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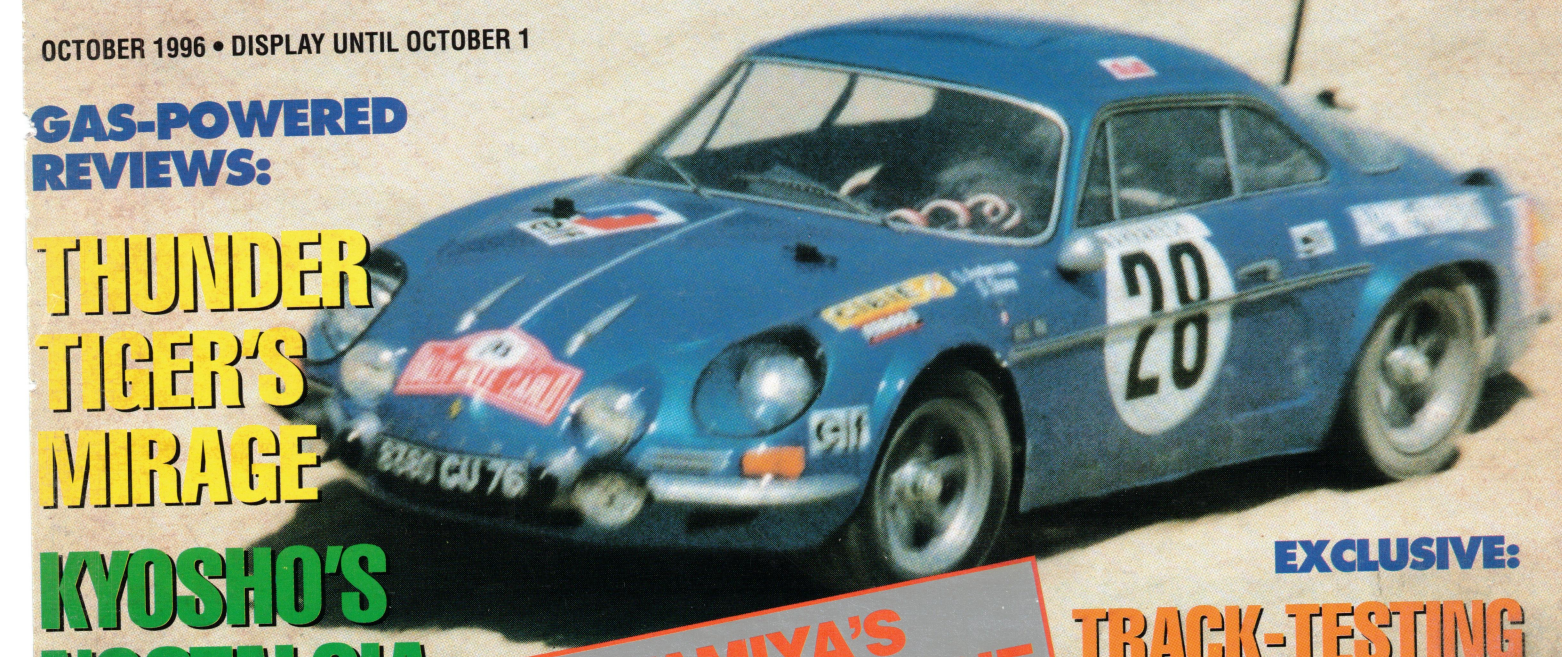

GAS-POWERED REVIEWS:

THUNDER TIGER'S MIRAGE

KYOSHO'S NOSTALGIA SERIES FERRARI

WCM'S K-1 NASCAR RACER

TAMIYA'S RENAULT ALPINE RALLY CAR

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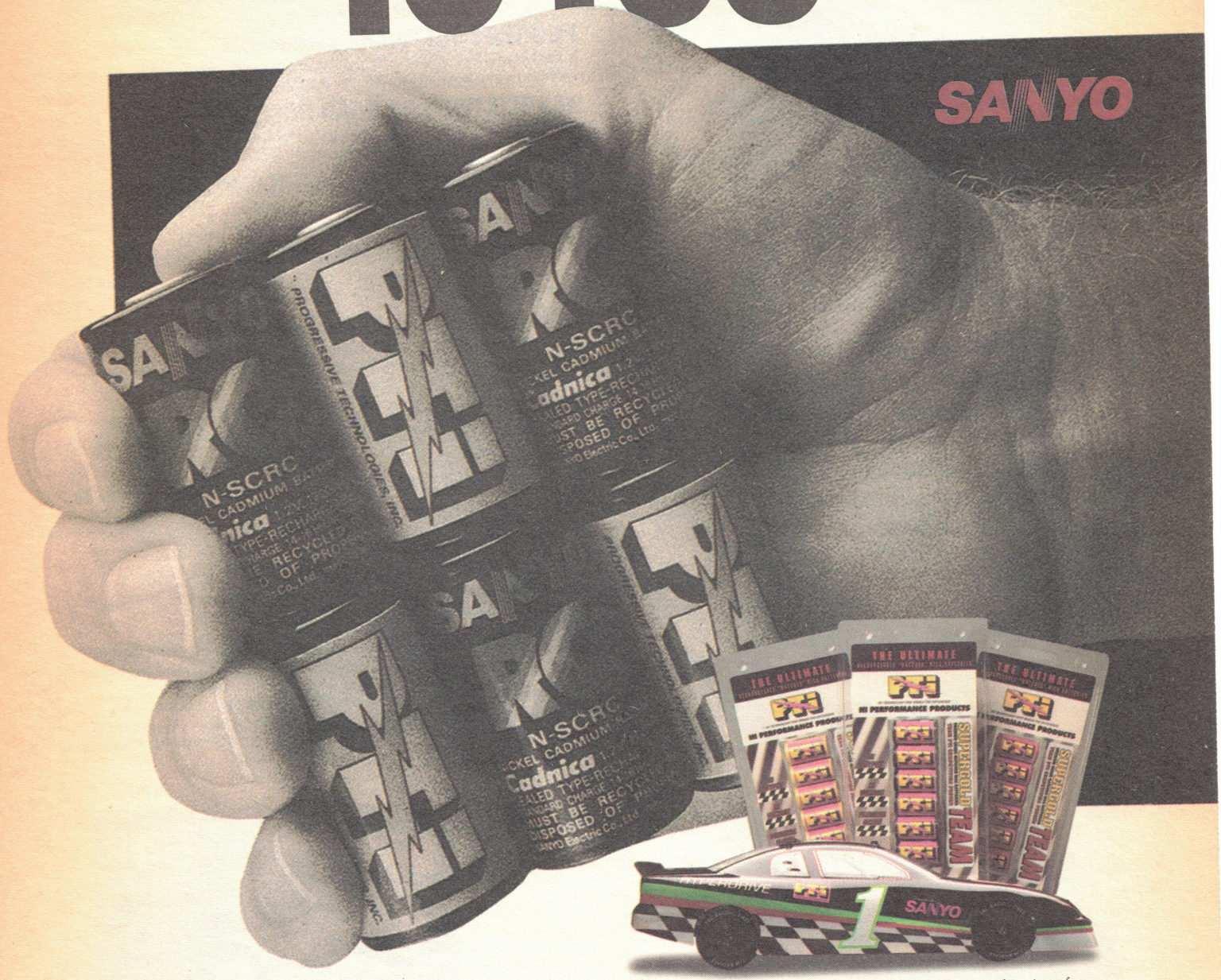

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OCTOBER 1996 VOLUME 12 NUMBER 1

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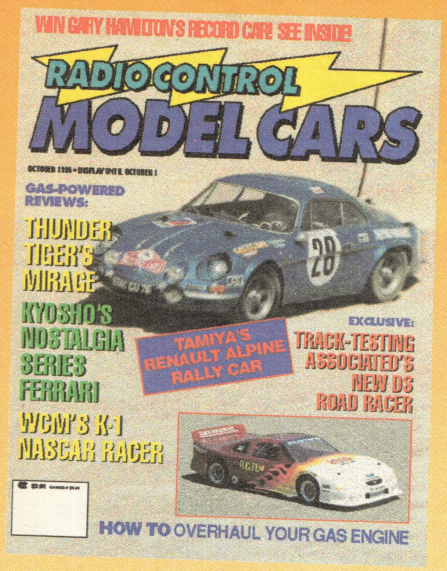

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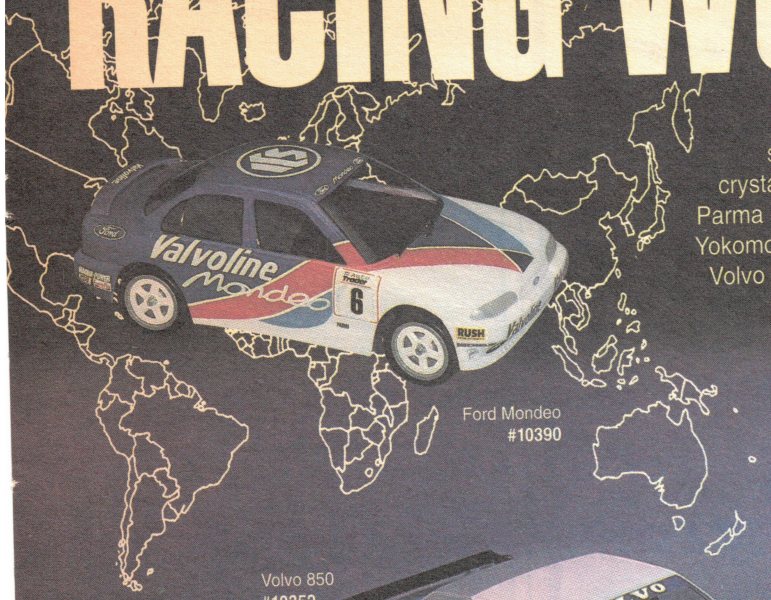

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- ✦ REVIEW: Tamiya's Mustang Cobra R
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- ✦ Detailing Dahm's Mini Body
- ✦ Racing in Oklahoma at the 1996 NORRCA Nats
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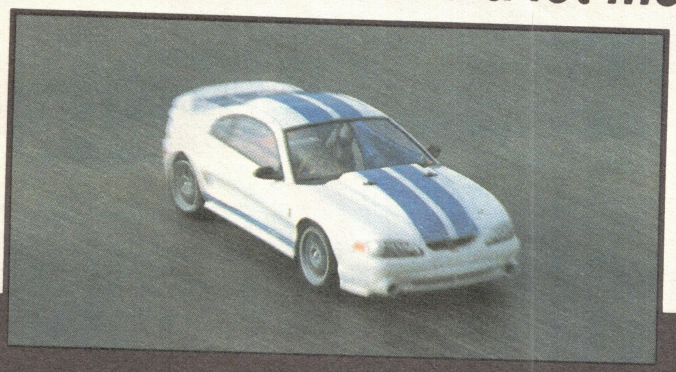

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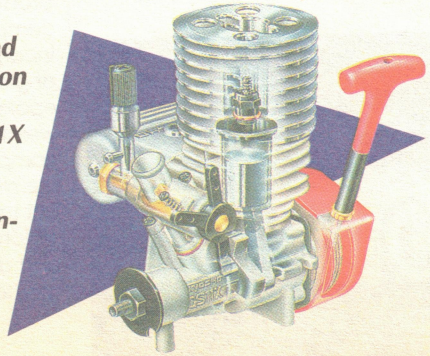

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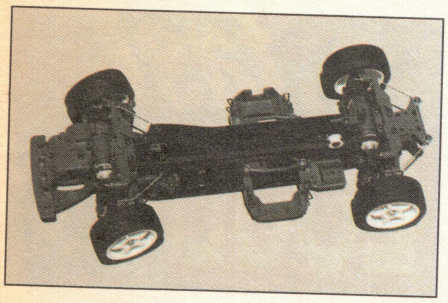


TAMIYA'S TA03F-PRO BELT DRIVE CHASSIS KIT

Tamiya's new TA03F is a radical departure from anything we've seen from this prolific RC company, in that the 03F has been designed solely for racing. The kit does not come with a body or motor, though most of the popular Tamiya TA01 and TA02 bodies are a direct fit. The motor choice is left up to the buyer.

The 03F maintains the same track and wheelbase, along with a handful of interchangeable parts as the earlier TA02. Such things as shocks, axles and dogbones, and other hardware-related items are the same as those on the 02.

The most notable new feature on the new chassis are the all-new gearboxes. Four-wheel drive is achieved by using a glass-reinforced belt that is tuned using an adjustable tension pulley. The chassis is a double-dck fiberglass unit that has virtually no flex. To improve the handling characteristics, Tamiya has mounted the motor on the front gearbox and added front and rear sway bars. Also new as a standard item is a complete set of maintenance-free sealed bearings. A set of slick racing tires, complete with foam inner liners and a 23-tooth pinion gear are also included.

RCMC has received a test chassis (pictured here) and testing is under way. Next month we'll present a complete track and component review of the new TA03F, which will be in stores later this fall. Watch for it!

FG'S HOT OPEL CALIBRA ROSBERG

One of the newest from the FG works in Germany is the Opel Calibra Rosberg model, a jewel in 1/5 scale. FG and SEI Racing have a long list of accessories for the touring cars, including Super Touring Audi A4 and Super Touring BMW 320i bodies, carbon brake pads for all disc brakes, Cyclone four-shoe carbon clutch, traction control computer (banned in competition), carbon "96" radio tray and Porsche driving lamp kits. Most of these items, plus a bunch of decal kits for the Mercedes Warsteiner and UPS Sonax and Porsche VIP are in stock at SEI. Give 'em a call. SEI Racing 14836 NE 31st Cir., Redmond, Washington 98052. (206) 556-9090.

NEW TRACK OPEN

SEI Racing, in Redmond, Washington, has announced the opening of a brand-new 1/5-scale raceway, dubbed "Fountain Court Raceway." The new track boasts a grass infield and asphalt soft shoulders and is a first-class facility all the way. The first North American Touring Car Championships for 1/5-scale cars will be held at the new track the weekend of September 19 to 22, featuring factory technical support, prizes, barbeque and more. For more information, contact SEI at (206) 556-9090. Tell 'em we sent you!

TAMIYA CHAMPIONSHIP SERIES

At the factory track in Aliso Viejo, California, Tamiya's TCS racing program brought out 103 entries in F1, FWD Sedan, Truck and Mini classes, reports race director Eric Sands. Mark Rebeck won in F1 class, Joe Houda took the trophy in FWD Sedan, Mike Allen was the winner in 4WD Sedan, Fernando Salas won 4x4 Truck, and in Mini, the win went to Roy Alaan. Here are the complete results:



F1
1. Mark Rebeck
2. Jason davis
3. Russell Johnson

FWD SEDAN
1. Joe Houda
2. Fred Medel
3. Tom Watana

4WD SEDAN
1. Mike Allen
2. Bob Sager
3. Randy Cook

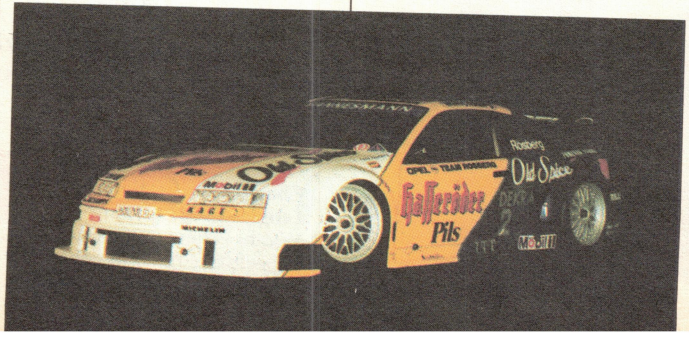
4X4 TRUCK
1. Fernando Salas
2. Jay Jaffee
3. Roy Mayes

MINIS
1. Roy Alaan
2. John Houda
3. Mike Haehn



CUSTOM CHASSIS PARTS

Judge Enterprises (726 Gail Ave., Sunnyvale, California 94086) is producing composite fiberboard material that you can cut to your own specifications for chassis, shock towers and other RC-related component uses. Along with the composite fiber material, Judge produces micro-sphered composite fiberboard that incorporates micro spheres of glass added to high-grade epoxy resins to create lighter weight board that does not compromise the strength of the material. Any rip saw can cut the composite fiber, which can be sanded, glued and drilled. Drop them a note for more information. ●





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BC 67 Professional AC/DC Charger

The BC 67 is similar to the BC48, but also includes a built-in heavy-duty AC/DC power for convenient operation. The solid power supply provides steady, strong charge current, even with low line voltages. Charges 6 to 7 cells at 0-5 Amps, or 4 and 8 cell packs at 0-2 Amps. Powered from 12V DC or 120VAC.



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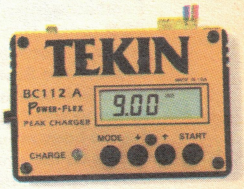
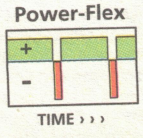


FEATURES: Adjustable Power-Flex action. Custom LCD with readout of Volts, Amps, Time, Charge Capacity, and Peak Volts. Three optimized charging profiles. 0-10 Amps Fast Charge and 0-500 Ma Trickle charge. Cool running 33KHz switching operation. Small, lightweight, and versatile enough to charge virtually any Ni-Cad battery you may own. Model 112A accepts 10-24V DC input. Model BC 112C accepts DC or ordinary 120VAC house current, and has a built-in 24 volt-10 Amp power supply. Both units now have Daisy-chain power cords, to reduce clutter, and are expandable with optional DIS350 Discharger/Cycler add-on, for cell matching and testing. 112C has an output jack so you can plug a second charger into the same power supply, to form a dual charging station. Both deliver leading edge charging performance. World Champion.



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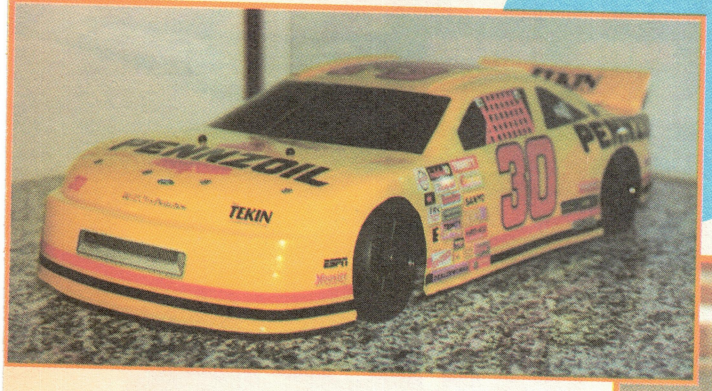
Readers' Page

WWW//.HIP READER PALS: AFTER RACING ALL SUMMER, YOUR CARS OR TRUCKS ARE PROBABLY PRETTY WELL THRASHED, EH? IT'S TIME TO PAINT UP SOME NEW BODIES, SHOOT SOME PHOTOS, AND SEND THEM TO OL' DEL'S WONDERLAND OF READERS' PHOTOS! WIN PRIZES! ATTAIN THE GLORY OF BEING PUBLISHED!! WHAT COULD BE EASIER THAN LICKING A STAMP AND SHIPPING OFF A COUPLE LOUSY PHOTOS, FER HEAVEN'S SAKE? DO IT NOW, AND YOU CAN BE A WINNER LIKE THE READERS WHOSE PHOTOS ARE DISPLAYED HERE...WRITE TO ME, DEL BAGSHAW, KEEPER OF THE READERS' PAGE, BOX 2459, CAPISTRANO BEACH, CALIFORNIA 92624.

Beat Knutti, from Frenkendrorf, Switzerland, says he's a loyal reader of *RC Model Cars*, and decided to send a photo of his



Kyosho TF2, a NASCAR racer that has placed Beat in third place in the Swiss Championship for the Kyosho World Cup '96. Beat's car has Tekin electronics, including their G12c ESC, GM Racing motors from Germany, high-grip Kyosho tires and two-hole pistons up front with 45wt oil, medium springs in the rear with 35wt oil. Beat will receive a free subscription. Good luck in the World Cup!



This Mardave 1/12 VW Special comes all the way from Braintree, Essex, England. It's owned and driven by Michael Barnes (13), who has several offroad racers, but this is his first onroad car, which he built over the weekend. It uses a 540 stock motor, a 12-tooth pinion, four-cell battery pack, coil-spring suspension and foam tires. The V-Dub was painted using Pactra's Pearl Purple, shot with an airbrush. Michael will receive a new Dahm's 1/12-scale Spitfire 12 SuperTruck body for his Mardave chassis. Congratulations!

He's from Minneapolis, he races a T2 and he's made a bunch of changes to his truck. Do you know his name? Well, it's none other than Tony Swanson! Tony says he added graphite shock towers from Associated, Boca Bearings' Ultra Seals bearing set, Deans' battery connectors, A Futaba Magnum 3PJ PCM radio, JR's 4735 servo, Kimbrough's Giant Servo Saver, MIP's ball bearing steering and CVDs, Parma body mounts, RPM's tie rod ends, servo mounts, hub carriers, suspension blocks, dust cover, shock body clips and center link, Sanyo 1700 mAH battery pack and Tecnacraft's titanium tie rods. How about this: a new Dahm's body for the T2—it's on its way to you, Tony. Thanks for the photo.



Aaron Dobble, from Thorold, Ontario, sends Del this photo of his Traxxas Rustler, powered by a ROAR '91 stock motor. Aaron uses a 1500 mAH Sanyo pack, and he's working on upgrading his Rustler right now. He uses it mainly for backyard bashing. We'll send along a new body to do some bashing with, Aaron, courtesy of Dahm's Racing Bodies.



This Team Losi LXT has been tricked-out with MIP's ball bearing steering kit, CVDs and Gold Shafts and Blue Seals, RPMs suspension arms and bulkhead, Pro-Line XTR tires, Futaba's Magnum Jr. radio and 9304 servo, Tekin's 411P2 ESC, an Extreme stock motor and Protoform's Nevada truck body. It's the work of Dan Starkey, from Englewood, Colorado, who will get a free subscription to *RC Model Cars* magazine.



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Note: If you know of a drag club or track that should be listed here, send the information to the Editor at RCMC, Box 2459, Capistrano Beach, California 92624. If you sell drag racing-related parts and equipment, we'd like to hear from you too.

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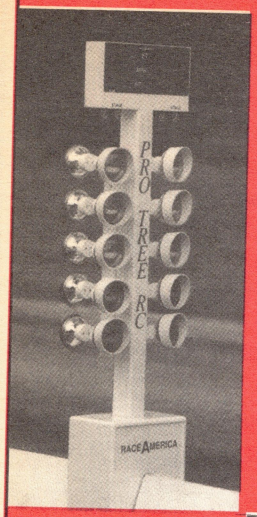

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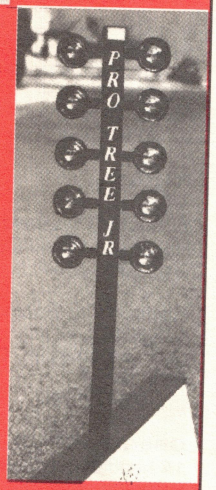

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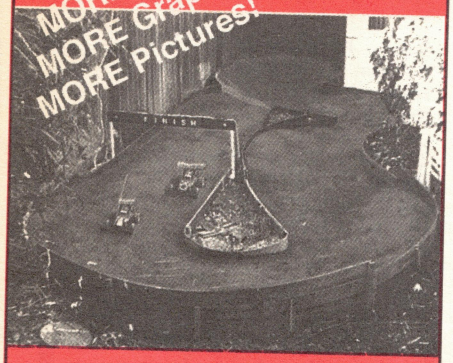

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Answerman

DEAR ANSWERMAN,

I have a Traxxas Nitro Hawk RC truck. It runs well, but I can't figure out why it doesn't start out fast. I have to push it to get it moving. How can I fix this situation? I also go through spur gears and clutch bells pretty quick. Is that part of the problem? I have tried high-performance parts, and I still get the same problems. Please help!

Jeff St. John
Berthoud, Colorado

A: It sounds like you're suffering from a gear mesh problem on the Hawk. The Traxxas uses tough 32-pitch gears, so you're either running too much clearance between the gears themselves or there's too much dirt in the area. Excess fuel residue can mix with dirt and stick to gears, so keep them clean. I'd also rebuild the truck's slipper clutch and make sure it's properly adjusted. A too-tight clutch will eat up gears, while a loose unit will be slow to start out. Onboard chassis flex could be doing the damage as could a bad shaft inside the gearbox. I'd recommend a complete teardown of the whole drive system. Check everything on the Nitro Hawk, then you'll know that it is working properly.

DEAR ANSWERMAN,

Because I don't want to ruin my 1/8-scale replica of a 1940s Kurtis-Kraft midget racer, I'm writing to you for help! I need numbers and lettering for my "baby" and need to know to know what's available on the market with respect to styles and colors, etc. Thanks for your help.

Bob Wolff
New Rochelle, New York

A: I'd recommend you contact Computer Imagery, 3049 Dranefield Road, Suite 10, Lakeland, Florida 33811 (941) 648-5214. They can supply you with any type pressure-sensitive graphics you desire for your open wheel car. They've done everything from full-sized aircraft to 1/10-scale pancars. Plus, they're RC car fans!

DEAR ANSWERMAN,

Last summer I purchased a Traxxas Rustler kit, and although I'm new to RC, I caught on fast. I need some information on the following subjects: what's the differences between six- and seven-cell battery packs? Are gas cars better than electric ones? Who makes aftermarket parts for the Rustler and where can I obtain a chopped body for the Rustler?

Adam Cullwane
Pepperel, Maine

A: I imagine you're currently using six-cell packs in your Rustler, so here's what will happen if you change to a seven-cell pack. You'll have an increase in initial power, but, you'll notice the runtime will be reduced. Gas RC vehicles normally have more horsepower than the electric-powered cars, but they also require more upkeep than the electrics. Pro-Line makes tires, Tower Hobbies has batteries, motors and bodies and Futaba has high-torque servos for your truck. As for a chopped truck body, check those available from Dahm's Racing Bodies or even the body off the Traxxas Spirit electric truck, the Parma California Sport truck, or the Bolink Radical Ranger.

DEAR ANSWERMAN,

Ever since I ran my RC car into a curb in front of my apartment complex, I've had radio problems. I've checked the motor, wires, speed control, switch and connectors, but it still acts up when I run the car. What's up?

Joe Merritt
Scottsdale, Arizona

A: Depending on the impact, it sounds like you have an onboard receiver problem. I'd pack up the receiver unit and send it back to the radio manufacturer for inspection. Most RC car receivers have small ceramic components that can fracture, causing your glitching problems. The frequency crystal can also be damaged in a crash. So always include it should you decide to ship the receiver into the service center.

DEAR ANSWERMAN,

Why doesn't RCMC cover anymore races run by Lake Whippoorwill Speedway? I always enjoyed the concours lineups they held prior to the races and the Whipporwill stories were a favorite of mine.

Bill Ferber
Elmhurst, Ohio

A: Unfortunately, the legendary Whippoorwill RC Speedway closed

continued on page 27

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Big Tips

SINGLE-SCALE THINKING

BY RICK EYRICH

Recently I had one of those "good news-bad news" situations happen to me while covering the first QSAC Champ event of '96. A racer approached, saying, "I really enjoy your Q-scale stuff in *RCMC*." After acknowledging his praise, I asked him what he thought about the rest of the magazine's contents and his reply caught me off guard.

"Oh," he said: "I only read the 1/4-scale stuff each month. I could care less about the rest of it."

Whoa, this isn't a real good idea folks as many, many things that you and I read in each issue of *RCMC* can help all scales of RC cars! Of course, I'm considered to be a large-scale fan; but trust me, I'm a fan of any scale of RC vehicle--and I'm better informed because of it.

Informed? Yep, many of the better ideas and tricks you might find on a 1/10-scale electric offroad truck will also work well on a Q-scale gas car too. What stuff? Well, how about mounting radio gear correctly, proper setup of shocks and even what's the best way to paint body shells.

There's absolutely no difference between how you would measure and adjust the tire stagger on either a 1/10-scale pancar and a 1/4-scale open-wheel sprinter. This is also the same situation with any RCer who's considering adding either a heat-monitoring sensor or a Futaba fail-safe module to their car, either electric- or gas-powered.

Here's a classic example of what we're talking about. A local offroad competitor decides to get into Q-scale oval racing. He purchases a 1/4-scale car with fully independent front and rear suspension (just like his offroad cars) and in a very short time he's running with the top half of the pack. Looking at his car's chassis you'd realize what he brought over from his offroad racing days! The onboard six-cell battery pack is made up from good NiCad cells and is assembled with good connectors and is secured tightly to the frame with battery holders from a RC10 buggy. All four shocks on the stock car have the right weight oil in them and have been properly bled of air from his offroad experience.

But this knowledge can go the other direction as well. Our new large-scale convert can also relate some useful info back to his old RC car buddies too! Like what? Well, where you can find large pieces of Lexan and Kydex, how to quickly repair busted bodies, and you could even compare notes on tire cap compounds between the two scales of RC car.

So you can see how single-scale thinking just isn't useful no matter what size RC car you have. Information and knowledge of all scales of RC cars can't hurt you; it can only increase your ability to run, race, and enjoy your Q-scale vehicles. End of sermon!



No matter what scale of RC vehicle you own or race, you can gain useful knowledge from all of them and apply it to your Q-scale car. Crossover ideas like material sources, setup, handling tricks and radio gear mounting tips are just a few instances of multi-scale thinking.

TIP OF THE MONTH

Let's suppose you've just completed a new body shell on your Grand National racer and even managed to get some pictures of prior to any ontrack damage! And while your photographs look OK, the stuff in the background throws off the scale look of the shots.

Well, now you can improve your car photos via a new computer setup found in some photo centers. Kodak, along with some other companies, now have systems that can erase any picture clutter you want! Check your yellow pages and you may be able to have that one perfect picture RCers wish for.

TRICK OF THE MONTH

With many Q-scale cars now using rollcage-less chassis design, a new potential race-ending problem raises its head: broken spark plugs. What happens is when the cageless car rolls over during a crash, the body compresses, then the highest point on the chassis (the spark plug) is snapped off under stress. You can reduce the chances of this glitch by wrapping the plug with a 35mm film canister.

Take either a Kodak or Fuji film holder (minus the cap) and cut an appropriate hole in the canister's bottom so it will fit over the plug and coil wire cap. Now fit the holder on the plug and measure how much of the canister you'll need to cut off to clear the coil cap. Cut the holder and re-install it on the engine. I wrap the unit with duct tape for a little extra support. Who knows, this simple fix could save you in a rollover.



Since many large-scale RC cars are designed without rollcages, the vehicle's spark plug becomes the frame's highest point--and also a vulnerable projection in case of a rollover. This engine has had a cut down Fuji film canister slipped over the plug and cap to increase its strength in the event of a crash.

UPDATE OF THE MONTH

In my recent Tips on workspace management I neglected to discuss how you can keep your work surface clean and shiny without undue effort. Many racers use regular cardboard box material

continued on page 27

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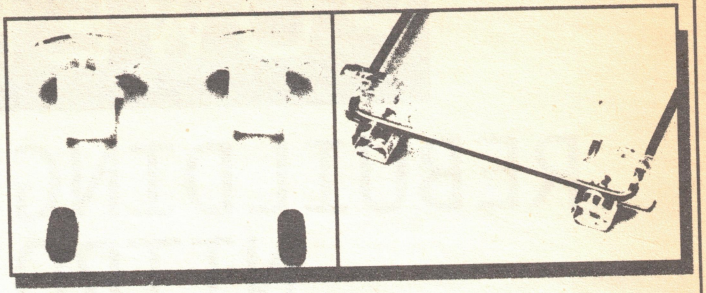

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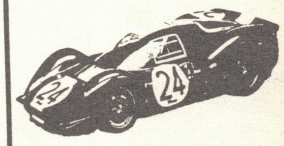

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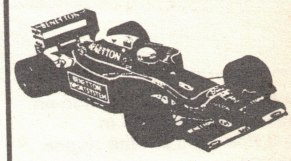

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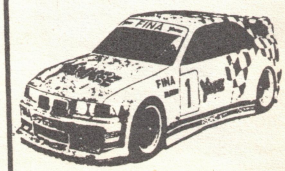

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BY JOHN ST. PAUL

POWER UP!

REBUILDING A .12 SIZE NITRO MOTOR



Clean the motor thoroughly with a toothbrush and electric motor cleaner before beginning the teardown. Try to keep dirt from getting inside the motor and carb.

Four Allen head bolts hold the head onto the block. Don't strip them!

Rotate the shaft until the piston is at the bottom of its stroke. Put your finger down the sleeve and pull up—it should slide out easily.

How you will know when it is time to rebuild your .12-size nitro motor? If you have noticed a loss in power, experience rough idling, the motor stalls easily especially when applying the brakes or if you can no longer tune it to run smoothly, then chances are your motor is due for a rebuild. These are all symptoms of a piston and sleeve gone bad.

It is inevitable that sooner or later your nitro motor will need a rebuild which for most of us is a very scary thought. The expense is bad enough, but the idea of tearing into something you know nothing about makes it even worse. Rebuilding a nitro powered motor is not rocket science but it does need to be treated with care. No special tools are required, only patience, time, and a well-lit clean work space are needed to perform the proper procedures for over hauling your mini power plant. This article will show you how to change the piston and sleeve, the crank bearings and what wear signs to look for on the piston rod and wrist pin.

