Two Wheel Pro-Stock heat was running on the track with 2 minutes left. We looked at J.R. Sitman, he said "Keep it going it's just a sprinkle." At the 3 minute mark, as the rain became more steady, we looked at J.R. again.

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THIS MONTH IN RACING

He indicated, "keep going". Since the drivers were turning in faster laps, as the mist soaked into the track, they didn't want to stop either. We made the four minute mark, under constant drizzle with a new TQ time. Naturally the next heat of drivers wanted to run on the fast damp track, rain or no rain, so they did.

2:00P.M. . . .THE BOTTOM FELL OUT

That next heat was Super Stock Truck. The trucks took the dirt/mud even better than the cars, and completed their fastest qualifier too. Just as the last of the trucks passed over the lap counter, after 4 minutes, the sky let loose with thunder and buckets of rain. Everyone ran for cover. After the

rain stopped, it took another half hour to clear the track of standing water. Amazingly, the track looked better then before the gully washer and what was left of the track was just perfect for the Mickey Thompson "real" driver's Challenge - shallow mud.

BIG GUYS AND LITTLE TRUCKS

A different Traxxas Team driver took each Mickey Thompson "star" driver aside for a 5 minute cram course in R/C driving. The matched Traxxas Trucks were set on the grid and then both driver and Traxxas coach, went up on the driver's stand for the race.

The circumference of the track was solid onlookers as

Dan Moynihan in his famous banana yellow shorts, prepared to add "color commentary" to the Challenge Race. As the starting tone sounded, 4 of the 5 trucks went "every-which" way, with only Roger Mears Jr. heading out around the first corner. By the time the other drivers stopped laughing and gained some sort of control, Roger's truck was 3 turns ahead, and the rest, as they say, was history as Roger Mears Jr. won easily. Roger was not a novice with R/C, having won this Challenge several times before at other Mickey Thompson Races.

While no other driver got close to Roger during the 4 minutes, the other drivers kept the crowd laughing and screaming by hammering each other continuously for most of the race. At the end of the race, the Mickey Thompson drivers hung around signing their signatures on R/C car bodies, the driver's stand, and hats and t-shirts for the R/C drivers and the spectators.

BACK TO "REAL" RACING

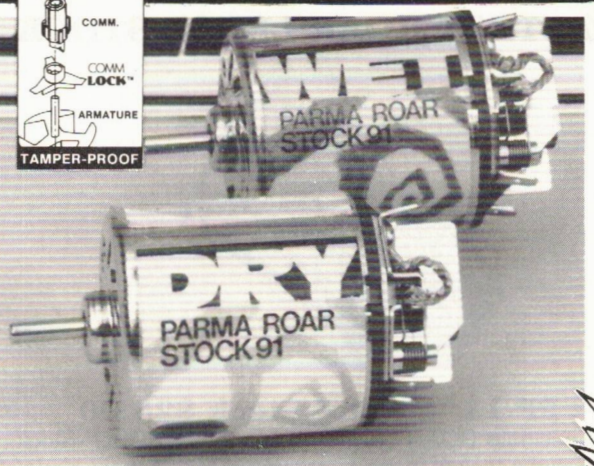
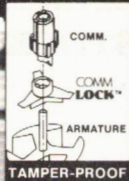
By the time the rain and the Challenge Race was over, it became obvious that the optional third round of qualifiers would not be possible. The last two truck heats of the second round were run and the mains were set.

Fact is, everyone was having so much fun with the "whole event", what with the Marines, the mud, the Mickey Thompson drivers, the constant crowds and the rain, that no one complained about the rain delay taking out the third qualifier.

TOP QUALIFIERS WERE AS
FOLLOWS:

Pro Stock Truck - Kirby Tschoepe
Open Truck - Justin Jenkins
2WD Pro Stock - Todd Handel
2WD Open - Todd Handel
4WD Open - Jonathan Morgan

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Sat. Nov 16 - Concours 9:30AM
1/12 Stock & 1/10 Stock 10AM
3 Qualifiers & Mains
Sun. Nov 17 - Concours 9:30AM
1/12 Mod & 1/10 Mod - 10AM
3 Qualifiers & Mains

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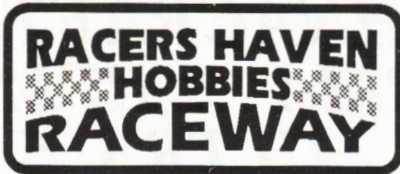
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 Saturday, November 9: 3 rounds qualifying, 10am.
 Sunday, November 10: Concours, 1 round qualifying,
 and mains, 10am.

CLASSES : 1/10 Novice, 1/10 Stock, 1/10 Modified, 1/12 Stock, 1/12 Modified.

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AWARDS : 1st-10th all "A" Mains, 1st-3rd all other mains.
 Concours 1st-3rd.

November 9&10, 1991
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RULES : GTP Bodies only, No CAN-AM or open cockpit, ROAR Rules apply, membership available at track.

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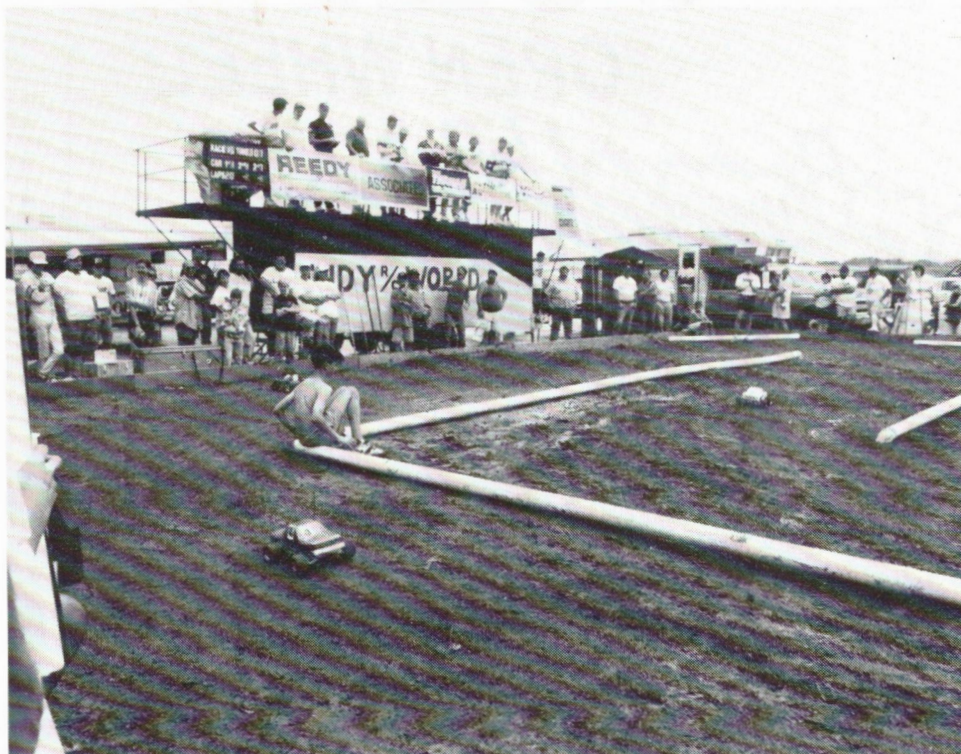
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Classes _____ Frequencies 1. _____ 2. _____ 3. _____

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THIS MONTH IN RACING



Pictured here is the "Challenge Race" with full scale race truck drivers.

2WD Stock - Randy Irvin
Super Stock Truck - Craig Ray

THE MAINS

As the mains started, the crowd of spectators, who were too early for the stadium races, surrounded the track. First of the A-Mains was 2WD Open, with only Todd Handel (Associated/Reedy, ERP) and Scott Montgomery (Traxxas, Peak Performance, KO Radios) turning 14 laps in the qualifiers. Todd, who had TQ position, got the hole shot but tangled with traffic on the second turn and by the time Todd was up again, he was 7 cars back with Scott Montgomery in the lead.

Scott never looked back, with Quincy Hughes (Traxxas, Light-speed Motors) and Caton Cobb (Austin R/C Center) two turns behind. Although no one was

immune to flipping on the track, once Scott gained the lead, he held his car down better than anyone else. Scott and Quincy Hughes made the 14 lap mark, with Scott 13 seconds ahead for the win!

2WD OPEN A-MAIN (TOP 5)

- 1st - Scott Montgomery
- 2nd - Quincy Hughes
- 3rd - Caton Cobb
- 4th - Bryan Roden
- 5th - Jonathan Morgan

In the Open Truck A-Main, Tom Owens (Traxxas, B & R Motors and current NORRCA NATIONAL CHAMPION), and Justin Jenkins (Traxxas & TQ) pulled the totally amazing and unbelievable record of 15 LAPS, with Tom crossing the finish 2 seconds ahead of Justin, but the rough track took its toll - Only 5 trucks finished!