GETTIN' CLEAN

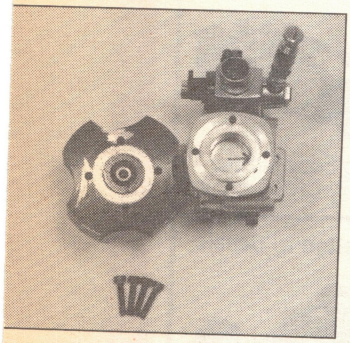
After removing the motor from the chassis, clean it thoroughly. I use a tooth brush and electric motor cleaner for this task. Try to keep the dirt and grime from getting inside the motor and carburetor. Remove the flywheel assembly and carburetor from the motor and give them a thorough cleaning before placing them aside.

DISASSEMBLY

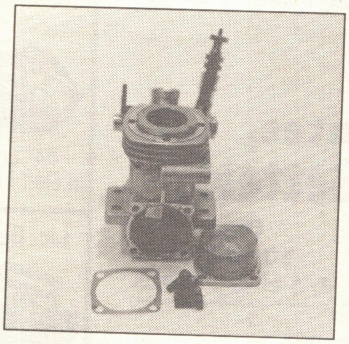
Removing the Head:

Four Allen-head bolts (usually metric) hold the head onto the motor block, and can be on rather tight. Make sure the Allen wrench is fully seated into the bolt head before you start cranking on the wrench. This is not a place you want to strip a bolt head.

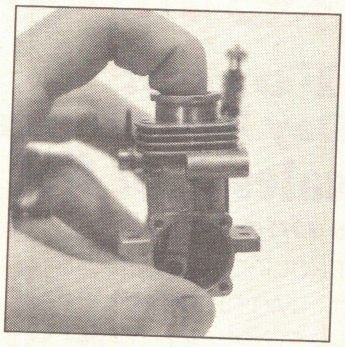
Remove the four bolts and lift the head off of the motor. Be careful not to lose the washer that goes between the head and motor. The washer is very thin and may be stuck to the bottom of the head appearing to be a part of the head itself. If it is stuck, leave it.

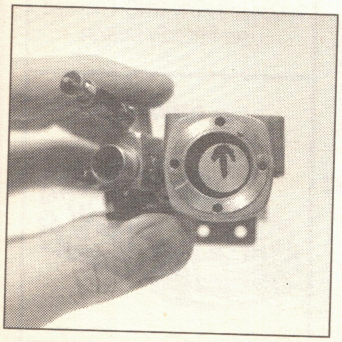


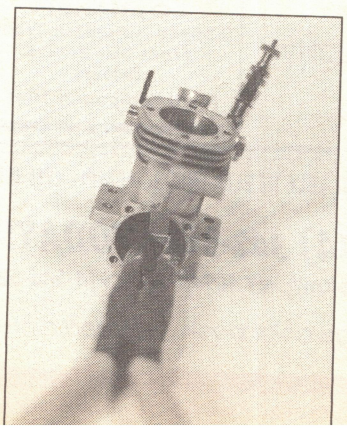
Put a mark in the top of the piston on the exhaust port side to aid in orienting it when you put the engine back together.



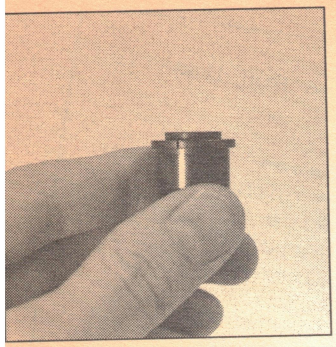
Don't rip or lose the gasket when removing it from the block. You'll need it for reassembly.



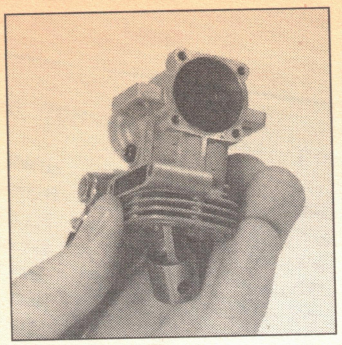




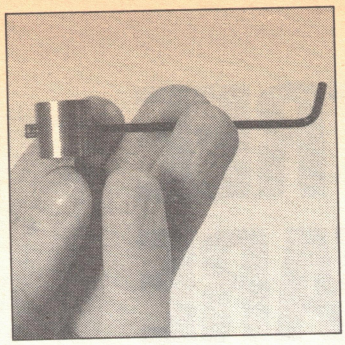
If you can't remove the piston rod with your fingers, use some pliers that have been wrapped with tape or cloth so you don't scratch the rod or any other part of the motor block.

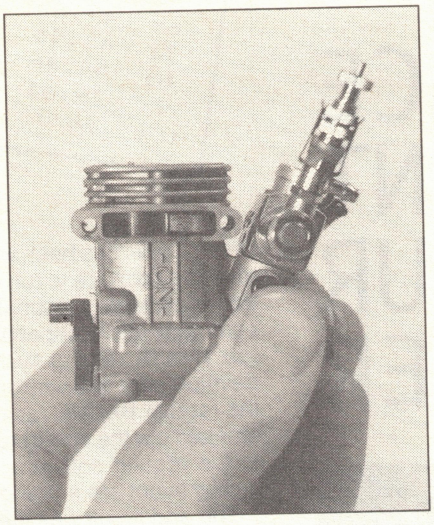


To find out whether the piston and sleeve are bad, put the piston in the sleeve in the same way it was in the motor. If you can push the piston to the top of the sleeve so that any portion protrudes from the top of the sleeve, the piston and sleeve are history.



Once you have successfully popped the connecting rod off of the crankshaft, turn the motor upside down to allow the piston assembly to drop out of the top of the motor.

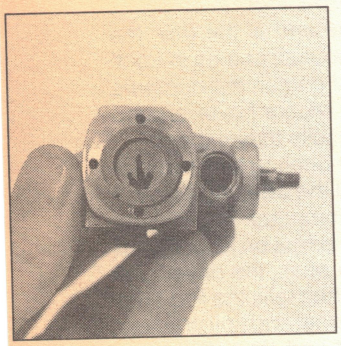




Use an Allen wrench to press the wrist pin out of the piston.

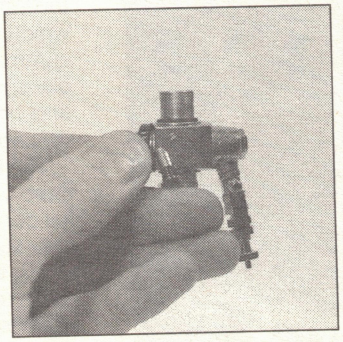
The crankshaft is seen here just sticking out of the back of the engine's block.

New piston and sleeve installed. Note that the notch in the sleeve must line up with the pin in the block.



High-temp RTV is used to stop pesky leaks around the backplate, exhaust header and needle valve.





Check the rubber O-ring at the base of the carb for cracks and make sure the O-ring is seated properly.



All the necessary tools needed to perform a successful engine rebuild.

Proper break-in procedures is vital to the longevity of any nitro powered motor. The following are general guidelines to breaking in a new or rebuilt motor. However the best procedure is the one outlined in your motor manual.

Needle Valve Setting

Screw your needle valve in until it stops (clockwise rotation). DO NOT over tighten, as these valves strip easily. Now turn it out (counter-clockwise rotation) at least three full turns. This should be a very rich setting which will make sure that all the internal parts of the motor get well lubricated thus keeping the motor running cool during the initial break-in period. For additional cooling during break in run the car or truck without a body allowing the motor head to be constantly cooled with fresh air.

RUNNING THE MOTOR

You should have an excessive amount of smoke out the exhaust continuously. If you don't, stop immediately and turn the needle valve out another turn. This also applies to the low end needle valve. If you do not see tons of smoke while the motor is idling then turn the low end adjustment screw out (counter-clockwise) 1/8 to 1/4 turn. Once you achieve tons of smoke out the exhaust you will experience no speed and no power, which is perfect.

Run at least three tanks of fuel this way. On the fourth tank of fuel you can start to lean out the motor by turning the needle valve in (clockwise), but do not make more than 1/4 to 1/2 turn adjustments to the needle valve per tank of fuel.

This is where I stop. Everyone has there own way to tune a motor. You need to decide how lean you want it to run. The more lean the air fuel mixture is (turning the valve clockwise) the more power and speed producing more heat which results in shorter engine life. In other words you decide how often you want to read this article. ●

PRO TREE SOFTWARE

RACE MANAGEMENT FROM YOUR COMPUTER

Qualifing round 7, SR/MOD Speed Run Modified

#	MPH	RUNS	ID	NAME
1:	67.56	3	15	Ross Reyes
2:	62.08	7	7	Rick Gannon
3:	55.13	7	2	Stan Rice
4:	52.59	6	13	Doug Peterson
5:	49.55	4	8	Ed Lawlor
6:	47.85	5	18	David Smith
7:	45.46	2	16	Sean Carberry
8:	44.46	4	23	Jeremy Crebs
9:	39.31	1	20	Ron Ordonez
10:	36.83	2	19	Rene Smith

A sample printout from the BADRC's (Bay Area Drag Racing Club) speed day modified class. Sorted from fastest to slowest, the software selects each driver's fastest run (or lowest ET in drag racing). The program prompts in a logical format to keep the action moving without delays.



The RaceAmerica Pro Tree setup in use at the BADRC Dragway in Sunnyvale, California. When hooked to the race management system developed by Bruce Curtis, you get comprehensive printouts of each drag race competitors' results.

BY WES MCPHEETERS

Bruce Curtis has been working for several months on creating software to run an entire drag race program from a portable personal computer using the RS-232 communications capability built into the RaceAmerica Pro Tree RC timing system. Having completed this development two weeks ago and proving it out with the regular BADRC racing program, he went ahead and laid out the speed run with a few enhancements to the regular software. Custom printouts for each racing event are a real plus.

The end result was the ability to display the status the leaders in each class at any time from the printout which was posted at the starting line. At the end of the day, the summary report provided summary data about all entries in each class immediately—no need to sit down and crunch the numbers and hope you get it right while a bunch of racers hover around waiting for you to come up with the same results they expect.

The Pro Tree RC has had a RS-232 port for printing time slips for three years and the latest versions have had the ability to provide full control of the Pro Tree from an external computer. This means the external computer can keep complete information about each racer. When they come to the line to make a pass, the driver and car is registered and logged, the computer then tells the Pro Tree when to start each event (including starting format and any bracket/index information), the Pro Tree goes ahead and starts the race, collects the race data (including any red lights, bracket breakouts and winner indication) and passes the data back to the computer after the race, at which time the computer prints the time slip and updates the appropriate files for driver and race class performance. The software can keep track of all practice and qualifying attempts to build race ladders as required progressively through a race program. All pairings for eliminations are prepared and confirmed at race time. Entering one drivers race ID causes a prompt for the matching racer and an error message will be displayed for unmatched racers. Alerts are also provided for radio frequency conflicts.

Sounds pretty simple, but it sure makes running a race a lot easier. Well worth the couple hundred dollars of expense for the software if you have the PC and a cable. For more information, call:

BRUCE CURTIS
Telephone: (408) 745-1489
e-Mail: brutus@www.badrc.org
Internet: http://www.badrc.org
RACEAMERICA
Telephone: (408) 927-6064
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New

Shown With
1/10 Universal Interior
(Fits All Bodies)
#10203

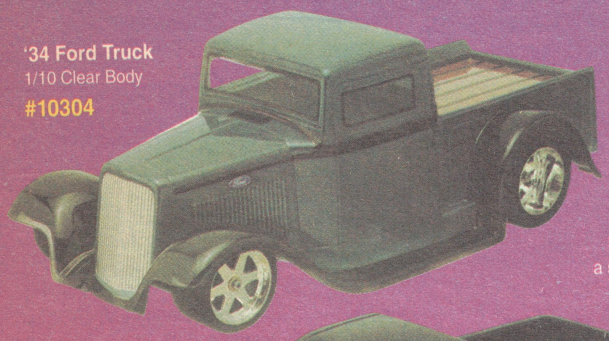


'97 Ford Bigfoot
1/10 Clear Body w/Decal
#10199

The '97 Bigfoot body from Parma comes complete with new body accessories that include a bug deflector, sun visor, roll bar cowling and a step molded in for a true scale appearance!

HAVE YOU FLOWN A Ford LATELY?

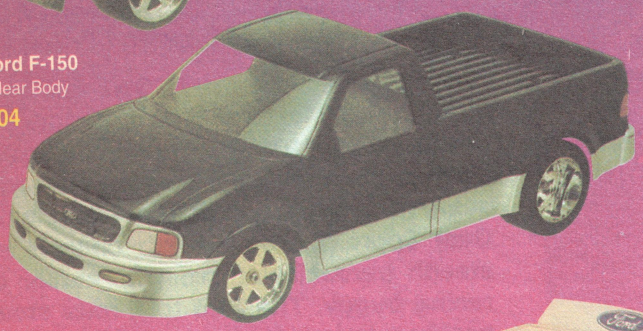
'34 Ford Truck
1/10 Clear Body
#10304



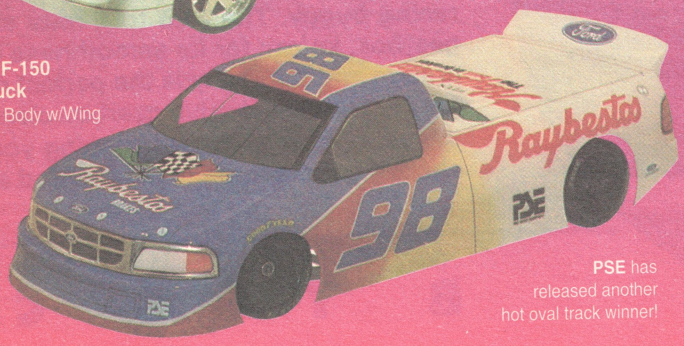
Take a trip back in time with Parma's '34 Ford truck body!

Swoopy fenders and a simulated wood bed!

'97 Ford F-150
1/10 Clear Body
#10204



'97 Ford F-150 SuperTruck
1/10 Clear Body w/Wing
#99046



PSE has released another hot oval track winner!

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The stylish New lines of the next generation of F-150 trucks are available for cruisin' the street or racing at the track.

Check out the nostalgic lines of the **New '34 Ford Truck** body which fits on your favorite Parma Good Times® chassis or any popular monster truck chassis. **Fly a Ford from PARMA/PSE!**

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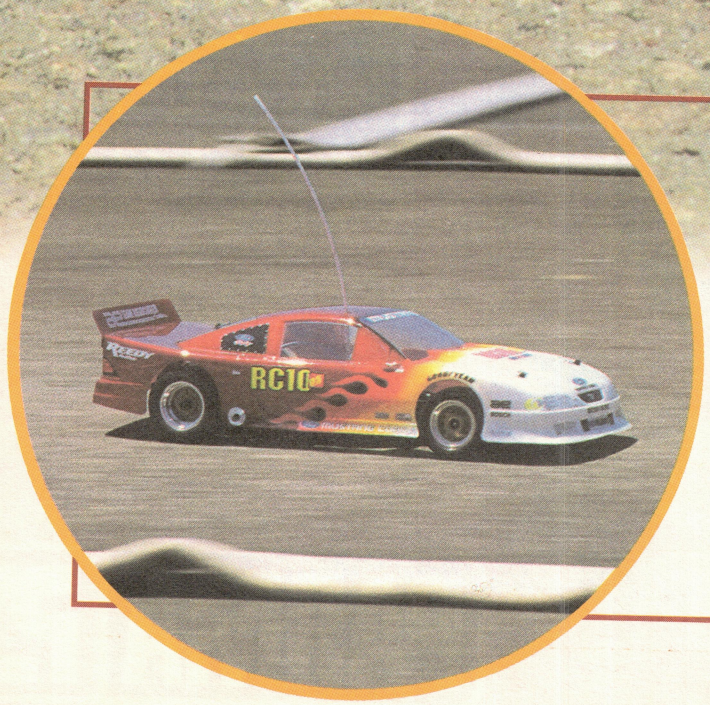
THE EVOLUTION OF THE RC1

The DS is available with either the Mustang body (shown here) or a German Touring Car Mercedes DTM.



The reincarnation of the RC10, one of the most successful remote control cars ever produced, into a pavement racer is a stunning development for the parking lot racing scene. The backbone of Associated's new Dual Sport (DS) is the tub chassis and stealth transmission from its earlier dirt racing buggy. The 2.25 to 1 ratio stealth gearbox, known for its smoothness in operation and durability is the perfect match for the two-wheel drive gearbox class.

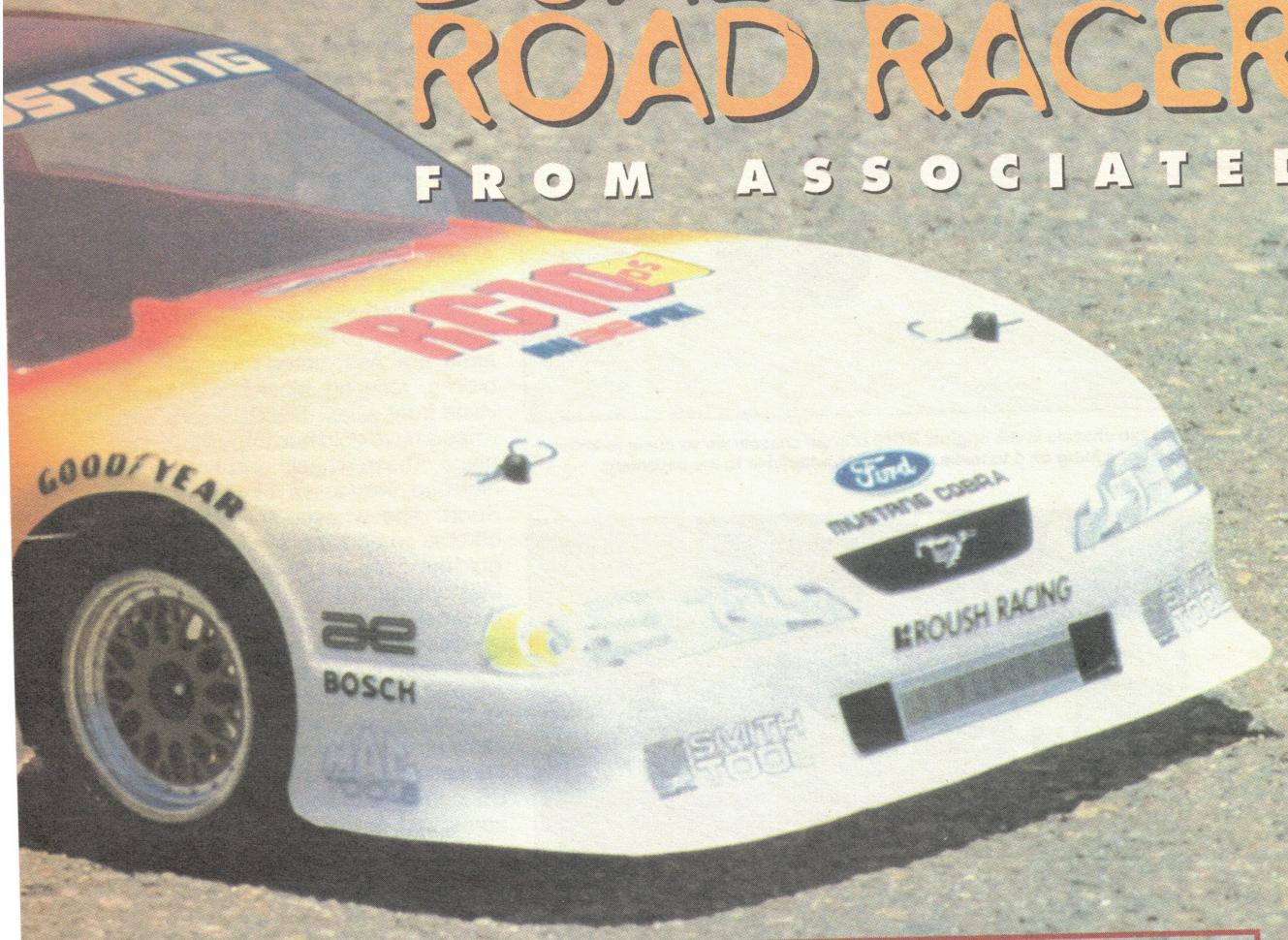
If you follow sedan-type racing you can choose your favorite class and find an RC

B Y C H

): FROM DIRT TO PAVEMENT

DUAL SPORT ROAD RACER

FROM ASSOCIATED



version to emulate your racing passion. Either an American-style SCCA Trans AM body or Eurotouring German C-Class DTM touring car body are currently available from Associated: the Mustang Trans Am body, the Camaro or the Mercedes DTM body and the BMW, with other body styles expected soon.

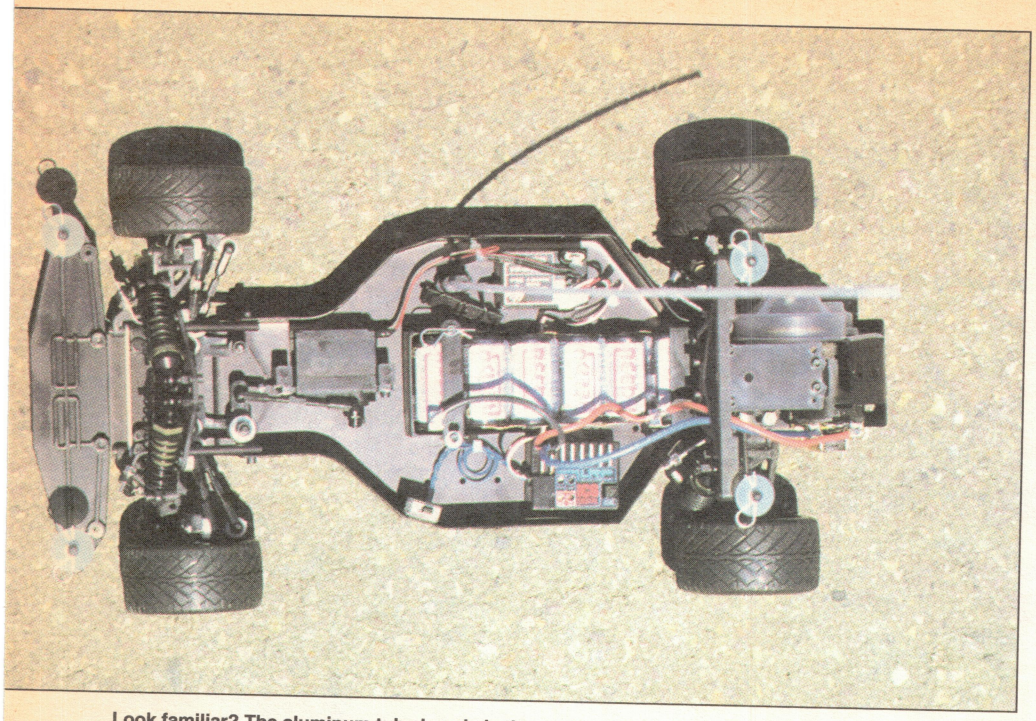
With open ground not as easily found these days the RC10 DS can be run about anywhere you find a traffic-free patch of asphalt or cement. My son and I do much of our car testing at a local school after hours—no cars, no curbs and a lot of asphalt to practice on without fear of hitting something, or being hit by a car the pluses of running here.

ASSEMBLY

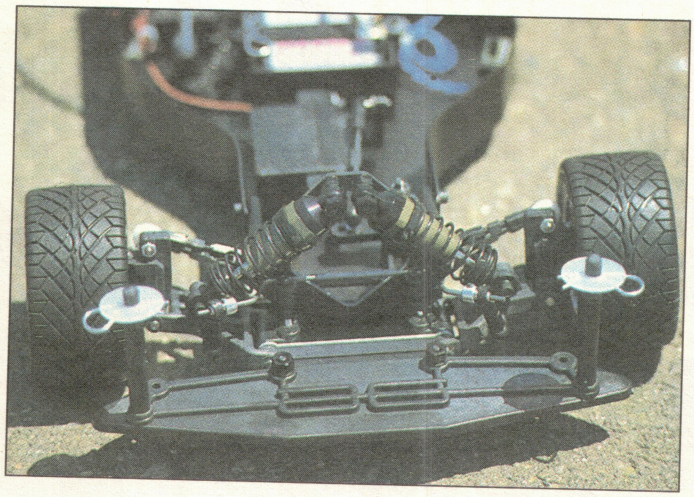
I'm getting ahead of myself just thinking of running the Dual Sport!

I highly recommend scanning the instructions from front to back just to get yourself in tune with the flow of assembly before starting. Reading and following the instructions saves time doing the work once and correct the first time. Enough preaching! I

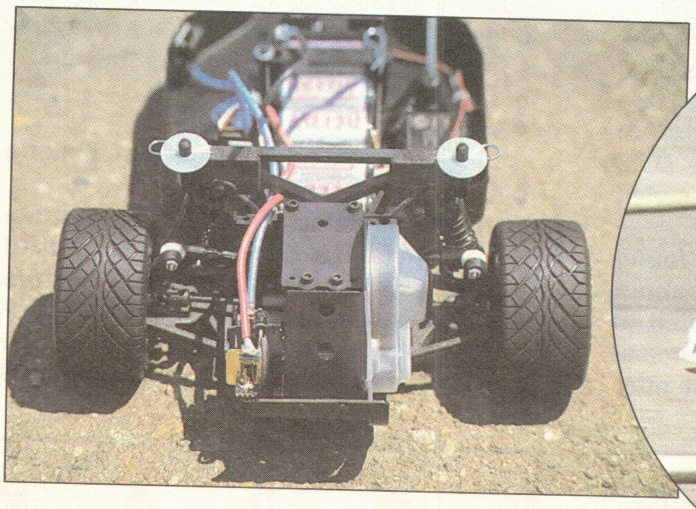
R I S D V O R A K



Look familiar? The aluminum tub chassis is the original RC10 offroad chassis we've come to know and love, with some new additions hung on it to make the chassis adaptable to the pavement.



Up front, the DS incorporates the front body mount posts into the front bumper. The front shock tower has a low profile to help keep the body as low as possible. The nose plate has eight degrees of kick-up to provide proper caster for onroad steering.



The venerable Stealth gearbox, smooth and dependable, anchors the DS's drivetrain. Coupled with a Reedy 12-turn triple, the Dual Sport was a blast to drive. The rear bulkhead is the updated version, borrowed from Associated's RC10 World's car

want to put the DS to the test, so let's get building.

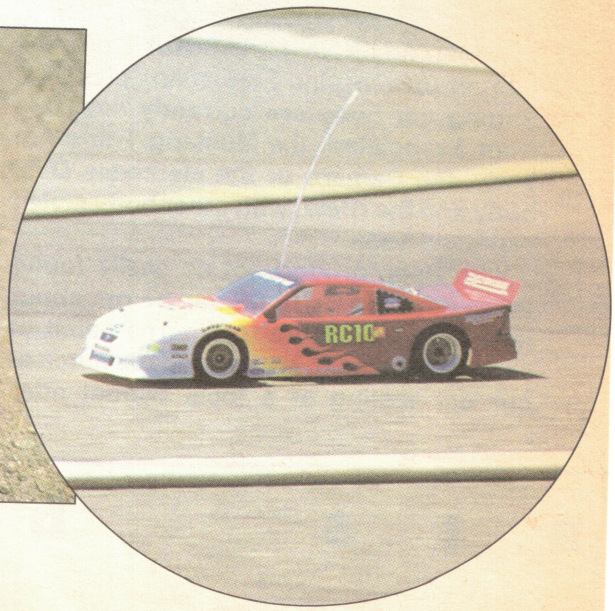
First, get yourself some containers to hold the parts so you won't get messed up using the wrong nut or screw.

Front end assembly comes first, with new molded composite A-arms which are narrow to help tuck the tires under the body. The front shock tower has a low profile in order to keep the body low and hugging the asphalt—in a word, "Slammed!" The DS nose plate has eight degrees of kick-up to provide the proper caster needed for onroad steering characteristics. The 0.56-inch shock bodies are used front and rear with .35 stroke shock shafts. The shocks are fitted with black 1.4-inch springs and four sizes of pre-loaded spacers to adjust ride height. A new front bulkhead holds the shock tower, front anti-roll bar and A-arms.

An onroad-style bumper holds the front body posts. To the outside of the front A-arms are Associated's durable carrier blocks, steering blocks and aluminum inline front axles. The BBS-style chrome wheels have gold hub caps that snap into place. These wheels and hubcaps look nice and really add a racy look to the Dual Sport. The wheels are black, though chrome wheels are available as well as gold hub caps. Super-sticky Pro-Line XTR-M2 compound 1.65 x 1.22 Speed Hawgs provided the grip up front.

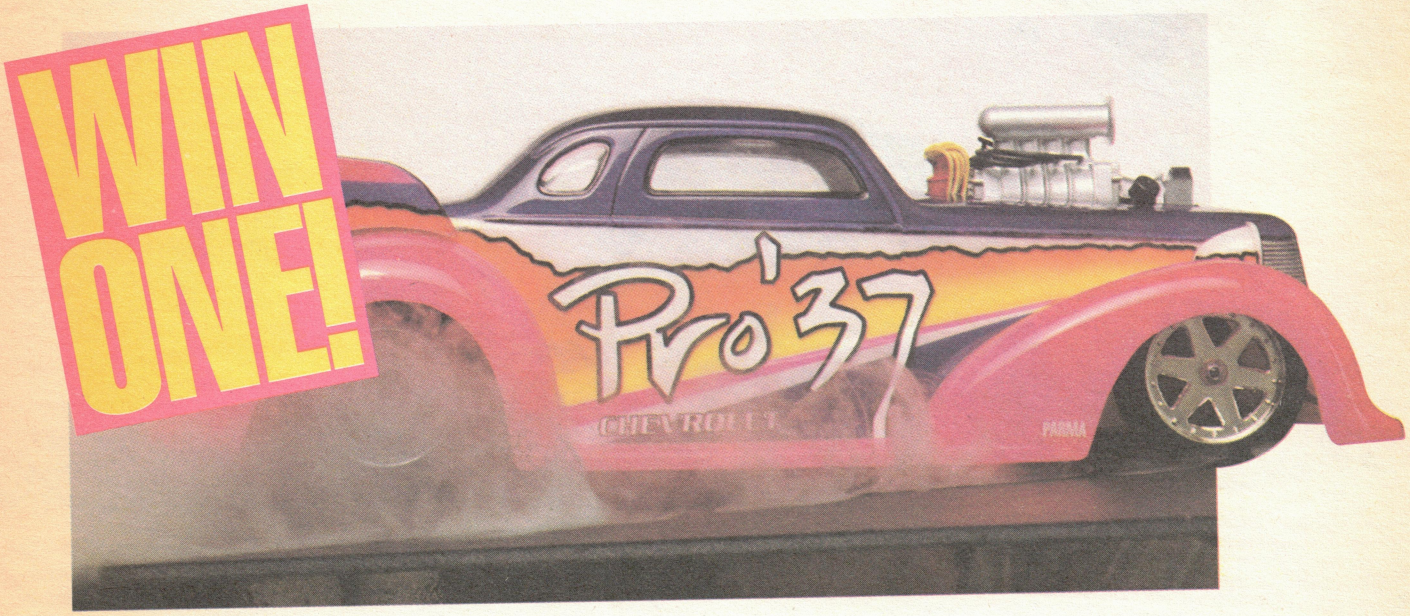
I discovered new bellcranks with a one-piece drag link included in the kit, which eliminates the center ballcups and turnbuckle linkage. These bellcranks are the same as used on Associated's T2 and GT trucks and incorporate a servo saver. The DS comes with three choices of servo horns: "A" for Airtronics servos, "F" for

continued on page 27



Cool BBS-style wheels with gold centers give the DS a seriously sport look. Pro-Line's treaded Speed Hawg tires work well, though considerable wear was noted after a day's racing.

PARMA'S WILD PRO '37 CHEVY



Here's your chance to hook up with the big boys! Send in the coupon at the bottom of this page, and you're in the running for one of these sharp Parma Pro '37 RC kits. The kit comes complete with Lexan body, tires, chrome wheels, fiberglass chassis, aluminum rear pod and wheel hubs, front suspension and a ball-type differential. Add your own motor, battery pack and electronics, and you're ready to rumble! RC Model Cars and Parma International are giving three of these beauties away, one each month! Enter today and you may be a winner!

Enter to win today by filling out the coupon below and mailing it to RC Model Cars, Pro '37 Chevy Contest, Box 2459, Capistrano Beach, California 92624. That's all you have to do!

One entry per person only; you must use the coupon below, or a photocopy of the coupon, or call toll free: (800) 243-9593 to charge and enter.