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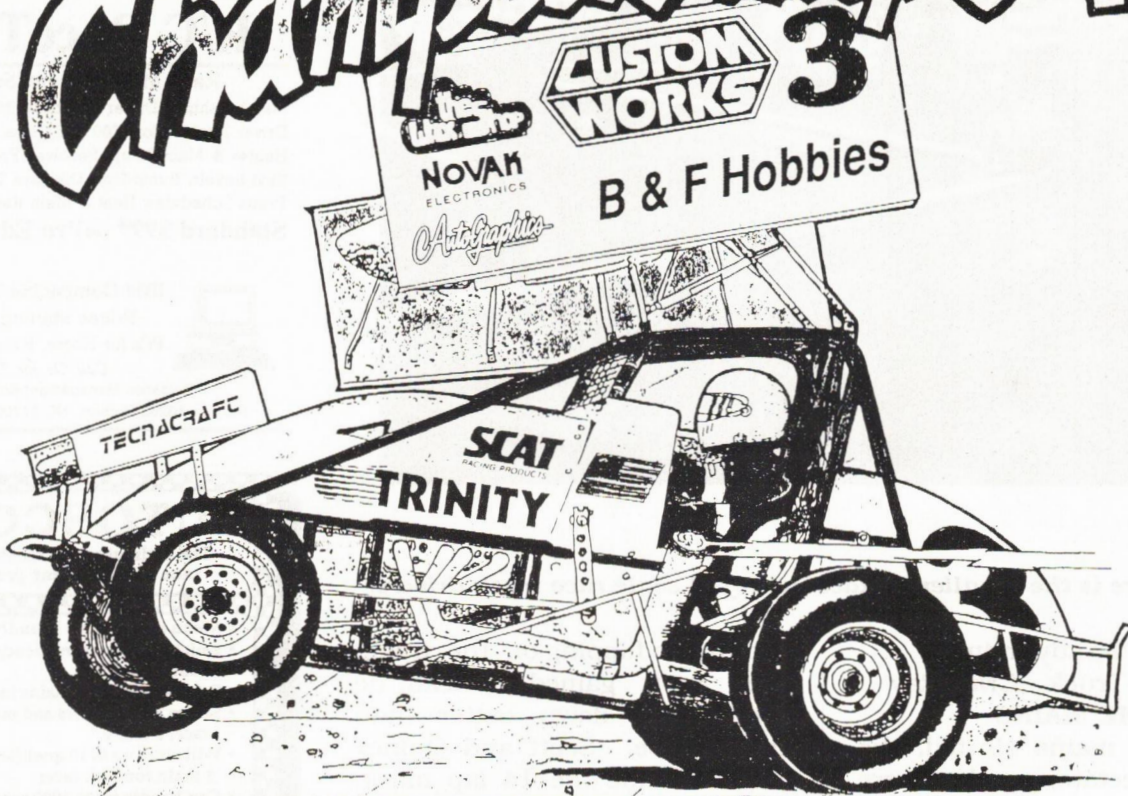
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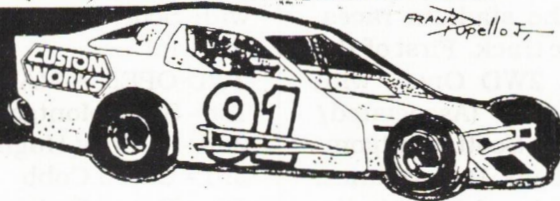
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THIS MONTH IN RACING

OPEN TRUCK A-MAIN (TOP 5)

- 1st - Tom Owens
- 2nd - Justin Jenkins
- 3rd - Steve Cross
- 4th - Don McMillan
- 5th - David Hill

In the 4WD Open A-Main, Jonathan Morgan (Associated/Reedy, Schumaucher & TQ) won by half-a-lap, but kept the crowd laughing the whole race. He set the record for the most sommersalts in one race, and at the same time turned the BEST INDIVIDUAL LAPTIMES of the day. His laps, (when he was right side-up), were almost 2 full seconds faster than anyone else in any class. He would flip and drop to 4th or 5th and then turn a lap time of 15.5 seconds to regain first in one lap, and then flip again. Keith Beasley in second place, was laughing so hard, he could hardly see to drive. Jonathan - what a crowd pleaser!

4WD OPEN A-MAIN (TOP 5)

- 1st - Jonathan Morgan
- 2nd - Keith Beasley (Keith may still be laughing)
- 3rd - Tommy Stommel
- 4th - Kyle Rains
- 5th - Josh Handel

In the middle of all this run-to-please-the-crowd fun, The 2WD Pro-Stock A-Main looked like good "clean" racing. Todd Handel (Associated/Reedy, ERP & TQ) lead until about the 2 minute mark with Scott Montgomery (Traxxas, Peak Performance, KO Radios) holding on to second place. At that point, Todd encountered lapped traffic and hung up. Scott passed Todd for the lead and held it to the end. This made the second win of the day for Scott Montgomery.



Pictured above are the Challenge Race Winners. (L to R) Danny Rico (3rd), Roger Mears Jr. (1st) and Johanny Rahab (2nd).

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THIS MONTH IN RACING

2WD PRO STOCK A-MAIN (TOP-5)

- 1st - Scott Montgomery
- 2nd - Todd Handel
- 3rd - Bryan Roden
- 4th - Danny Montgomery
- 5th - Peter Reddien

The Last "Pro Class" race of the day was the Pro Stock Truck A-Main. While R/C racing often looks like a sport for young "video-game-generation" drivers, there were two drivers in this A-Main whose combined age was over 120. I, of course, won't mention either Jane or Don McMillan's names.

Kirby Tschoepe (Traxxas & TQ) lead for the first 3 minutes, all the while Jane McMillan (Traxxas) was closing in on him. But, as she would get close, he would turn on the after burners and pull one turn ahead until - with less than one minute left - Kirby's truck started to noticeably slow down. The crowd, who had been watching Jane try to close on Kirby, went wild! There was only 15 seconds left in the race and 2 turns separating them both. Jane cut the corners and Kirby tried to keep his slowed truck going

around the last corner of the track. Time ran out with a dead heat "drag" down the front strait for the finish, with both trucks only inches apart. The spectators, the drivers and the announcers were yelling. It looked like a dead heat, but the electronic lap counter gave the result - Jane McMillan won by 8/100th of a second! Kirby smiled. A great ending for the 1991 NORRCA Dallas Mickey Thompson Challenge. The drivers and the spectators had a full day of R/C racing. It was an event!

PRO STOCK TRUCK (TOP 5)

- 1st Jane McMillan
- 2nd Kirby Tschoepe
- 3rd Don McMillan
- 4th Steve Cross
- 5th Steve Risenhoover

The drivers in the following classes cannot enter the Open (Modified) or "Pro Stock" Classed under NORRCA rules. It gives them great racing without having to drive against the more experience "sponsored" drivers. Other than this restriction, their races are identical to all the other classes and every bit as exciting.

2WD STOCK A-MAIN (TOP 5)

- 1st - Tim Dewitt
 - 2nd - Kavin Mitchell
 - 3rd - Randy Irvin
 - 4th - David Martin
 - 5th - Cameron Spruill
- ### SUPER STOCK TRUCK A-MAIN (TOP 5)

- 1st - Craig Ray
- 2nd - Dean Arrington
- 3rd - Jacob Finkle
- 4th - Ron Owens
- 5th - John Brumley

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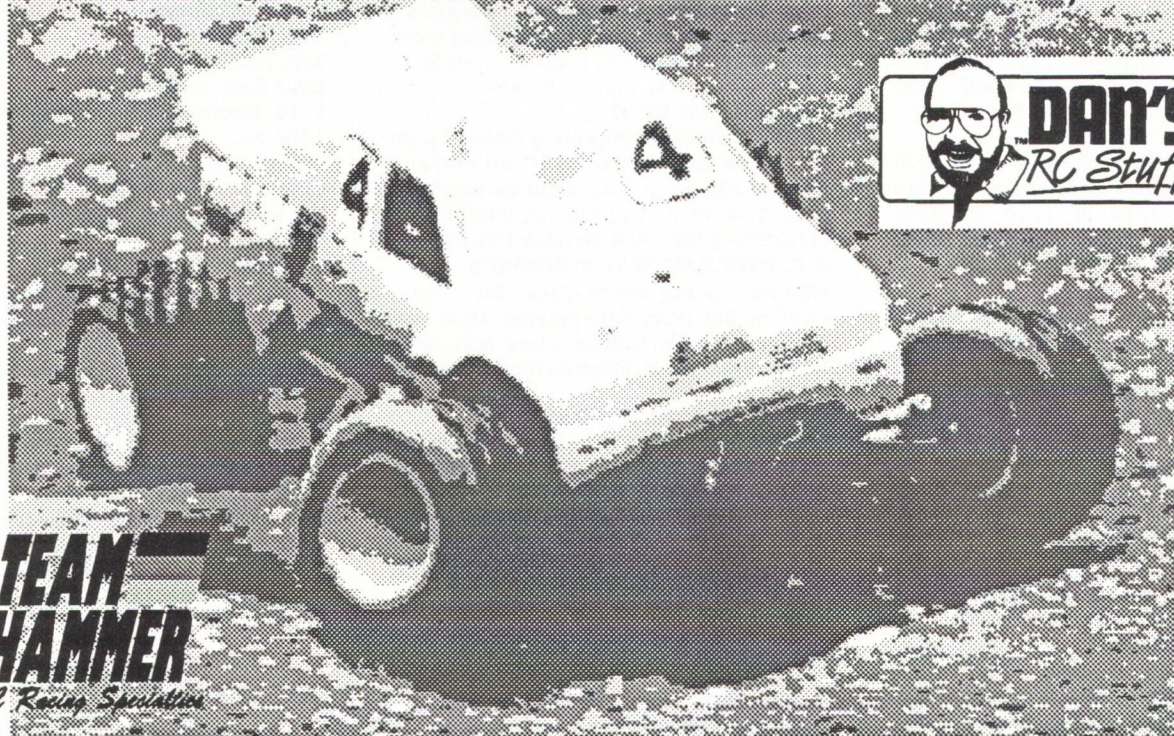
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Georgia OFF-ROAD STATE CHAMPIONSHIPS

NOVEMBER 9-10

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NOV. 10...TRACK OPENS NOON, MAINS START AT 2PM
WARM-UP RACE OCT. 12, AT 3PM.



NORRCA

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1/4 Scale Dirt Oval every first and third Saturday. 1/10 scale: Tues. Tamiya Off-Road, Thur. Off-Road & Dirt Oval, Fri. 1/10 and 1/12 on-road, first Sunday Dirt Oval, second Sunday 1/10 & 1/12 On-Road, third and fourth Sundays Off-Road. 7920 Webster, Highland, CA, (714) 864-1770.

THE RANCH PIT SHOP

1/10 Scale: Every Wednesday night at 6 p.m. Alternating Oval and Off-Road. Every fourth Sunday 1/12 & 1/10 On-Road combined Program. 1655 E. Mission Blvd., Pomona, CA 91766, (714) 623-1506.

SMR/CRC

1/8 Scale & 1/10 On-Road: First Sunday of each month at G.I.A., 1660 Stewart Street, Santa Monica, CA. Sign-up 8:30 a.m. For more info call Glenn Williams (213) 734-7888, Chris Chan (213) 393-3735, or Tom Wong (213) 821-5472.