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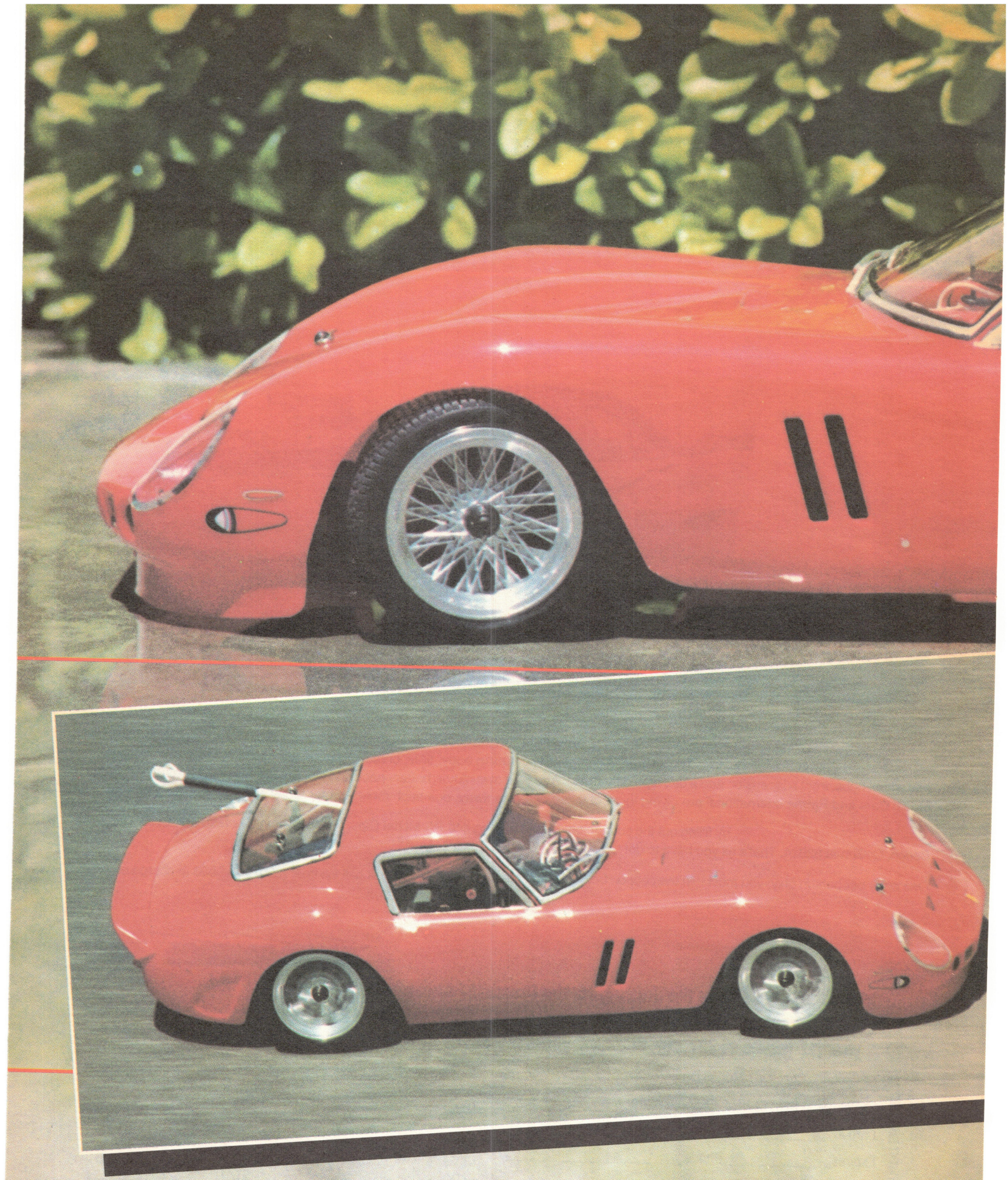
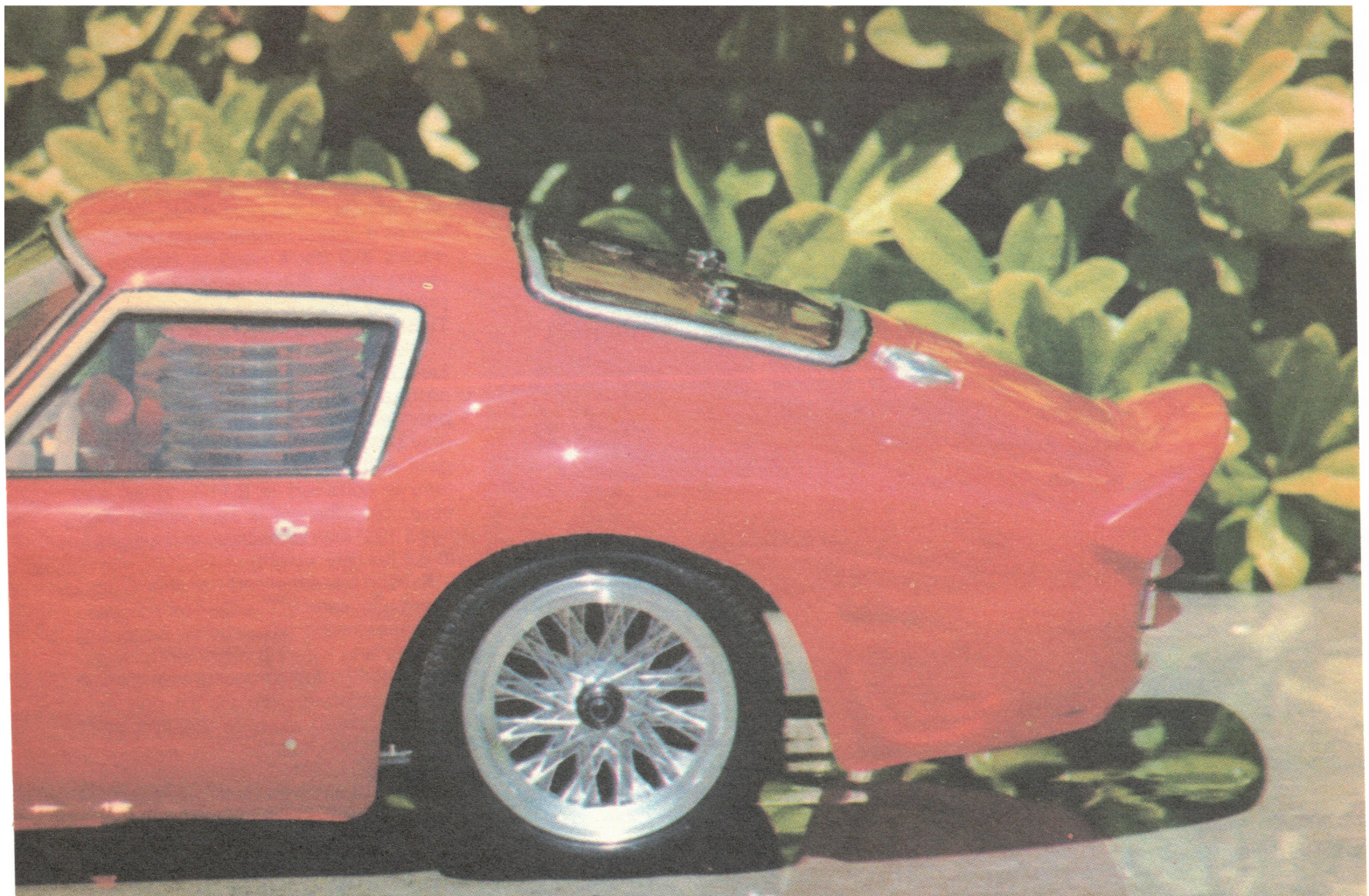


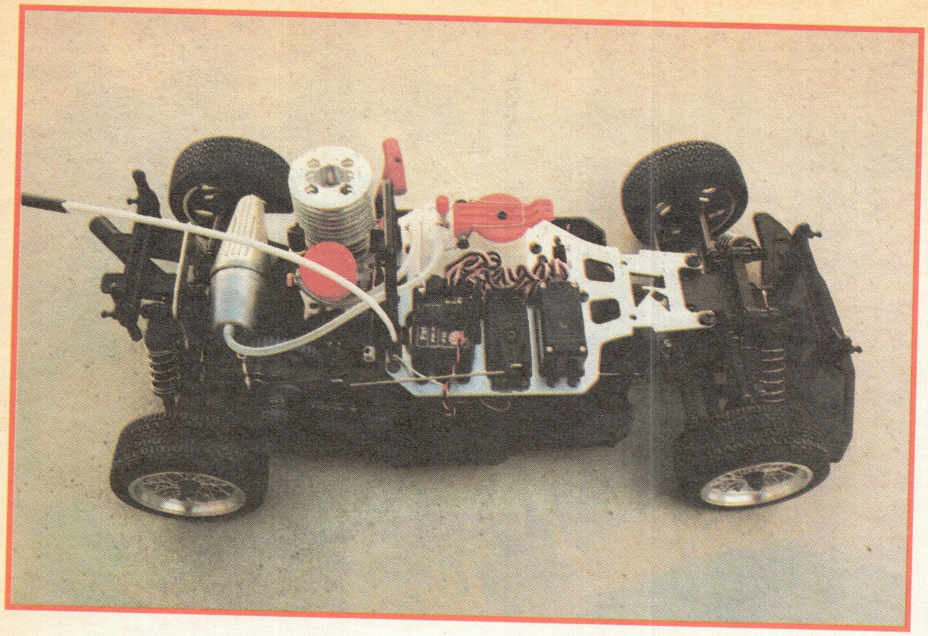
BY DOUG ADAMS

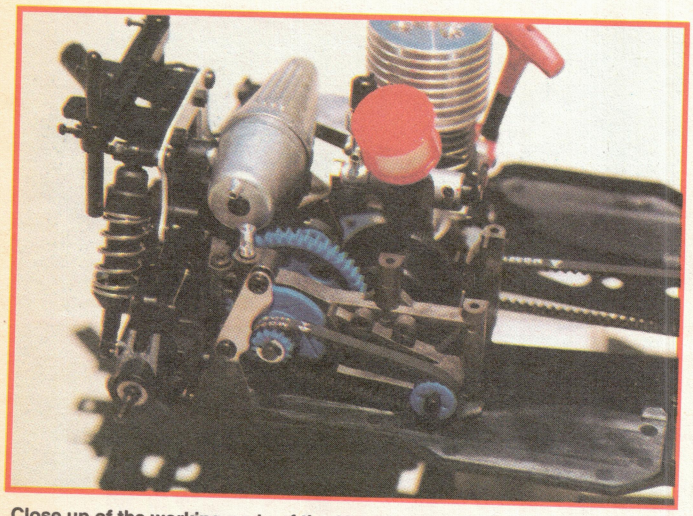


THE KYOSHO FERRARI 250 GTO

MAXIMUM HORSEPOWER!

Classic car and RC enthusiasts alike will enjoy the new line of 1/10-scale Nostalgia Series kits from Kyosho. These kits are a part of Kyosho's Pure Ten, in reference to the authenticity of the cars' scale appearance and nitro-powered performance.

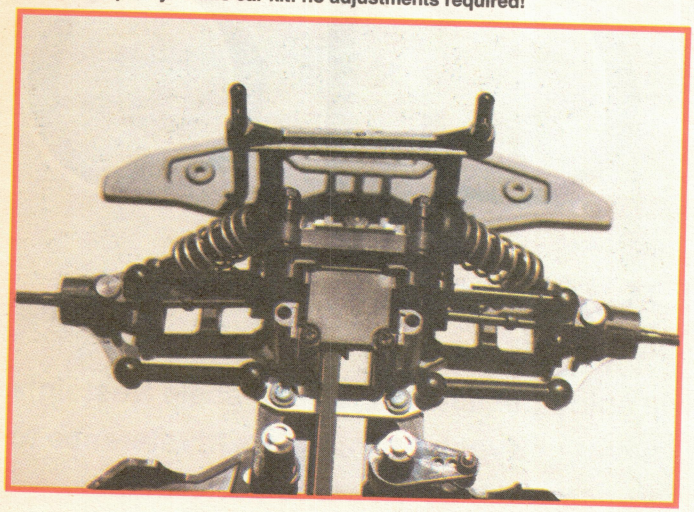


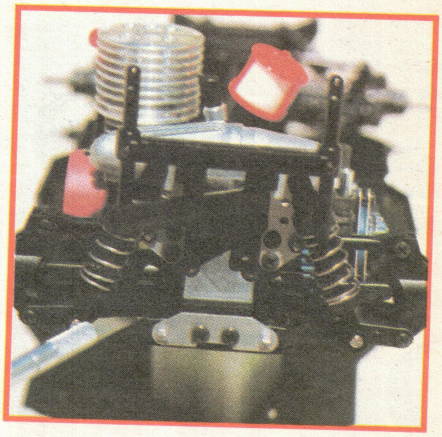


Close up of the working parts of the 250 GTO's four-wheel drive belt and gear system clearly shows the GS11's disc brake, attached to the outboard side of the spur gear shaft. A third belt drives the rear wheels.

Chassis with top plate on showing servo brake/ throttle linkage. At this point, the throttle can be easily adjusted so it doesn't open all the way during break-in procedures.

Take a look at the steering and upper control arm linkage. You'll notice the round ends on the links. These fixed-end links are the way that Kyosho brings simplicity to this car kit: no adjustments required!





The hobby knife points to the ride height adjusting set screw. These screws are found on each lower control arm. Ride height can be lowered by screwing in or raising the control arms.

The new Ferrari 250 GTO Lexan body is a beautiful replica of one of the world's most sought-after collector cars. The 250 GTO comes appointed with authentic treaded tires mounted on one-lug chrome wire wheels, deep bucket headlights as well as a host of chrome parts and all the decals that you'll need to capture the racing magic that is symbolized by the prancing black stallion.

THE NUTS AND BOLTS OF IT

The 250 GTO is powered by a .10 nitro-fueled engine that is mounted sideways on the aluminum bi-level chassis. Power is provided to the front and rear gearboxes (that's right, four-wheel drive) through a gear and belt system. Final drive gear ratio is achieved at 8.11:1. When fully assembled the car is 19.3 inches long, has a 10.2-inch wheelbase and weighs in at 3.6 lbs.(dry weight).

Kyosho has simplified—or should I say nearly eliminated—the need for painstaking chassis setup (suspension, caster and camber and steering alignment), by going to fixed-length components and no-oil shock absorbers. Virtually the only suspension-related adjustment that you need to make is ride height.

A CLOSER LOOK

As with all kits from the larger Japanese RC companies, the directions for the GTO are well written and illustrated. Setting the Kyosho directions apart is the fact that the entire direction book is written in English, the only exception being the tech sheet for the .10 nitro engine, which is in English and Japanese. Also included in the kit is a large, exploded-view parts diagram of the entire car, making it easy to see how all of the parts go together.

FROM THE GROUND UP

As previously mentioned, the chassis of the 250 GTO is a bi-level aluminum assembly. All of the critical assemblies are protected by molded plastic impact guards that attach to either side of the lower plate. Also attached to the lower chassis plate are the front and rear gearboxes, steering and throttle linkage, the transfer gear cluster and of course, the engine.

The upper chassis plate serves several functions. First, it acts as a stiffener for the components below, such as the two transfer gear bulkheads and the chassis plate itself. As you might know, gas cars produce considerable vibration, so it is important that all of the components are properly secured. When the top plate is

continued on page 27

ANSWERMAN CONTINUED FROM PAGE 12

last year 1after one of the longest runs of any RC track around. Since its closing, several tracks, like the ones in King, North Carolina and the Ameri-Trac in Illinois have become the home of the bigger onroad/oval events you'll see covered in *RCMC*.

DEAR ANSWERMAN,

I have two questions: will servos from my RC airplane work on a RC car and does anyone make an add-on remote switch I can use to activate running lights on my RC car? I prefer to use a pistol-style radio and my Futaba Sport model doesn't allow for a third-channel to switch on the headlight and tail lights?

Bruce Winston
Salem, Oregon

A: Servos are servos! If your aircraft units have enough torque to control your type of RC vehicle and they match the radio system, use them! As for a light switch, Ram's #76 Xtra Control will allow you to remotely switch on and off your car's DC lights. Made up of a mini transmitter/receiver system, this setup can also activate Ram's siren or horn. So, call Captain RAM at 847-740-5220 for additional information on the RAM Controller. •

BIG TIPS CONTINUED FROM PAGE 14

as a work surface and simply dispose of it once it's used up. "Used up" means it's gotten covered with dried CA glue, oil stains and the regular grime from cleaning and maintaining your car. Use regular masking tape to attach it to your table and you're assured of a clean workspace at all times.

WRAP UP

Well, that's it for this month's Big Tips column. Hopefully I've passed along the notion of including all scales of RC vehicles in your Q-scale thinking. Next month we'll detail the technique of checking two-stroke powerplants for worn internal pieces and leaking seals or gaskets through pressure testing. Talk to you next time! •

DS ROAD RACER CONTINUED FROM PAGE 22

Futaba servos and "J" for JR Propo servos. The battery cup and strap are borrowed from the functional battery holder style of the offroad RC10.

To the rear, the bulkhead is the updated design used on the RC10 World's car and now on the Dual Sport. The rear shock strut is from the new age of molded composite material. Between the rear bulkhead and shock strut a pair of locator pins on the strut and a channel in the bulkhead house the rear anti-roll bar wire. The shock strut has an outer and inner hole for tuning your suspension and very clean body mounting posts. The rear bulkhead supports the transmission brace as well as the rear camber rods.

The Dual Sport comes with 1.5 degrees rear suspension mounts and 0 degrees rear bearing hubs carriers. The Dual Sport has total of 3 degrees toe in for a good balance of traction, speed and steering. You can change these mounts and carriers to tune for different tracks or your favorite parking lot conditions to achieve more traction, speed, or steering. Each change gives you something and also takes something away.

Very stiff molded composite A-arms are new with two holes for tuning anti-roll performance. Depending on which kit you buy dictates that your car has either dog bones and stub axles or universal axles. In this article, our Dual Sport is the RC10 DS Racer kit.

The RC10 DS Sport kit is supplied with an improved mechanical speed control. The design has a much better mounting system which relates to a dependable control for the entry-level user.

The Dual Sport is following the RC10 racing heritage right out of the box—a real winner!

The rear wheels are chrome-plated BBS style, also with gold hub caps. Taller and wider Pro-Line 1.65 x 1.40 Speed Hawgs XTR-MZ compound tires are mounted on 3/16-inch wider rear rims. The Stealth gearbox speaks for itself one of the best three-gear transmissions in offroad racing, and more than ready for the onroad Dual Sport.

ELECTRONIC INSTALLATIONS

The DS is now a roller and ready for the electronics. For our testing we chose a Reedy 12-turn triple DS racing motor, LRP-ICS electronic speed control, Futaba FP-R103F receiver, Airtronics 94737 servo and a Reedy matched 6-cell "Ultra Pack" 1700 SCRC.

ROAD READY

Test time was here and Saturday was the right day, as our local elementary school parking lot would be empty. The plan was to run the DS at the school and make any adjustments we felt that were needed, then go over to our nearby parking lot race track and let the Dual Sport show its stuff. Our first impression was that the DS was quick off the turns and carried good speed down the straightaway. The DS turns well in tight turns as well as the sweepers.

We had the anti-roll bars adjusted in the softest position initially, and I quickly noticed that the DS had more body roll than I like. We started making adjustments to the anti-roll bars a little at a time until the car was stable yet still turned well and had good rear traction. After a couple of batteries we felt ready to try the parking lot race coarse. I'll tell you what the Dual Sport is so quiet you could barely hear it go around the course. The LRP-ICS Speed Control is very efficient and applies the power smoothly. The Reedy 12-turn triple had a very nice power band of torque and rpm, moving the Dual Sport around the track very quickly.

After this test session we were ready for race day which was the following day. We ran in Expert 2WD Gearbox class as our Dual Sport was the first in the area to test the competition.

A GREAT FIRST TIME OUT

The final result was what we had expected— first place in the gearbox class!

As a bonus, we ran the DS in an open class that's held just for fun at our track. You can use any motor, any type car, as many cells as you want, a "Run What Ya Brung" style of racing. Well, the results were the same—TQ and first place. We had run the quickest time of the day and this included pan cars, four-wheel drive sedans—anything you can name, the DS topped them all.

What more can I say? If you want a very fast car that requires very little maintenance, pick up a DS and let the four-wheel drive guys thrash between rounds while you sit back with a cold soda and let your battery peak. I predict that within one year this will be the biggest class of parking lot cars to be run. The Dual Sport is following the RC10 racing heritage right out of the box—a real winner!

PRODUCT SOURCES

Associated Electrics, 3585 Cadillac Ave., Costa Mesa, California 92626. (714) 850-9342

Pro-Line Tires, Box 456, Beaumont, California 93444. •

250 GTO CONTINUED FROM PAGE 26

attached to all of the pick-up points along the lower chassis it forms a rigid structure that aids in vibration-dampening and eliminates any chassis flex that might occur when the suspension is operating under a load such as the g-forces of a fast, sharp turn.

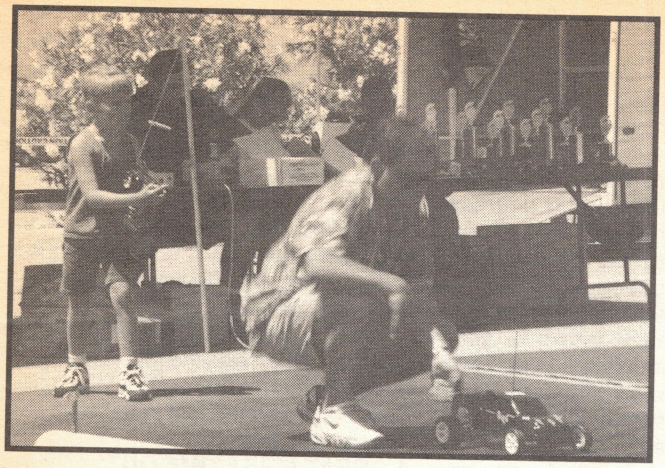
And finally the top plate is the mounting point for the throttle and steering servos as well as the fuel tank.

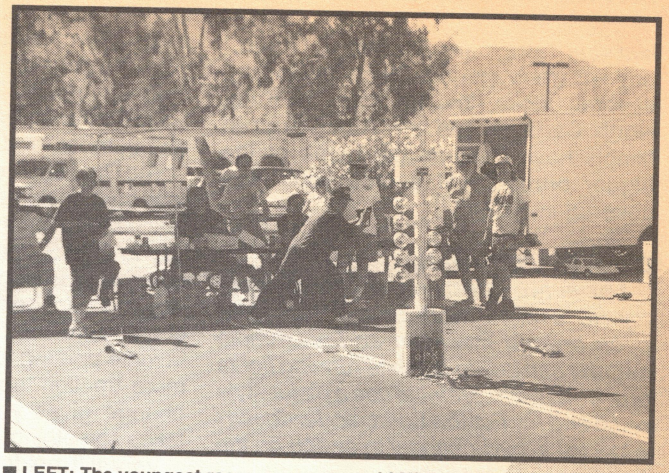
GEARBOXES

The front and rear gearboxes of the 250 GTO are basically the same. Both boxes use a planetary gear diff setup that, when connected with the belt drive, provides four-wheel traction.

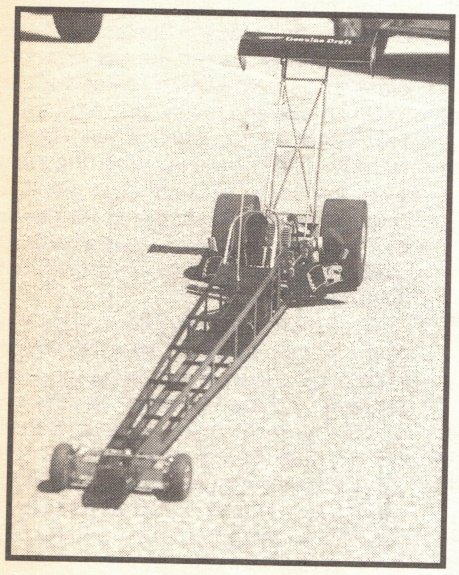
The planetary gear clusters are housed in plastic differential cases that are molded with cog teeth around the outside. The

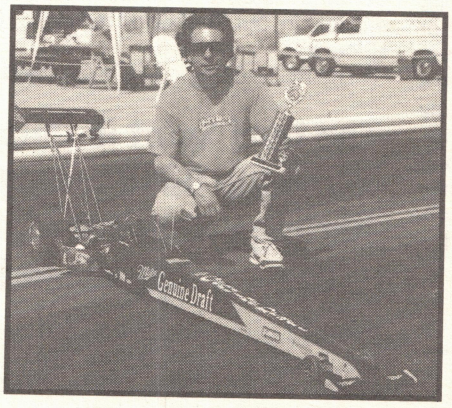
continued on page 34



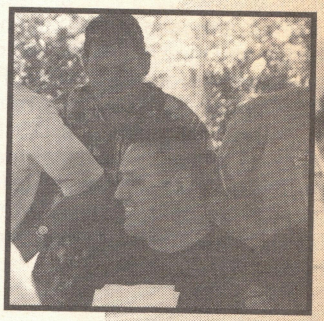


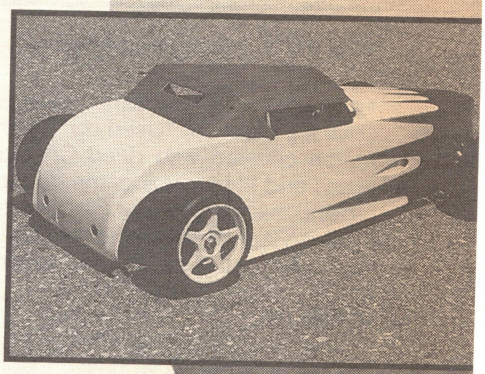
■ LEFT: The youngest racer, seven-year-old Michael Sharwin has his chief mechanic (his dad) stage his car. Micahel did well in the bracket class before losing to veteran Jim Shauer in a close elimination race.
■ RIGHT: Randy Spearing (at right) gets an early jump and the win.





Wade Savage shows off his concours trophy and the beautiful Miller Genuine Draft car—built from scratch.



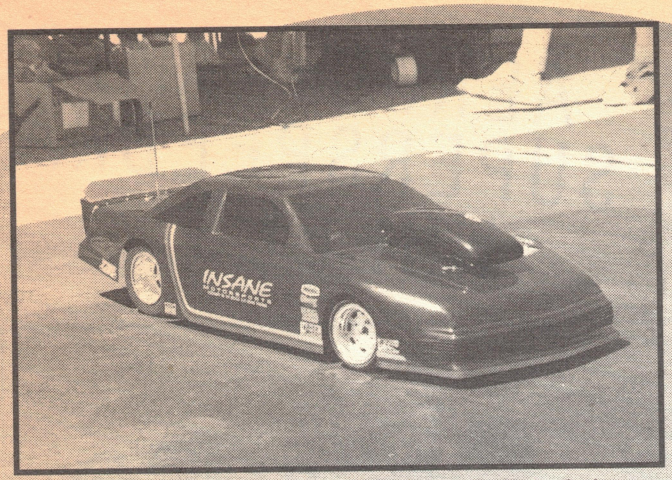


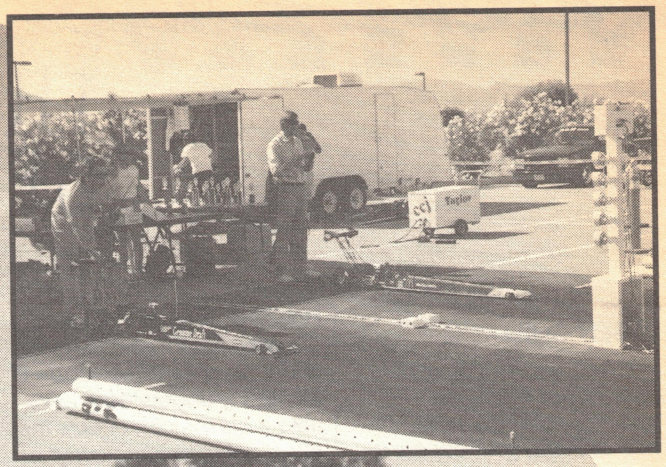
Regularly scheduled RC drag racing is back in Southern California, thanks to the efforts of three names relatively new to the sport, Tom Ocegueda, Mark Adams and Bill DeGaine. Every month at the Oasis Water Park in Palm Springs, under the auspices of the SoCal Drag Club, RC drags are a reality. The track is the best I have seen; perfectly flat, ten-foot wide lanes with a slurry coat on the parking lot and then generous applications of VHT on race day and a shutdown area that must go on for 400 feet. They set up with dual finish zones to accommodate both 1/10th

continued on page 45

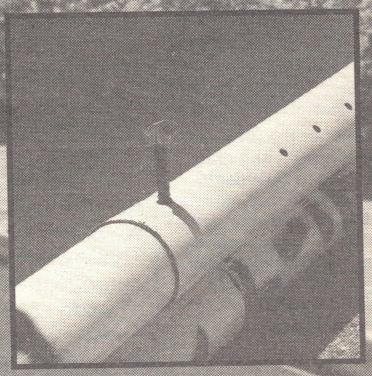
PALM SPRI

Hot Times in th





■ LEFT: Derek Underwood, from Yucca Valley, came to Palm Springs with a sharp quarter-scale Pro Stocker. ■ RIGHT: Wade Savage goes head to head with Jeff Peltier. Peltier took the win in this round.



■ ABOVE LEFT: Tom Ocedueda, from Goodyear Grip Tires handles the race program at Oasis. ■ LEFT: Jim Adams' good-looking coupe.

The excellent race facility in Palm Springs features a flat parking lot (located at the Oasis Water Park) with a smooth slurry top coat. The setup uses RaceAmerica's Pro Tree with double speed trap/finish sensors for 1/10- and quarter-scale racers. Track barriers (inset) are made of irrigation pipe held in place with rebar welded to a flat plate on the pavement.

OGS

he Desert

BY WES MCPHEETERS

RESULTS

(For those cars still running)

1/10 BRACKET
1. Mike Myhre
2. Jim Schauer
3. Michael Sharwin

1/10 ALCOHOL FUNNY CAR
1. Jim Schauer
2. Randy Spiering
3. Larry Lockmann

1/10 TOP FUEL DRAGSTER
1. Larry Lockmann
2. Mike Lockmann
3. Mike Russo

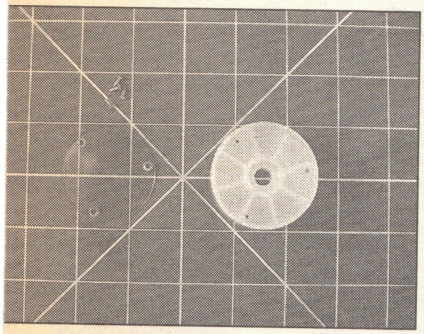
1/4 PRO STOCK
1. Derrick Underwood
2. Mark Adams

1/4 TOP FUEL DRAGSTER
1. Ed Storm
2. Mark Adams
3. Wade Savage

THE AERODYNAMICS OF SUPERSPEEDWAY WHEELS

BY BEN CHIU

Everyone knows that wheels and tires are the most important parts on a car. Without them, your car can't roll along the ground, let alone turn or accelerate.

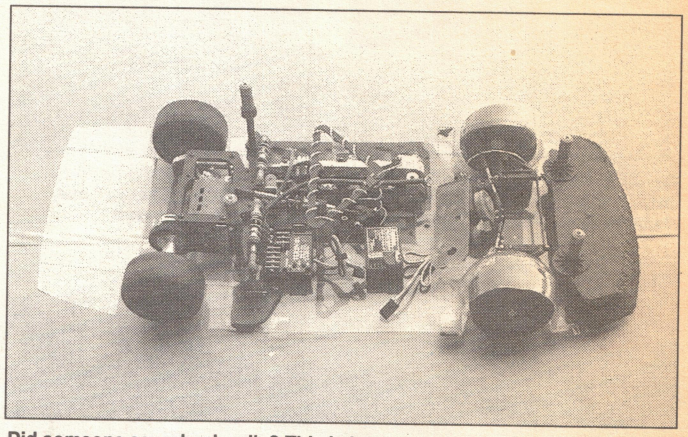


Wheel discs, whether the press-on type or other, reduce lift and drag to some extent. These Speedskin wheels and screw on Aerodisk wheel covers from Kimbrough (also available from BoLink) are a good example of how the RC industry is beginning to take aerodynamics seriously. Too bad these aren't available with rubber caps.

However, when it comes to the aerodynamics of wheels and tires, their effects aren't as clearly understood. Let's take a closer look at how they affect SS cars and how you can improve their aerodynamic properties.

WHY WHEELS?

In real SS cars, wheels spin inside wheel wells so they are partially shielded from the effect of the outside air stream. In these cases, only the lower area of the wheel near the ground is directly affected by the air stream. This reduces the influence of rotating wheels on the overall aerodynamics of the car. Fortunately, or unfortunately, our RC SS cars have hollow bodies with no wheel wells to speak of. That's why the effects of aerodynamics on wheels shouldn't be ignored. It can provide an aerodynamic advantage, even though it's a small one. Nevertheless, since The *Racer's Edge* is all about exploiting advantages big and small (remember many small advantages add up to big ones!), this topic is worthy of further investigation.

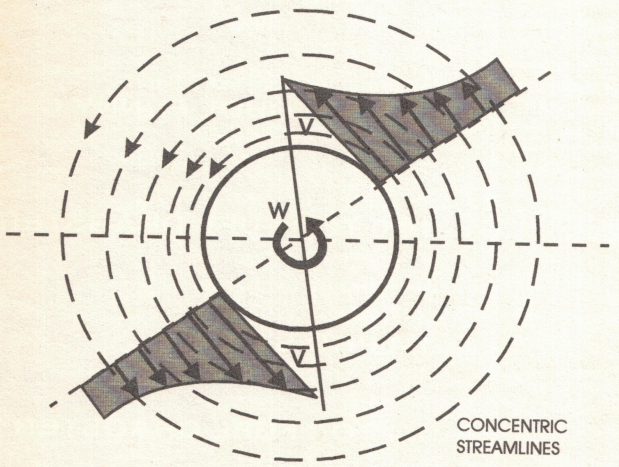


Did someone say wheel wells? This is how we generated some of the information presented here.

WHEEL MYTH

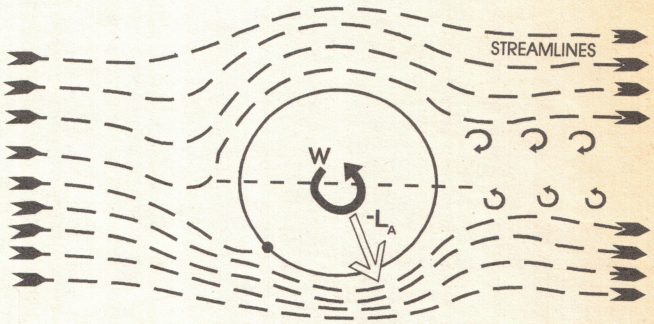
Many believe that due to the rotation of a wheel, it produces a downward aerodynamic force. It's a natural conclusion if you look at a spinning wheel away from the ground. When in forward rotation, the wheel seems like it's "scooping" air out from under it (which creates a low-pressure area there) and moves the wheel downward due to the downward aerodynamic motion. However, from what we know from previous discussions, you probably gather that isn't possible when the spinning wheel is placed on the ground. The actual airflow pattern and aerodynamic force acts upward and creates lift under those conditions. Regardless, to remove all doubt, let's take a closer look.

ROTATING WHEEL IN STILL AIR



Every part of a car has a boundary layer attached to it. This includes the wheels. If you recall boundary layer theory, the air closest to the surface of the wheel moves along with it as it rotates. Due to viscosity, successive layers get pulled along by the layers below it, but the effect decreases as the distance from the surface increases. In this case, the air closest to the surface of the wheel travels much faster than the layers above it.

ROTATING WHEEL IN UNIFORM AIRSTREAM

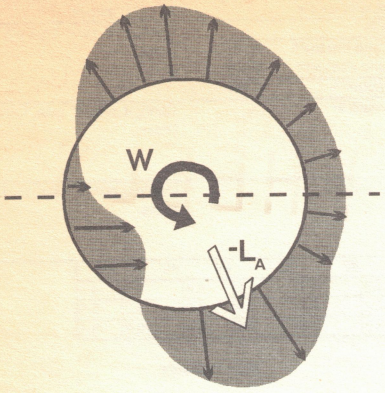


When exposed to a uniform airstream, a rotating wheel generates negative lift.

WHEEL LIFT

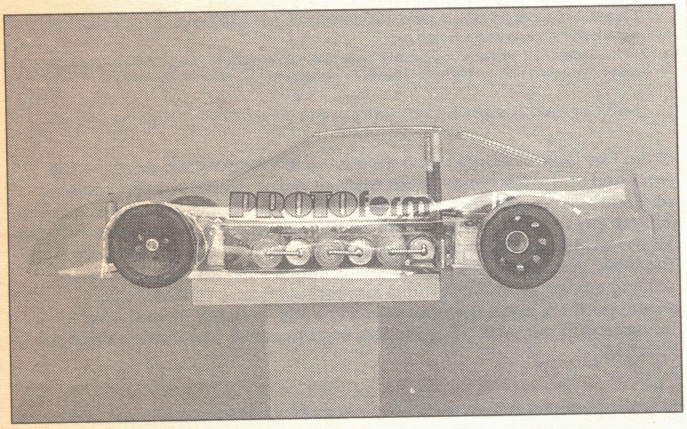
When rolling on the ground, the wheels on a car rotate in an "anti-stream" direction. This means when points along the outer circumference of the tire reach the point furthest from the ground, they move

AIR PRESSURE DISTRIBUTION OF WHEEL ROTATING IN UNIFORM AIRSTREAM



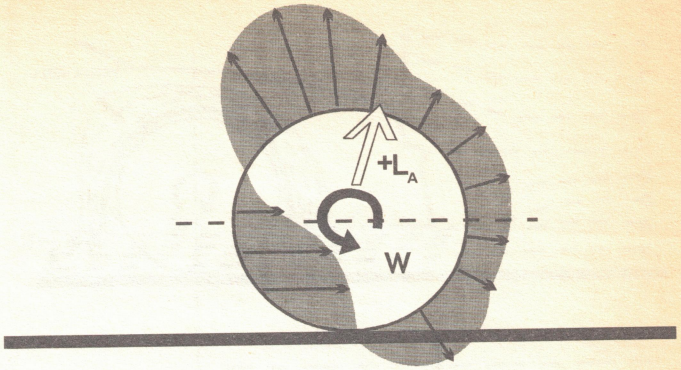
The reason why we see a negative lift tendency in this example is due to two things happening. On the bottom half of the wheel, the air layer closest to the surface is being "pulled" away from the passing stream by the wheel rotation (again due to the boundary layer principle). This causes a low-pressure region to form there. Furthermore, the air that initially would be flowing over the top of the wheel is "pulled" down by viscosity. This creates a higher-pressure region on the top forward part of the wheel. The result is a force that acts down and slightly rearward.

directly against the oncoming air stream at double the car's velocity. Conversely, the points moving at the bottom of the wheel move with the air stream at nearly an identical speed as the airflow passing around it. As you may recall, every part of a moving car has a boundary layer attached to it. This includes wheels. When the wheel boundary layer gets pulled over the top of a wheel (when rolling in a forward motion), it makes contact with the oncoming airflow in direct opposition to it. We also already know, higher airspeeds mean lower local pressures and slower air speeds mean higher local pressures. With lower pressure at the top of the wheel and higher pressure at the bottom, these conditions produce wheel lift. Furthermore, the wheels on our cars travel on the ground and not in free air (at least not intentionally!). This interaction between the tires and the road forces/squeezes the oncoming air flow out from below it. In addition to ground effect, this action also creates even more unwanted lift.



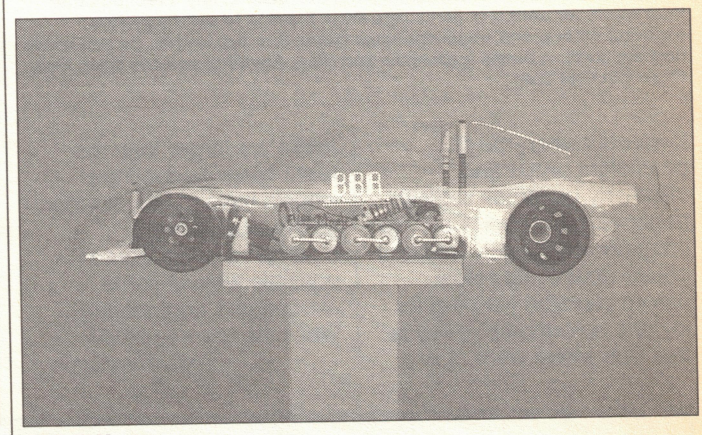
Protoform 1995 Grand Prix.

AIR PRESSURE DISTRIBUTION OF WHEEL ROLLING ON THE GROUND



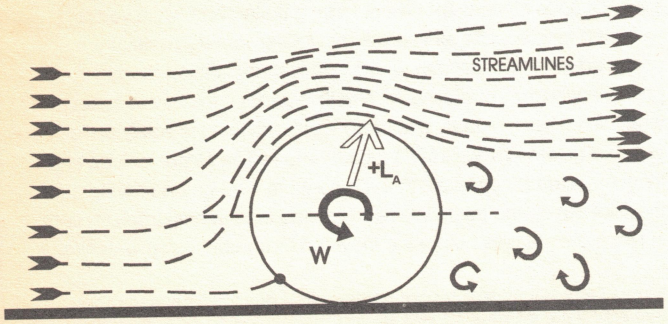
The ground interferes with any flow that would normally pass under the wheel as seen in the uniform airstream example. The air passing over the wheel meets the air traveling along at the wheel surface at double the velocity of the wheel. This causes a low-pressure region to form there. While this occurrence is no different than before, the main difference between this example and the uniform stream example is that there is no longer a larger low-pressure region being generated under the wheel due to the ground. Furthermore, air that tries to pass under the wheel just gets squeezed out toward the sides. Nevertheless, it contributes to added turbulence (drag) and lift to some extent.

can reduce lift, you reduce drag. We briefly touched on the most conventional method used to reduce wheel drag earlier. It's by covering the wheels inside wheel wells. The smaller the wheel wells, the less lift (and subsequently drag) is created. Research has shown that if you decrease ground clearance and increase the proportion of wheel rotation inside a wheel well, it will decrease the total aerodynamic drag coefficient of the wheel. In full size cars, it is known that the minimum wheel drag coefficient is reached at a shielded height to wheel diameter ratio of about 75%. It is also known that a wheel will show positive lift within a wheel well. However, when the clearance of the wheel well is



BBR El Monte.

WHEEL ROLLING ON THE GROUND

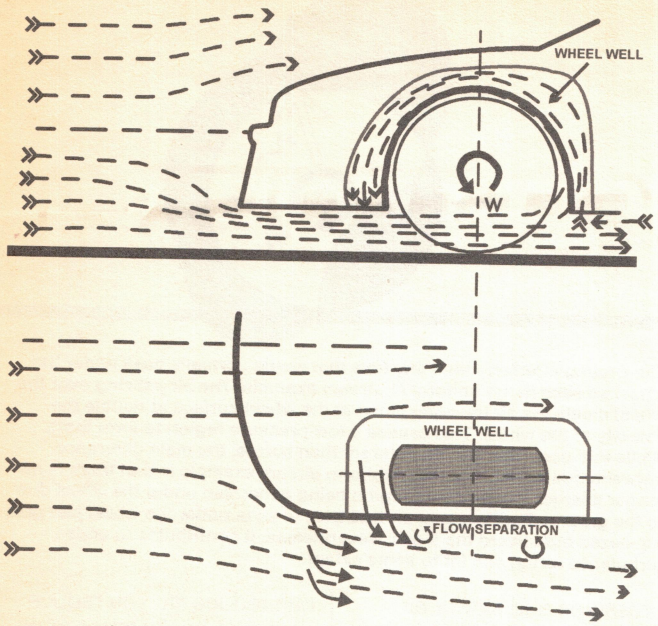


If you take the same rotating wheel and place it on the ground, it generates positive lift.

WHEEL DRAG AND REDUCTION

Any aerodynamic force that goes in any direction other than the direction of the intended motion of the body causes drag. Just as we've generally seen before, if you

AIRFLOW PATTERN AROUND WHEEL ON CAR IN MOTION WITH WHEEL WELL



The airflow pattern in a wheel well must look familiar now. It resembles what happens inside hollow polycarbonate RC bodies. The flow is from back to front. Of course, a wheel well limits how large this internal flow is, but as we know, any aerodynamic force that goes in any direction other than where we want it to go causes drag. Starting to get the picture? (Bottom) Wheels and wheel openings cause flow separation. As you know flow separations cause turbulence and drag. Anything you can do to limit these will limit drag.

lowered further, the lift coefficient drops and ultimately becomes slightly negative. How cool! Can you imagine wheels and tires that create downforce? Now before you start jumping for joy, the unfortunate reality is that with wheel wells, the fronts are larger than the rears because the front wheels have to turn to steer so the elusive high downforce wheels aren't possible without some extravagant engineering. While the rears are still

continued on page 46

HOBBY LABS
***AeroDyno*™ data**

MODEL: El Monte
FROM: BBR Scale Racing Products
All tests no wing or spoiler

TYPE: Narrow SS, Regular weight
WIND: 60mph 70° dew pt. 46°
29.92" pressure

Config 1: 0° rake, back in
Notes:

Front AeroDyno Factor™	**-2.52**
Rear AeroDyno Factor™	**0.29**
AeroDyno Factor™	**1.25**

Config 2: 0° rake, back out
Notes:

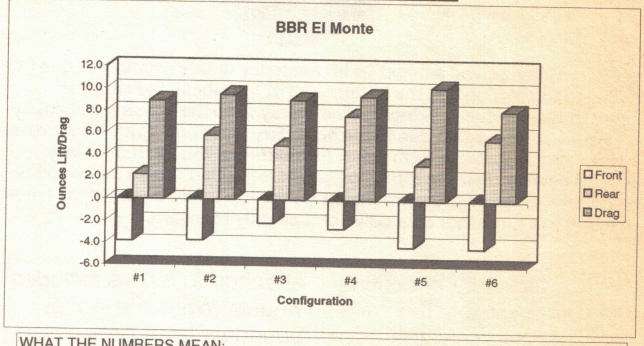
Config 3: neg. 1° rake, back in
Notes:

Config 4: neg. 1° rake, back out
Notes:

Config 5: pos. 1° rake, back in
Notes:

Config 6: pos. 1° rake, back out
Notes:

	#1	#2	#3	#4	#5	#6
Front	-3.8	-3.7	-2.1	-2.6	-4.2	-4.3
Rear	2.2	5.8	4.9	7.6	3.2	5.5
Drag	8.9	9.5	9.0	9.4	10.2	8.1

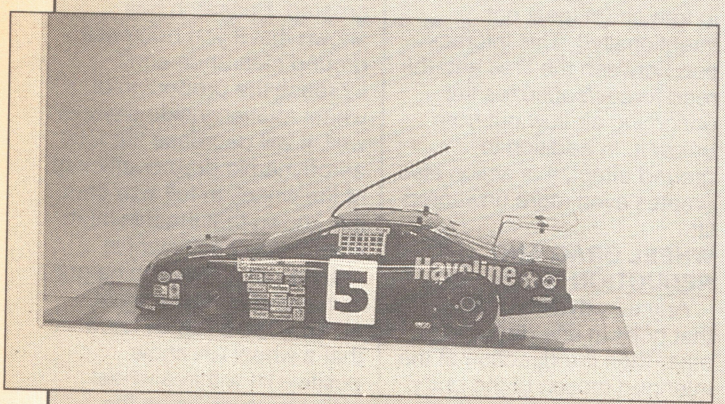


WHAT THE NUMBERS MEAN:
- All numbers quoted in ounces except for AeroDyno Factors™.
- AeroDyno Factors are percentages based on the standard PROTOform '92-'93 Thunderbird reference body. AeroDyno Factors of less than 1.00 means lower L/D compared to the reference body. AeroDyno Factors higher than 1.00 mean higher L/D. Negative AeroDyno Factors indicate negative lift is generated (because the test standard generates positive lift). AeroDyno Factor percentages still apply.
- Remember: The "ultimate" lowest drag body may not be what you want. You can't win any races if you can't stay on the track. You must consider lift bias' in your calculations.

AeroDyno™ and AeroDyno Factor™ are trademarks of HobbyLabs. All rights are reserved.

Note: The BBR El Monte numbers quoted are not realistic because the front end of the car bends down when at speed, which needless to say, shouldn't be run like that. While placing support under the nose improved L/D performance significantly (although rear downforce was reduced), we let the quoted numbers stand because the tests of every other body from the other manufacturers did not use or require any additional support. Adding any supplementary nose support such as a TD Enterprises Protector foam bumper would give any body an unfair lift and drag advantage in our tests. (See the last installment of *The Racer's Edge* for details.)

Since our last installment, we've once again made good on our promise. On June 1, 1996 HobbyLabs' newest test pilot Gary Hamilton obliterated Mike Blackstock's existing Expert Modified track record at the Carson, California Velodrome by completing an inconceivable 20 laps in 4:11:14. (Look for a chance to win Gary's actual record-setting car with all the goodies on page 51 this month.) For those of you counting, that's about six seconds faster than anything ever seen before in this class. Could this just be another coincidence? Well, I'm sure there are those out there who will continue to speculate on whether we really know anything about anything (although we can't see why anyone would continue to argue with success), but as of this writing we've earned three track records in three different classes and we only have three drivers. I think it's quite obvious that we're getting faster, and while you're welcome to speculate all you like, I'm telling you we've mainly achieved all of this through aerodynamic manipulation made possible with the AeroDyno™. Whether or not you want to believe what we've been revealing is really worth anything is solely up to you, but as always, we'll lay it all out here in T*he Racer's Edge* and let you decide for yourself. In the meantime we'll go on proving our theories out on the track. We're interested in obtaining track records in two more classes before we move on to onroad. Keep watching. •



Here's Gary Hamilton's record-setting car. Look for a chance to win this actual car on page 51 this issue.

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TEAM ASSOCIATED

NOVAK ELECTRONICS, INC. RACING TEAM

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Schedule: **Pre-Entries close September 23rd. Entries received after the 23rd will be charged an additional $10.00.** ***There will be uncontrolled pratice on Friday at approximately 1pm.*** **To enter the gates on Friday for practice, the fee is $5.00, per person.** Saturday gates open at 6am, controlled practice from 9am to 12pm. Racing at 12:30pm. 2 qualifiers on Saturday. Sunday gates open 7am practice till 8:30, 3rd qualifier at 9:00am. NASTRUCK Speed Run 1/2 hour after qualifing, followed by the Unlimited Speed Run. **All heats and mains will be 20 cars. Each racer must have 3 sets of frequencies prior to race day (bring extra frequencies).** Tables and chairs will be available for rent only for out of state racers. Power will be provided, bring your own extension cords, power strips, tables and tarp. **Schedule may change and can be adjusted at any time.**
Track Address: Dominguez Hills College, 1000 Victoria Blvd, Carson, CA. High banked concrete oval. Cap tires.
Entry Fees: All classes except the Speed Run are $40.00 if pre-entered. Speed Run Entries are $25.00. To enter either Speed Run you must be entered in another class. One shirt for each driver. **No phone or fax entries.**
Spectator & Pit Crew Fees: Spectators $2.00 each (3 or more persons in a group a flat $5.00). Pit Crew $2.00 each (refunded when the pass is returned).
Hotel Info: Holiday Inn, 310-781-9100. **Rooms are 1st come 1st serve. Make your reservations before September 1st. Ask for the NORRCA Race Rate.**

Mail entry form with check to NORRCA 1651 W. FOOTHILL BLVD. #225, UPLAND, CA 91786. 909-944-5381

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(6) SPORTSMAN MOD NASTRUCK____ (7) SUPER SPEEDWAY____ (8) UNLIMITED SPEED RUN____ (9) NASTRUCK SPEED RUN____
FREQ. 1._____ 2._____ 3._____ FREQ. 1._____ 2._____ 3._____

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250 GTO *CONTINUED FROM PAGE 27*

installation of the gear clusters and the drive belts is done simultaneously.

Since the gearboxes are cutaway on one end for the drive belt, they end up being nothing more than a mount for the self-contained diff instead of a true gearbox.

The ring and pinion gear transfer and reduction is achieved through a series of exposed gears that are mounted between two bulkheads on two shafts. Because of the position of the engine and the fact that the car is four-wheel drive, the gear system has to be arranged in such a way that the drive belts are aligned with the center of the chassis.

To accomplish this alignment Kyosho uses several gear shafts. The drive system is very straightforward, although I don't know how easy it will be to explain. Anyway here goes! The pinion, mounted on the bell housing of the motor, turns the spur gear that is mounted on a common shaft with the rear diff drive and the transfer gear/disc brake. The transfer gear connects the front gearshaft with the rear gear shaft using a drive belt. From there the shaft offsets toward the center of the chassis where another drive gear is connected to the drive belt that supplies power to the front diff. All in all there are three belts and six gears, and that includes the pinion and spur. Whew! Straightforward, right? Actually, it is a very smooth, effective system.

From the diffs the power travels through the dogbones to the axles that are supported in the uprights of the independent suspension.

SUSPENSION

If you thought the drive system was a breeze wait until I tell you about the suspension! No, just kidding. The suspension system of the 250 GTO is very user-friendly. There are no radical settings to make or oil-filled shocks to build nor are there any adjustable links to mess with.

Everything from the steering linkage to the upper control links are fixed-position, snap-on ball-end links. Kyosho has a variety of upgrade parts but I don't think that's what the 250 GTO is all about. This is a great hobbyist fun and even entry-level gas car kit. I don't believe there are any racing implications here. But, the resources are there just in case the day comes that you want to start making changes to the car.

As I said before, the shocks are oil-free. The main shock shaft presses into a plastic bushing that, along with the shock spring, provide all of the dampening. That's it! The shocks mount to the lower control arms and shock towers that are located on the front and rear gearboxes. And remarkably, when assembled, the shocks actually feel pretty good.

The car's ride height is adjusted using set screws that get installed in the lower

continued on page 44

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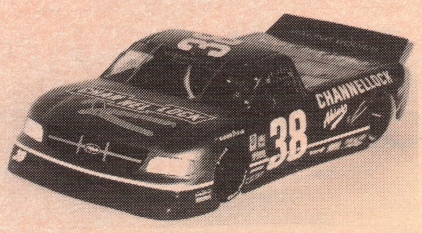
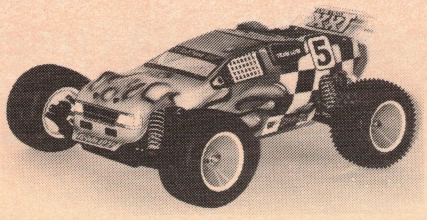
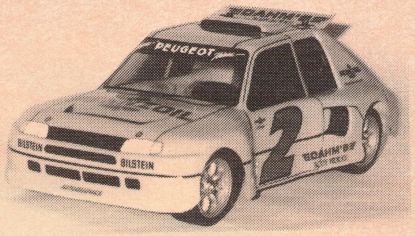


NEW!!! D225 SPITFIRE STD™ 1997 Styling. Race Winning Aerodynamics. Fits Standard Width (Wide) Cars like **RC10L**, **Evolution 10**, & **Serpent Impact II**. Includes Spoiler, Headlights & Grill Decal.



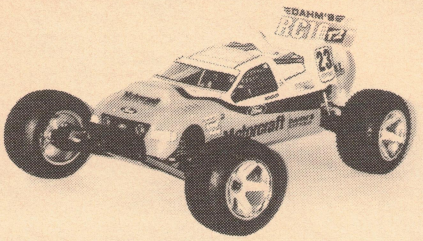
D200 SLAMMER X™ Fits **Team Losi XXT.** Super Low & Narrow. 3-D Side Panels that Hug the Frame, Cooling Vents, Spoilers, Headlights & Grill Decal!



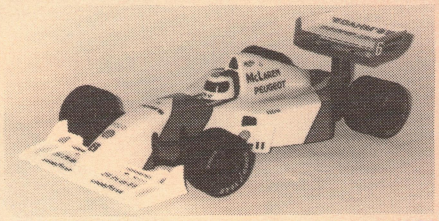
NEW! D222 *KILLER BEE™* Fits **Tamiya Mini Coopers**, **Fiats**, & 12th Scale Cars like the **Associated RC12L**! Peugeot Turbo Mini Styling. Head & Taillight Decals & Roof Spoiler. Join the Swarm, Get Your **Killer Bee** & Sting the Competition!



D205 & D206 RAMMER SS™ Fits **RC10LSS** & Wide **Tamiya**, **HPI**, **Kyosho** 4WD Sedans. Superior Aerodynamics. Wind Tunnel Tested. NORRCA Approved. **D205** Light **D206** Strong Lexan



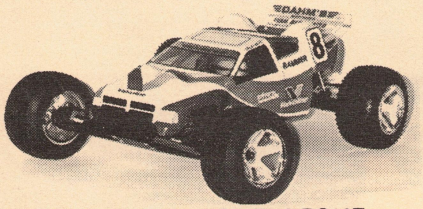
NEW! D221 SPITFIRE™ '97 ProTruck Styling. Fits **RC10T**, **RC10T2**, Tamiya **Stadium Blitzer, &** Traxxas **Rustler.** 3-D Side Panels, Headlights & Grill Decal.



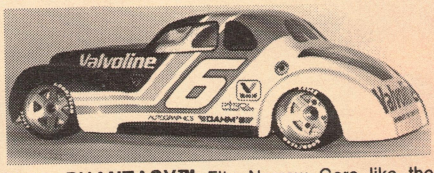
D212 TYPE M - F1 KIT Fits **Tamiya**, **Kyosho**, **HPI**, F-1 Cars. Body, Bi-Level Wing & Turning Vanes.
D211 TYPE M - F1 BODY - Body Only



D219 & D220 SPITFIRE SS™ Fits **RC10LSS** & Wide **Tamiya**, **HPI**, **Kyosho** 4WD Sedans. **Superior Aerodynamics. Wind Tunnel Tested.** ROAR Approved. **D219** Light Lexan, **D220** Strong Lexan



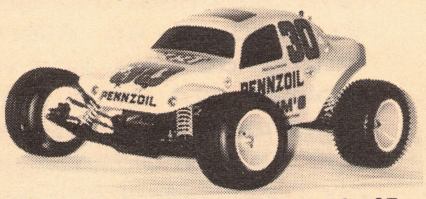
D203 RAMMER™ Fits **RC10T2** & **RC10T**. Low, Light & Narrow. 3-D Side Panels that Hug the Frame. Cooling Vents, Rear Spoiler & Grill Decal.



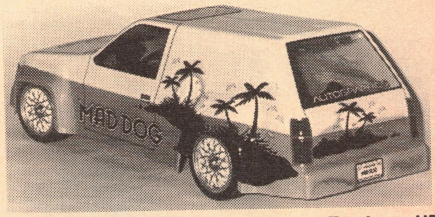
D204 PHANTASY™ Fits Narrow Cars like the **RC10LSS** & **EV10SS**. It also fits Wide **Tamiya**, **Kyosho**, & **HPI** 4WD Sedans. Drag Racing, Oval Racing, Street or Show! Headlights & Taillights Decal.



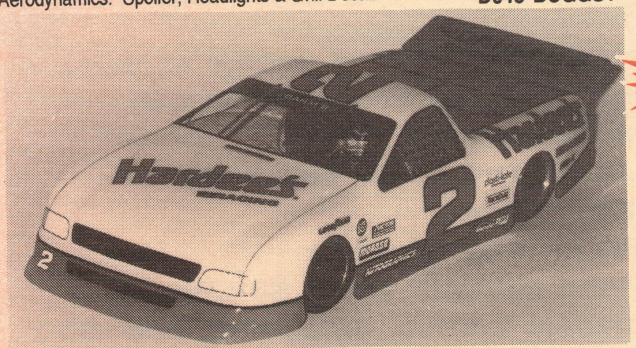
NEW! D218 RAMMER STD™ Fits **RC10L**, **Evolution 10**, & **Serpent Impact II**. Race Winning Aerodynamics. Spoiler, Headlights & Grill Decal.



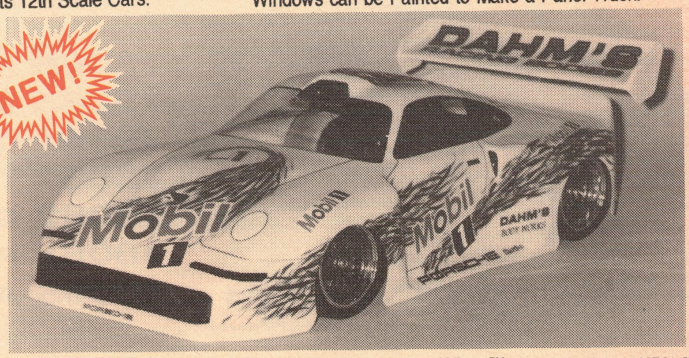
D056 BUGGSY™ Fits **Losi XXT** & **RC10GT**.
D080 BUGGSY™ Fits **RC10T2** & **RC10T**
D043 BUGGSY™ Fits 12th Scale Cars.



D191 THRILLER™ Fits Narrow **Tamiya**, **HPI**, **Kyosho**, & **Yokomo** 4WD Sedans. Grill Decal! Side Windows can be Painted to Make a Panel Truck.



NEW!!! D224 SPITFIRE 12™ 1997 Style Nastruck Fits 12th Scale Cars like the **Associated RC12L**, **Trinity Revolver**, & **Bolink Mini Cup**. Also fits the **Tamiya Mini Cooper**, turning it into a Wild Mini Truck! Features 3-D Side Panels for Superior Aerodynamics. Spoiler, plus Headlights & Taillights Decal. The Ultimate 12th Scale Racing Body - If You aren't Driving a Spitfire, You are Probably Following One!



NEW! D226 PIRANHA™ GT1 with **Extreme Wing™**. Fits **Tamiya**, **HPI**, & **Kyosho** Wide 4WD Cars, & Narrow S.S. cars like the **RC10LSS**. Features Advanced Aerodynamics, Superior Ground Effects, Roof Scoop, Side Scoops, & Vents, Rear Spoiler, Extreme Wing, & Headlight Decals. Shown Painted like the Porsche - Mobil 911/GT1. **NEW! D227 PIRANHA™** GT1 Body without Wing.

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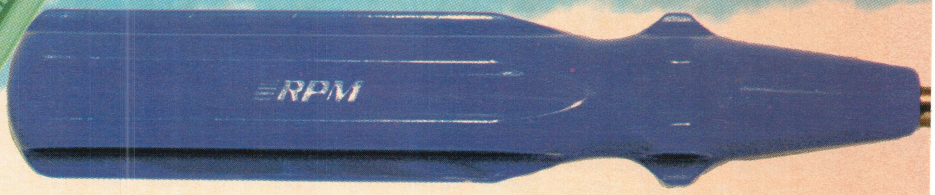

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RC10DS complete kits include clear polycarbonate body shells. Models shown have been custom painted and detailed.

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At Team Associated we don't think that racing in parking lots means your car has to handle like a shopping cart.

The RC10 Dual Sport was engineered to bring real racing to less than ideal track conditions. Totally new, fully independent suspension and the World Champion Stealth transmission have been brilliantly mated to the classic RC10 aluminum alloy tub to produce an RC race car of stunning performance.

RACE YOUR RC10DS ALMOST ANYWHERE YOU WANT.

Turn a cul-de-sac into a speedway, a parking lot into a road course. The new DS runs on semi-pneumatic tires that hook up on almost any hard surface. In fact, the RC10DS will race on surfaces that most pan cars can't even run on. With handling superior to 4WD's!

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You can start with a complete RC10DS kit with body, or you can convert an old RC10 using our Dual Sport Conversion Kit.

The new DS kit gives you everything you need to get any original RC10 buggy ready for the asphalt: road racing wheels and tires, suspension arms, our alloy bodied, custom racing shocks, shock towers, anti-roll bars, front kick-up and all the necessary hardware.

GO DIRECTLY TO THE HEAD OF THE CLASS.

With Team Associated's new RC10DS you're entering a new and highly competitive class of RC racing with a chassis based on one of the most successful RC cars ever, our RC10. Four times a World Champion in off road racing, the original RC10 provides the backbone of the new DS and ensures its racing heritage in 2WD gearbox.

Let our Dual Sport kits put the fun back in RC racing. Build a real racing machine for the parking lot, the RC10DS from Team Associated.

RC10DS DUAL SPORT

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NORRCA ELECTRIC WORLD CUP CHAMPION



RC10T2

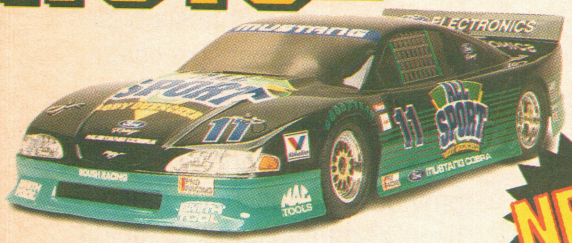
The all new **RC10T2's** computer-aided design has resulted in a truck that has much more steering and rear traction.

IFMAR WORLD CHAMPIONSHIPS 13

RC10B2

The all new **RC10B2** won the IFMAR World Championships in Japan, placing 1st, 2nd, 4th, 5th, and 7th, as well as taking Top Qualifier honors. *The RC10 has now won 5 IFMAR World Championships.* There is none better.

RC10DS DUAL SPORT



NEW!

These 1/10 on road kits use Associated's RC10 tub chassis for superior performance on the parking lot.

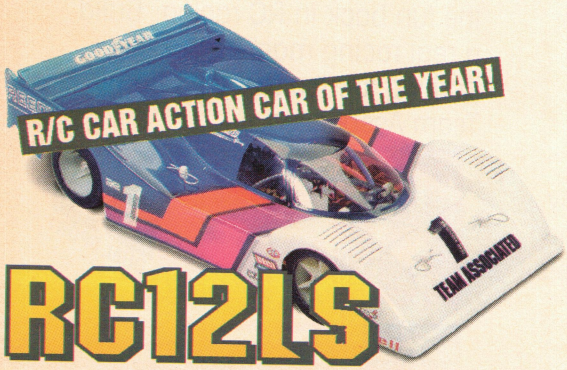
RC10GT



NORRCA GAS WORLD CUP CHAMPION

The most advanced 1/10 gas truck available anywhere, setting new track records everywhere.