G & S OFF-ROAD RACEWAY

1/10 Scale: Every Sunday - San Carlos & Meridian Avenue, San Jose, CA.

REECE'S R/C RACERS

1/10 Scale: 1st & 3rd Sundays at Spinner's Airport Raceway, 2nd & 4th Saturday's at Reece's R/C Racers, (209) 784-0922.

SROKA'S INDOOR R/C

1/10 Scale: Every Sunday - Oval racing every 4th Sunday. 5216B Arboga Rd., Marysville, CA 95901. Call Michael or Vickie Sroka (916) 742-6148 or (916) 741-3051.

HOBBY HAVEN RACEWAY

1/10 Scale: 1756 First Street, Livermore, CA 94550. For further info call (415) 443-5828 M-F 10 a.m. to 6 p.m.

FAST LANE R/C

Address is 25845 San Fernando Rd. #21, Saugus, CA 91350. Contact John or Darlene at (805) 255-2404. Racing is off-road, dirt oval, asphalt road course and asphalt oval.

SONOMA COUNTY RACEWAY

1/10 Dirt Oval, 1/10 Off-Road, 1/10 & 1/12 Asphalt: 806 Brookwood Avenue, P. O. Box 9565, Santa Rosa, CA 95405. Mark White (707) 571-7565, Schedule info (707) 571-8044, Competition Products (707) 571-8048.

THE SQUARE ROUNDHOUSE SPEEDWAY

1/10 Scale: Saturdays 3 events per month, Off-Road, Monster Truck Pulls and Oval Race. Oval dirt track and Off-Road tracks. 1468 Lander Avenue, Turlock, CA 95380, (209) 668-4454. Ask for Harold Lindquist.

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1/10 Scale: Indoor Off-Road racing every Tuesday & Thursday evening beginning at 7 p.m. and Saturday at 2 p.m. 2011 Placentia Ave., Costa Mesa, CA 92627. for more info call (714) 631-1555.

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1/10th Dirt Oval racing every Friday 7 p.m. All classes. Sat. & Sun. 1/10 dirt oval and off-road 10:30 a.m. Also night racing. 5631 Lone Tree Way, Antioch, CA 94509. Call (415) 754-5700. Ask for Jack Hanson.

R.C. CITY RACEWAY & HOBBIES

Off-road racing every Tues., Fri., Sun., Oval racing every Sat./Practice time and rentals available. Call for more info. (408) 262-3188. 1453 N. Milpitas Blvd., Milpitas, CA.

MOUNT SHASTA R/C RACEWAY

1/10 Scale: Lassen Lane and Smith Road. (916) 926-4717. Home of Cal-Ore Off-Road Championships. 1/10 off-road racing every other Sunday. May through October. Indoor carpet racing 1/10 & 1/12 November through April. 826 Pine Street, Mount Shasta, CA 96067.

HOBBY HUT

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331 Mariposa Court, Upland, CA 91786. (714) 981-9641 or fax (714) 981-0527

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CANADA

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R.R.O.L.

1/12 carpet racing Tuesday, 1/10 carpet racing Wednesdays. Sept. to May, Asphalt & off-road in summer. Remote Racers of London, P. O. Box 7241, Stn. E. London, Ontario, N5Y-4J0, Canada. Dan Engelbreth, (519) 668-0427.

S.T.A.R.C.

1/12 Scale: Wed. nite - STARC Club Series. Rockton, Ontario, Canada. Sam Burke (519) 621-5424.

S.O.R.C.R.C.C. 1/12 Scale: Southern Ontario Radio Control Race Car Club in Toronto, Ontario, Canada. Racing alternating Sunday nites Oct. - April Scott Reynolds 298-4941 or Gary Joi 421-9061.

CONNECTICUT

PANTHORN RACEWAY

1/10 Scale: Panthorn Park, Burritt St., Southington, CT. Every Saturday May 1st - Nov. 1st. Off-road, oval, baja, truck pull ing. Call (203) 628-9345 Ben Carr, 272-9326 Pete Church, 237-6976 Bob Lavoie, 879-2316 Steve Magnani.

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1/10 Off-Road, from end of April to middle of October. Racing every Sunday weather permitting. Call Mike Belmonte at (203) 661-0145. Track is at Old Field School in Fairfield, CT.

R/C HOBBIES RACEWAY

1/10 Scale: Route 163, Bozrah, CT. Racing every Sunday, May 1 to Oct. 30. For more information call (203) 886-9441, ask for Mike or Bob.

SNORR

1/10 Scale: Racing every 1st and 3rd Sundays. P. O. Box 438, East Haven, CT, (203) 469-2594 or (203) 481-5813, Dave Seales.

BUCKLEY SPEEDWAY

1/10 Scale: 37 Douglas Street, Hartford, CT. Every Sunday April 1st to Nov. 31st. Black top oval. For more info call "Ziggy" or Debbie Kwasnicki (203) 246-4778.

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1/10 dirt off-road on an indoor track, every Wed. 7:00 p.m. and Sat. at 2:00 p.m. 1/10 dirt oval racing Thur. and Fri. at 7:00 p.m.. 1512 S.E. Village Green Dr., Port St. Lucie,

FL 34952 (407) 337-9000

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1/4 scale, and 1/10 scale: Large asphalt oval racing alternating every Saturday and Sundays April thru October. 1220 Shappert Dr., Machesney Park, IL 61111, (815) 282-1311.

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THE INSIDE TRACK

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1/10 Scale indoor dirt track. Thurs., oval; Fri. truck pulls; Sat. off-road. P. O. Box 76, 305 Browne Avenue, Scranton, KS 66537, (913) 793-2313.

KANSAS R/C RACING CLUB

Every Second Sunday, Junction City; Every 4th Sunday Enterprise.

DEE & MEE HOBBIES

Two tracks; dirt oval and off-road, oval on Mon. and off-road on Fri. Both at 7:00 p.m. Carpet 1/12 on Tue. at 7:00 p.m. 628 Kansas, Topeka KS 66603. 357-4232.

KENTUCKY

HOBBY CENTER

1/10 & 1/12 Scale: High banked carpet oval track. Racing Fri. 7:30 p.m. Call (502) 683-7611. 1233 Sweeney St., Owensboro, KY 42301.

RIVER CITIES R/C RACEWAY

1/10 Scale: Racing at 5:30 Saturday evenings under a light area. Call Randy Aust (606) 836-4273 or Jason Graham (606) 836-2613. Ashland, KY 41101.

MARYLAND

MASON DIXON R/C CAR CLUB

1/10 Scale: Every Sunday at 1 p.m. Track location at Hagerstown Fairgrounds, Hagerstown, Maryland. Call King's R/C Cars, 219 E. Washington St., Hagerstown, MD 21740, (303) 739-0080.

CENTRAL MARYLAND ELECTRIC RACING CLUB (CMERC)

Community R/C Speedway

1/10 Scale: Racing every Saturday dirt oval. Middletown Park, Middletown, Maryland. Contact John Mauchamer, (301) 698-9545. 1/12 Scale: Mark Coats (301) 694-7420.

TEAM R & R, INC.

1/10 & 1/12 scale indoor oval carpet racing. Every Sunday. for more info (301) 848-2144 or (301) 876-2983. Westminster, MD 21157.

MARYLAND R/C CLUB

1/10 & 1/12 scale racing Indoor carpet. Contact Toy World R/C, (301) 424-0430.

THE COCKEYSVILLE ASTRODOME

1/10 Scale: C.A.R. Cockeysville Astrodome Racers, Inc., 10854 York Rd., (Rear) Cockeysville, MD, (301) 666-1098. for further information call Art LaPole (301) 889-2070.

GPA HOBBIES, INC.

GPA Speedway races 1/10 off-road and 1/10 and 1/12 indoor road. For schedule information call (301) 805-9004 or write to GPA at 3498 Crain Hwy., (Collington Plaza), Bowie, MD 20715.

MASSACHUSETTS

BROCKTON INTERNATIONAL SPEEDWAY

1/10 & 1/12 Oval racing on Mon. 7:30 p.m. 1217 Main St., Brockton, MA. For information call (508) 588-9355.

R/C PERFORMANCE CENTER

1/10 Scale carpet oval and indoor off-road

dirt track. Racing Tues., Thurs., Sat., & Sun. 4 Manley Street, West Bridgewater, MA 02379. Ask for John (508) 588-9666.

HOBBIES ETC. RACEWAY

1/10 & 1/12 scale: Every Sunday Racing at 1 p.m. Indoor on-road carpet. For more information call (617) 389-3331. Medford High School, Winthrop St., Medford, MA.

NORTH EAST AUTO RACERS (NEAR)

The club hosts 1/8 gas and 1/10 electric road racing. Track is behind Cobblestone's Restaurant. Races are scheduled May through October. For full schedule contact George Denault at (508) 346-8456.

MEGADROME RAEWAY/BRCCR CLUB

One of the largest facilities on the East Coast. Track is located at North Adams Plaza, Rt. 8 Curran Hwy., North Adams, MA 01247. (413) 743-7223.

MICHIGAN

FLINT R/C CAR CLUB

1/12 on carpet & 1/10 scale. For more info call: Ralph Herndon (313) 658-5390 or Tom Hoos (313) 658-1043.

USA RACEWAYS

1/10 & 1/12 Scale: Every Thursday oval & off-road Every Fri. indoor carpet oval. Tuesday on-road. Saturday on-road. 6083 Dixie Highway, Bridgeport, MI, (517) 777-7USA.

TAIT'S HOBBY SHOP

1/10 & 1/12 Scale: Sat. off-road 12 noon. Sunday Dirt Oval 12 noon. Mon. Indoor Oval Carpet 7 p.m. Tues. Truck/Car pulls 7 p.m. 1/10 & 1/12. Wed. Outlaw Dirt Oval 7 p.m. Friday off-road 7 p.m. 3270 Bay Road, Saginaw, MI 48603, (517) 799-3900.

SIDEWAYS CITY

1/10 Scale: Racing every Tues. & Fri. nite and Sun. afternoon. Track is a super speedway cement oval. Dirt track open May thru Sept. Call (616) 792-2004 for further info. Located in Wayland, MI.

HARRISON INTERNATIONAL SPEEDWAY

1/10 Scale: Friday nite high banked small oval. Sunday large flat oval. 3519 N. Clare Avenue, Harrison, MI 48625, (517) 539-7959.

GLASS CITY RADIO CONTROL

Racing 1/10 & 1/12 scale: Clayton White (1/12) (419) 882-2518 or Mike Marshall (1/10) (313) 241-5321.

MINNESOTA

NORTHSTAR RACEWAY

1/10 Scale: Featuring Minnesota's first indoor & outdoor clay oval and off-road surfaces. Tues. Off-road; Thurs. Oval; sat. off-road. Call for complete schedule (612) 757-0374, 10751 University Avenue, Blaine, MN 55433.

MISSISSIPPI

FASTRACKERS RACEWAY

1/10 scale off-road racing every weekend. One of the biggest and most challenging off-road tracks in Region 6 ROAR sanctioned. For more information and racing schedule,

write - 4909 West Gate Hills Dr., Meridian, MS 39305 - (601) 693-8368.

JACKSON R/C RACING ASSOCIATION

Car and truck racing Sundays at 10:30 a.m. and Tuesdays at 6:00 p.m. Computerized lap counting, all classes pan stock and modified, gearbos stock and modified, truck, 4 X 4, Dominator class, and 1/12 if enough to run. Track is 2 1/2 miles west of Rt. 9 on Rt. 526. (908) 905-1593.

NEBRASKA

HOBBYTOWN

1/10 Scale: 1/4 mile high banked indoor carpet tracks at two of our stores. The Lincoln track is at our Sutter Place Mall store location at 5221 S. 48th St., Lincoln, NE 68516, (402) 483-7427. The Omaha, NE track is located at Rockbrook Village at 11011 Elm Street, Omaha, NE 68144, (402) 391-5669. Tues. 7 p.m. - Lincoln; Wed. 7 p.m. - Omaha; Sat 1 p.m. - Lincoln & Omaha; Sun. 1 p.m. - Lincoln & Omaha.

OMAHA NEBRASKA RADIO OPERATED AUTO DRIVERS

1/10 & 1/12 Scale carpet and pavement racing. Oval and road course. (402) 331-2907.

NEW HAMPSHIRE

HOBBIES PLUS & R/C RACEWAY

Track is at 14 Celina Ave., Hashua, NH 03063. This is New England's largest (350 ft.) and fastest banked carpet oval. Also 26 x 72 flat carpet track dedicated to 1/12 road racing. Pit areas with electricity for over 200. Complete hobby shop, computer scoring. For more information call (603) 882-9200.

ACTION R/C RACEWAY

1/10 Scale & 1/12 on-road, 1/10 off-road cars and trucks. Indoor carpet high banked oval. Family Fun Hobbies, 201 Washington St., Claremont, NH. (603) 543-1022.

NEW JERSEY

AMERICAN HOBBIES

1/10 Scale: Thurs. Oval; Sunday Off-Road & Oval. for info call (201) 446-2010.

PARLOR HOBBIES

1/10 & 1/12 Scale: Short track stock car racing on road courses. 1/10 on asphalt. Truck class with 1/12 on road, off-road. Rabbit Lane & 34 Broad St., Matawan, NJ, 566-3158.

GLASSBORO'S GRAND OVAL

1/10 and 1/12 indoor carpet oval and road course racing. Outdoor banked clay oval. Racing Wed., Fri., Sat. and Sun. (609) 863-1551. 167 Rt. 47 DSouth (Delsea Dr.), Glassboro, NJ 08028.

NEW YORK

LAWRENCE RACE PARK

1/10 & 1/12 Scale: Nov.-Mar. carpet racing 1/12 scale. Oval and road racing April-Oct. 2509 Macedon Center Rd., Palmyra, NY 14522, (315) 597-6429.

WALT'S HOBBY & CRAFT

1/10 & 1/12 Scale: Two indoor tracks. 1/10 clay oval, Mon. & Sat; 1/10 Gearbox carpet, Mon.; 1/12 & 1/10 carpet, Tues. Oval and Road Course. Weight Pulling Wednesday. 2 Dwight Park Drive, Syracuse, NY, (315) 453-2291.

RADIO OPERATED AUTO RACING OF ROCHESTER

1/10 Scale: Monday Pro Night; Tuesday Boy Scout Night; Wednesday Teen Night; Thursday Indoor Clay; Friday ROARR Meetings; Saturday & Sunday Family Days. 110 Anderson Ave., Behind Village Gate, 274 N. Goodman St., Rochester, NY.

REC. R/C RACEWAY

1/10 Scale Clay Oval Track. Saturday - Oval; Sunday Off-Road. Call Erin Clancy (914) 868-7715. Route 82 to Standfordville, NY 12581.

ROMAC

1/10 and 1/12 on large carpet oval. Thursday and Sunday. (Northern Lights Mall) N. Syracuse, NY. For more info call (315) 468-1463 or (315) 468-6544.

SCHENECTADY R/C SPEEDWAY

1/10 & 1/12 Scale: Indoor oval carpet and Monster Trucks. 955 State St. Schenectady, NY, (518) 3709-3747.

BROWNIE'S HOBBIES

1/10 Scale: Off-Road Dirt Track. Friday evenings 4WD & 2WD. Track open April - November. 124 Bennett St., Staten Island, NY 10302, (718) 727-2194.

RAPID TRANSIT RACEWAY

1/10 Scale: Mon, Tues., & Sat. - Practice. Wednesday - Stock & Mod.; Thursday Sprint Car; Friday Sportsman & Open Class. 2104 Broadway, Schenectady, NY 12306, (518) 372-0777.

CAPITOL DISTRICT R/C OUTLAWS

1/12 Scale 4-cell carpet. Oval and road course. Every Friday at 7:30 p.m. October to April. For further info contact Capitol District R/C Outlaws, 223 Fourth St., Scotta, NY 12302, or Sam Roberts (518) 374-3801.

NORTH CAROLINA**DIXIE R/C HOBBY SHOP**

1/10th Scale: Every weekend Sat. & Sun. The races will alternate between oval and motorcross starting in May. P. O. Box 135, Ramseur, NC 27316, after 6 p.m. (919) 824-2770.

MID-CAROLINA R/C SUPER SPEEDWAY

1/10 & 1/12 high speed banked quad-oval and road course. Located on Flint Hill Rd., Off I-77/Carowinds exit, So. of Charlotte, NC. Fred Penland, (704) 373-2535 7:30 A.M. to 4:30 P.M.

ASHEVILLE HOBBY SPEEDWAY

1/10 & 1/12 scale asphalt oval-indoors. Racing Wed. & Sat. 7:30 p.m. Highway 25, Naples, NC 28760, (704) 684-9814 ask for Jack or Sharon Murdock. 1/10 Dirt Oval & Off-Road. Racing Sat. & Sun. 1st & 3rd weekends. 6200 McGregor Dr., Charlotte, NC 28227, (704) 545-0746 ask for Steve Hill.

RC HOBBY & RACEWAY

1/10 & 1/12 indoor carpet racing Nov.-Mar. Oval and Off-Road dirt racing every Saturday. For more info (919) 228-6809, 1358 S. Church Street, Burlington, NC 27215.

BOOGLE BAY R/C RACEWAY

600 foot asphalt oval raceway with 30 foot wide straits and 40 foot wide turns. The track races 1/10th, 1/12th and 1/4 scale. Racing set every month in advance every Saturday and Sunday. Rt. 1 Box 324, Linden NC, 28356 - (919) 488-5408.

NORTH DAKOTA**NORTHERN MINI-RACERS**

1/10 Scale on-road, carpet, road racing. Saturdays Sept. through May. P. O. Box 415, Minot, North Dakota. For information call Pat McWethy (701) 839-8868 or (701) 852-6254. Roger Lee (701) 839-4731 or (701) 839-5294.

KOUNTRY KLIN HOBBY

1/12 Scale small indoor carpet track & hobby store. Box 247, 324 Railroad Ave., N. Mohall, ND 58761, (701) 756-6307.

OHIO**TARCAR-TOLEDO AREA**

1/8 gas stock cars. Black clay tri-oval. Sundays late April thru Mid-October. For more info call Dave Scanes, (419) 893-1916.

1/8 RACERS OF TOLEDO

1/8 & 1/10 scale asphalt road course. Every other Sunday from Mid-April to Mid-October at the Woodville Mall rear lot. For schedule and info contact Brent Gottfried (419) 843-3231.

THE RACER'S CHOICE - RADIO CONTROL HOBBIES

Located at 1298 U.S. Rt. 42, Mason OH 45040. Large outdoor off-road track, over 400' long with 100' straight, elevation changes, jumps, moguls and banks. Lighted with large driver's stand. Also banked 40' - 100' oval. Organized racing weekly. Fully stocked shop, for details and schedule call Holly, Tony or Adrian at (513) 398-5539. Track located just north of Cincinnati, near Kings Island.

CORCAR - COLUMBUS, OH

1/10 off-road racing May thru Sept. every Sunday. For more info call Ray Williams, (614) 890-2983.

ALCAR INTER. R/C RACEWAY

1/10 Scale off-road Friday nights. 1/12 & 1/10 carpet Sundays. 33501-A Lake Rd., Avon Lake, OH 44012, (216) 933-6017.

ALTERNATIVE RACING ASSOCIATION

1/10 and 1/12 on-road. Two large tracks indoors and outdoors. 2600 17th SE, Canton, OH 4730, (216) 484-2587.

INNOVATIVE HOBBIES & LAKES SPEEDWAY

Large indoor multi-layout ozite carpet track and large outdoor dirt oval. Racing Wed., Sat., Sun. 3425 Manchester Rd., Akron, OH 44319, (216) 645-1333.