R/C CAR ACTION CAR OF THE YEAR!



RC12LS

Our family of RC12L cars have won 6 IFMAR World Championships. They're easy to drive and tough to beat!

R/C CAR ACTION CAR OF THE YEAR!



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On road racers have made our National Champion RC10L car the most popular on road car. The RC10LSS has revolutionized high banked oval racing, shattering the speed record with an *85 mph run!*

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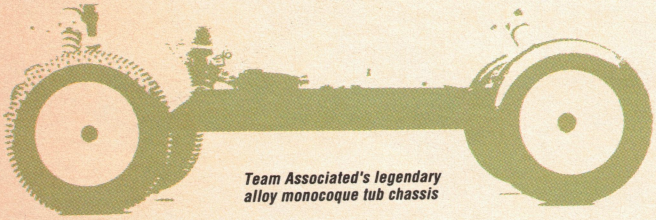
NOBODY KNOWS GAS RACING LIKE THE TEAM.

A lot of people would like you to think they created the whole concept of RC gas racing.

But with over 25 years of experience racing RC gas cars and winning two IFMAR Gas World Championships, Team Associated knows gas racing.

That's why the Team built the RC10GT.



Team Associated's legendary alloy monocoque tub chassis

Our RC10GT is the real thing, designed and engineered by the same racers that brought you the original RC10 and the RC10T.

While it might be enough for some to simply drop an engine and a fuel tank into an electric truck, the Team takes this kind of powertrain transfusion seriously. The RC10GT is a completely integrated package created to take maximum advantage of gas power yet versatile enough to accommodate all popular .12 and .15 size engines.

The most advanced, high performance vehicle of its kind, the RC10GT features competition proven, four wheel suspension with precision, coil-over shock dampening. Our World Famous Team Associated Stealth ATC gearbox is also adapted to the RC10GT, to get all that nitro power to the ground and our race-ready disc brake gets it all slowed down in a hurry.



IFMAR World Champion factory drivers Brian Kinwald and Cliff Lett teamed with Curtis Husting in designing, track testing and racing our RC10GT prototypes.

Like all our kits, hardware and materials are nothing but the best. And because Team Associated understands RC racers, and their budgets, the RC10GT is available with either bushings or ball bearings and for both pull and non-pull start engines.

Enjoy the sound and power that makes gas RC racing come alive. The RC10GT is the ONLY RC gas truck with Team Associated's proven performance and reliability. Because no one knows RC gas racing like the Team.

Quick-fill 75cc fuel tank lets you race as long as you want with simple 2 second pit stops.

All terrain tires developed by Pro-Line specifically for the RC10GT

Wide track, long throw suspension, molded from durable, dyeable virgin nylon



The RC10GT is available in several Sport and Competition versions for most .12 or .15 engines. We highly recommend the .12 size for scale performance and reliability.

RC10GT

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SPECIFICATIONS

MODEL NUMBER	MAX. PULSED DRAIN CURRENT	CONTINOUS DRAIN CURRENT	DRAIN SOURCE RESISTANCE
SP-1802 SERIES 1 way with brake w/ BEC			
WEIGHT: 1.25 oz. • SIZE: 0.8 x 1.7 x 0.7 in. • OPERATING VOLTAGE: 6.0 - 8.4 V, 5-7 cell			
SP-1802N	600 amps	150 amps	0.01 ohm
SP-1802DL	800 amps	200 amps	0.008 ohm
SP-5XX SERIES 2 way w/ BEC & thermal overload protection			
WEIGHT: 2.5 oz. • SIZE: 1.6 x 1.8 x 0.8 in. • OPERATIING VOLTAGE: 6.0 - 8.4 V, 5-7 cell			
SP-520+	560 amps	140 amps	0.012 ohm
SP-560	800 amps	200 amps	0.009 ohm

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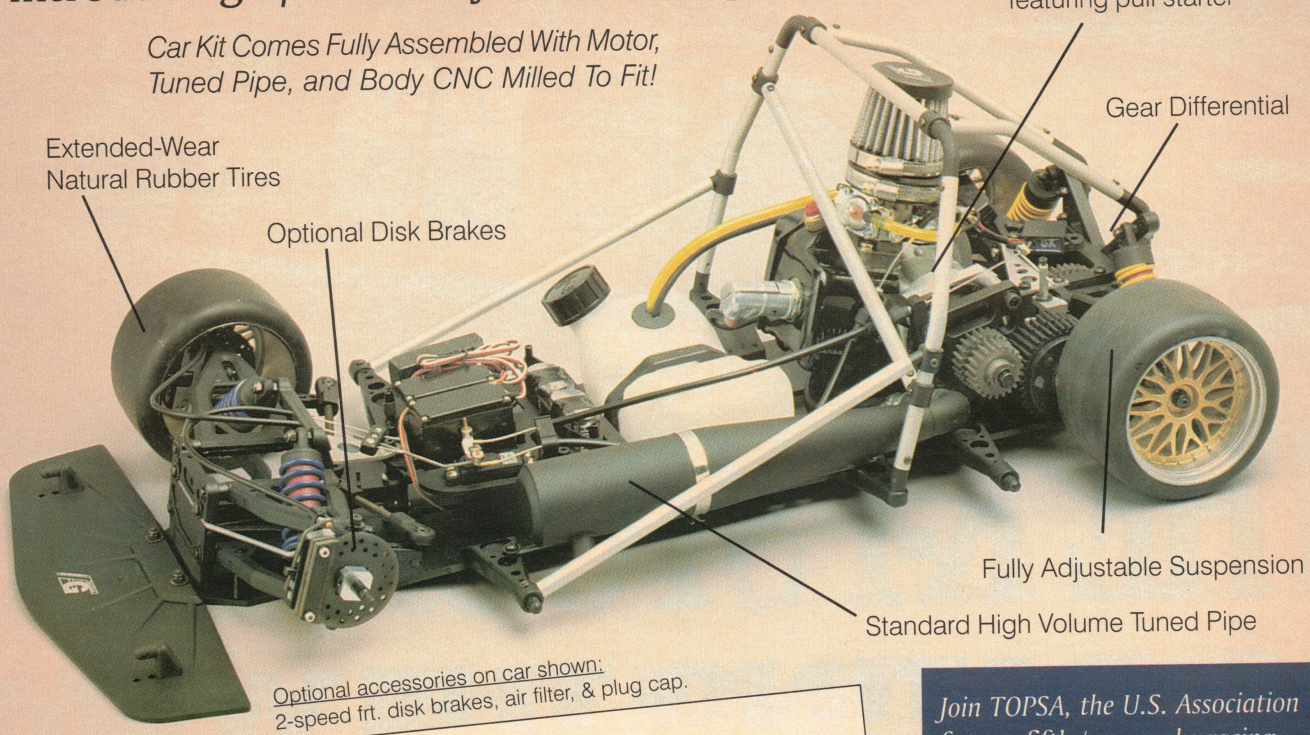
Car Kit Comes Fully Assembled With Motor, Tuned Pipe, and Body CNC Milled To Fit!



Optional accessories on car shown:
2-speed frt. disk brakes, air filter, & plug cap.

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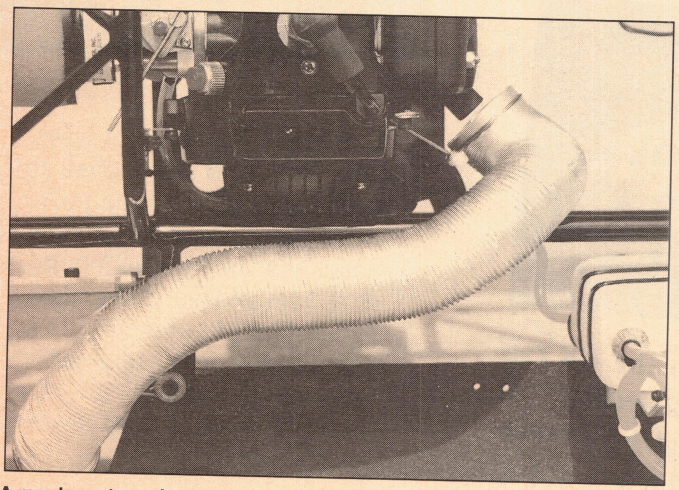
THE K-1 STOCK CAR

UPDATING THE WCM G



A regular automotive carb preheater hose was used to route the Zenoah engine's exhaust gases and heat away from the main frame. Two 1/16-inch piano wire braces were made up to retain the flexible metal hose against the muffler outlet and at the exit point at the back of the car.



To add support, a DuBro 3/16-inch wheel collar was attached to the backside of the WCM's refueling nozzle. Tygon brand fuel line, a Sullivan inline filter, and a modified 8-ounce fuel tank were also added to the K-1 fuel system.

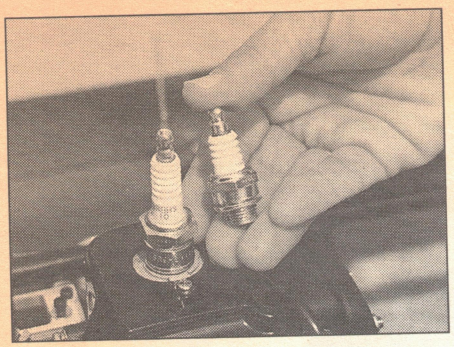
The WCM K-1 Grand National 1/4-scaler has seen approximately 30 to 40 hours of total runtime since its full-blown review in the July, 1996 issue of *RCMC*. The main point of this update story will be to provide you with all of the vehicle's "ins and outs" since that review was published. So, without further delay, here's what *RCMC* did to upgrade the racer.

THE CHASSIS MODIFICATIONS

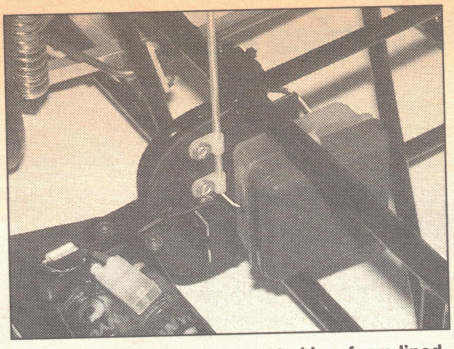
As for the basic setup of the K-1, it has remained the same since the vehicle was first received for testing. The BRP capped tires are still healthy, the shocks haven't leaked a drop of oil and the frame itself hasn't shown any ill effects, even after a few ontrack shunts.

A few personal changes were made to the car, with most centering around the car's fueling setup and engine exhaust routing. If you read the monthly *Big Tips* column, you know that Q-scale fuel tanks are a hobby of mine! So, a newly modified eight-ounce DuBro tank was secured to the K-1's tank assembly.

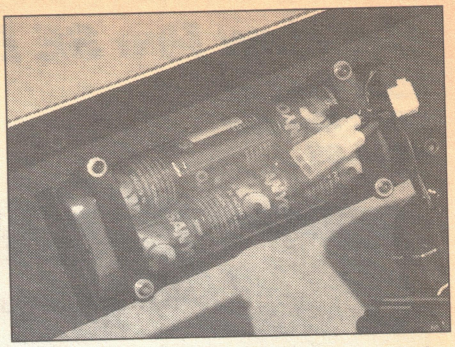
Before the lines were connected to the new fuel tank, a pair of changes were made to the car's engine exhaust area. A 1-1/



An NGK BR9HS-10 resistor spark plug went in the cylinder hole.



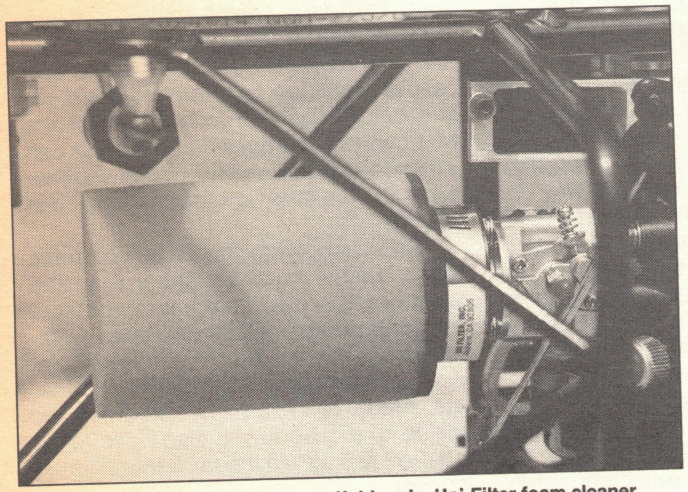
The PCM receiver was remounted in a foam-lined "Tupperware-like" box and it was in turn pop-riveted to a homemade radio plate.



Associated's #6334 battery holders were bolted to the WCM's Kydex left-hand sidepod to keep the six-cell SCRC 1700 pack from leaving the car.

OPPOSITE: Since its full review in the July '96 *RCMC*, the WCM K-1 car has been given a full 40-plus hours of runtime. And in that time no parts have been needed, other than the ones the author added for his personal setup ideas. The PRC Lexan Monte Carlo body shell has also remained in good condition throughout the testing period. The heavy-duty Velcro was cut in half, as it was too strong.

QUARTER-SCALE RACER



A New Era machined air intake manifold and a Uni-Filter foam cleaner went on the engine's carb assembly. This type of foam filter is widely used in large-scale racing and is easy to remove and service.



An externally mounted EY-850 ignition module replaced the stock unit.

2- inch by 18-inch auto carb preheat flexhose was used to route the Zenoah's exhaust gases out the rear section of the chassis. First, the 2hp engine's muffler cover was removed and the flex hose was shaped to where the hot gases would exit out by the right rear tire.

To retain the hose, two 1/16-inch piano wire hangers were fabricated. One was mounted to the engine housing, the other on the right-hand chassis pod. The tank assembly was also relocated, 2-3/4 inches forward and 3/4 of an inch outward on the pod. Again, to help isolate the exhaust gases from the fuel system.

Now, the Tygon brand lines, #189 Sullivan inline filter, and tie-wraps were attached to the tank, chassis, and carb assembly. The final chassis touch was to add a locking collar to the refueling nozzle using a DuBro #599 3/16" wheel collar to the refueling nozzle hose connector.

ENGINE TWEAKS

Since QSAC rules don't allow many alterations to engines, the Zenoah in the K-1 chassis only got a couple of changes. An externally mounted EY-850 ignition module replaced the stock unit and a NGK BR9HS-10 resistor spark plug went in the cylinder hole. On the intake side of the engine, a #44 Walbro main jet went inside the carb while the stock air filter setup went in a box with the stock module, tank, and spark plug. A New Era brand intake manifold and an Uni-Filter foam air cleaner were then installed on the Zenoah. A setup like this is quite common in Q-scale racing circles. The foam filter is both easy to maintain and supplies ample clean air to the powerplant.

ONBOARD RADIO BITS

While the same Futaba 1024 PCM transmitter and receiver used in the review are still in use on the K-1 vehicle, some changes were made to the rest of the control systems. Associated's #6334 battery holders were bolted to the WCM's Kydex left-hand sidepod to keep the six-cell SCRC 1700 pack from leaving the car. The PCM receiver was remounted in a foam-lined "Tupperware-like" box and it was in turn pop-riveted to a homemade radio plate.

This Kydex plate also was retained to hold an aluminum (again homemade) on/off switch and RX antenna tube. The antenna rod was held in place with two Radio Shack 1/8 inch

continued on page 47

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250 GTO CONTINUED FROM PAGE 26

control arms. The ride height is virtually the only adjustment that you have to or can make to the multi-link four-wheel independent suspension.

THE ENGINE

Power is supplied to the 250 GTO from a .10 GS-11 Kyosho nitro engine. Even though Kyosho calls the GS-11 an "entry-level engine that is easy to setup," it is still very important to first break the engine in, then properly maintain it.

Now, I'm not the best mechanic when it comes to gas cars but, after looking at the GS-11 I don't think that I'll have any problems. All of the adjustments, the idle stop and high-speed screws are very accessible. And to make things easy Kyosho sends the engine completely assembled. The only thing that you have to do to the engine is install the muffler, which is held on by two screws.

You don't need any special starting equipment to fire the GS-11. The fuel tank comes with a built-in primer pump and the engine is complete with a recoil cord starter. Fuel line is also included in the kit. The only things that you will need are two gas car basics, obviously fuel and a glow plug starter.

Kyosho recommends that you run the engine on 10 to 15% nitro glow fuel. If you are thinking about buying a gas car but aren't sure about the mechanical aspect, don't worry. The directions spell out in detail all of the adjustments, settings, the break-in procedure, running tips and if you do get into a situation there is a section on trouble shooting.

ASSEMBLY

The 250 GTO goes together as easy if not easier than some of the four-wheel drive electric car kits that I have assembled. The nice thing about the GTO is that the front and rear of the car are for the most part identical. So you get familiar with what you are doing very quickly.

As always, I start by looking at the parts and reviewing the instruction book. It is always important to assemble all of the parts that involve grease on a clean surface. Keeping dirt and such out of parts that are coated with grease, especially the gear differentials, is a must.

The other thing that I would recommend for beginners and old pros alike is the infamous muffin tin. I use a 12-hole tin to hold the contents of the various parts bags. The compartments are perfect for holding all of the small hardware. If you get the hardware mixed up it makes it hard to follow along with the directions.

During the assembly process the only thing that I had trouble with was the rear gear/belt cluster, only because I thought I knew what I was doing and bypassed the directions. I found out the hard way that it's much easier if you follow along with the people who know what they are doing. You'll find several key things throughout the directions that are explained in better detail, including direction of installation on certain parts, adjustment of the disc brake and the gear mesh.

After the gears and belts are installed the engine plate and engine go in. At this point, specifically step 28 of the directions, you should pay close attention to the engine-mounting procedure. This is where the gear mesh between the pinion and spur are set. Kyosho does a great job of illustrating just how the setup should look.

Moving on, the suspension and shocks are no problem; no adjustments. But, as with any plastic parts you should be careful when installing screws. This kit uses a bunch of self tapping screws in plastic parts. If you over-tighten these screws you run a risk of stripping the parts.

All in all, if you are patient and of course careful you will be able to put the entire chassis, including radio gear, together in about two and a half hours.

FERRARI RED

There is no mistaking a Ferrari red paint job and it would be a sin to paint the body of this legendary car anything but red. Even if you can't match the red perfectly it's still red. The body in this kit comes covered with a thin film of plastic. The plastic prevents paint overspray from getting on the exterior of the body shell. Be sure to remove the plastic but, not until after you paint.

Before painting our Ferrari I washed the Lexan with warm water and a mild dish soap. Doing this cleans any dirt or molding agents from the body.

The paint scheme is very basic and easy to do. It's just red! That's it. But, there is a catch—the instructions call for the windows to be trimmed in silver. This can either be accomplished with paint or something like pin-striping tape, the choice is yours.

Before applying the paint you have to do a little masking. Other than the windows the only thing that requires masking are the headlights lenses. Remember, this kit has those great recessed headlights. The headlight buckets, made of Lexan that attach to the inside of the body will also have to be painted red as will the tail lights and the spoiler.

Once the paint had dried I proceeded to drill the mounting holes and install the lights, wipers, spoiler and gas cap. The finishing touches came in the form of some great-looking trim decals. These decals look like chrome—or like a stick-on photo-etched part, very nice! The kit also comes with a sheet of racing decals and numbers, just in case you prefer the competition look.

Before cutting out the wheel wells and mounting the body, I mounted the natural rubber treaded tires on the replica spoke wheels. The tires that come with a foam inner liners, should be glued to the rims before the car is run.

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READY FOR THE ROAD

Unlike electric cars, the gas car will require a little more attention before it can be run. Naturally, you have to install the radio gear, center the servos, adjust the throttle and brakes then fuel and fire it up.

Now, most everyone will notice that there is no electrical power in the car so, how will the radio work? Well ,you have to add a receiver pack, commonly a pack of four double A batteries. This type of battery holder will usually come with most radios.

Good, we have power and fuel and the engine adjustments have been made. I think it's time to plug in the glow plug heater and start it up.

Per the directions, I took great care in breaking the engine in properly. The keys to this process are running the engine rich, not allowing the fuel level to go below 1/8 of a tank full during break-in (2-3 tanks of fuel) and not over-revving the engine. The entire break-in process was time consuming and at times a little smoky, but worth the effort.

After break-in I installed the body and took the machine for a drive in the parking lot of a local school. It's a good practice to run a gas car in an open area, mainly so you can enjoy their speed and have plenty of room to maneuver, in case you get into a situation that catches you by surprise.

Now, normally parking lots aren't the smoothest surfaces around and this one was no exception. I used the full extent of the Ferrari's suspension on several occasions. I was pleased to see that the shocks worked as well as I expected. The nice thing about the car was that the four-wheel drive just pulled through the turns and the power was instant on exit. The speed of the car, along with the elevation changes of the parking lot and several natural obstacles made for some very interesting negotiations. The gas engine's run time was a welcome change for me, mainly because I'm used to only running four minutes at a time in electric car racing.

WRAPPING IT UP

So, here is your chance to own a one of the rarest Ferraris on the planet. Gas-powered four-wheel drive and plenty of speed for everyone, the Kyosho Pure Ten 250 GTO. If a Ferrari doesn't excite you, look to Kyosho for a wide selection of nostalgia cars built around this proven engine chassis combination. They offer a great-looking Ford GT-40 (the Ferrari killer!), a MGB MK-1 and a.sleek Ferrari 330 P4. Other more current Pure Ten cars running under the "GP Spider" banner, such as the Opel Calibra, Skyline GT-R, Porsche 911 GT-2 and the Sard Supra are on your dealer's shelves, so you have lots of fine Kyosho kits to choose from.

PRODUCT SOURCE

Great Planes Model Distributors, Box 9021, Champaign, Illinois 61826. ●

PALM SPRINGS *CONTINUED FROM PAGE 29*

scale at 132 feet and Quarter scale at 165 feet for their RACEAMERICA timing system. Even the track edge barriers are a novel idea to minimize damage to errant vehicles.

Running as a club operation, Mark Adams builds Q-Scale Dragsters through his D&M Racing operation, Tom Ocegueda represents Goodyear Rubber which provides the tires many of the racers use and Bill DeGaine is an asphalt contractor operating as Zebra Striping and helped secure and prepare the race site through his contacts with Oasis Water Park Tom provides the race commentary and generally keeps everything running smoothly assisted by Jennifer Adams with the record keeping They have five rain free Saturday races under their belt and we know summer in Palm Springs doesn't bring rain — just a lot of sun. With a Saturday event, travel to and from is more convenient for a lot of people and since a lot of the Southern California/Nevada racers are within a two hour drive, this place should make a lot of sense. Race entry fees are barely covering track preparation, mailings, trophies and all the other miscellaneous expenses incurred with a class operation like this.

On this particular race day, some of the

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old guard of drag racing were out to check out the action and the track. Randy Spiering who used to operate the races at Colton, California, was out to hone some of his national record holding skills. Derrick Underwood from the Yucca Valley Q-Scale group was on hand as was Jim Shauer, the Rainman, to run in two classes. Also, Larry and Mike Lockmann from Lockmann Precision were running some of those Lockmann built vehicles (as a side note, this writer learned they are coming out with a low cost Sportsman Car later this year which should help get new racers into drag). But I also learned some of the regulars were missing due to other commitments for full size racing and a RC boat event in Las Vegas. Of course this happens, but they are trying to schedule around some of the known conflicts so if you are interested, get on the mailing list by giving Tom Ocegueda a call at (909) 987-1774.

As far as the racing went, a good number of 1/10th scale racers were on hand from the bracket racers to the Alcohol rails plus Pro Stock and Top Fuel Dragsters in the Q-Scale class. Wade Savage had his beautiful new Q-Scale Rail Miller Genuine Draft which has been over a year in the making. Wade was a little cautious on the throttle but the general consensus was there was a very competitive machine at the race but this day he settled for the Concourse trophy. He was also with Jeff Peltier who showed off the new McDonalds Rail. Of course, Mark Adams had a garage full of cars with three rails, theBudweiser King, Shake Rattle & Roll, and Monkey Business plus the Pro Stock Q Scale. Derek Underwood had a new Pro Stocker (his garage is getting full also). Bill DeGaine had his Zebra Striping Funny Car. In the 10th Scale ranks, Randy Spiering had his funny car from days of old—even with the same old battery pack—but he hadn't forgotten the racing form. There was Jim Schauer and the Lockmanns and a host of other new comers with some pretty competitive equipment.

Seven year old Michael Sharwin made his drag debut in the Bracket class and seemed to have a pretty good time. He was consistent and had good RT's — the key ingredients to success in this class. He made the more experienced guys sweat a bit before finishing third. He'll be back!

At the end of the day, there were some race winners, a lot of new friends, a renewal of old acquaintances and a commitment to do it all again next month. Any club with a motto that reads "Deal with it!" can't be all bad.

Soooooo, Southern California and Nevada, New Mexico, this is a good event to check into. The facility can handle more people. Bring the whole family; those who don't race can enjoy the Oasis Water Park or go shopping in Palm Springs — even if it is just window shopping!

Future race dates 8/17/96.

ORGANIZATIONS MENTIONED IN THIS ARTICLE

SoCal Drag Club, Tom Ocegueda (909) 987-1774.

D & M Racing, 5032 Redhill Ave Suite D, Tustin, California 92680. (714) 259-7760.

Goodyear Grip Tires 8833 Industrial Lane, Rancho Cucamonga, California 91730. (909) 987-1774.

Zebra Striping, Cathedral City, California (619) 322-3739.

Oasis Water Park 1500 S. Gene Autry Trail, Palm Springs, California (619) 325-7873.

Lockmann Precision, 7344 Eucalyptus, Unit 1-B, Hesperia, California 92345. (619) 947-3684

RaceAmerica, Inc., Box 3469, Santa Clara, California 95055-3469. (408)927-6064. ●

RACER'S EDGE CONTINUED FROM PAGE 32

candidates for modification, you should note that they have a comparatively small effect on the rest of the car. That's because they follow more or less directly behind the front wheels and if you recall, operate in conditions radically different (due to the underside of the car) than the front wheels.

WHEELS AND INTERNAL AIRFLOW

Aerodynamic drag is also caused by another phenomenon related to wheel rotation. The velocity distribution in the axial direction on both sides of the wheel is locally slower than the general flow over the car. Again, slower flow corresponds to higher local pressures and it's a physical fact that air tends to flow from regions of higher local pressure to regions of lower local pressure. This adds to the general cross-flow airflow pattern we saw when discussing the underside of the car and internal aerodynamics. Air travels from higher pressure areas to lower ones. The airflow directed along the sides of the vehicle is on the average faster than the airflow between the ground and the bottom of the car. In faster air streams the air pressure is lower than that in a slower one. This causes air from the underside to tend to flow diagonally toward the sides and join the air stream outside as we discussed last time. Also, rotating wheels (which creates relatively lower local pressure) actually causes air to move from inside the body (because of the higher local pressure there) out through the wheel wells.

TIRES, WHEEL COVERS AND DRAG

Everyone knows wide tires have a wider footprint and cause an increase in tire to road drag (rolling drag). Wide tires also increase aero drag due to their larger size. They need to move more air out of the way than smaller ones. Placing flat or nearly flat wheel covers over the rims of wheels has been known to reduce drag in full-size

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cars. Statistical analysis of test data by Adam Opel A.G. has shown that the average effect on fitting smooth covers to production cars with standard rims produces a reduction of vehicle drag coefficient by about 0.009 for stationary wheels. This is generally, but not always, accompanied by an increase in the lift coefficient of the vehicle by a similar amount. However, data provided by Mitsubishi engineers report that coefficient savings in the order of 0.005% have been realized by just adding on smooth hub caps on their full-size production cars. While these saving don't sound like much, RC cars can benefit more from these savings. Read on.

OTHER CONSIDERATIONS

Before we discuss how to minimize the negative effects of rotating wheels, I should mention a couple of things. While we've used the *AeroDyno™* to compile the bulk of the material we have and will present here in *The Racer's Edge,* the information regarding wheels and resulting recommendations was compiled from full scale data and our own on-track testing. This is because the *AeroDyno* is not a rolling ground plane design and studies have shown that wheel lift is 30% higher when the wheel is rotating than when standing still. While our *Phantom Ground Plane™* design minimizes the effects inherent with a stationary ground plane wind tunnel, it doesn't recreate the effects of rotating wheels. Nevertheless, we've collected enough information to "ball park" some conclusions. We've found the results correlate with our on-track testing and lab tests. Some of the full scale conventions that we've found to be valid in the RC world include the following: Full-scale tests at the Pinafarina wind tunnel indicate that overall lift is affected more than overall drag to changes in the ratio of the cavity width to wheel width and change in the ratio of cavity radius to wheel radius. Of course this effect is more apparent in open wheel cars like those in Formula 1 and IndyCars because wheel wells limit the amount of lift a rotating wheel can generate. Nevertheless, anytime you generate lift, you generate vortices, and the creation of the vortices requires energy. In this case, the energy comes from wheel momentum. This constitutes another part of wheel drag.

WHAT WORKS?

Just as we've seen with every other aerodynamic problem, when considering rotating wheels we're stuck dealing with lift and drag. We already know, generally if you decrease lift, you decrease drag, and if you decrease drag, you increase your speed potential. In theory, the simplest way to decrease drag is to decrease lift by putting your wheels inside close fitting wheel wells. However, in practice, as you would imagine, this is a cumbersome project that would challenge anyone's engineering and modeling skills. Fortunately, you can decrease drag by simply installing wheel covers. While full-scale testing reveals only slight decreases in lift and drag, in RC SS cars, the effect on drag is much greater. This is because the wheel covers slow down and limit the airflow being pushed (or pulled depending on how you want to look at it) out of the hollow body by the rotating wheels and outside airstream. As we've discussed last time, the less air you cause to move inside the body, the less drag it will create. Adding wheel discs accomplishes this.

SKEPTICS ABOUND

Without unequivocal hard data on RC cars to prove what we're saying here (our stationary ground plane tests only yielded drag and lift reductions in the neighborhood of 0.1 and 0.3 oz. respectively), there are bound to be skeptics—and rightfully so. Furthermore, trusting full-scale data as a substitute for scale data can be hard for some to accept since, as we've seen and will continue to see, there are differences between the two. Some are subtle, and some not so subtle. Nevertheless, let's delve further into this month's topic because we'll never say anything here that we can't prove or logically explain. This, as always, is our policy so you can decide for yourself. Next time you're racing, try this little experiment. Run stick-on wheel discs on the outside of your wheels for a while. Eventually, you'll notice that the wheel discs on one or two wheels will regularly "blow off" at high speeds. I know that doesn't prove anything since the outside airflow could be pulling them off, but humor me a bit further. Next race day, place some wheel discs on the in*side* and outside of the wheels. If you place wheel discs on both sides of the wheel, it will end your fly away wheel disc problem. This proves that the airflow moves from the inside out and not the other way around. While you could argue that the outside disk is exposed to the outside airflow and that causes it to fly off, it wouldn't matter. The outside of the wheel is exposed to the same external airflow whether you run the disc on the inside or not. Case closed! Furthermore, this also proves that there's air traveling through your wheels which causes an increase in drag (remember any aerodynamic force that goes in any direction other than the direction of the intended motion of the body causes drag).

Until next time... have fun and be fast! ●

WCM K-1 CONTINUED FROM PAGE 43

wire holders (part# 64-3028) and plenty of tie-wraps were added to keep all these pieces secured to the K-1's chassis.

In the servo department, the same Futaba S9304 throttle/brake unit and twin S148 steering servos are all working strong in the Q-scale RC racer. The only modification here was to replace the throttle/brake servo-saver with a solid round Futaba wheel to give the car a bit more

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positive brake action.

HOW'S THE BODY HOLDING UP?

One word: fantastic! The PRC Chevy Monte Carlo Lexan body is still looking good on the K-1 chassis. A few small dings have appeared, but considering the impacts it's seen, the PRC body has remained a tough, strong unit. The alteration made was to reduce the amount of sidepod Velcro because it worked too well—you couldn't remove the body without stressing the Lexan.

FINAL THOUGHTS

Of all of the "tinkering" done on the Texas-bred Q-scale car, the only really necessary alterations were the addition of the exhaust gas routing hose and the new receiver foam box to protect the fuel and radio signals! Of course, other owner will want to tweak their cars in certain ways; but there's one very important final idea to think about. No matter how you should decide to set up your K-1, you're working with a well-designed, sturdy and race-ready large scale RC car.

PRODUCT SOURCES

WCM Corp., RT. 2, Box 207-A, Buffalo, Texas 75831; (903) 322-4869.

DuBro, 480 Bonner RD., Wauconda, Illinois 60084; (708) 526-2136.

Associated Electrics, 3585 Cadillac Ave., Costa Mesa, California 92626; (714) 850-9339.

New Era Models, Box 7378, Nashua, New Hampshire 03060-7378; (603) 888-8645. •

LATE UPDATES FROM THE FACTORY

In recent discussions with WCM's Rick Binnicker, it was learned that several new manufacturing line updates have been implemented on the K-1.