AEROTECH RACEWAY

1/10 oval/tri-oval and off-road dirt. 409

Applegrove Rd. North Canton, OH. Call Ron at (216) 499-1300.

MODELER'S HAVEN RACEWAY

1/10 clay oval May thru October. Electricity, water, indoor restrooms and shaded pit area. Contact Bob at (216) 499-6000. 4255 Portage N.W. North Canton, OH 44720.

MID OHIO R/C RACEWAY

We race 1/10 off-road and dirt oval all indoors. There is a 300 foot oval track with the off-road track built inside of that. In addition to that, we have scale 1/4 mile slot car drag races. Call Bob Curtis at (513) 233-2807 for more information. Trtrack is in Huber Heights, Ohio.

D & S HOBBIES AND RACEWAY

Racing is 1/10 and 1/12 4-cell. Race days are Wed., Fri. and Sun. Track is closed Mondays. D & S Hobbies, 7701 Crile Rd. Unit 3, Concord, OH 44077

OKLAHOMA**R.C.A.R. OF TULSA**

1/10, 1/12 Scale: Indoor racing. 3025 South Sheridan Rd., Tulsa, OK. For more info call Dave Cole (918) 745-9898.

RCRC OF OKLAHOMA

1/10th scale indoor dirt oval and dirt off-road. Racing on this large track is at 7 p.m. Tuesdays and 5 p.m. Saturdays. Complete hobby shop with plenty of pit space and AC power. 400 WS. Vermont, #104, Oklahoma, OK 73108. Call (405) 942-7272 and ask for Robert Jones.

OREGON**R/C SPEED CENTER R/C ADDICTION**

1/10 & 1/12 scale, banked dirt oval racing, dirt off-road racing, sled pulls, muddog. 2810 N. Pacific Hwy., Medford, OR 97501. Call Gene or Betty Skelton, (503) 779-8298.

PENNSYLVANIA**CARCLUB-COCHRANTON AREA**

Racing every Friday at 6 p.m.; Saturdays 9 a.m.; Sundays at noon. Large indoor carpet-dirt outdoor. Call for info Harry Turner, 120 W. Adams St., Cochranton, PA 16314. (814) 524-7788.

C.A.R. CLUB

Racing every Sunday. Tamarack Raceways, Contact Harry Turner, 120 W. Adams St., Cochranton, PA 16314, (814) 524-7788.

WAGONHILL HOBBIES

Indoor 1/10 & 1/12 on-road racing every Friday night. Outdoor Off-Road every Saturday night. 225 S. Board St., Grove City, PA (412) 458-4711.

TC'S R/C'S

Inside and outside race track and RC Shop. 1537 Freeport Rd., Natrona Heights, PA 15065, Call 226-8802.

PHILLY RADIO CONTROLLED**RACERS R/C CAR CLUB**

1/10 on-road paved track. Sundays, April thru November 11 a.m. 7790 Dungan Rd., N.E. Philadelphia. Jon (215) 224-4822 or Bernie (215) 831-1835.

EAST ST. RACEWAY AND ART CENTER

Over 4,000 Sq. foot carpet track. Computerized lap counting. Racing starts at 7 p.m. each night. Friday oval racing; Saturday stadium off-road. Located at 747 E. Railroad Ave., Verona, PA 15147 (412) 826-0602

SOUTH CAROLINA

BNS COMPETITION HOBBIES

Contact Bob Sanford, (803) 224-8591. Route 7, Box 380, Anderson, SC 29624. Racing and open practice Wed. 6:30 p.m. Every Saturday 1 p.m. 1/10 Dirt Oval.

REMOTE HOBBIES INDOOR RACING

Friday nites - Oval 1/10; Saturday - Road Course 1/10. Shop (803) 736-9446, Track (803) 699-0528. 9005 C Two Notch Rd., Columbia, SC 29223.

BEREA R/C SPEEDWAY

Fri. Nights 1/10 conc., banked oval; Sat. nights stadium off-road for trucks and buggies; Sunday unlimited oval; 707 Sulpher Springs Rd., Greenville, SC 29610. (803) 246-4702.

TENNESSEE

HITT'S HOBBY & RACEWAY

Tuesday Oval; Thursday Off-Road Stock; Saturdays Off-Road Novice; Sundays Off-Road Modified; Oval and Off-Road. 853 Wren Rd., Goodlettsville, TN 37072. For info call Ben or Kent (615) 859-3465.

TEXAS

HAL'S R/C RACEWAY

Saturday is on-road asphalt 1/10. Sunday is off-road. Registration both days is at 11:00 a.m. 1440 Bessemer, El Paso, TX 79936 (915) 591-2213.

RIVER CITY RACEWAY

On Quincy Road, Wichita Falls, TX. Every 2nd & 4th Sundays at Noon. Call (817) 691-1478.

ARROW HOBBIES

Wednesday - 1/10; Every other Friday 1/8 Sprint cars only; Saturdays 1/10 dirt oval. 2710 So. 1-35 West, Burleson, TX, (817) 295-2821.

VICTORIA HOBBY SHOP

Every Sat. Off-Road; Every Sunday - Ovals. 5211 John Stockbauer, Victoria, TX 77904, (512) 575-3270.

EAGLE HOBBY CENTER & RACEWAY

Every Saturday 1/12 4 cell stock and modified. 1/10 6 cell stock on-road. Eagle Hobby Center & Raceway, 3601 Shepherd, Balch Springs, TX 75180, (214) 557-5290.

COASTAL BEND SANDBLASTERS

R/C CAR CLUB

Races first thru third Sundays, 2 p.m.

start. Bill Witt Park, Yorktown Road, Corpus Christi, TX. Call Pete Broadway (512) 992-4448.

ROADRUNNER R/C CENTRAL

1/12 carpet oval or road course. Thurs. 1/10 carpet oval. Tues. & Fri. nite & Sun. p.m. 5620 Bellaire, Houston, TX 77081, (713) 661-7574.

ROADRUNNER R/C NORTH

1/10 Dirt oval Wed., Fri.; 1/10 Dirt Off-Road Sat. & Sun. 12760 Veterans Memorial, Houston, TX 77014, (713) 537-7758.

ROADRUNNER R/C SOUTH

1/10 Indoor Dirt Off-Road Wed, Fri. & Sat. 12902 Player, Houston, TX 77014, (713) 728-2277.

TEXAS R/C RACEWAY

Home of the Plano Outlaws

Tues. & Sat. - 1/10 on-road; Fri. - NASCAR nite; Sunday 1/12 on-road. 75 Central Expressway at 15th St., Exit 29, Palisades Square Shopping Center, Plano, TX. Call Jim (214) 517-7485 or Dean (214) 519-0324.

AMERICAN ANGLER TACKLE & R/C

HOBBY CENTER'S "AA" RACEWAY

Two dirt tracks, oval & off-road. Races every Sunday, 1 p.m. Tracks alternated. Races every Saturday 11 a.m. oval. Hobby shop on site. 1617 Toomey Rd., Austin, TX 78704, (512) 474-8277.

WESTSIDE HOBBIES

1/10 Racing every Sat. 1/10 on-road racing every Sun. on asphalt. Alternating oval and road course. 7214-A N. Mesa, El Paso, TX 79912. For additional information call Tom, Mark or Tim at (915) 585-1864.

FINISH LINE HOBBY & RACEWAY

1/10 scale indoor off-road every Fri. and Sat. 8:00 p.m. 1/12 indoor carpet every Tue. 7:00 p.m. 11925 Jones Maltsberger, San Antonio, TX 78216. Call (512) 491-0088 for more information.

UTAH

I.R.C.D.R.A.

Race indoor off-road every Saturday at 6 p.m. 3150 Brinker, Ogden, UT info call Hobby Express (801) 621-4013.

VERMONT

MIKES HOBBIES & RACEWAY

Indoor banked 1/10 carpeted oval, on-road racing. Six classes every Wed. at 7:00 p.m. and Sun. at 1:00 p.m. Track at 162 N. Main St., Rutland, VT 05701 - (802) 775-0059. For more information ask for Lee or Chuck.

VIRGINIA

F/X CITY RACEWAY

Every Saturday 1 p.m. The Frame Gallery,

13340 F Franklyn Farm Road, Herndon, VA 22071. For info call Eric Zelman (703) 471-4499.

WINNERS CIRCLE HOBBY SHOP & RACEWAY

Racing every Saturday night at 6 p.m. Oarge oval carpet. 3236 W. Clayton St., Richmond, VA 23230 (805) 355-7076.

COOPER'S RC RACE CENTER

Racing every Sunday 2 p.m. oval and off-road. Contact Norris (804) 724-4182. Rt. 4, Box 122B, Chatham, VA 24531.

WEST VIRGINIA

BIG BOYS TOYS HOBBY SHOP AND TRACKS

Dirt and carpet oval tracks. Racing every Sunday evenings; Monday and Thursday evenings. Bridgeport, WV, (304) 842-5799.

WEST VIRGINIA REMOTE CONTROL RACEWAY

Racing every Sunday. Doors open at 12 noon, racing starts at 1 p.m. The track size is a 90 X 50 foot carpet oval. Prizes in all "A" mains. Track is at 601 Jefferson Rd., South Charleston, WV 25309. Call Russell Pauley (304) 346-7223 after 6 p.m.

WISCONSIN

MADISON AREA RADIO CONTROL CAR ASSOCIATION, INC.

Factory Outlet Mall, Madison, WI 1/10 & 1/12 scale carpet racing. Racing 6 p.m. Sat. & 7 p.m. Tues. George Jerdee (608) 873-7286.

J. G. S.

Wisconsin's finest off-road race track. Perfectly groomed 100 ft. straightaway, computer scoring, driver's stand, starting lights. Racing every other Sunday 1 p.m. Menomonee Falls, WI (414) 255-2040.

TRACKSIDE RACEWAY

Dirt oval racing every Thursday night 6 p.m. Menomonee Falls, WI (414) 255-2040.

ABC R/C

Clay track racing every Saturday 1 p.m. Truck pulls every Tuesday 6:30 p.m. 1441 B E. Main Street, Waukesha, WI 53186, (414) 542-1245.

ALL IN 1 RACEWAY

5612 S. 108th St., Hales Corners, WI. 1/10 scale indoor dirt track. High speed semi-oval and true off-road courses. Racing Wednesday nights at 6 p.m. Sat. & Sun. at 1 p.m. For more info call (414) 425-4060.

RC RACEWAYS AND HOBBIES

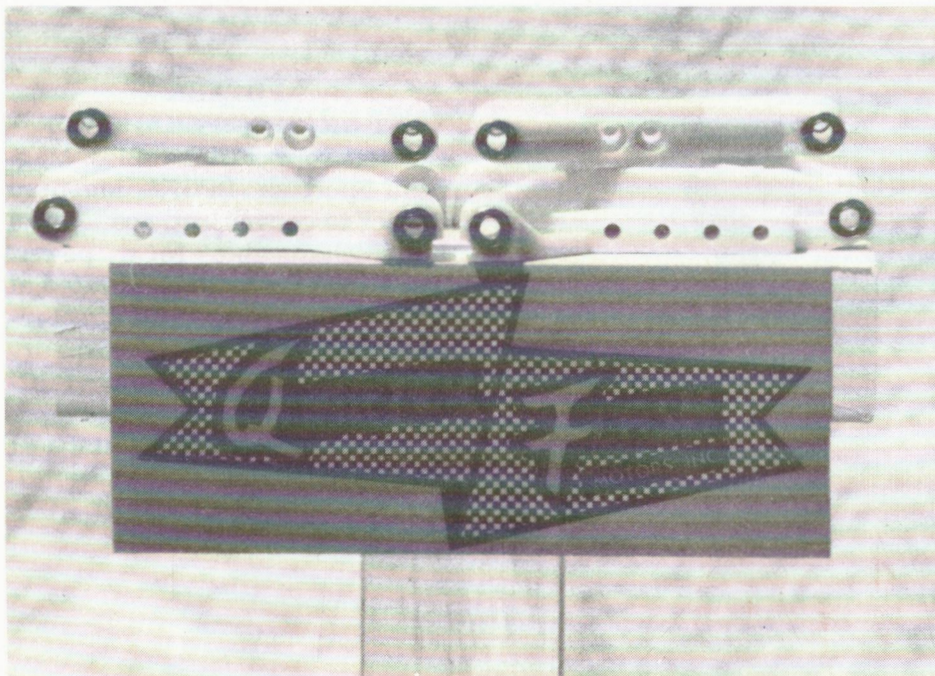
1/10 Indoor dirt oval Fridays & Sundays. Off-Road Wednesdays. Outdoor Asphalt Thursday (weather permitting). Fully stocked hobby shop. For more info (414) 764-9701. 181 W. Marquette Avenue, Oak Creek, WI 53154.

FOR THE RACER

Part # 3581 POWER MOLDED BRUSHES pr. \$3.50

Part # 3582 RPM MOLDED MOTOR BRUSHES pr. \$3.50

Two new style motor brushes are now available from Parma for On and Off-road racing. POWER molded brushes feature silver shunt wire with eyelets as well as high-graphite content. Means greater torque under racing conditions. Parma RPM molded motor brushes are a softer, low-graphite content brush which also features silver shunt wire and eyelets. This brush is designed to give you higher RPM's under racing conditions. Ask to see Parma's entire line of motor and electrical accessories wherever fine hobby products are sold. Parma International Inc., 13927 Progress Parkway, North Royalton, Ohio 44133.

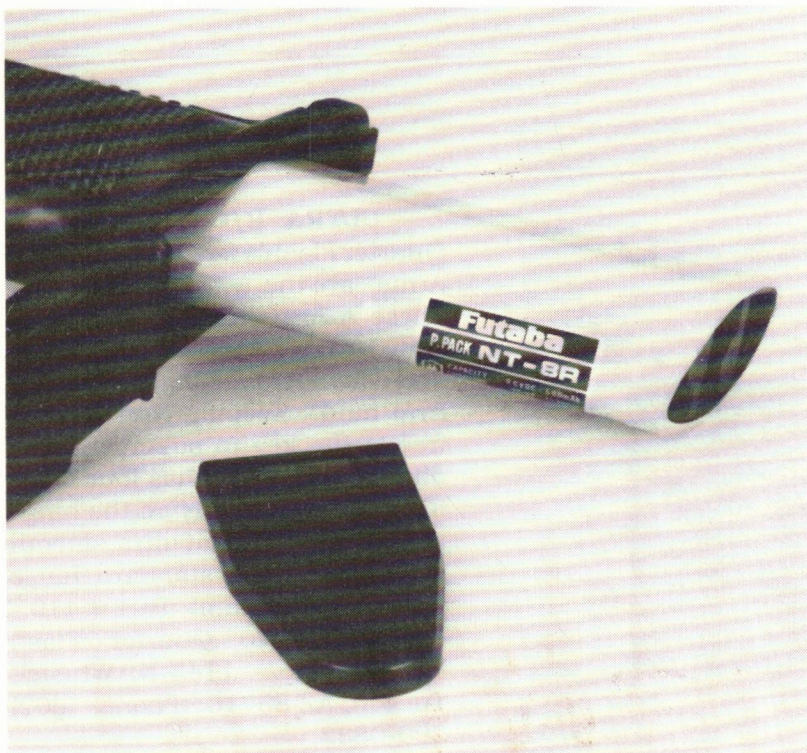
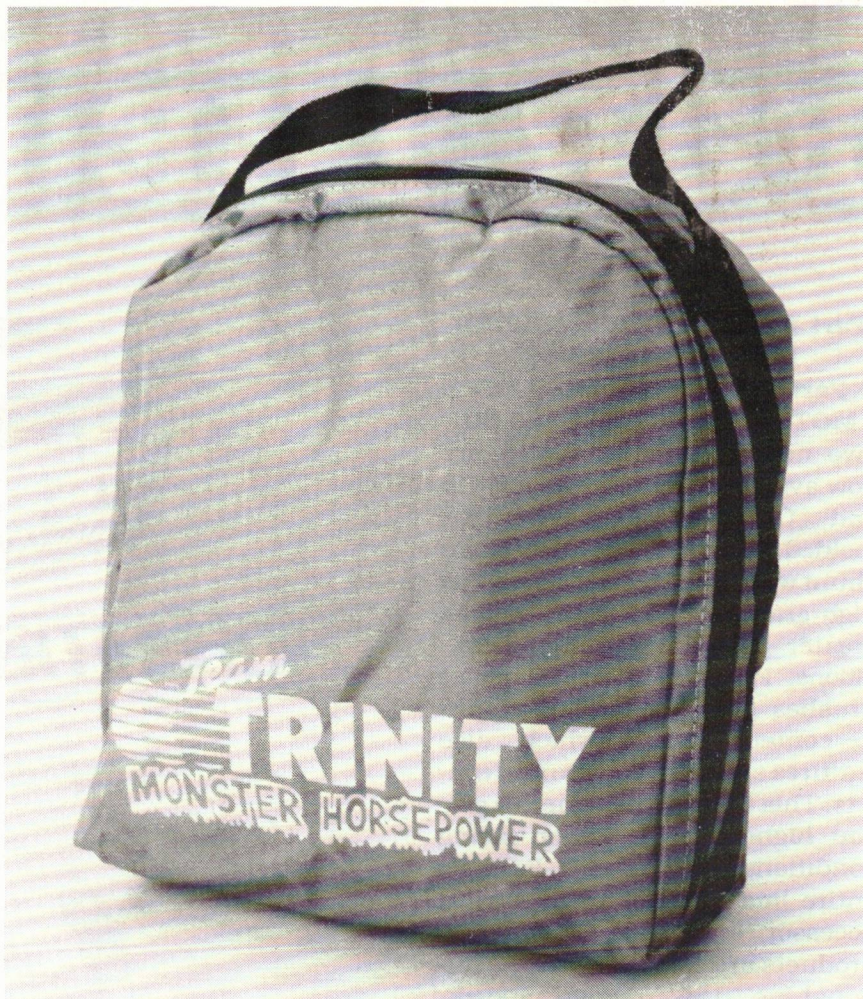


ULTRA R/C 10 ARMS

Quarter Flash's new "Ultra R/C 10 Arms" are the wave of the future! These A-Arms are bearing supported to give your car that smooth and consistent feeling with no A-Arm bind. Keeping your A-arms free is the key to superior handling. Each A-Arm has four bearings that ride totally on the hinge pins to give you that ultra-smooth action. Must use standard hinge pin, not titanium! Part # 419 - Retail \$69.95. Quarter Flash Motors, Inc., 1143 N. Winstel, Tucson, AZ 85716. Phone: (602) 290-0833.

THE TRANS BAG

Part # 9032. Retail \$19.99. Available to protect your expensive transmitter while it's in impound or being transported to the track our "Trans Bag" fits the bill. Purple Nylon with black trim and the Trinity logo in bright yellow. All bags have a serial number for easy ID while it is impound. This bag is also a good way for transporting your 8mm camera to the track! Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, N.J. 07036 Phone: (908) 862-1705.



FUTABA

NT-8R/2PB(2PBKA) NiCd

Convert your Futaba 2PB Magnum Sport or 2PBKA Magnum Junior to convenient, economical and rechargeable NiCd power. The NT-8R Power Pack is rated at 9.6V/500mAh and is a direct replacement for the standard, dry cell battery case. Requires FBC-8B NiCd charger (available separately). Available from Futaba at fine hobby shops everywhere.