Up front, the steering block material has changed from aluminum to Delrin plastic for two reasons: the composite unit doesn't require lubrication, which in turn means the part won't attract dirt and grit. Also, the front swaybar mount has been raised on the frame to help the car move through the corners more freely. There's also an optional 1/4-inch swaybar (3/16 is stock) available now from WCM.

Rick also mentioned that Delrin shock bodies and color-coded sprints are now both standard OEM on all four of the K-1's dampeners. There have been shock tower relocations done on both ends of the chassis as well. The rear trailing arm area has seen some beefing up with an arm and hub brace. WCM has returned the disc brake unit over the review's cable setup.

And finally, WCM now ships its K-1 cars with the Matthews Racing Products (MRP) line of host and cap tires mounted on their chassis. These new Q-scale tires come in a wide variety of firmness and compound choices. Contact WCM or MRP's Steve Matthews, at (713) 621-9524 for more information on the new MRP tires. •

REEDY RACE CONTINUED FROM PAGE 63

6 JASON RUONA, RC10T2, REEDY
7 DEREK FURUTANI, LOSI XXT, MAXTEC
8 BILLY EASTON, RC10T2, REEDY
9 TODD CARISEO, RC10T2, REEDY
10 MARK PAVIDIS, RC10T2, REEDY

.12 GAS TRUCK A-MAIN

Brian got around Greg in the first couple minutes of the race to take the lead in the 30-minute race, with Greg second, Mark Pavidis third, Richard Saxton fourth and Scott Hughes fifth.

The trucks were all pretty close going in for the first pit stops at 7-1/2 minutes. At the 15-minute midpoint, Brian had about a straightaway lead, with Hodapp and Pavidis in their own race for second and Saxton and Hughes racing for fourth.

During the last 7-1/2-minute segment, Brian had opened up almost a full lap lead over Hodapp. Pavidis was only a couple seconds behind Hodapp, but by now, Pavidis and everyone behind him were slipping and sliding all around the track. Looking at the trucks after the race, Brian and Greg used the silver IFMAR stud tires, and their tires looked brand new, showing no signs of wear. However, Mark, Scott, Richard and the others had worn the pins completely off their rear tires, which were now completely smooth on the inner halves. We've still got something to learn about tires, obviously.

.12 GAS TRUCK A-MAIN RESULTS

PLACE, RACER, TRUCK, ENGINE
1 BRIAN KINWALD, LOSI GTX, O.S. MAX
2 GREG HODAPP, LOSI GTX, O.S. MAX
3 MARK PAVIDIS, RC1OGT, O.S. MAX
4 R. SAXTON, RC1OGT, O.S. MAX
5 S. HUGHES, RC1OGT, O.S., MAX
6 DUSTIN BIBER, RC1OGT, O.S. MAX
7 ALBERT GUARDADO, LOSI, O.S. MAX
8 JASON ASHTON, RC10GT, O.S. MAX
9 S. TAVAKOLI, LOSI GTX, O.S. MAX
10 JON ANDERSEN, LOSI GTX, O.S. MAX

.12 GAS TRUCK B-MAIN RESULTS

1 GREG DENNETT
2 AUSTIN DVORAK
3 RON ROSSETTI
4 JUSTIN MORRISON

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7 DARIN LEFKOWITZ
8 JASON AYERS
9 CHAD BRADLEY
10 JASON RUONA

EXPERT STOCK TRUCK A-MAIN

While the leaders were out in front banging into each other, Randy Poh kept his cool, working his way up to take the lead. Randy was driving great, with no one able to catch him, but then with just two laps to go he stuck himself into the pipe by the tabletop, and Gabe Boudreau took the lead and the win. Kurt Busch took second, and Kenny Johnson third.

EXPERT STOCK TRUCK A-MAIN RESULTS

1 GABE BOUDREAU
2 KURT BUSCH
3 KENNY JOHNSON
4 RANDY POH
5 BOB RUSSELL
6 TRAVIS AMEZCUA
7 CHAD ROTT
8 KELLY HALL
9 DARIN LEFKOWITZ
10 BRAD ROGNEY

EXPERT STOCK TRUCK B-MAIN RESULTS

1 JIMMY RAMPA
2 FRED GORDON
3 BRIAN WRIGHT
4 JEREMY KOPP
5 BEN AROMIN
6 JEFF ROE
7 VICTOR TRAMAGLINCO
8 BRYAN WINBERRY
9 DAVID STEBBINS
10 STEVE KEMBLE

EXPERT MODIFIED TRUCK A-MAIN

Kurt Busch took the lead with Bryce Beaver in second, and Albert Guardado in third. Albert Clemons got by Guardado to go into third. Then Busch got stuck and Beaver took the lead with Clemons second and Guardado third.

Beaver got a little sideways and Clemons took the lead, with Beaver now second and Busch third. Busch got by Beaver right before the end to take over second place.

EXPERT MODIFIED TRUCK A-MAIN RESULTS

PLACE, RACER, TRUCK, MOTOR
1 ALBERT CLEMONS, LOSI XXT, QUARTER FLASH
2 KURT BUSCH, RC1OT2, REEDY
3 BRYCE BEAVER, RC10T2, REEDY
4 ALBERT GUARDADO, LOSI XXT, PEAK
5 AUSTIN DVORAK, RC1OT2, REEDY
6 GABE BOUDREAU, RC10T2, REEDY
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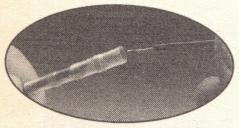

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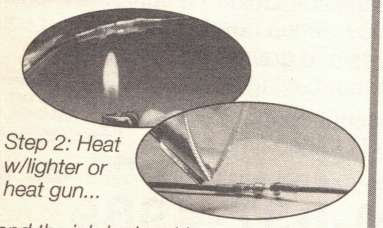

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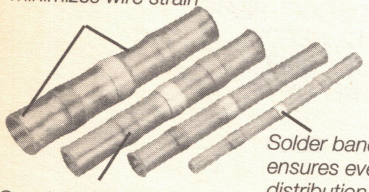

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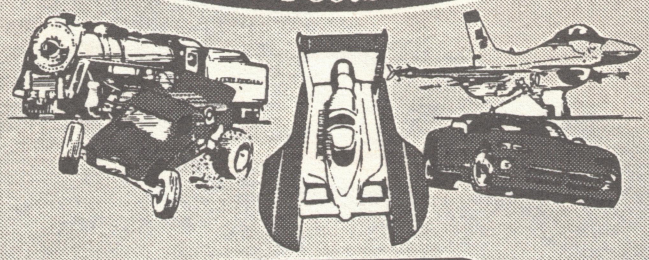

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RENAULT ALPINE A-110

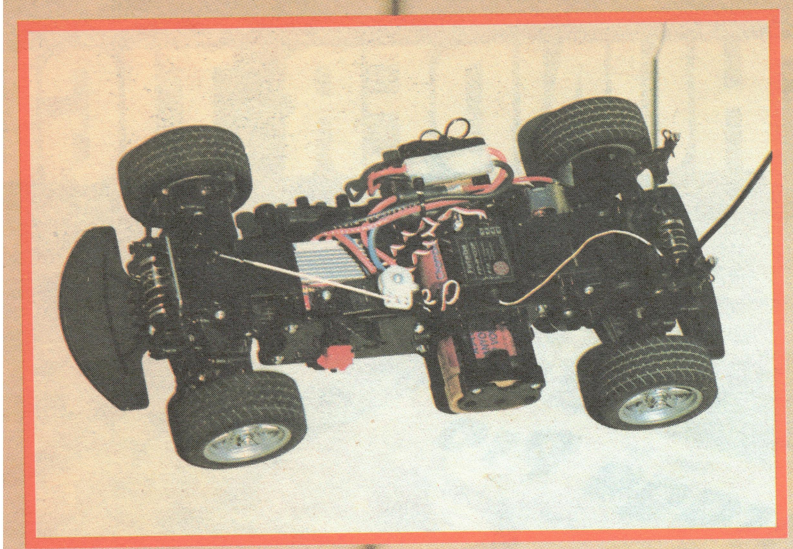
The history of the Renault motor car can be traced back to the late 1800s, to the birth of the automobile and organized racing. Louis and Marcel Renault, along with such factory teams as Fiat, Benz, Peugeot, Opel and Mercedes, began to shape the future of motor racing with the tradition of the Grand Prix and endurance races like the historic French Grand Prix at LeMans.

continued on page 58

BY DOUG ADAMS



The low-slung body, designed by Michelotti and reproduced in great detail by Tamiya, became the most recognized Alpine in history. Modified Renault R-8 components powered this beauty to many victories. The Tamiya version comes with an adequate 540 motor. Performing as a rally car should, the Alpine, equipped with treaded tires, races on pavement and dirt at the Tamiya facility in Aliso Viejo, California.



The Alpine's M-02 rear-wheel drive chassis is roomy yet compact. The rear gearbox can accommodate three different gear ratios, providing plenty of motivation for the sleek A-1 10.







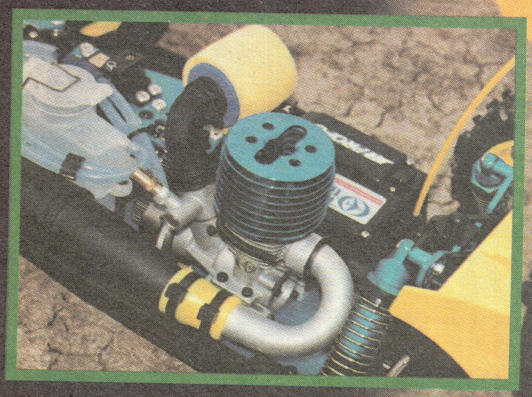
The Alpine comes dressed in Monte Carlo Rally livery. Recessed headlamps and additional driving lamps accent the rally package.

THUNDER TIGE

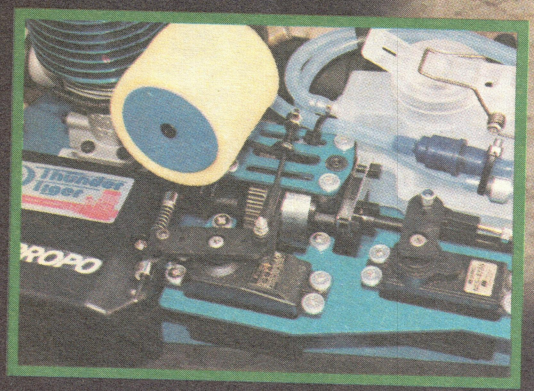
BY CHRIS KOVACHEVICH



The Mirage Pro's components have been placed for easy access and accessibility for both tuning and repair.



The Thunder Tiger Pro .21 engine used for this test has adequate horsepower and good tunability. Be sure to shorten the overall exhaust length to 10.5 inches for the best performance.



Servos are placed for easy access and all linkages are provided in the kit. The front/rear brake bias is accomplished through the upper and lower brake arms.



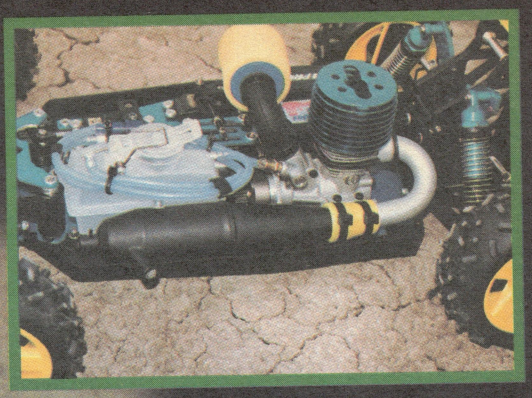
Value is not a word often used by those of us who race radio-controlled cars. We, as racers have all been exposed to the saying that goes something like "You can tell the size of the boys by the price of their toys." The folks at Thunder Tiger are unquestionably doing their part to bury this philosophy with the release of their

continued on page 64

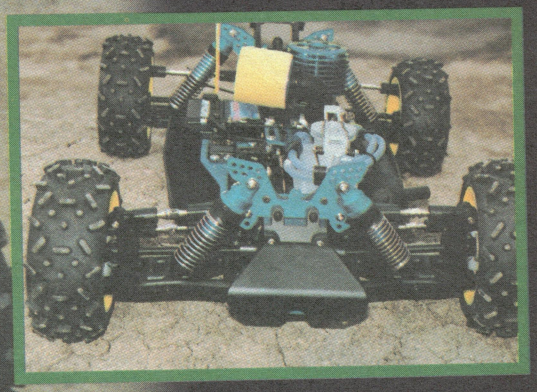
SPECIFICATIONS: LENGTH - 18" WHEELBASE - 12

R MIRAGE PRO





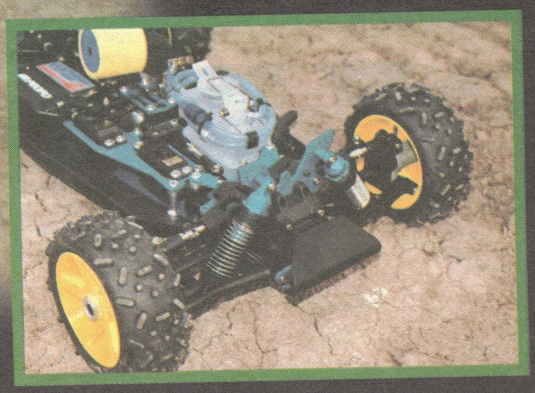
With the exception of the electronics, all items necessary to assemble the Mirage are included in the kit. The pipe gives excellent performance.



The front and rear shock towers offer a total of 16 different possibilities for shock placement. Experimentation is in order here to achieve both up and down damping and maximum suspension travel.

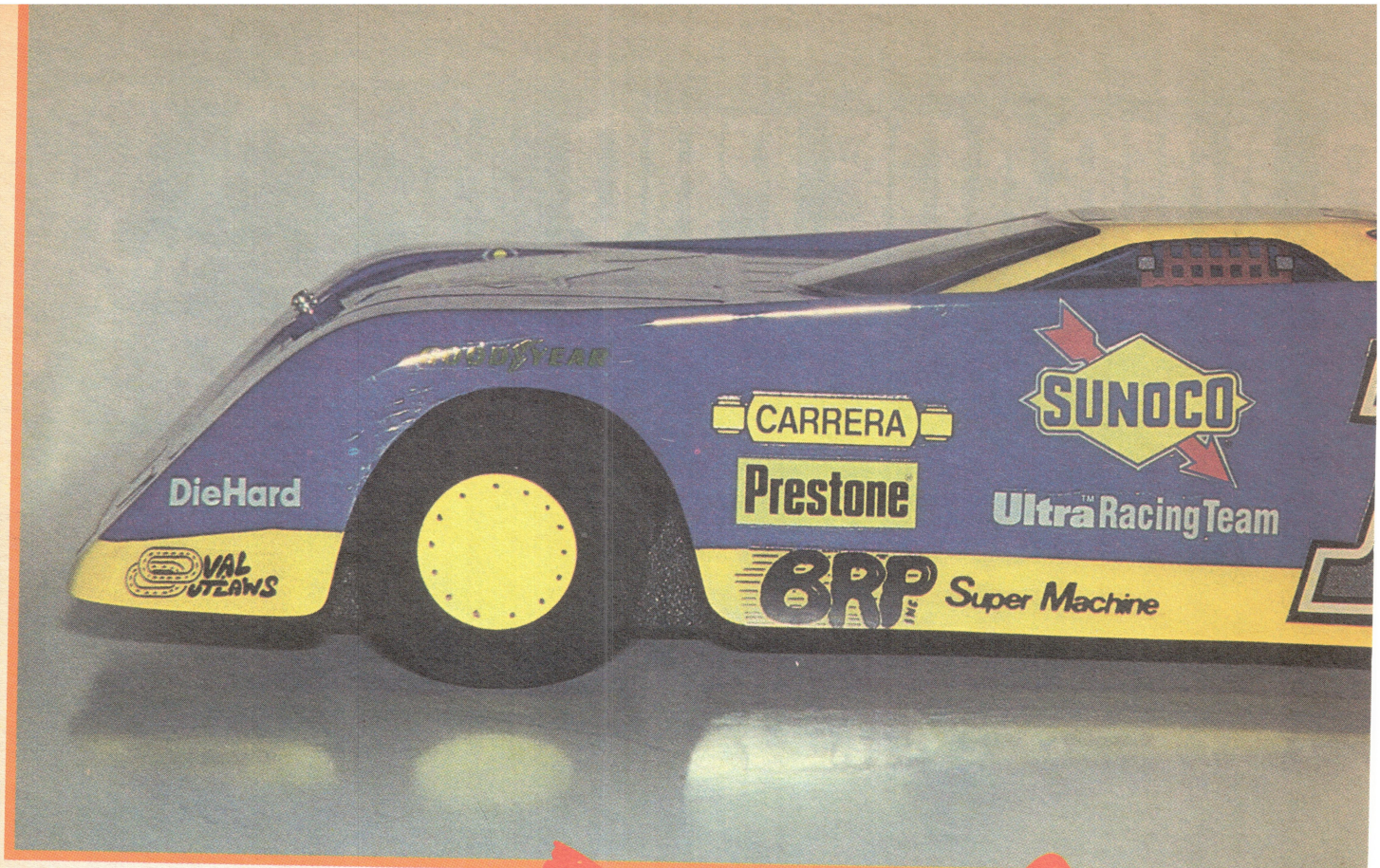


The supplied body and wing are both good-looking and durable. The body fits tightly and is molded with all cutouts plainly shown, along with a clear cover to protect it from over spray. These are little touches that make assembling a new car enjoyable.



All components are durable, high quality and well thought out.

3/4" FRONT WIDTH - 12 1/4" REAR WIDTH - 12 3/8"



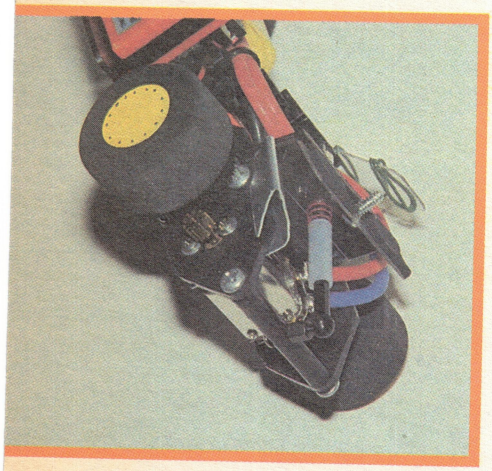
Dirt Conv

FOR THE SUPER OV

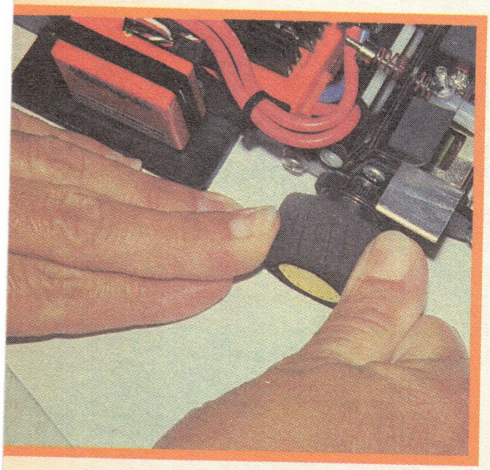
Of all the 1/18-scale Bud's Racing Products' RC vehicles, the dirt wedge version seems to be the one least talked about. If you've never seen them, full-sized late model racecars are very popular with racers and fans alike.

We've decided to convert an onroad version of the Super Oval Outlaw to dirt oval car specs. The main thrust of this article will be to show two things: that the BRP requires only minimal

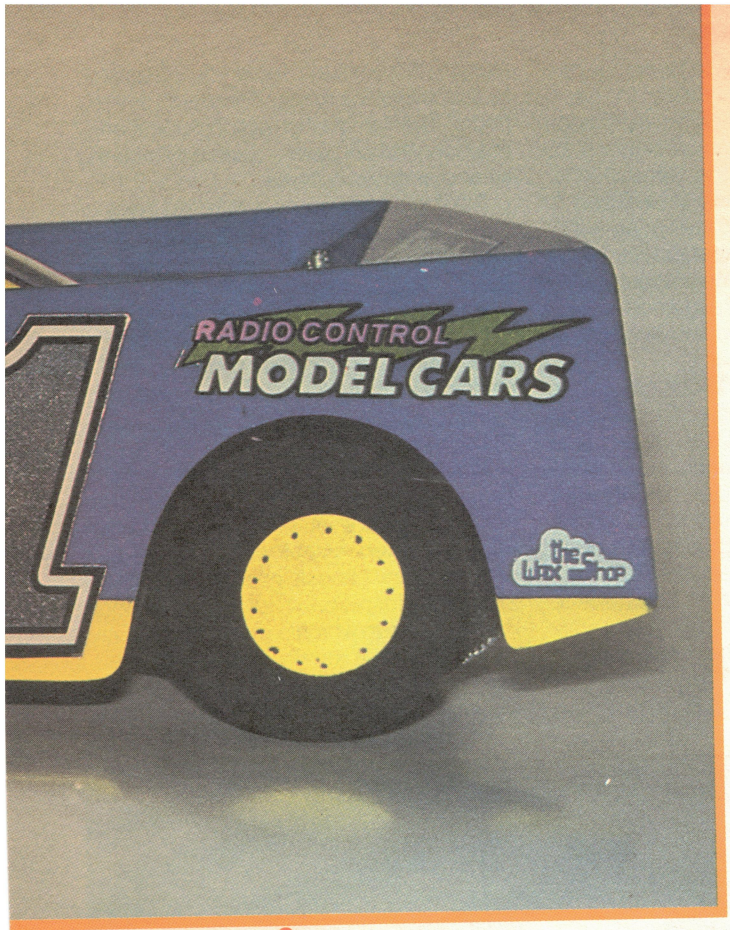
BY RICK



The vehicle's rear slider suspension shaft was angled downward to help clear the lower wedge body shell. This was done by re-drilling the front rod hole in the Kydex upright and then using a longer ball joint on the rear pod post. Silicone tubing on the on the rear rod shaft gives the BRP a bit more give on clay surfaces.



Using a hobby knife small angled slits were made in the car's rear foam tires. These cuts improve the traction on hard clay or dirt and can also be done to the front tires to increase steering action.



ersion

AL OUTLAW

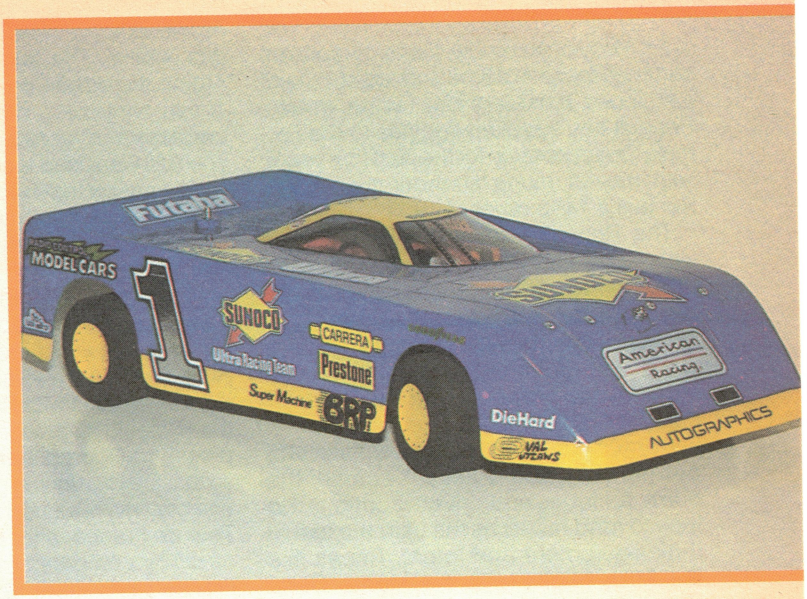
tinkering and money to alter the basic Outlaw to dirt racing form, and second, how well it ran once it was completed.

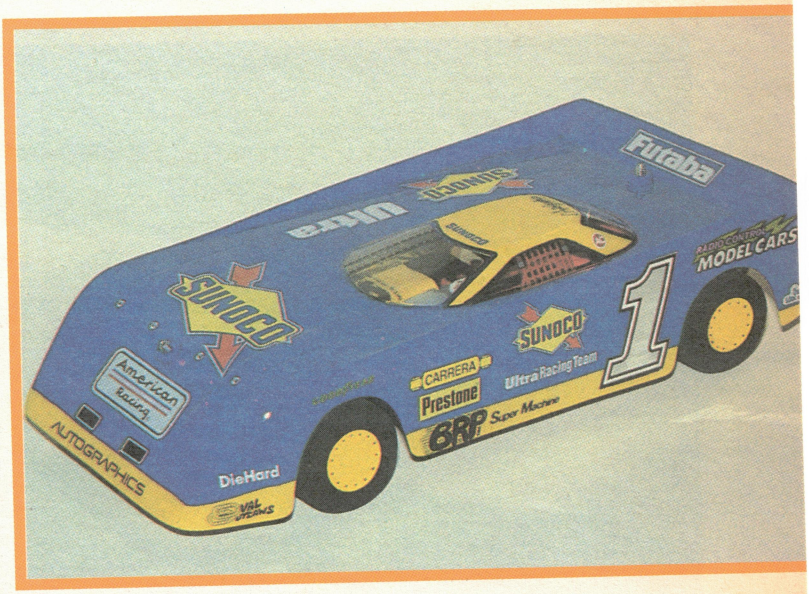
WHAT WAS NEEDED

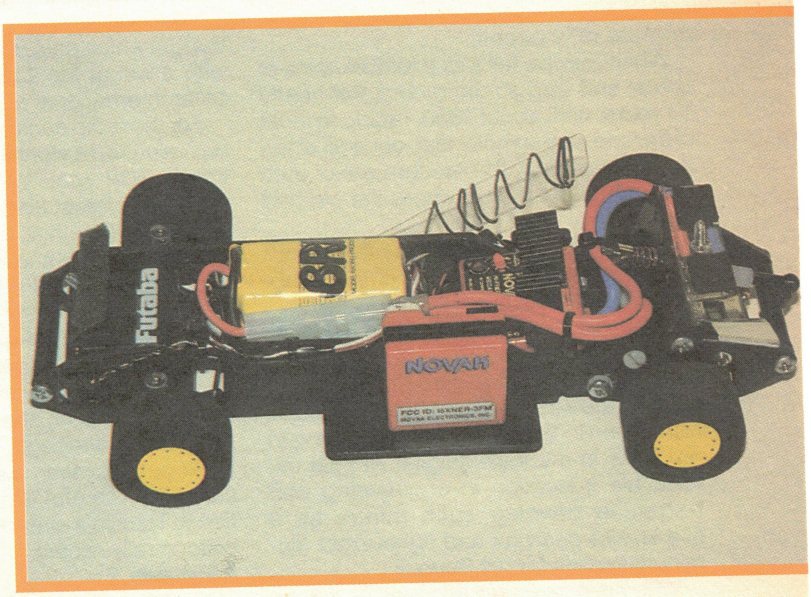
Of course, the most important thing needed to

continued on page 73

Y R I C H







The BRP Super Oval Outlaw's single biggest conversion change was the addition of the dirt wedge Lexan body shell. This body comes stock with a clear side airdam but it was left off by the author during early testing. The wedge body shell got a Sunoco blue and yellow paint scheme reinforced with Autographics decal sheets. The small wheel covers are actually office supply store price marking dot labels and are sold in several colors. The three main modifications done to the car's chassis centered on the lowering of the body mounts, altering the rear suspension setup and transposing the ESC and battery pack locations. BRP orange compound rear tires were also modified to fit the car's front axles, thus giving it a more dirt car look.

RENAULT ALPINE CONTINUED FROM PAGE 52

As many of you know, these companies survived the test of time and are still major influences in modern-day racing. In fact, Renault has supplied engines to the Formula One champion for the past four years, with motors much stronger than Louis Renault's 14hp racer of 1902.

The Renault legacy in racing began with races like Paris to Vienna and the grueling Paris to Berlin, a 687-mile, three-day epic. But, with political reform came the banishment of racing through the roadways of several European countries, relegating racers to areas specifically designated for racing.

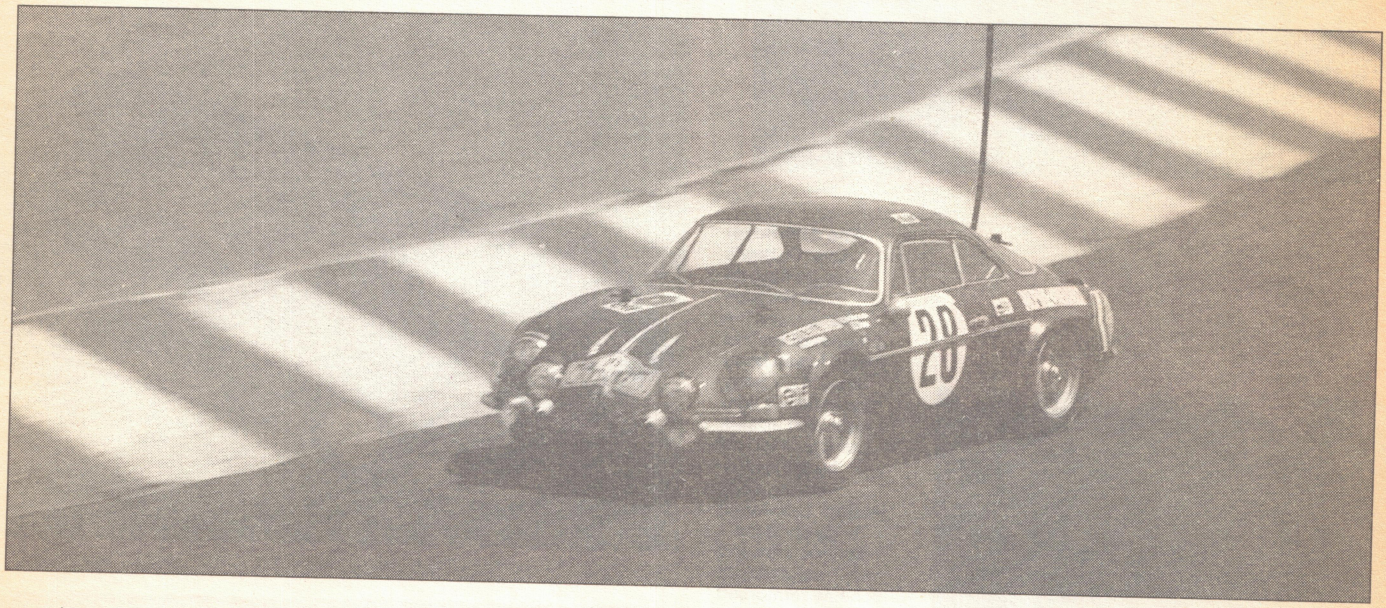
As racing circuits became smaller and permanent race tracks became the norm, factories and drivers continued to look to road rallies as the ultimate test of their equipment and talent. Races like the Mille Miglia and the Monte Carlo Rally became headliners on the already popular rally circuit.

When Europe fell into a terrible state of unrest and war, so did racing. For nearly 10 years, until about 1950, racing in most of Europe was on hold. But, once all of the dust had settled, the modern era of auto racing had picked up where the old had left off.

In an effort to get France and the French automotive industry involved in racing, Jean Redele, son of a Renault dealer from Dieppe, began to race modified Renaults in European road rallies. It wasn't long before Redele found himself on the podium as the winner of the 1950 Coupe des Alps. Then in '52, '53 and '54, Redele won his class in the Mille Milglia. Redele utilized his education in engineering and began to develop such things as a five-speed gearbox and lightweight aluminum bodies for his Renault

With his new-found success as a race driver and passion for the Renault car, Redele decided in 1954 to open his own fabrication and race facility under the name Alpine, in honor of his first win in the Coupe des Alpine. The first cars produced by Alpine were based on the Renault 4CV. These cars using a newly developed fiberglass bodyshell were known as A106. The A106 sported a central tubular backbone chassis that became the foundation for all Alpines to come. In addition, Alpine added a cabriolet, styled by Michelotti to the 106 line.

Alpine then took the Michelotti cabrio design and developed a 2+2 coupe which became known as the A108. By this time Alpine had been developed a close working relationship with Renault. Shortly after the Renault R8 saloon was launched Alpine reconfigured their chassis and body so that the R8 running gear could be used. The car was renamed the A110 Berlinette Tour de France, after the 108 model successfully competed in the 1962 Tour de France (auto race). By 1968 Alpine had secured 100% of the Renault competition budget which paid dividends immediately with a win at the Coupe des Alpine and other international rally races.



For the radio control enthusiast, Tamiya has released a stunningly accurate rendition in 1/10 scale of the Renault Alpine A110. The latest from Tamiya utilizes the M chassis (the third model to do so, after the Mini Cooper and Fiat Abarth) and the second rear wheel drive (M) car.

The Alpine comes complete in 1971 Monte Carlo Rally trim with additional driving lamps, treaded semi-pneumatic tires and authentic rally markings. Like the Abarth and Mini, the Alpine shares an M-chassis, although, in the rear wheel drive configuration the chassis is called the M-02. The Alpine makes a great addition to Tamiya's already successful line of historic rally racers.