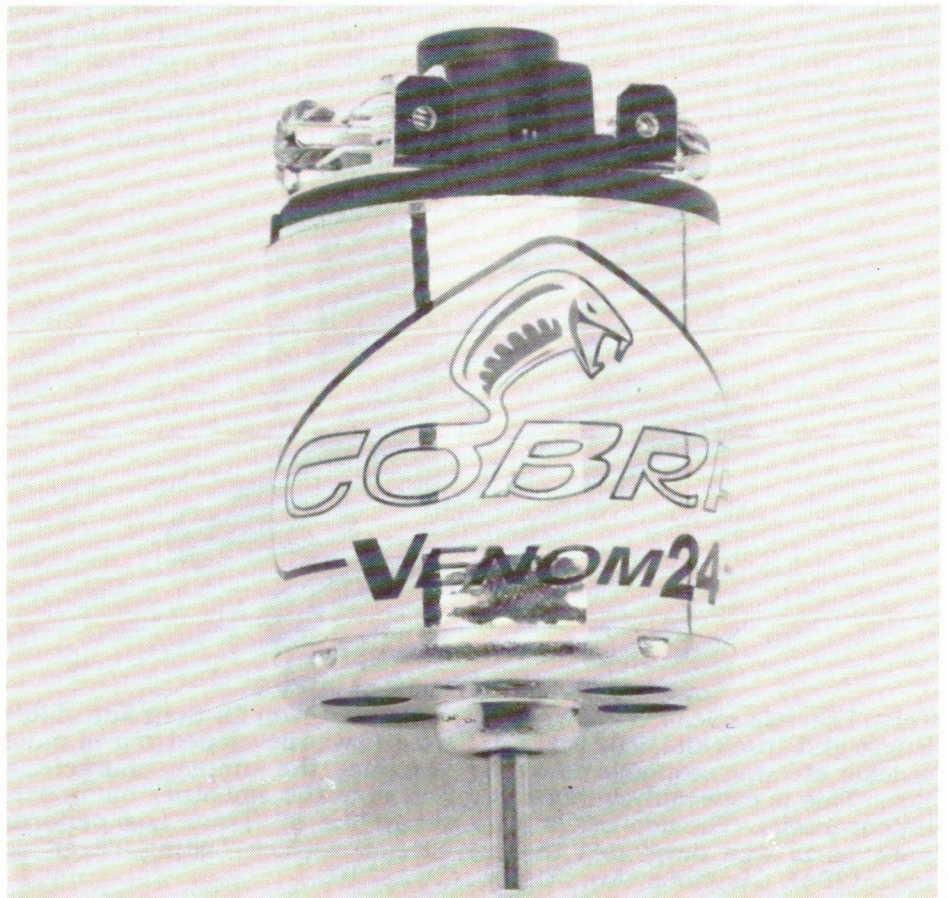


KYOSHO LAZER ZX-SPORT 4WD

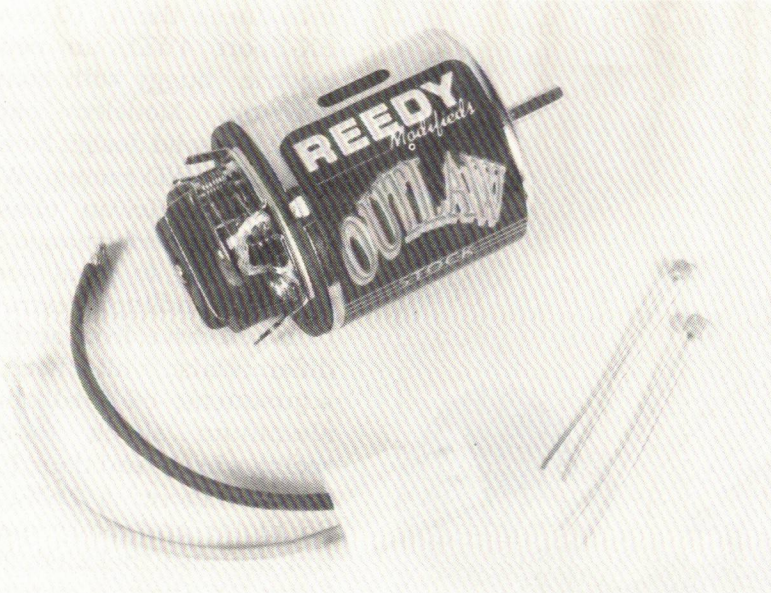
Product # KYOC0102. Kyosho introduces the 1/10 scale Lazer ZX-Sport 4WD, an economical electric buggy with competition potential. Modelers can build upon the solid design for a serious future in 4WD racing. Within its lightweight Kelron chassis are many high-performance features contributing to great speed and smooth handling: extra-reliable twin belt drive; front and rear gear differentials; all-wheel camber adjustment; oil-filled shocks on aluminum shock towers; 2.2" racing wheels and tires; ball bearings and more. A LeMans Stock 05 motor and rotary speed control are also included. Kyosho's Lazer ZX-Sport is distributed to leading retailers nationwide exclusively by Great Planes Model Distributors, 2904 Research Road, Champaign, IL 61821. Phone (217) 398-3630.

VENON 24

New from C & M Team Cobra. 1991 Roar Legal Stock Motor. This Motor is Radical. Slotted arm design develops as much horsepower and speed as most of the 36-44 degree timed motors. Comes with 2 sets of brushes and springs. Our special brush combo maximizes motor performance. Part # 1127 Retail \$28.00. For more information contact: C & M Team Cobra, P.O. Box 701-353, W. Valley City, UT 84170. Phone: (801) 250-9747.

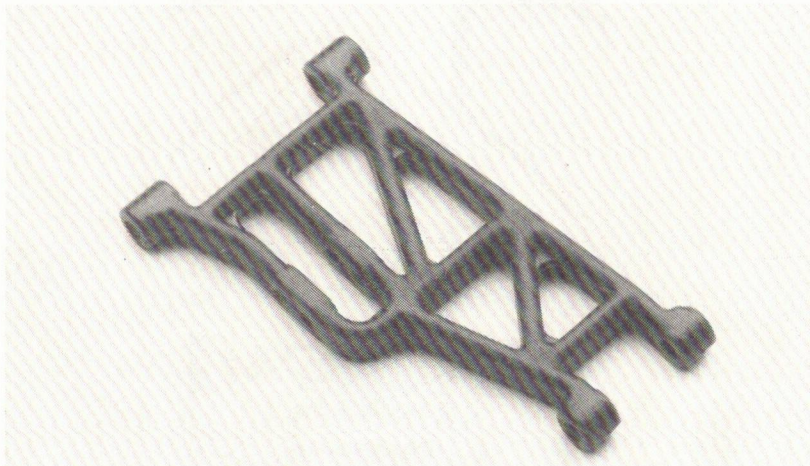


Advertiser's Directory



MR. OUTLAW STOCK

Mr. Outlaw - for use where ROAR '91 motors are not required. Designed to furnish a high-power stock motor that will last. Not a one-night throwaway Motor! The Reedy Mr. Outlaw features: Maximum of 38 degree timing to furnish winning power and still maintain efficiency and motor life; Wet magnets for that torque needed for off-road racing; New slotted can to adjust the magnetic field for RPM and efficiency; Heat sink brush holders: if the motor runs cooler, it lasts longer and goes faster; Silver shunted, low resistance brushes; Reedy "copper head" motor springs: proper brush tension is an important factor in motor performance; Anti-noise and installation directions to reduce any radio interference. Associated Electrics, Inc., 3585 Cadillac Avenue, Costa Mesa, CA 92626. Phone (714) 850-1744.



NEW SWEEP FRONT A-ARMS

Team Losi has released their new swept front A-Arm for their line of R/C Buggy and Truck kits. The Part # A-1013 arm was developed to give much quicker steering response as well as enhance the jumping characteristics. This is especially important on some of the smoother high-speed indoor tracks. The new swept front A-Arm like all Team Losi performance parts was developed through extensive track testing. Team Losi Inc., 13848 Magnolia Ave., Chino, CA 91710.

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STRIKE FIRST

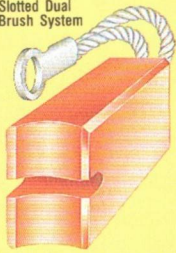
with TRINITY BRUSHES

No matter what type of racing you do, there is a high horsepower, low friction, long wear Trinity Motor brush to suit your needs!

Trinity brushes are molded, not cut like cheap copies, which are prone to stress related breakage. These brushes are designed as replacements for all Trinity, Orion, Yokomo, Kyosho and Air Supply motors.

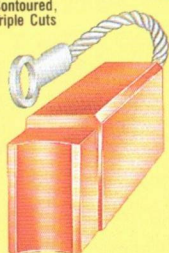


Slotted Dual Brush System



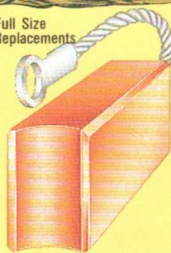
The first new brush designed for today's motors! Dual shunts for lowest resistance, new non-glazing formula. Slotted face for less arcing, less heat build-up and a more positive brush to commutator contact area. These are the only brushes that allow the hottest 8 thru 14 turn modified motors to produce maximum horsepower. #4103 - \$3.50

Contoured, Triple Cuts



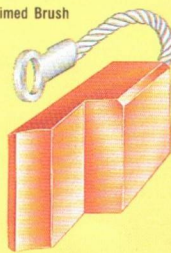
For 1/12 scale, on-road cars. Gives more torque and less arcing by maximizing the ratio of current draw vs friction on the commutator. For 14 to 20 turn motors. Speedworks 0007, 0012, #4034, soft compound for 4-cell #4037, for 6-cell \$4.99

Full Size Replacements



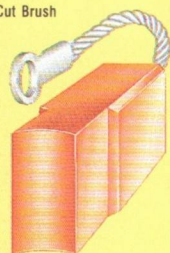
#4005, \$5.25 Soft compound comes in stock Trinity and Speedworks motors, w/springs. #4038 \$3.00 Hard compound for longer life in off-road motors. In Trinity modifieds 1700 to 1704. #4046 \$3.00 Soft compound produces higher rpms in stock and on-road motors. #4065 \$1.99 Same as 4038 but w/out terminal.