ASSEMBLY

You'll find that the Alpine is very easy to assemble. By using the kit-provided wrench, along with a few basic tools, you will be able to assemble the rolling chassis in several hours. The Tamiya instruction book is easy to follow and contains valuable info on the kit and accessory items.

All of the parts come in lettered bags or on lettered parts trees. In order to keep track of the small parts, once the bags are open I would recommend using small, identified containers. It's also important to have an uncrowded work space. This will give you the opportunity to lay all of the parts out so that you can see what you are working with.

CHASSIS

Absent from the Alpine kit is the familiar Tamiya tub-style chassis. Because of the compact nature of the Alpine and the relatively short wheelbase, Tamiya has utilized a new chassis configuration, designated M, for monocoque. A monocoque is a structure in which a group of parts are joined to form a strong, rigid structure.

If you're familiar with other Tamiya chassis you know that the gearboxes are joined to the chassis with screws. The gearboxes are separate pieces that can be detached from the chassis, leaving the tub chassis in tact.

The M-chassis is completely different. In order to create a monocoque Tamiya has incorporated the gearboxes into the supporting structure of the chassis. When the entire package is assembled the gearboxes end up sandwiched between the two chassis rails. The chassis rails on their own resemble a split-tub. Long screws join the two halves as well as attach the gearboxes.

When assembling the chassis pay particular attention to figure 20 of the directions. You'll notice that several screws go from the inside out, on each chassis half. These screws hold the battery end stops to the chassis and should definitely be installed before the chassis is joined.

SUSPENSION

One thing that the keen eye will notice is

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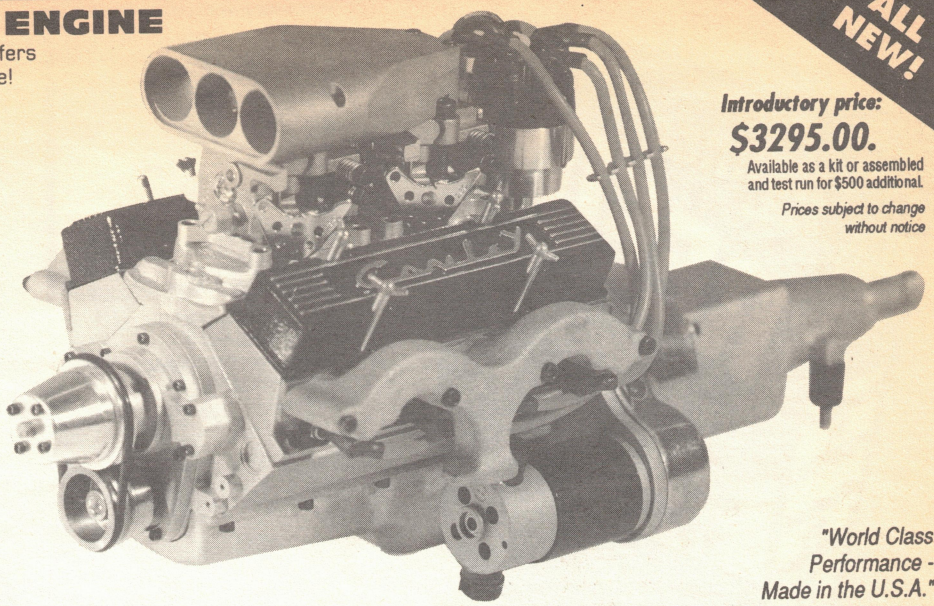

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that the suspension parts that attach to the front and rear cases are similar. In fact, the parts are identical! A quick look at the parts pictures and callouts will reveal that the Alpine uses two C and two D parts trees. This can be particularly beneficial if you happen to break parts. When you buy replacements you get two. If you get involved in racing, it's always nice to have spares around just in case!

The suspension of the Alpine is unique in many ways as well as simple and effective. You will find that there is no oil used in the shocks and that there are only two shocks instead of four.

Internally the shock uses a piece of rubber tubing around the shaft, that can be cut to provide different grades of dampening. Externally a standard rebound shock spring is used in conjunction with spring-tensioning spacers. In an effort to help with dampening and suspend the weight of the car, Tamiya has added an additional spring, located between the four lower control arms and the front and rear cases.

The shocks themselves are mounted horizontally and become the link between each of the lower control arms. Because of the suspension design the shocks only work when the suspension components, at each corner of the car, travel independently of each other, like on a rough surface. Any chassis roll (weight transfer when the car is turning) that is experienced is taken up by the additional springs at each wheel.

DRIVETRAIN

Like the chassis, the rear gearbox is a two piece unit that contains a non adjustable, limited slip, planetary gear cliff. The cliff gear assembly is the only thing that is located inside the gearbox. The rest of the gears (the idler and spur-counter) are installed on shafts from the outside, once the gear case is assembled.

An external gear case cover serves several functions. When installed, the cover becomes the bushing carrier for the outside gear bushings as well as a gear protector. It is important to keep and dirt and gritty material out of the gears and gear lube. Any such contamination can cause gear wear.

Because the Alpine is rear-wheel drive, it obviously doesn't have a front gear case. The case at the front of the car is simply a structure that is used as an attach point for the suspension components. But, I still refer to it as the front case.

The Alpine comes stock with a 540-type sealed endbell motor and a choice of three different gear ratios. The gear case is marked and drilled for the specific pinion sizes. After choosing a pinion size you simply install the pinion to the motor, using the kit provided pinion tool, then locate the motor screws to the appropriate holes in the gear case and install the motor. This system makes it virtually impossible to get a bad gear mesh between the pinion and spur.

The Alpine comes stock with a 540-type sealed endbell motor and a choice of three different gear ratios.

Like most gearbox cars, the Alpine's rear wheels are driven through the differential to a pair of dogbone-style half shafts. As common with most Tamiya cars, the wheels are located on a plastic hex nut that is held in place by the spindle pin.

A single nut secures the replica three-lug Alpine wheels to the spindle. In order to maintain grip on the rally circuits of the world, the Alpine uses semi-pneumatic, natural rubber tires with foam inner liners, for added strength. The tires are treaded and are supplied in two different compounds, a regular compound for the front and an M-grip compound for the rear. As always the tires should be attached to the rims with CA glue.

BODY SHOP

The body for the Alpine A110 is molded from clear Lexan and coated with a thin film of plastic. The plastic protects the outside of the body from overspray. As usual, the body should be washed out with warm water and soap so that any mold release lubricants are removed. Once the body is dry, the kit-provided window mask can be located, in preparation for paint.

The paint scheme of the Alpine is a fairly basic metallic blue, which can be found in the RC paint section of most hobby stores. I just shot the body with the paint, then when it was dry I shot a backing coat of silver, which brought out the metallic in the paint. That was it—quick and easy!

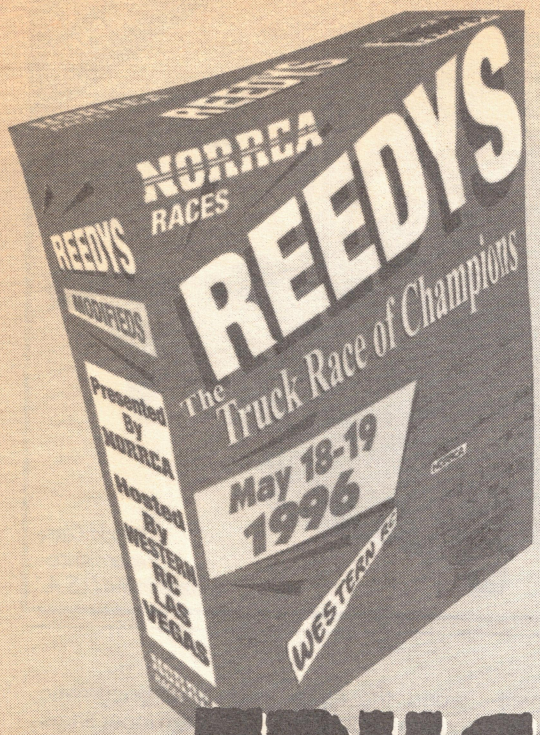
Once the paint was dry I peeled the thin protective coating off and prepared to install the decals and additional plastic parts. There was nothing tricky about any of the finishing work; I just followed the instructions for location and placement of the parts and decals.

One thing that I didn't do was paint any of the plastic parts or bumpers. The instructions call for these parts to be silver leaf, but the photos that I had showed them as a dull silver so I left them the way they came out of the box. When the body was finished I hated to drive it because I didn't want to crunch the great-looking rally lights on the front end but, the show must go on.

POWERING UP

By now it's no secret that I use the same

continued on page 64

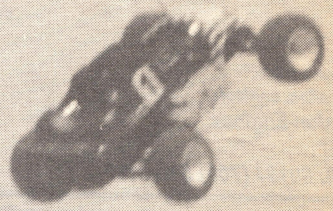




Mike Reedy got a little sunburned, but it didn't slow him down maintaining his motors.

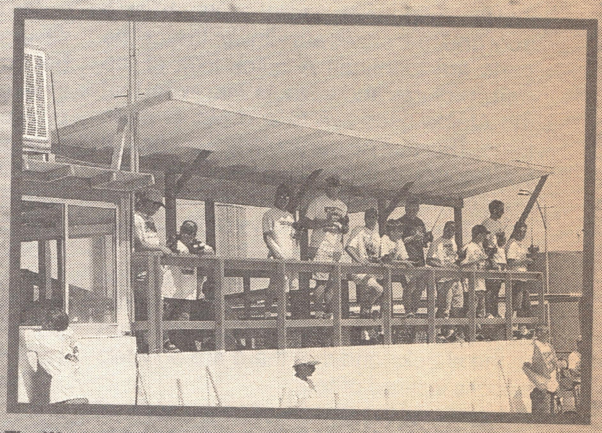


Brian Kinwald was certainly on this week. Does that say "Speed for Hire" on his cap?



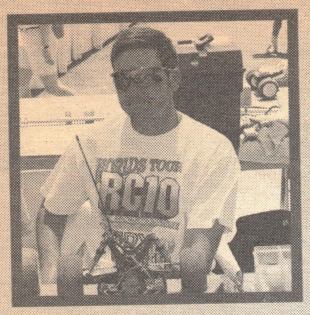
TRUCKIN' IN VEGAS: THE 1996 REEDY/ NORRCA RACE OF CHAMPIONS

BY GENE HUSTING

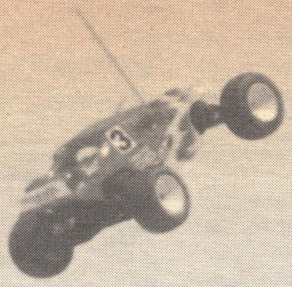


The Western RC Raceway, in Las Vegas has a great track, with a large covered drivers' stand and covered pits.





Richard Saxton lives in Las Vegas, and was thinking he might have a home track advantage, until the track got blue-grooved, which was totally new to everyone in Vegas.



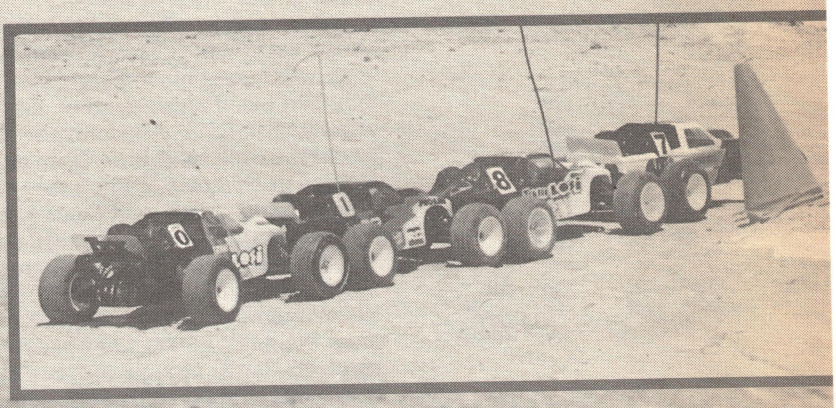


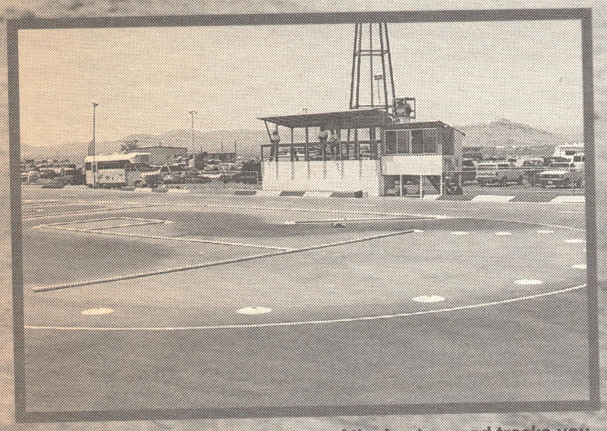
Scott Hughes was right in there taking a top-three spot in the main.



Greg Hodapp TQ'd the Gas Truck class, and took two strong second-place finishes.

No, this isn't a photo finish, but just simply the drivers having a little fun lining up for their qualifying run.





Western RC Raceway also has one of the best onroad tracks you can find.



The pit area was clean and covered, with the drivers all having enough pit space.

This NORRCA event was held at the Western RC Raceway in Las Vegas, Nevada. Randy Grigg, the owner of the Raceway, started racing RC offroad at a different track in Vegas. At the same time, he had set up a simple offroad practice track on some land not being used, next to his large auto wrecking business. This is about six to seven miles west of the Las Vegas strip. When the original track closed, all the racers wanted to race on

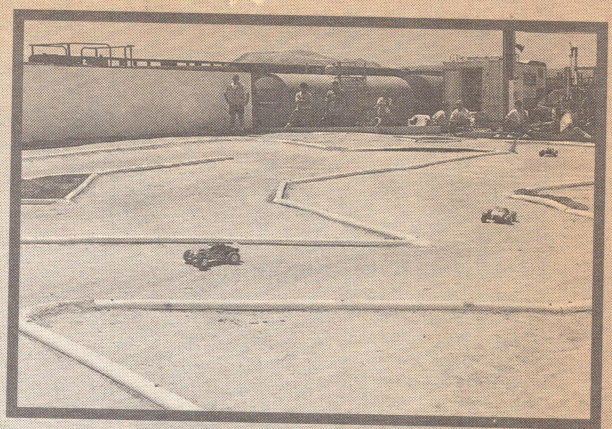


Randy's small practice track. There just wasn't room for all this to happen, so Randy decided to build a full offroad track, complete with a drivers' stand and covered pit tables.

After doing all of that, he also wanted to do onroad racing. So, right next to the offroad track, he built a beautiful onroad track for 1/12 and 1/10 cars. It's a first-class layout. Very smooth asphalt, with banked corners, which makes it ideal for oval racing. Randy also has a hobby shop and snack bar. On top of that, there is also great lighting so they can run during the evening hours when it's cooler.

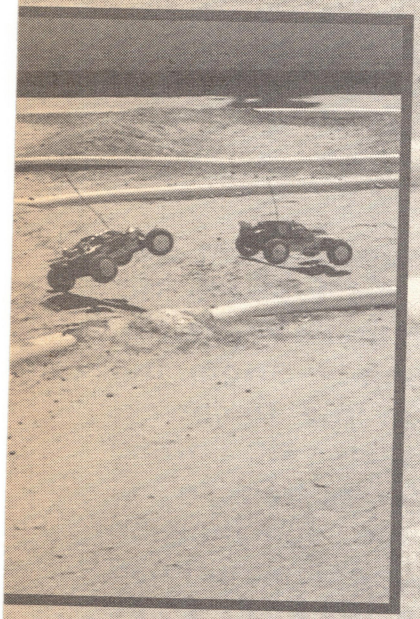
We were lucky when we were here because there was a steady wind all day long, which kept the temperatures in the 80s. The event was set up so that there was an Invitational class of drivers in the electric truck class, plus an Open class for the gas truck racers, and classes for Expert Modified, and Expert Stock trucks.

Everyone had three qualifying runs, four minutes long in the electric classes, and five minutes in the gas truck class. The Nevada dirt (if you want to call it that) is more like a combination of white dirt with sand, so Randy brought in some clay to help cement the ingredients together. Then he double-packed the track, and it actually did get a blue groove, but then it dried out too much, and started to break up. All the local drivers said it was much better than the dust bowl they were used to racing on.



This was a fast esse section that looked relatively easy to the drivers. However, trying to cut those corners too tight caused major problems.





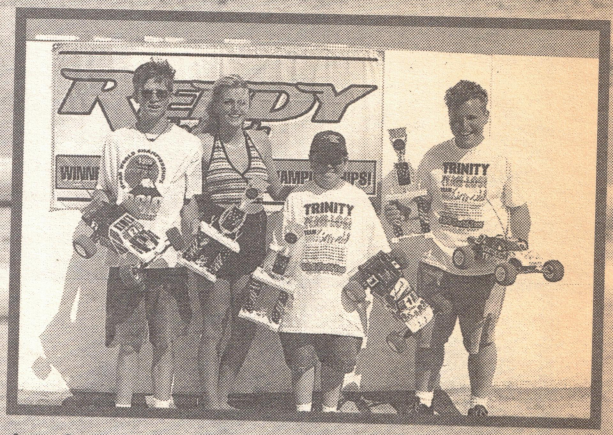
This ripple section was really tough because the trucks were never pointing the same way as you wanted.

INVITATIONAL CLASS QUALIFYING

Brian Kinwald led the first round of qualifying with a quick run of 11 laps in 4 minutes and 17.94 seconds, or 11-4.17.94. Jason Ruona was just a couple seconds behind with 11-4.20.30, followed by Greg Hodapp with 11-4.21.17.

Brian also led the second round with 11-4.14.26, with Richard Saxton just a second behind with 11-4.15.88, and Jason Ruona, another second behind, with 11-4.16.58.

Brian ran away in the third round with a clean run of 11-4.09.32, followed by Scott Hughes with 11-4.15.25. Mark Pavidis missed his second qualifying round, but came beck with an 11-4.15.44. Greg Dennett was next with 11-4.16.51, followed by Billy Easton with 11-4.16.73, and Greg Hodapp with 11-4.16.83.



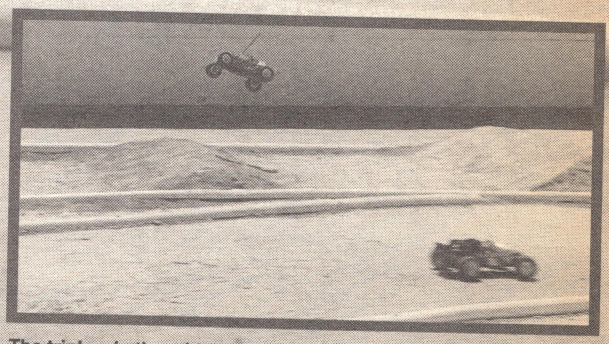
Anna Curtis, Miss Reedy Race, presented the trophies to the happy winners. Brian Kinwald (C) TQ'd and won the Electric Invitational Class, with Greg Hodapp (R) taking second and Scott Hughes finishing in third.

.12 GAS TRUCK QUALIFYING

Brian took right off with the lead in the first round of qualifying again, with a good 13-5.05.93, followed by Richard Saxton with 13-5.09.25, Scott Hughes with 135.11.75, Sohrab Tavakoli at 13-5.12.14 and Jason Ruona with 13-5.12.18.

Saxton with 13-5.13.41, Greg Dennett at 13-5.15.20, Dustin Biber with 13-5.20.25, Scott Hughes at 13-5.20.83 and Brian Kinwald with 13-5.21.58.

Greg Hodapp had his problems in the



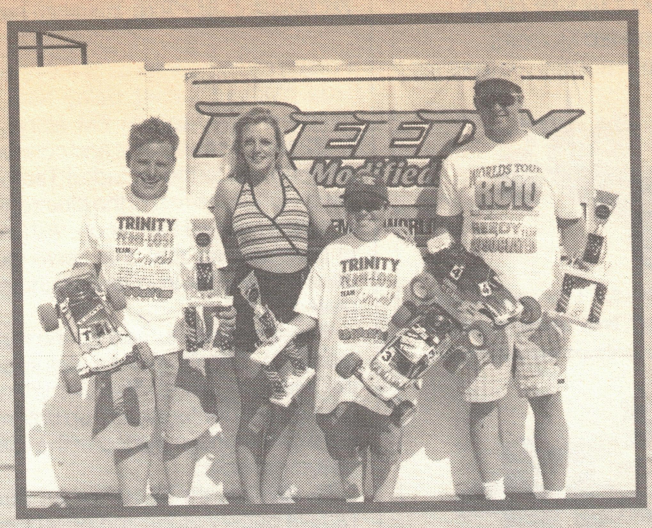
The triples, in the middle of the track, could be taken with one jump, but half of the drivers chose to make it in two jumps.

first two rounds of qualifying, lasting just two minutes of the first round and then not being able to start the second round, even though qualifying was held up quite a few minutes waiting for him. Greg made it up in the last round by taking the TQ spot with 14-5.22.63.

Richard Saxton followed with 13-5.03.27, then Brian with 13-5.05.38, Mark Pavidis with 13-5.07.59 and Dustin Biber with 13-5.09.84.

EXPERT STOCK TRUCK QUALIFYING

Everybody was chasing Kurt Busch, but they couldn't catch him, as Kurt took the Top Qualifier spot with 10-4.04.88, plus he also had the next best time with 104.06.71. Gabe Boudreau was next with 10-4.08.56, followed by Kenny Johnson at 104.09.66, Randy Poh with 10-4.11.86 and Darin Lefkowitz with 10-4.12.53.



Brian Kinwald takes another win in the Gas Truck Class, while Greg Hodapp takes another second place. Greg wasn't blushing, he was really sunburned. Mark Pavidis finished third on his smoothies.

EXPERT MODIFIED TRUCK QUALIFYING

Kurt Busch took his second top qualifier honors with a quick run of 11- 4.19.06, followed by Albert Guardado with a close 11-4.20.60, and Bryce Beaver right behind with 10-4.00.27, and Brent White a whisker back at 10-4.00.54.

INVITATIONAL A-MAIN

Brian took off in the lead from his pole starting position, with Scott Hughes following in second, Mark Pavidis in third and Greg Hodapp, who made a great drive around traffic on the first lap, to move up from his eighth starting position, to take over fourth.

A few laps later, Greg was able to get by Mark and move into third, with Richard Saxton also moving past Mark to go into fourth. Brian was starting to pull away from Scott, who had Greg in his rear mirrors now.

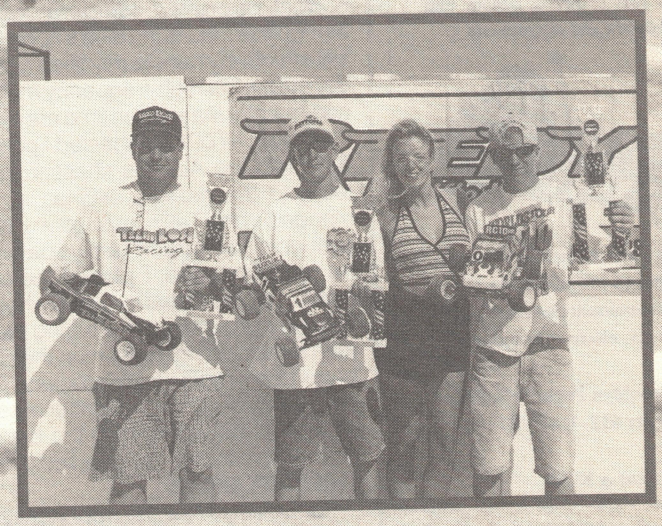
Greg managed to get by Scott, while Scott and Saxton were swapping positions back and forth. Greg pulled up on Brian's rear bumper, but never tried a pass. Everyone knows he's supposed to let Brian win. So, Brian won with Greg second, Scott third and Saxton fourth.

INVITATIONAL A-MAIN RESULTS

PLACE, RACER, TRUCK, MOTOR

1 BRIAN KINWALD, LOSI, XXT, TRINITY
2 GREG HODAPP, LOSI, XXT, TRINITY
3 SCOTT HUGHES, RC10T2, REEDY
4 RICHARD SAXTON, RC10T2, REEDY
5 GREG DENNETT, RC10T2, REEDY

continued on page 49



Gabe Boudreau (R) won the Expert Stock Class with his RC10T2 truck, while Kurt Busch (C) TQ's and finished second with his RC10T2, and Kenny Johnson finished third with his Losi truck.



Albert Clemons (C) won the Expert Modified class, with Kurt Busch (R) taking another TQ spot and another second place finish, while Bryce Beaver took third.

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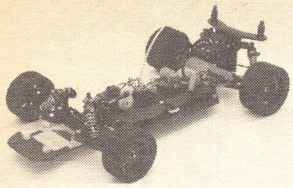
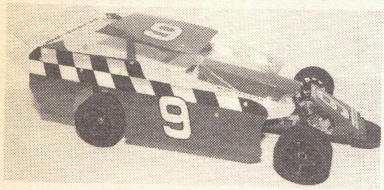
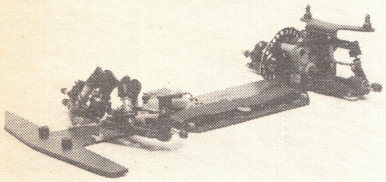


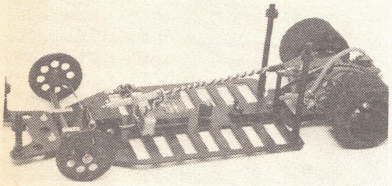
HUGGER - Oval kits for RC10, " T "or Losi. Includes chassis, shock towers, bumper, body mount, aluminum bulkheads, battery strap kit, hardware and instructions.



VULCAN - Direct drive oval kit for RC10. Includes chassis, shock towers, body mounts, motor plates, rear carriers, front bulkhead, hardware and instructions.



HUGGER PRO - New kit for smooth tracks, narrower and lighter then HUGGER. Also includes rear a arms, rear carriers and bearings, MIP cvd drive system, four Delta style shocks, all hardware and instructions.



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See pages 23 and 69

RENAULT ALPINE CONTINUED FROM PAGE 59

Futaba radio gear for all of the reviews that I do. Without further delay here goes: I installed my Magnum FM along with an S132 servo in the Alpine and connected the steering rod to the included Tamiya servo saver. Once the rest of the electronics were installed I turned the car on, with the motor unplugged, so that the servo could be centered and the front-end alignment completed.

A visit to Tekin turned up the new Command 10, Tekin's sports series speed control with Quicktune. The Command 10 is packed with features that, up until recently, were only found in the top of the line racing speed controls.

To start off, the C-10 comes wired with Tamiya battery plugs and bullet connector motor plugs, making it a great choice for a direct, no soldering required installation to your Tamiya car. Tekin provided a universal receiver plug kit makes the C-10 adaptable to a host of radio equipment. Tekin also provides motor capacitors that should be soldered onto the motor and used in conjunction with the ESC.

The C-10 is equipped with Tekin's GoldFet 11 transistors and a built-in heatsink for cool, efficient operation. Thermal overload and solid state protection prevent damage in the event that the battery is hooked up backwards or if the unit to heat up beyond normal operating temperatures. Even though this ESC is in Tekin's sport line it will still effectively handle modified motors and because of its high-frequency motor drive, commutator life and run time are extended.

So, with all of that digested I popped the C-10 into the Alpine's chassis, tuned my radio to the desired settings as recommended in the Tekin instruction book, then connected a charged Tamiya battery pack. As recommended, I placed the car on a block of wood so that the drive wheels were off of the ground, before tuning the ESC. I then turned on my radio then the ESC and began the simple tuning process. The ESC was ready for action in a matter of seconds. Additional adjustments to the brakes can be made manually on your radio.

THE TEST DRIVE

Fortunately I had the opportunity to take the Alpine over to the Tamiya test track, located behind their Aliso Viejo California headquarters during one of their free weekly practice sessions. I brought several test packs with me so that I could enjoy the Alpine's long run time. Even though the Alpine comes with a 540 motor you will find that it has plenty of power.

I had the suspension set up in kit trim for the test on the smooth road course track. I have to admit I'm not the greatest road course driver so I took it easy through the tight section of the track, but in the sweeper, esses and on the straight I opened it up and enjoyed the power and acceleration of the rear wheel drive. Fortunately all incidents were avoided and the body survived.

Considering that the Alpine was a rally car that ran on all types of surfaces and that Tamiya also had a dirt track, I couldn't help myself.

I removed the shock spring spacers, for a softer ride, and headed to the offroad track. Now, realistically, the Alpine isn't made to go over jumps and such so I won't try to tell you that I conquered the dirt track, but what I will tell you is that the Alpine, with its rear wheel drive and treaded tires, was a kick in the dirt. Through the dips, around the turns, kicking up plumes of dust and slinging dirt everywhere was great fun. Unfortunately, I now had to clean everything up but, it was worth it.

If you're ready to take on the rally tracks of your neighborhood, take a look at the Alpine. You'll find that its basic design, ease of assembly and minimal maintenance is perfect for anyone just starting out. On the other hand if you want to get involved in racing the Alpine makes a great entry level spec class (no modifications allowed) race car.

PRODUCT SOURCES

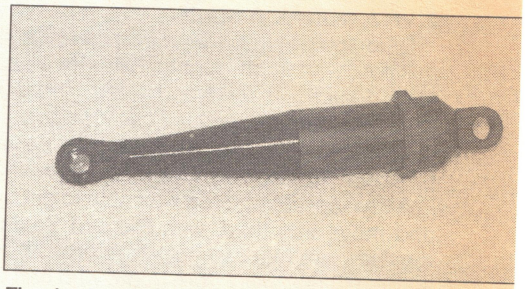
Tekin Electronics 940 Calle Negocio, Ste. 140, San Clemente California 92673.

Tamiya USA, 2 Orion, Aliso Viejo, California 92662.

Futaba Corp. of America 4 Studebaker, Irvine Califonria 92713. ●

MIRAGE CONTINUED FROM PAGE 54

new Mirage Pro l/8-scale 4-wheel drive buggy. The Mirage Pro is a full-featured and out-of-the-box competitive entry into the rough and tumble world of 1/8-scale competition. In terms of bang for the buck, the Mirage can't be beat! The car has



The shocks are of an excellent design with bladders supplied to minimize air mixing with the shock oil and changing the damping characteristics. The supplied boots keep dirt out of the shock shaft/seal area and don't seem to affect the damping of the shock due to their flexible, thin construction.

excellent fit and finish and has all of the features necessary to be competitive with the best buggies available.

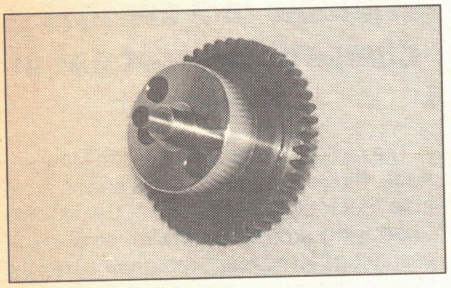
The Mirage Pro is among the most complete kits available on the four-wheel drive 1/8-scale market. Full bearings are supplied, along with both a header, coupler and a tuned pipe (features frequently lacking in more expensive kits) along with a paper-type of air cleaner and all linkages necessary to complete radio installation.

Sway bars for both front and rear are included, along with all necessary hardware for their installation. Most kits include "tires" of some type but the Mirage comes with an "X-dash" type of tire along with the required foam to make them work best. These tires should work well on a lot of tracks.

The list of features included in the Mirage Pro kit is both extensive and impressive. One of the areas that the Mirage excels in is that of drivetrain design. Using three planetary differentials with machined aluminum housings (for stability as a result of the heat generated during the long mains common to four-wheel drive gas racing) and hardened gears throughout, the drivetrain promises to be both durable and strong. In addition, the Mirage features front universal joints for better transfer of power and handling in this critical area of the car. Another really nice feature included in the Mirage kit are the turnbuckles for all suspension and steering linkages. The turnbuckles are strong and feature both a hex area and a hole for easy adjustment. Independently adjustable (front/rear bias) disk brakes are incorporated in the Mirage. The kit provided for this test also included the excellent Thunder Tiger PR0 21B-R engine which is a three-port design rated at 2.1 horsepower! Certainly enough to get a rookie 1/8-scale driver such as myself around the track!

ASSEMBLY

If you've never assembled an 1/8-scale four-wheel drive buggy before (I hadn't) then you're in for a surprise. The number of parts necessary to assemble one of these pups is incredible! Lots and lots of screw bags and bits and pieces. The included instruction manual is well produced, with the screw sizes and types shown beside each step along with diagrams of the major parts at the back of the book. The only area that I found the Mirage lacking was that the bags containing the parts weren't labeled, even though they were referred to by number in the manual. Just take your time and read every aspect of the instructions and the assembly will go smoothly.



The aluminum planetary differential housings are of excellent design and are virtually leak-free when properly assembled. Be sure to clean the screw threads with brake cleaner and apply Loctite when you assemble the diffs to the gears.

It wasn't too hard to figure out which was which and I'm probably just spoiled from the number of 1/10-scale electric cars that I've assembled over the years. To make the assembly process easier, I sorted the screws by size and type into an old egg carton so that I could grab the size I needed when indicated on the instructions.

Be sure to use Loctite or some type of thread-locking compound on all screws that are inserted into metal parts. The vibration from the single-cylinder gas engines we use will vibrate almost any metal-to-metal connection loose.

The instructions begin with the assembly of the differentials and these went together smoothly. For proper operation, 1/8-scale diffs require that you fill them with grease or silicone for proper operation. The supplied grease was of unknown viscosity and as a result I substituted Kyosho 30000 in the front and rear units with 50000 in the center. The viscosity of the silicone lubricant used affects the handling of the car and the relationship of the two types that I used is a known starting combination for a car of this type. The front and rear diffs were filled half full and the center diff was filled as full as I could get it. Be sure to clean off the Allen screws after you have assembled the diff unit and apply Loctite to the threads before you

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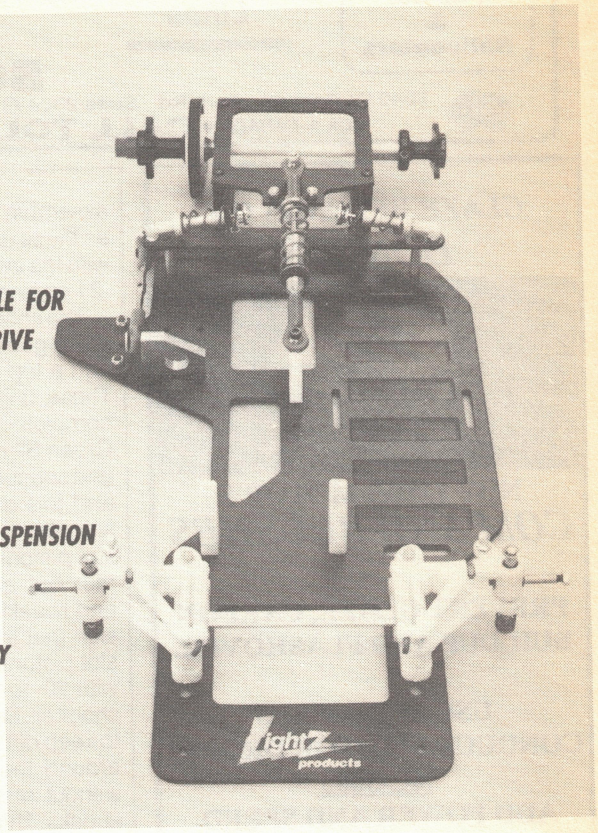

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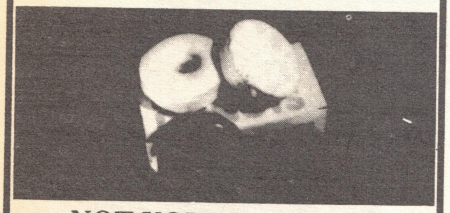

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assemble them to their respective gears as these units have been known to loosen with the awesome horsepower applied by .21 engines.

The shocks provided with the Mirage kit are a good design utilizing double seals and a top bladder to control air and dirt. These units assemble easily and when completed operate smoothly. I did use Green Slime to lubricate the O-ring seals and spacers when I assembled the shocks and this always makes a smooth shock smoother. The instructions call for single-slot pistons in the front and double in the rear but after several weeks of fiddling and tweaking I have come to the conclusion that the car works best using single slot pistons in both front and rear shocks with 20- to 25-weight Associated silicone shock oil. Boots are provided for the shocks to keep dirt from getting into the seal areas around the shafts and these work well without restricting the movement of the shocks. This is an excellent idea that other manufacturers should consider!

Clutch assembly on an 1/8-scale car can be a hassle if you're not used to working with the high-tension springs necessary for the proper operation of these types of clutches. I found that after I had installed the first spring and shoe assembly that it was easier to install the other two if you inserted a short screw between the clutch nut and the inside of the shoe to hold the shoe out and allow the next shoe to be inserted. The shoes are a tight fit and require some patience to assemble.

The balance of the assembly of the kit is straightforward and clearly outlined in the manual I would caution anyone building this (or any other kit for that matter) to complete the steps in the order that they are presented. I forgot to install the rear sway bar at the proper time and even though you can eventually get it done, it takes longer if you do it out of order.

The only bug that I encountered during the assembly process was that the slot in the upper servo brace which allows clearance for the steering linkage needed to be enlarged to allow full travel of the steering servo. I accomplished this with a sanding drum attached to my Dremel tool. Considering the number of steps and overall complexity of the kit, this adjustment is certainly minor.

ELECTRONICS

As is the case with any high performance gas car, top of the line electronics are necessary to be competitive. For this test I have chosen my usual J R4735 steering servo. These servos have the speed and torque necessary to handle the high stresses that a four-wheel drive buggy places on the steering servo. I used a Futaba 9401 servo for the throttle since it has about the speed and torque that I find best for this my use as a throttle servo.

I feel that they have really done their homework with this car to provide the best value available in a car that is competitive right out of the box.

The radio box included with the Mirage is huge. Since there is all of this space available I decided to use some 1000 mAH cells I had lying around for the receiver pack, assuming that no matter how much I ran the Mirage during an evening of racing that they would never dump or even get close to it! I arranged the cells into a four down, one up and sideways configuration to allow space for a JR 223 receiver. This is a full-size receiver which is supplied with the 756 transmitter that I am so fond of. JR equipment has proven to be reliable over the three-year span that I have owned it and I highly recommend it to anyone in the market for a top of the line radio.

SETUP

I have used the following in the set up of the Mirage for this test:

EXHAUST HEADER:
Shorten 1-1/4" to 10.5"
SHOCKS:
Front one slot piston, 20 wt. Associated

silicone oil Rear 1 slot piston, 20 wt. Associated Silicone oil
DIFFS:
Front Kyosho 30000 wt. silicone
Center Kyosho 50000 wt. silicone
Rear Kyosho 30000 wt. silicone
TOE:
Slight amount of toe-in
Sway Bar:
Rear only

To achieve maximum suspension travel on the Mirage, I ground down the stops located at each lower arm at a 45-degree angle to allow greater travel. This allows you to use the lower holes on the shock towers to achieve greater suspension travel. Be sure that you use the suspension limiters in the arms after you have achieved maximum travel so that you don't over extend the shocks. Experimentation is in order here due to the large number of possible combinations for mounting the shocks. I have found that the middle row, second from the outside hole works best on both the front and rear towers. On the front arm, I use the inside hole and on the rear I use the outside hole.

BRAKES:
Set to allow the rear brake to actuate slightly before the front brake begins to engage.

As you can plainly see, the Mirage has many options for setup and allows the racer to fine-tune his car to any track condition and driving style.

PERFORMANCE

Using my setup, I went to my home track, Real RC Raceway in Pleasant Hill, Missouri. Track owner Steve Hale had agreed to serve as designated driver for my photo shoot and allowed me to use the track so that the Mirage could be tested under near-racing conditions. I use the term *near* as we've been experiencing quite a bit of rain here in the Western Missouri area and you can plainly see from my photos that the track was a little muddy in some places and dry in others. Steve's experience with 1/8-scale cars was valuable during the break in and





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tuning stages prior to running the car at full speed on the track.

Any .21-powered buggy seems fast and the Mirage is no exception! But, as with all other forms of RC racing, handling is probably more important and this area is where the Mirage really shines. It is predictable and turns in hard when driven with power applied as you enter turns. The shocks and suspension work well in conjunction with the good front-to-rear balance of the car. Jumps are handled with grace and predictability and the Mirage seems very forgiving when subjected to driving errors by yours truly. As could be expected when driving a totally new type of vehicle, I hit the pipes and other objects enough during this test that I am convinced that the Mirage is durable enough to be raced seriously at any level.

RACETIME

With the photos out of the way, I embarked on my first competition experience with the Mirage at our weekly Friday night session at Real Raceway. Learning to drive a four-wheel drive buggy is a pretty natural thing to do except that you need to remember to apply throttle when you want the car to turn. Otherwise, it's pretty much standard RC racing and all the rules apply such as not hitting objects and other cars if you want to go fast! I was able to qualify the car fourth (out of 12 entries in class) which I felt to be reasonable when you consider my lack of experience in this type of racing. For the main I brought my son Jason out of retirement (as a pit dude) and we set out to give the Mirage its baptism under fire with a full field of cars to compete with for 15 minutes. The Mirage performed flawlessly during the main and I was able (with the help of son Jason's good pit work) to finish in second place behind local hot shoe and general fast guy Doug Von Mosch (who is going to the World Championship in England later this month to race for Mugen). An excellent beginning for a car that's not getting as much help from its driver as it should!

CONCLUSIONS

As the new kids on the block in 1/8-scale four-wheel drive class, Thunder Tiger had a lot to prove with the Mirage. I feel that they have really done their homework with this car to provide the best value available in a car that is competitive right out of the box. Gas racing of any type is perceived to be expensive but the reality in this case is that it is possible to assemble a competitive Mirage using top-of-the-line components for about the same amount of money that you would spend on a 1/10-scale gas truck!

The excellent tunability of the Mirage will prove to be an asset as different tracks are encountered. When initially assembled, the Mirage is somewhat tight overall which leads me to believe that it won't loosen up and get sloppy like a number of other cars I have experienced.

continued on page 73

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You read that right—we're giving away Gary Hamilton's actual record-breaking NORRCA Velodrome super-speedway car, as featured in *The Racer's Edge* series on aerodynamics, complete with (most) everything on it. (See notes below for details.) This is for real! When we approached Gary with this promo idea months ago he said, "Sure, the HPI's so easy to set up, it won't be a problem building a new one." After talking with his sponsors, they agreed to supply him with brand-new replacements. We're giving away the actual car and accessories that put Gary Hamilton in the record books!

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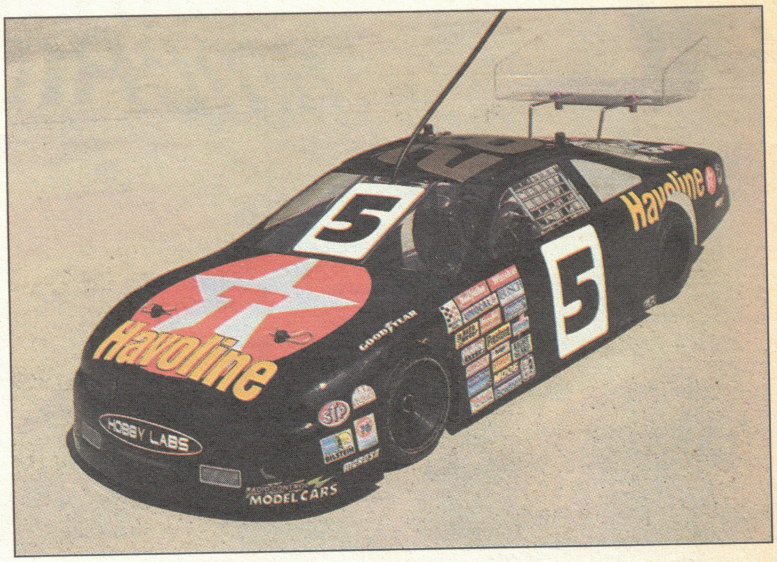

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RACE ENGINEERING

Here are the products Gary Hamilton used to set a new superspeedway track record:

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AutoGraphics of California	Texaco Havoline decals (no longer available)
BoLink RC Cars	Dampener #BL 5193
BSR Tires	Pro-lite silver "R" Compound Caps
Custom Works	Shock #1346
*Elite Speed Products (ESP)	1700 Sanyo SCRC batteries
**Futaba	PCM radio
Futaba	S9601 servo
Hobby Products Int'l (HPI)	Road Star 10GO chassis #101
Parma/PSE	Hot Dam Wing

Manufacturer	Part
Hobby Products Int'l (HPI)	Aluminum wing buttons #6085
Kimbrough Products	64-pitch, 112-tooth spur gear #212
Lightspeed	New Silver Expert brush #3400A
Novak Electronics	Tempest ESC #1760
***Novak Electronics	NER-3FM receiver
Peak Performance	EBX series 13 triple modified motor
Protoform	'96 T-Bird HS body #1210R
Robinson Racing	64-pitch Silencers pinion gear
TD Enterprises	Protector/PT bumper #TDSSPT
Wolfe Motorsports	Blue shock spring #10-121

* Gary (understandably) won't part with his radio or battery pack. ESP is supplying a replacement for his original two year old ESP pack to give the winner.
** Not being given away (see ***Note:)
*** Note: Novak Electronics will provide the winner with a three-channel FM receiver as a substitute. It may not be a PCM radio, but hey, some lucky person is getting all this stuff for free... so no complaining!

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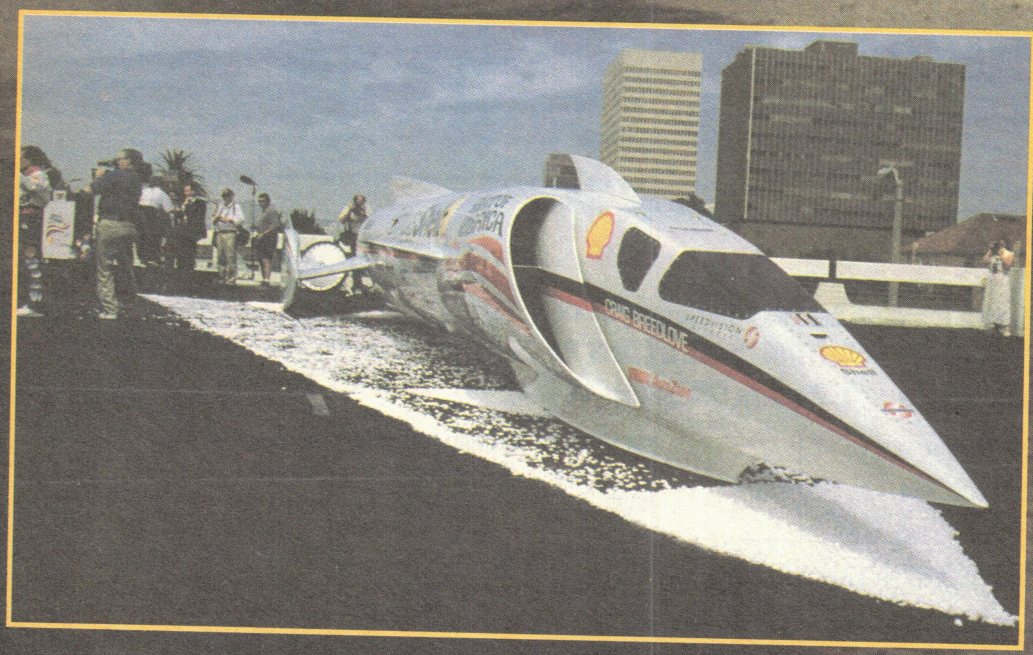
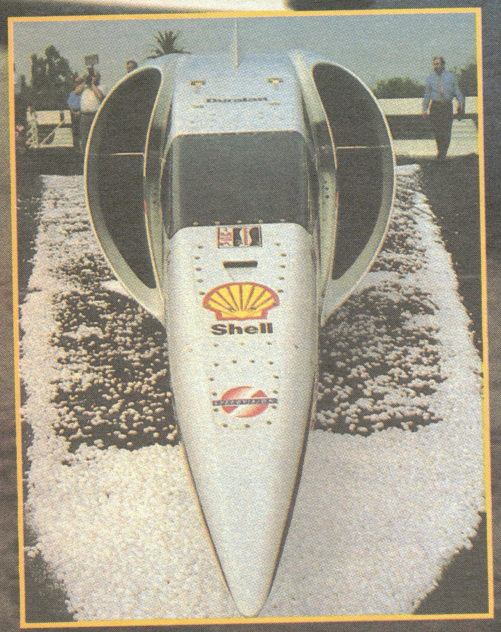
Craig Breedlove's Race for the Record



The debut of the all-new Spirit of America was held at the Petersen Auto Museum in Los Angeles, California for media and guests. Craig Breedlove, along with several sponsor representatives, spoke briefly about the LSR project before the shroud was lifted to reveal the sleek Spirit.

The Spirit Is Alive

STORY AND PHOTOS BY RICHARD DOWDY



Head-on view shows the cockpit from which Breedlove will control the Spirit of America (he has a throttle, brake and steering wheel). Huge intakes feed air to be mixed with Shell unleaded pump gas to power the jet engine.

Craig Breedlove, the American hotrodder who built his first jet-powered land speed car, the Spirit of America, in his dad's garage in Southern California, and later drove it to a record speed of 407 mph at Bonneville Salt Flats, is back again—this time to wrest the World Land Speed Record now held by Englishman Richard Noble. The current record speed of 633.468—set in 1983 by Noble's Thrust II—is one Breedlove aims to shatter by driving his jet-powered car to 700 mph, and then to an astounding 765 mph (the sound barrier) after the record has been assured.

Recently, the newest Spirit of America was unveiled in Los Angeles, at the Petersen Auto Museum for the benefit of the media. It's appearance was breathtaking: long and sleek, the vehicle has a tiny forward cockpit, much like a jet fighter's. There are three Centerline front wheels, made of aluminum with carbon and glass composite tread capable of withstanding 800 mph, plus an additional wheel positioned on either side of the engine's exhaust and covered by sleek batmobile-like fairings. The car body is steel tubing covered with a stressed aluminum skin—the same construction used in Breedlove's first record-setting Spirit.



The business end of the Spirit, with jet exhaust port and twin 'chutes below.



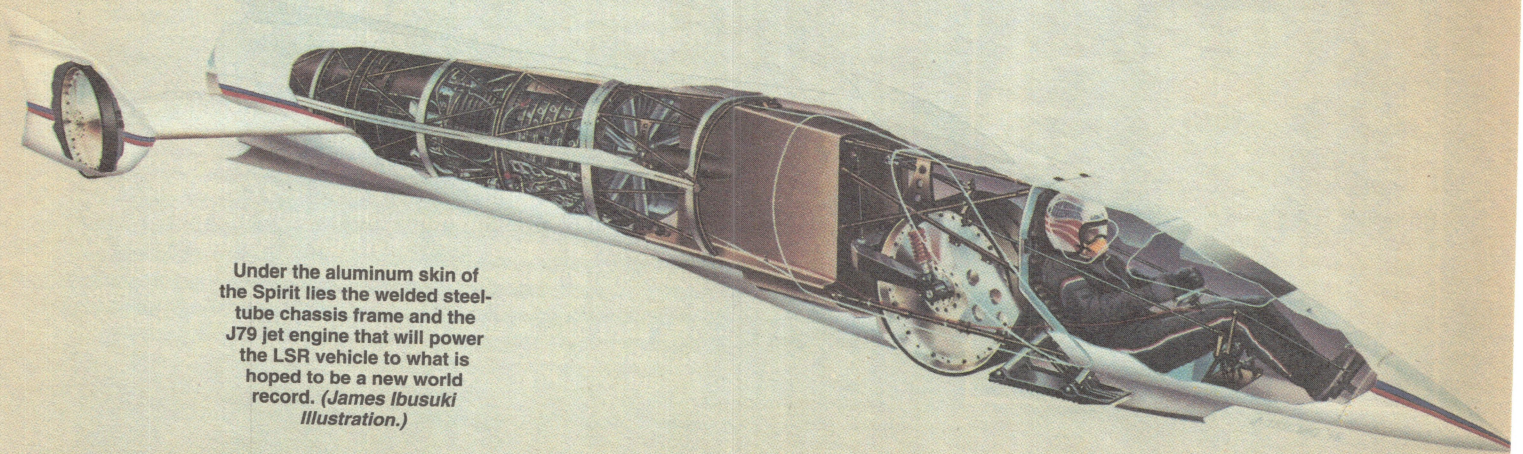


■ ABOVE: Breedlove and Sammy Tasmo Breedlove III, "the most aerodynamic dog we could find to act as team mascot," said Breedlove at the unveiling of his speed machine. Sammy *won't* be going along for the ride.
■ RIGHT: Actor and race driver Craig T. Nelson (left) has purchased rights to Craig Breedlove's life story with the aim of bringing it to the screen.

The current car weighs in at only 8500 pounds, while the J79 jet engine is capable of emitting 22,650 pounds of thrust (about 45,000 hp). Brakes? Well, there's no thought of trying to stop this low-flying jet at speeds above 200, but there is what is called a "friction ski" located right under the driver's seat, which can be deployed to drag along the ground to bring the vehicle to an eventual halt. Over 200 mph, now that's another story. Twin parachutes can be activated to help slow the Spirit, but there is no such thing as a panic stop at these speeds! And that's the reason that Breedlove and other WLSR drivers choose places like Bonneville and Black Rock Mesa for their attempts: a long, long runoff area, about 11 miles in distance. That allows for five miles to get up to speed, a one-mile trap to record the speed, and five more miles to get the vehicle stopped.

The success of the record attempt depends in large part not on Breedlove's design of the LSR vehicle, nor the hard work his team has put into constructing this exquisite speed dart. The most fickle part of the equation is the salt surface at Bonneville and the weather. Though he's reserved the Salt Flats for his initial run, recent summer rains have rendered the surface unsuitable, so Breedlove is turning to his second choice: a dry lake bed at Black Rock Desert in Nevada. Both Breedlove and Englishman Richard Noble have reserved the Black Rock site for their record attempts in September, though Breedlove prefers the harder salt surface at Bonneville. Noble's new car, the Thrust SSC, to be driven by RAF fighter pilot Andy Green, employs two jet engines and weighs 14,500 pounds, is steered from the rear and relies more on brute thrust to get it up to what is hoped a record speed.

Which leaves us with the enviable opportunity to be witness to the culmination of years of effort by these two protagonists as they go virtually head-to-head within sight of one another, on the lonely expanse of desert in northwest Nevada. It should be a memorable show of speed. ●



Under the aluminum skin of the Spirit lies the welded steel-tube chassis frame and the J79 jet engine that will power the LSR vehicle to what is hoped to be a new world record. *(James Ibusuki Illustration.)*

MIRAGE CONTINUED FROM PAGE 68

As you can see, I like the Mirage!

UPGRADES FOR THE MIRAGE

During a recent conversation with Bill Jeric of Thunder Tiger USA, the subject of upgrades came up. They are working on a couple of areas of the car that could be changed for better performance at the higher levels of competition. These include front and rear braces for the chassis along with a fiber type of brake disk for greater durability during long mains. This isn't much considering the complexity of these cars and is proof positive that Thunder Tiger "got it right" the first time through with the design of the Mirage. As these upgrades are developed, I will bring you updates through *Radio Control Model Cars*.

PRODUCT SOURCES

Horizon Hobby Distributors, 4105 Fieldstone Avenue, Champaign, Illinois 61821 (217) 355-9511

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BRP DIRT CONTINUED FROM PAGE 57

#201 Outlaw Wedge Lexan body shell. Throw in an extra pair of orange compound rear tires, four 1/8 I.D. steel .024-inch washers, an Associated ball joint, two Autographics decal sheets, some scrap Lexan sheet and a 3/16-inch I.D. silicone fuel tubing, and you've got everything needed for this conversion.

WHAT WAS MODIFIED ON THE OUTLAW

Three areas on the Super Outlaw received changes during the dirt wedge changeover.

The body mounts, front wheels and rear suspension were all modified during the test. Starting at the front of the chassis I took a pair of orange compound rear tires and fit them on the front spindles. This was done to give the vehicle the look of a full-sized late model which use wide rubber on all four corners of the chassis.

And since both the front and rear wheels found on the BRP have 1/8-inch diameter holes in them, only a narrower hub width was needed to fit the wider rears on the BRP's front axles. I used a fine-tooth X-Acto saw to remove the inside pitch screw area of both rims and the wheels fit the stub axles easily after that.

Some lowering was done to both body mounts on the Super Oval Outlaw to better fit the new wedge body. The front Kydex mount was dropped 3/16 of an inch and some trimming was needed on the rear unit. This mod also required doing some tinkering on the Super's rear suspension setup.

Approximately 5/16 of an inch of Kydex was cut off the rear mount and a new .030-inch Lexan L-piece was servo-taped to the cut down mount. The dirt wedge body now fit the chassis nicely; but the Super's suspension slide rod setup stuck up too far, so some final tweaking was needed.

First, the short stock rod ball end was removed from the car's rear pod bracket and was replaced with a longer one from Associated, along with a 4-40 retaining screw. The ball pivot was used

the BRP Super Outlaw has once again proved its ability to suit any RCers preference whether it's on pavement or dirt.

because the lowered nature of the rear body mount which also doubles as the suspension spring locator. I had to redrill the mount's pivot rod hole in the Kydex, meaning that the stock rod pivot location would cause rod interference with the motor can.

So the longer Associated ball joint raised the rod high enough to both clear the motor and not cause any binding in the pod's movement up and down. The stock twin suspension springs were used on the oval conversion, but a length of silicone tubing replaced the kit's rod locking collar. This was done to give the BRP a bit more flex to allow it to track the dirt turns and bumps a bit better.

The final chassis mod was to add two additional thin steel washers to each side of the Outlaw's rear axle and wheels. This gave the car a slightly wider rear track that looked better with the late-model wedge body.

PAINTING AND DECAL APPLICATION

The body received a two-color paint job, consisting of Pactra's Blue Streak and Daytona Yellow Lexan car paints.

The idea was to recreate a Sunoco-like scheme on the body. Two Autographics decal sheets (#654 and #203-24) features Sunoco decals in several sizes; and this, along with some other Autographics stickers, including their #171-101 number sheet, completed the look.

Some thin foam strip kept the paint from being scraped off the body via the mount plates; and a blue Sharpie marker was used to color coat the two nylon body retainers.

TIME TO RUN IT!

Owing to the car's 1/18-scale dimensions, a suitable-sized clay oval layout was created on a local offroad track. The wide front straightaway was chosen for the oval and its hard-packed clay surface was made from Florida limestone, sugar sand and Georgia red clay.

Once on the dirt, the converted BRP had what I'd call a neutral setup. The wedge would steer thorough the corners without any tendency to push out or oversteer (slide out) the rear. But, I wanted the late model to have the rear a little loose around the corners so a change was made on the radio gear location.

First, the four-cell battery pack that normally resides in the rear of the BRP frame was relocated nearer to the Futaba S132H steering servo.

Next, the Novak 410-M1c ESC went into the pack's spot, thus transferring some weight forward in the car.

This gave the Super more steering and allowed the driver to hang out the rear end and drift the wedge through the turns. The car's short wheelbase makes this kind of touchy to spin out, but one final alteration made this technique slightly easier.

Using a fresh #11 hobby blade, I made some angled slices in the rear foam tire surfaces. These cuts, under the sideloads of cornering, act like traction edges and give the rear tires more grip. Future experiments in this area may include making notches, rather than slits, in the foam tires.

FINAL THOUGHTS

After testing the BRP wedge on several occasions, I have only noted one additional area of modification that might need addressing: excess dirt build up on the BRP's chassis. Since the Oval Outlaw sits so low to the ground, a bunch of loose or wet clay on the track was deposited into every nook and cranny of the wedge's chassis.

Some small homemade Lexan shields mounted to either the inner body shell or the chassis itself should help eliminate this build up.

Beyond this one point, the converted BRP RC car makes a good little dirt oval car. And since it only took a new body and a few small alterations to make it that way, the BRP Super Outlaw has once again proved its ability to suit any RCers preference whether it's on pavement or dirt. So, if the thought of fresh clay and sliding sideways interests you, consider the BRP. You'll find it works great on any surface you can throw at it.

PRODUCT SOURCE

BRP, 1575 Lowell St., Elyria, Ohio 44035. (216) 284-0270.

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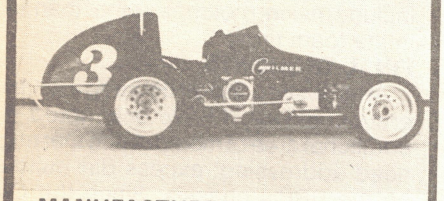

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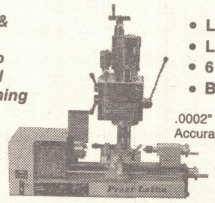

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TRAXXAS

HIGH VOLTAGE EXCITEMENT!

RUSTLER

Model **3701** unassembled kit
Model **3710** Ready-to-run

BANDIT

Model **2401** unassembled kit
Model **2410** Ready-to-run

STAMPEDE

Model **3601** unassembled kit
Model **3610** Ready-to-run

A Traxxas ready-to-run car or truck puts you behind the wheel and ***in control*** fast! Drop in a charged battery pack, and you're racing within minutes (no assembly required). You get ***all the performance*** you need to blast killer rooster tails, catch major air, or burn up the asphalt.

OFF-ROAD

Get serious in the dirt with the ultimate performance machines, Traxxas ***Bandit, Rustler, and Stampede***. They're designed for the driver who wants to ***go fast, have fun, and spend less.*** We're not talking bare bones beginner cars or stripped-down racers here. Each is fully-loaded with trick custom parts like long-travel, fully-independent suspension; adjustable, oil-filled shocks; efficient 48-pitch gears; steel-gear differential; Rigid, dual-plane, fiber-composite chassis; and the hot, new Stinger™ 20-turn motor (***30% faster*** than our standard RS-540SH motors).

Go for the ***Rustler*** for unequalled stadium race truck action. Its superb handling, speed, and balance will help you outrun and out-corner trucks costing twice as much. Check out the ***Bandit*** for a super-quick, agile buggy that claws its way to the front of the pack. Its perfect for the racetrack or anywhere you want to run. The ***Stampede*** is the first high-performance monster truck. Its awesome ground clearance, long-travel racing suspension, and huge monster tires will tackle the extreme terrain that others wouldn't dare touch.

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The Traxxas Spirit could be the "ultimate parking lot racer." It's equipped with adjustable oil-filled shocks and rubber tires, so it can handle the ruts and bumps of "real-world" pavement. The Stinger™ 20-turn motor and sleek, full-coverage body keep the action fast. It's hard to believe that Spirit is the least-expensive, ready-to-run, hobby-class truck on the market. A complete Spirit package can be half the price of some other race cars. Two can go racing for the price of one. Get your buddy, get your dad, get the whole family involved. Up to six people can race at one time! Now that's the Spirit of competition!

SPIRIT

Model 1209 Ready-to-run

Bodies shown are custom painted. Ready-to-runs are fully assembled.
Batteries and charger not included. Kits include motor and rotary speed control.

RUSTLER



STAMPEDE



BANDIT



SPIRIT



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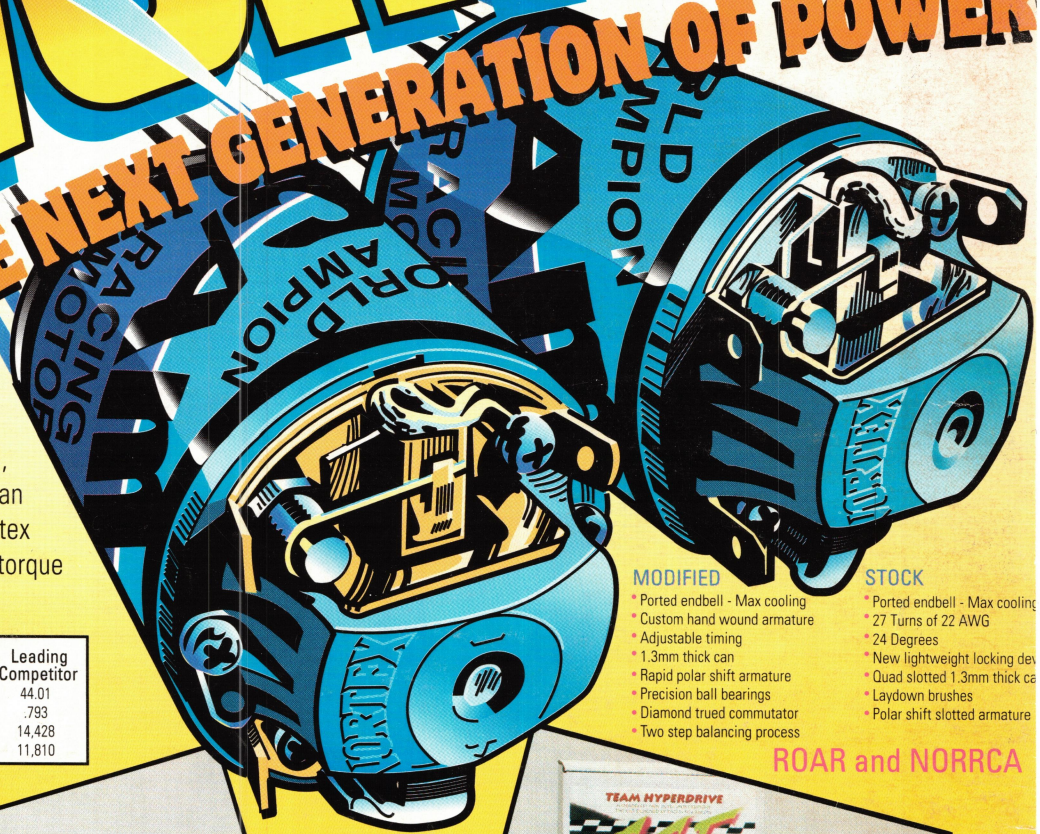
Max Torque (in./oz.)	.809	.793
Peak RPMs	16,227	14,428
Peak Efficiency Reached (RPMs)	12,415	11,810



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