Timed Brush



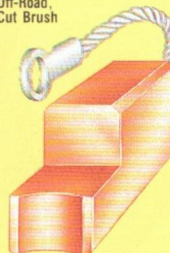
Shape increases timing and RPM's in stock motors. These work so well they should be illegal! For Trinity 2000, 2020, Speedworks 0004, 0005, 0444 and all Yokomo and Kyosho stock motors. #4007 - \$4.79

Cut Brush



The narrow face increases RPMs, reduces arcing. Designed for oval racing or motors with lots of timing advance. #4006 - \$4.79

Off-Road, Cut Brush



For on and off-road motors with 14 turns and more. Less friction on commutator gives higher rpm's and more torque. Hard compound for longer life. Used in Trinity 1705 thru 1711 and Speedworks 0001, 0002, 0003, 0008, 0009 & 0555. #4035 - \$4.79



TRINITY Trinity Products, Inc.

1901 E. Linden Ave., #8, Linden, NJ 07036 • (201) 862-1705 • FAX: 201-862-6875

THE Junior T

- Junior T Features:**
- ▶ Adjustable H-Arm Rear Suspension
 - ▶ Long Matrix Fiber/Resin Composite Chassis
 - ▶ 8 Precision Shielded Steel Ball Bearings
 - ▶ Tough, Externally Adjustable Transmission
 - ▶ Oil Filled, Coil Over Shock Absorbers
 - ▶ Molded Skid Plate Bumper
 - ▶ Durable Polycarbonate Body
 - ▶ A-Arm Front End With Rack Type Steering
 - ▶ Precision, Team Losi Pinion Gear Included
 - ▶ Attractive, 1 Piece Wheels With Race Proven Monster Racing Tires
- Needed To Complete:**
- ▶ 2 Channel Radio System, Battery Pack, Motor, Speed Control and Paint

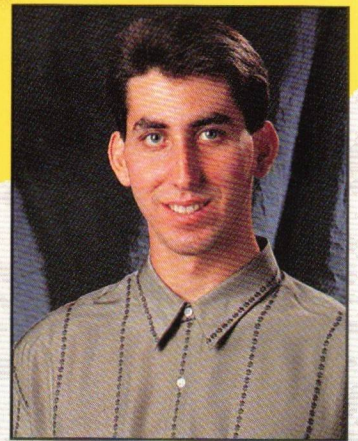
★ **COMPETITIVE**
★ **ECONOMICAL**



**1:10 SCALE ELECTRIC
2 WD OFFROAD RACING
MONSTER TRUCK**

CREATED BY

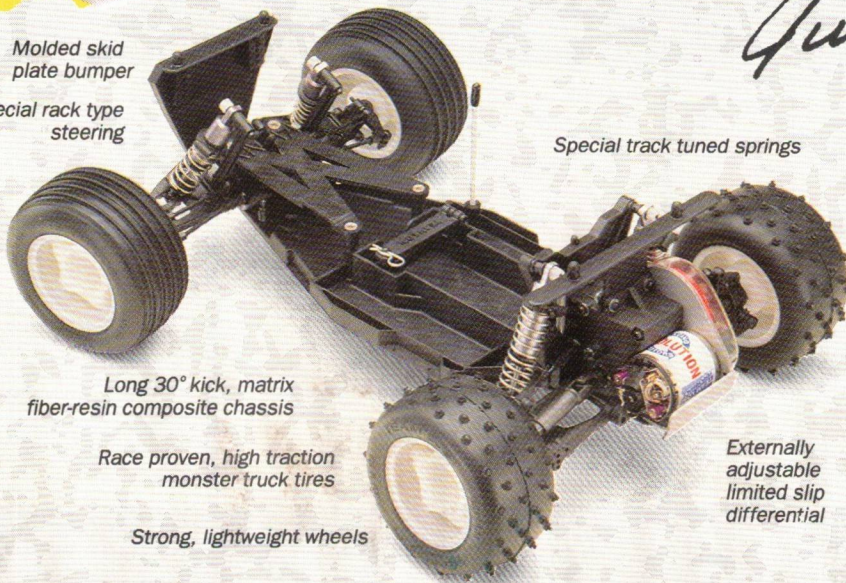
*Gil Losi
Junior*



Pressurized,
oil filled shocks

Molded skid
plate bumper
Special rack type
steering

Special track tuned springs



Long 30° kick, matrix
fiber-resin composite chassis

Race proven, high traction
monster truck tires

Strong, lightweight wheels

Externally
adjustable
limited slip
differential

Why JUNIOR? Because the Junior T is Gil Losi Junior's solution to the dilemma of how to make your first truck a winner. Gil Junior wanted to create a truck that was both economical and seriously competitive; the result is the Junior T. Choose the Junior T and let the race proven Team Losi technology and innovation work for you. Make your first truck a winner . . . The Junior T!

TEAM LOSI
PERFORMANCE

Chino, CA 91710 • (714) 465-9400

SPEED SECRETS OF TEAM ASSOCIATED

RACING SILICONE SHOCK OIL

This 100% pure silicone oil has reliably proven not to thicken in hot weather or thin out in cold. 2 oz. bottles, 10 wt. (#5420), 20 wt. (#5421), 40 wt. (#5422), 80 wt. (#5423) and 160 wt. (#5425).



REEDY COMPETITION MOTOR ACCESSORIES

Ultra brushes for off-road, #735, \$3.00. Copper head springs for off-road, #740, \$2.50.

REEDY ULTRA SERIES

Each MR. series motor contains the Ultra Torque Magnet for broader power band, and free on-road conversion kit for added versatility.



ATLANTIC GOMME RACING TIRES

These long-wearing, high traction, low drag tires were used by the Team to win the ROAR 1/10 On-road Nationals! #8132, front, \$24.00. #8156, rear, \$26.00. NEW rubber compound. #8133, front, \$12.00. #8157, rear, \$16.00.



1/10 SCALE BODIES

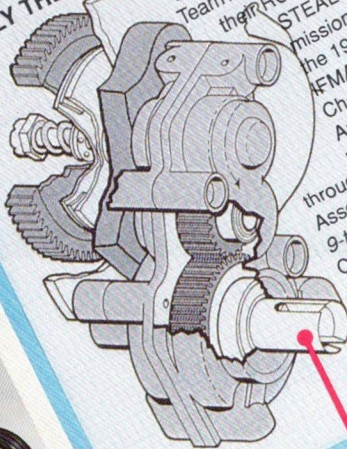
Chevy Lumina (narrow) Super Speedway on-road #6179, \$18.00. Chevy Lumina (wide) on-road #6172, \$18.00.



SIMPLY THE BEST.

STEALTH TRANSMISSION

Team Associated equipped their RC10 with the new STEALTH transmission and swept the 1989-1990 IFMAR World's Championship in Australia, a technological breakthrough helping establish Associated Electrics as a 9-time IFMAR World Champion! Includes the NEW Associated Torque Control with high torque ball differential and other race-winning features. #6560, \$120.00.



1/10 SCALE BODIES

Viper single seat off-road buggy #6121, \$14.00.



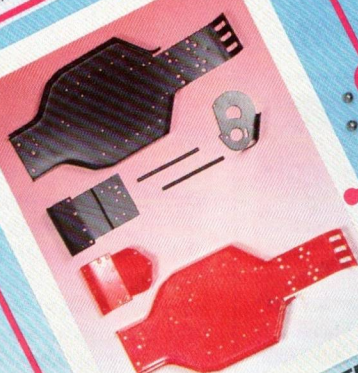
CARBIDE DIFF BALLS

Super hard, longer-lasting and smooth. #6619, 1/8" dia., qty 8 balls, \$8.00. #6576, 5/64", qty 6, \$6.00. #6581, 3/32", qty 12, \$12.00.



RC10 TEAM CAR BLACK ANODIZED CHASSIS PARTS

Chassis, #6301, \$30.00. Nose plate, #6309, \$9.00. Nose brace tubes, #6321, \$5.00. Motor mounting plate, #6604, \$6.00.



PRECISION SPUR AND PINION GEARS

New 48 pitch gears for greater adaptability of fine-tuning to win!



NEW GREY SHOCKS

Hard anodized and Teflon-coated over precision machined shock bodies for long wear and super performance.



RC10 BRIGHT-COLORED NEON CHASSIS & NOSE PLATE

Chassis, \$35.00. Hot pink, #6302. Red, #6303. Blue, #6304. Green, #6306. Yellow, #6307. Nose plate, \$11.00. #6315. #6316. #6317. #6318. #6319.



REEDY 1400 SCR BATTERY PACK

The new powerful SCR Ultra Power pack adds to Reedy's growing line of race-winning SCE and SCR matched battery packs. #606, 6-cell SCR, \$60.00. #607, 7-cell SCR, \$70.00.

TEAM ASSOCIATED
3585 Cadillac Ave. Costa Mesa, CA 92626
Phone: (714) 850-9342 FAX 714-850-1744
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If you think other stadium racing trucks are fast, wait till you see the gas-powered Kyosho® Outlaw Rampage.



**Includes one glow starter, four racing tires,
and 30,000 RPM.**



Recoil starting on the included O.S. .12 CZ-R makes engine starting fast and easy.

There's no turning back. The first time you drive a gas model, you're hooked. You hunger for incredible speeds. You demand louder engines, faster runs. And Kyosho keeps pace by supplying the best R/C gas models available.

Kyosho's 1/10 scale Outlaw Rampage gas-powered 2WD stadium racing truck shows why gas power is so hot. And we're not talking just about the authentic Ford Ranger body.

Super power. Super speed. When you throttle up on the Outlaw Rampage, you let 30,000 RPM fly. Not to mention considerable quantities of exhaust, dirt, and decibels, all

from the mighty O.S. .12 CZ-R.

Easy, easy, easy. The included engine starts with just a tug on the pull-start. Engine, fuel tank, and gear box are already mounted to the rugged aluminum chassis. Don't worry about motor winds, battery choice, or recharging. You've got a piston-packin' powerplant that's ready for action on any 1/10 scale track.

The Outlaw Rampage dominates the dirt, riding on an independent suspension and four adjustable, oil-filled shocks. The lightweight racing wheels and tires, proven on the ROAR Region III Monster Truck Champion Outlaw Ultima, find traction anywhere.

See your hobby dealer for real stadium truck racing action: Kyosho's gas-powered Outlaw Rampage. "The speed and sound of gas cars just can't be equalled by anything else."



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